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Are Certain Elections More Predictable Than Others? A
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Characteristics Upon the Predictability of British
National Elections From 1945 to 2017.

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Department of Political and Cultural Studies

Swansea University

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Abstract

Despite a wealth of literature existing with regards to electoral prediction, no pieces exist that address whether certain elections are more predictable than others. Indeed, the existing literature invariably focuses upon the accuracy and efficacy of the methods used to predict elections, without addressing the nature of the elections that are being predicted. Consequently, a fundamental avenue of enquiry remains unexplored within the current literature, resulting in a stark and surprising lacuna and rendering the dominant paradigm problematic. To remedy this deficiency, this paper addresses whether certain elections are more predictable than others and ascertains which characteristics cause their predictability to vary. Owing to both temporal and spatial limitations, electoral predictability is addressed with a specific focus on British national elections from 1945 to 2017.

In order to achieve its aims, this paper engages in a series of bivariate analyses between measures of predictive accuracy and electoral characteristics. Specifically, the correlation between the total dichotomous and total mean absolute error exhibited by pre-election polls conducted for the twenty-three studied elections and six specified electoral characteristics is ascertained and utilised to draw conclusions. Ultimately, this paper finds that certain elections are indeed more predictable than others, with certain characteristics having a greater impact on the studied measures of predictability than others. However, due to both the small size of the utilised data set and its limited scope, it is accepted that the conclusions drawn are only indicative in nature. Despite this, owing to the unique nature of this paper, it is hoped that the conclusions drawn will provide a foundation for the future exploration of this hitherto unexplored avenue of enquiry to further our collective understanding of the predictability of elections.

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Supervision	Date, duration	Notes	Initials Supervisor	Initials student
1: Brief outline of research question and preliminary title (by pre June)	30/05/2017 1 hour	Outline agreed.	MW	J.T.
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5: Submission (30 September)	20/09/2017 1 hour	Final draft approved	MW	J.T.

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Table of Contents

Abstract.....	i
Declarations and Statements.....	ii
Table of Contents	iii
Acknowledgements	v
List of Tables	vi
List of Figures.....	vii
Introduction.....	1
Chapter One: Literature Review.....	5
Polls-based Approaches to Electoral Prediction.....	6
Alternative Methods of Electoral Prediction	21
The More Things Change, the More They Stay the Same.....	30
Chapter Two: Theory and Hypotheses.....	32
Conceptualisation and Dependent Variables	32
Independent Variables and Hypotheses.....	41
Chapter Three: Methodology	49
Chapter Four: Analysis.....	59
Macro-level Analysis.....	59
Bivariate Analysis.....	64
Conclusion	87

Appendices	92
Appendix A: Tabulation of Raw Variable Measurements.....	92
Appendix B: Normalised Party Vote Shares	93
Bibliography	94

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List of Tables

Table 1 – Measurements of Total Mean Absolute Error.....	60
Table 2 – Measurements of Total Dichotomous Error.....	62
Table 3 – The Bivariate Correlation Between Total Dichotomous Error and Independent Variables	65
Table 4 – A T-Test of Total Dichotomous Error and the Closeness of the Race.....	70
Table 5 – The Bivariate Correlation Between Total Mean Absolute Error and Independent Variables	73
Table 6 – The Bivariate Correlation Between Total Mean Absolute Error and Independent Variables When Total Mean Absolute Error is Less Than Four	77

List of Figures

Figure 1 – Density of Total Mean Absolute Error Values.....	61
Figure 2 – Density of Total Dichotomous Error Values.....	63
Figure 3 – A Scatter Graph Displaying the Bivariate Correlation Between Total Mean Absolute Error and the Effective Number of Parties in an Election	74
Figure 4 – The Bivariate Correlation Between Total Mean Absolute Error and Proximity to the Present	76
Figure 5 – The Bivariate Correlation Between Total Mean Absolute Error and Strong Party Identification	82

Introduction

In 2016, the outcomes of the U.S. presidential election and the EU referendum in the United Kingdom ran contrary to the majority of predictions.¹ Indeed, owing to their ramifications, they constituted two of the starkest failures of electoral prediction in recent memory and undermined popular faith in polling.² However, these predictive failures were not isolated or anomalous incidents and certainly were not without historical precedent. Pre-election polling failed to predict the outcome of elections in 1948,³ 1970,⁴ and 2015 prior to the bifold failure of 2016.⁵ Moreover, polls also largely missed the mark in the 2017 general election in the United Kingdom.⁶ Each of these failures was swiftly followed by post-mortem analyses questioning why the polls failed.⁷ Indeed, such analyses are ubiquitous in both academic literature and the media. Despite their abundance, these analyses invariably adopt an

¹ Carl Bialik and Harry Enten, *The Polls Missed Trump. We Asked Pollsters Why.* (2016), <<https://fivethirtyeight.com/features/the-polls-missed-trump-we-asked-pollsters-why/>> [accessed 15/09/2017]; Chris Cillizza, *How Did Polls Miss the Presidential Election Result So Badly?* (2016), <<https://www.nytimes.com/2017/05/31/upshot/a-2016-review-why-key-state-polls-were-wrong-about-trump.html?mcubz=1>> [accessed 15/09/2017]; Natalie Jackson, *How Brexit Polls Missed the 'Leave' Victory* (2016), <http://www.huffingtonpost.com/entry/brexit-polls-missed_us_576cb63fe4b017b379f58610> [accessed 15/09/2017].

² Kristen Soltis Anderson and Patrick Ruffini, 'How to Restore Faith in Election Forecasting', *Gulf News*, 27 November 2016 <<http://gulfnews.com/opinion/thinkers/how-to-restore-faith-in-election-forecasting-1.1936112>> [accessed 15/09/2017].

³ Warren J. Mitofsky, 'Review: Was 1996 a Worse Year for Polls Than 1948?', *The Public Opinion Quarterly*, 62.2 (1998), 230-249 (p. 230).

⁴ Patrick Hennessy and Tony Freinberg, *Labour Couldn't Lose – Until It Did* (2005), <<http://www.telegraph.co.uk/news/uknews/1489080/Labour-couldnt-lose-until-it-did.html>> [accessed 15/09/2017]; BBC, *1970: Shock Election Win For Heath* (2008), <http://news.bbc.co.uk/onthisday/hi/dates/stories/june/19/newsid_3829000/3829819.stm> [accessed 15/09/2017].

⁵ Tom Clark, *The 2015 Election Disaster Doesn't Mean We Should Give Up On Polling* (2015), <<https://www.theguardian.com/commentisfree/2015/may/12/2015-election-polling-pollsters>> [accessed 15/09/2017].

⁶ Ashley Kirk, *How Did the Pollsters Get the General Election So Wrong Again?* (2017), <<http://www.telegraph.co.uk/news/0/general-election-did-polls-get-wrong-failing-see-theresa-mays/>> [accessed 15/09/2017].

⁷ The Week, *Election Polls 2015: What Went Wrong?* (2016), <<http://www.theweek.co.uk/election-2015/62834/election-polls-2015-what-went-wrong>> [accessed 15/09/2017]; Daniel Katz, 'An Analysis of the 1948 Polling Predictions', *Journal of Applied Psychology*, 33.1 (1949), 15-28 (p. 15); Andrew Gelman, *Brexit Polling: What Went Wrong?* (2016), <<http://andrewgelman.com/2016/06/24/brexit-polling-what-went-wrong/>> [accessed 15/09/2017]; Edward Malnick, *Revealed: How the Pollsters Got it Wrong – Again* (2017), <<http://www.telegraph.co.uk/news/2017/06/09/revealed-pollsters-got-wrong/>> [accessed 16/09/2017].

introspective stance and focus on the perceived methodological deficiencies of polling.

Resultantly, none exist that adopt an extrospective standpoint and address the nature of the elections that are being predicted. Consequently, no substantive literature currently exists that addresses whether certain elections are more predictable than others. Thus, a prominent lacuna exists.

Ultimately, the identified lacuna is extremely surprising, as given the interest of the media in addressing polling inaccuracy in the wake of predictive failures,⁸ along with the wealth of academic literature pertaining to electoral prediction,⁹ it would be expected that something as fundamental as whether certain elections are more predictable than others would have been addressed previously. However, it has not, and elections are currently homogenised in analyses, with the characteristics that make even nominally similar cases distinct remaining universally ignored. Thus, a whole avenue of enquiry remains unexplored within the dominant paradigm, rendering it problematic and undermining our understanding of the predictability of elections. This paper intends to remedy this deficiency and fill the lacuna in not only the literature, but also our collective understanding. In order to achieve this, this paper will engage in a unique and potentially paradigmatically significant study of the impacts of the characteristics of elections

⁸ ITV, *Times the Election Polls Got It Wrong* (2017), <<http://www.itv.com/news/2017-04-18/times-the-election-polls-got-it-wrong/>> [accessed 17/09/2017]; John Rentoul, *The Opinion Polls Got it Wrong Yet Again – they Cannot Predict Modern Democracy at Work* (2016), <<http://www.independent.co.uk/voices/donald-trump-us-election-2016-hillary-clinton-pollsters-got-it-wrong-predict-modern-democracy-a7406456.html>> [accessed 17/09/2017]; David Millward, *How the Pollsters Got the US Election Wrong – Just Like Brexit* (2016), <<http://www.telegraph.co.uk/news/2016/11/09/how-the-pollsters-got-the-us-election-wrong---just-like-brexit/>> [accessed 17/09/2017].

⁹ Josh Pasek, 'Predicting Elections: Considering Tools to Pool the Polls', *Public Opinion Quarterly*, 79.2 (2015), 594-619 (p. 594); John Antonakis and Olaf Dalgas, 'Predicting Elections: Child's Play!', *Science*, 323.5918 (2009), 1183-1183 (p. 1183); Thomas J. Bouchard, 'The Lost-Letter Technique: Predicting Elections', *Psychological Reports*, 25.1 (1969), 231-234 (p. 231).

upon their predictability, with a specific focus on British national elections from 1945 to 2017. Accordingly, it will endeavour to answer the following research question:

Are certain elections more predictable than others? If so, what are the characteristics which cause their predictability to vary?

In order to effectively answer both facets of the stated research question, this paper will be divided into four substantive chapters and a conclusion. The first chapter will systematically review the existing academic literature pertaining to electoral prediction. Therein, the existing literature will be reviewed in a chronological manner, from the birth of polling in 1916 to the 2017 general election in the United Kingdom. The themes that run throughout the literature will be identified in order to ascertain the scope and focus of existing works. Moreover, it will be shown that no substantive literature has been written with regards to whether certain elections are more predictable than others, thereby confirming the lacuna that this piece intends to address and cementing its unique nature.

Once the existing literature has been reviewed, the second chapter will proceed to address the theory that underpins electoral prediction and will utilise theories and knowledge that exist within the broader discipline of political science to derive testable hypotheses. It will begin by ascertaining the nature and limitations of predictability, along with defining predictive accuracy in a bifold manner and showing that certain phenomena are more predictable than others. Thereafter, the bifold definition of predictive accuracy will be applied directly to pre-election polling and both the dichotomous and continuous measures of accuracy will be explicated, ultimately serving as the dependent variables of this paper. Finally, the independent variables from the study will be identified and utilised to derive testable hypotheses.

After the establishment of the hypotheses, the third chapter will address the methodology. Therein, the temporal and geographical scope of the paper will be outlined and justified. Once this is complete, both the dependent and independent variables will be operationalised in order to allow them to be utilised in later quantitative analysis. Within this process, the sources of data from which the independent variable measurements are derived will be stated. Finally, the methods by which the data will be analysed, and thus how the hypotheses will be tested, will be addressed.

With the variables operationalised and analytical methods explicated, the fourth chapter will analyse the gathered data and test the stated hypotheses. This analysis will broadly be bipartite in nature, comprising two sections: macro-level analysis and bivariate analysis. These sections will then be subdivided and address both dichotomous and continuous measures of accuracy. Ultimately, the macro-level analysis will identify overarching trends within the data, whilst the bivariate analysis will comprise in-depth investigation in order to explicitly test the hypothesised relationships.

Once the analysis is complete, the paper will proceed to the conclusion. Therein, the analytical findings will be summarised and applied directly to the stated hypotheses to test their veracity. Thereafter, these findings will be utilised to provide an answer to whether certain elections are more predictable than others and, if so, which characteristics cause their predictability to vary. However, the answer provided by this paper will necessarily be qualified by its limitations. Thus, with the research question and structure established, this paper will proceed to review the existing literature.

Chapter One: Literature Review

An expansive and multi-faceted literature exists with regards to electoral prediction. This review will characterise the existing literature with a focus on pre-election polling, as it stands as the predominant means of electoral forecasting.¹⁰ However, alternative approaches to electoral prediction will also be addressed in order to provide a full account of the literature.

This review will take a chronological approach to the literature from the emergence of the *Literary Digest* in 1916 to the failure of polls to predict the outcome of the 2017 general election in the United Kingdom. It will identify that a trend of post hoc methodological critique and revision exists within the literature, especially in the wake of predictive failure, along with the fact that the preponderance of literature focuses on predictive accuracy.

In order to address these trends, a broadly quadripartite approach will be utilised. Four waves of literature will be identified as having emerged in the wake of the predictive failures of 1936, 1948, 1970, and 2015, with methodological critique and revision, along with a focus on predictive accuracy running throughout the intervening years. Moreover, it will be shown that online analyses in the wake of the bifold 2016 predictive failure and the 2017 general election in the United Kingdom stand as potential precursors to the emergence of a fifth wave of post hoc methodological critique, thereby continuing the trend. Thereafter, the review will address alternative methods of electoral prediction to show the extent of the current academic literature and provide further evidence for identified themes.

¹⁰ David Rothschild, 'Forecasting Elections: Comparing Prediction Markets, Polls, and their Biases', *Public Opinion Quarterly*, 73.5 (2009), 895-916 (p. 895).

Although the identification of these themes is significant, what is most important for this review is what is not present within the literature. This review will show that the continuous focus on introspective, post hoc methodological critique has resulted in a lack of academic literature taking an extrospective view and focusing on the impact of the characteristics of elections upon their predictability. Ultimately, this review will highlight that the one piece of literature that briefly addresses the impact of the characteristics of elections upon their predictability – that of Gelman and King in 1993¹¹ – is underdeveloped, fundamentally different to what is being attempted herein, and has not been built upon by subsequent academic work, resulting in a prominent lacuna. This lacuna will then be reinforced by highlighting that the impact of the characteristics of elections upon their predictability has also not been substantively addressed in literature addressing alternative methods of prediction.

Polls-based Approaches to Electoral Prediction:

Despite scholars holding that straw polls date back to the 1824 U.S. presidential election,¹² and the fact that early literature, such as the *Farm Journal* and *Pathfinder*,¹³ was the focus of animus

¹¹ Andrew Gelman and Gary King, 'Why Are American Presidential Election Campaign Polls So Variable When Votes Are So Predictable?', *British Journal of Political Science*, 23.4 (1993), 409-451 (p. 419).

¹² Tom W. Smith, 'The First Straw? A Study of the Origins of Election Polls', *Public Opinion Quarterly*, 54.1 (1990), 21-36 (p. 21); James W. Tankard Jr., 'Public Opinion Pollings by Newspapers in the Presidential Election Campaign of 1824', *Journalism Quarterly*, 49 (1972), 361-365 (p. 361); George Gallup and Saul Rae, *The Pulse of Democracy: The Public-Opinion Poll and How It Works*, (New York: Simon and Schuster, 1940), p.3; George Gallup, *The Sophisticated Poll Watcher's Guide*, (Princeton: Princeton Opinion Press, 1972), p. 240; William Lydgate, *What America Thinks*, (New York: Thomas Y. Crowell, 1944), pp. 1-3; Mildred Parten, *Surveys, Polls, and Samples: Practical Procedures*, (New York: Harper and Brothers, 1950), pp. 1-2; Catherine Marsh, 'Opinion Polls – Social Science or Political Manoeuvre?', in *Demystifying Social Statistics* ed. by John Irvine, Ian Miles, and Jeff Evans, (London: Pluto Press, 1979), p. 268-289; L. N. Webb and R. J. Wybrow, 'Polls in a Changing World', *Journal of the Market Research Society*, 16.263 (1974), 263-269 (p. 264).

¹³ Claude E. Robinson, *Straw Votes: A Study of Political Prediction*, (New York: Columbia University Press, 1932), pp. 47-51; Barbara A. Bardes and Robert W. Oldendick, *Public Opinion: Measuring the American Mind*, (Lanham: Rowman and Littlefield, 2016), p. 18.

due to inaccuracy,¹⁴ for the purposes of this review, the emergence of the *Literary Digest* in 1916 serves as the first significant literary occurrence.¹⁵ Despite successfully predicting the outcome of U.S. presidential elections in 1920,¹⁶ 1924,¹⁷ 1928,¹⁸ and 1932¹⁹, the *Literary Digest* incorrectly predicted that Landon would win the 1936 election.²⁰ Conversely, the competing quota sampling surveys conducted by Gallup, Roper, and Crossley correctly predicted the election.²¹ In the wake of the failure of the *Literary Digest*, the first wave of literature engaging in methodological critique was born.

The First Wave of Methodological Critique

The predictive outcome of the 1936 U.S. election is of bifold significance. Firstly, the victory of quota sampling polls over straw polls established scientific pre-election polls as the worldwide standard for electoral prediction, resulting in a significant increase in polling literature.²² Secondly, the predictive failure of the *Literary Digest* brought about the first wave of introspective, post hoc methodological critique and revision, establishing a theme which runs throughout the subsequent literature.

¹⁴ Archibald M. Crossley, 'Straw Polls in 1936', *The Public Opinion Quarterly*, 1.1 (1937), 24-35 (p. 24); Nick Moon, *Opinion Polls: History, Theory and Practice*, (Manchester: Manchester University Press, 1999), p. 8.

¹⁵ The Literary Digest, 'Political Reports from 3,000 Communities', *The Literary Digest*, 28 October 1916, pp. 1087-1091.

¹⁶ The Literary Digest, 'How the Straws Say the Election Will Go', *The Literary Digest*, 23 October 1920, p. 14

¹⁷ The Literary Digest, '2,386,052 Straws Forecast Tuesday's Tempest', *The Literary Digest*, 1 November 1924, pp. 5-8.

¹⁸ The Literary Digest, 'Final Returns in the Digest's Presidential Poll', *The Literary Digest*, 3 November 1928, pp. 5-7.

¹⁹ The Literary Digest, 'Roosevelt Bags 41 States Out of 48', *The Literary Digest*, 5 November 1932, pp. 8-9.

²⁰ The Literary Digest, 'Landon, 1,293,669; Roosevelt, 972,897', *The Literary Digest*, 31 October 1936, pp. 5-6.

²¹ Peverill Squire, 'Why the 1936 Literary Digest Poll Failed', *The Public Opinion Quarterly*, 52.1 (1988), 125-133 (p. 126); David Freedman, Robert Pisani, and Roger Purves, *Statistics*, (New York: W. W. Norton and Co., 1978), p. 303; Adam J. Berinsky, 'American Public Opinion in the 1930s and 1940s', *Public Opinion Quarterly*, 70.4 (2006), 499-529 (p. 501); Harold F. Gosnell, 'How Accurate Were the Polls?', *Public Opinion Quarterly*, 1 (1937), 97-105 (p. 104).

²² Rothschild, p. 895.

The failure of the *Literary Digest* vindicated the methodological critique of sampling techniques that Gallup published in 1936 and resulted in a post-mortem to identify how the publication failed.²³ The *Literary Digest* concluded that issues of survey response existed, but offered no remedy for them.²⁴ Moreover, pollsters and academics argued that response bias was to blame.²⁵ Thus, the precedent for introspective post-mortem analysis in the wake of predictive failure was established.

Despite the success of Gallup and company, a focus upon the predictive accuracy of polls rose in the literature. Indeed, in 1937, Crossley questioned whether it was possible to accurately forecast elections using polls, concluding that it was provided that the samples utilised were representative.²⁶ However, such confidence was not shared by his contemporaries, many of whom questioned the efficacy of polls.²⁷ Thus, not only did the predictive failure of 1936 give rise to post hoc methodological critique, but it also gave rise to the literary focus on the accuracy of polling. Ultimately, this literary theme continued in, and was furthered by, the second wave of methodological critique that rose soon after.

The Second Wave of Methodological Critique

The failure of polls to predict the victory of Truman in the 1948 U.S. presidential election brought about a second wave of introspective, post hoc methodological critique within the literature, which was largely characterised by continuity. Indeed, in the same vein as the

²³ Susan Ohmer, *George Gallup in Hollywood*, (New York: Columbia University Press, 2012), p. 57; Katherine A. Bradshaw, 'America Speaks: George Gallup's First Syndicated Public Opinion Poll', *Journalism History*, 31.4 (2006), 198-206 (p. 201); Jean Converse, *Survey Research in the United States*, (Berkeley: University of California Press, 1987), p. 117.

²⁴ The Literary Digest, 'What Went Wrong with the Polls?', *The Literary Digest*, 14 November 1936, pp. 7-8.

²⁵ Daniel Katz and Hadley Cantril, 'Public Opinion Polls', *Sociometry*, 1 (1948), 155-179 (pp. 167-168); Crossley, p. 27; Gosnell, p. 108.

²⁶ Crossley, p. 24.

²⁷ Lucien Warner, 'The Reliability of Public Opinion Surveys', *The Public Opinion Quarterly*, 3.3 (1939), 376-390 (p.376); Harold F. Gosnell and Sebastian de Grazia, 'A Critique of Polling Methods', *The Public Opinion Quarterly*, 6.3 (1942), 378-390 (p. 378); Katz and Cantril, p. 155.

analysis conducted by the *Literary Digest* on survey response, Crespi argued in 1948 that the interview effect results in unrepresentative survey responses.²⁸ The critique of sampling methodology posited by Gallup was also built upon in a study by Hochstim and Smith in the same year which criticised quota sampling, holding that it was less accurate than probability sampling.²⁹ Continuity was also evident in literature produced in 1949. Indeed, Terris posited that the questions asked by pollsters were too difficult to be fully understood by the populace at large, resulting in unrepresentative responses.³⁰ Additionally, Rogers criticised the control of question and interviewer biases inherent within polling.³¹ Thus, both built upon the previous work on survey response by Crespi and the *Literary Digest* and continued the theme of post hoc methodological critique.

However, literature produced in the wake of 1948 was not solely characterised by continuity. Indeed, in 1949, a post-election analysis by the Social Science Research Council progressed the methodological critique of polling. It criticised the polls conducted for the 1948 election for inadequately handling undecided voters, failing to screen non-voters out of samples, and failing to measure late changes in voter intention. Ultimately, the Council demanded that pollsters improve their accuracy by utilising probability sampling.³² This stood as one of the first examples of methodological revision in the face of predictive failure.³³

²⁸ Leo P. Crespi, 'The Interview Effect in Polling', *The Public Opinion Quarterly*, 12.1 (1948), 99-111 (p. 110).

²⁹ Joseph R. Hochstim and Dilman M. K. Smith, 'Area Sampling or Quota Control? Three Sampling Experiments', *The Public Opinion Quarterly*, 12.1 (1948), 73-80 (pp. 73-80).

³⁰ Fay Terris, 'Are Poll Questions Too Difficult?', *The Public Opinion Quarterly*, 13.2 (1949), 314-319 (p. 314).

³¹ Lindsay Rogers, *The Pollsters: Public Opinion, Politics, and Democratic Leadership*, (New York: Alfred A. Knopf, 1949), p. 124.

³² Mosteller et al., *The Pre-Election Polls of 1948: The Report to the Committee on Analysis of Pre-Election Polls and Forecasts*, (New York: Social Science Research Council, 1949), pp. 41-84.

³³ Martin R. Frankel and Lester R. Frankel, 'Fifty Years of Survey Sampling in the United States', *The Public Opinion Quarterly*, 51.2 (1987), 127-138 (p. 129).

The theme of methodological revision in the wake of predictive failure was continued by Gallup in 1951. Gallup highlighted how issues regarding the prediction of the 1948 election had been remedied to accurately predict the 1950 U.S. congressional races.³⁴ 1951 also saw the continuation of post hoc methodological critique, as a study by Haner and Meir corroborated the earlier work of Hochstim and Smith, concluding that quota sampling was less accurate than probability sampling.³⁵ Despite this continuity, the 1950s also saw progression in the methodological critique of polling. Indeed, in 1953, some of the first pieces of literature to address response and non-sampling error within polls were published.³⁶

Ultimately, the literature produced in the wake of the 1948 predictive failure and throughout the 1950s focused on introspective, post hoc methodological critique and revision. Moreover, literature focused on methodological revision conformed to the literary focus on predictive accuracy. However, no literature was produced that utilised an extrospective view to ascertain if the 1948 election possessed characteristics that made it more difficult to predict than other elections. Thus, a lacuna was beginning to form.

Literature produced in the 1960s encompassed both methodological critique and a focus on predictive accuracy, and primarily built upon past work. Indeed, issues of survey response were once again addressed in 1960 when Perry found that the accuracy of polls was undermined by the fact that many respondents who state that they intend to vote do not

³⁴ George Gallup, 'The Gallup Poll and the 1950 Election', *The Public Opinion Quarterly*, 15.1 (1951), 16-22 (pp. 16-22).

³⁵ Charles F. Haner and Norman C. Meir, 'The Adaptability of Area-Probability Sampling to Public Opinion Measurement', *Public Opinion Quarterly*, 15.2 (1951), 335-352 (pp. 335-352).

³⁶ Morris H. Hansen, William N. Hurwitz, and William G. Madow, *Sample Survey Methods and Theory*, (New York: John Wiley and Sons Inc., 1953), pp. 1-77; William Gemmell Cochran, *Sampling Techniques*, (New York: John Wiley and Sons Inc., 1953), pp. 290-330.

actually do so.³⁷ Additionally, predictive accuracy was raised by Bernard and Hennessy in 1961 who argued that no polls forecasted close elections in 1960 with sufficient accuracy.³⁸

Methodological critiques of sampling were also perpetuated in 1962 when Plowman contended that public opinion was too complex to be measured by the arbitrary cross sections of responses derived from sampling.³⁹ Moreover, in 1965, Kish furthered criticism regarding non-sampling error.⁴⁰ Additionally, in 1969, Crossley and Crossley also progressed methodological criticism by positing that pollsters create the very public sentiment that they measure.⁴¹

Thus, the literature of the 1960s conformed to the theme of methodological critique and both sustained and furthered past criticism. Furthermore, it is evident that the literature was preponderantly focused on predictive accuracy. However, there was once again no literature produced pertaining to whether certain elections are more predictable than others, thereby exacerbating the lacuna. Ultimately, these identified themes rose again in 1970 with the third wave of methodological critique.

The Third Wave of Methodological Critique

The failure of polls to predict the outcome of the 1970 general election in the United Kingdom gave rise to a third wave of post hoc methodological critique and revision in the literature. Most academics echoed similar criticisms to those voiced by the Social Research Council in 1948, holding that a late swing in voter intention and low turnout caused the

³⁷ Paul Perry, 'Election Survey Procedures of Gallup Poll', *Public Opinion Quarterly*, 24 (1960), 531-542 (p. 534).

³⁸ Bernard C. Hennessy and Erna R. Hennessy, 'The Prediction of Close Elections: Comments on Some 1960 Polls', *The Public Opinion Quarterly*, 25.3 (1961), 405-411 (p. 409).

³⁹ D. E. G. Plowman, 'Public Opinion and the Polls', *The British Journal of Sociology*, 13.4 (1962), 331-349 (p. 331).

⁴⁰ Leslie Kish, *Survey Sampling*, (New York: John Wiley and Sons, 1965), pp. 1-297.

⁴¹ Archibald M. Crossley and Helen M. Crossley, 'Polling in 1968', *The Public Opinion Quarterly*, 33.1 (1969), 1-16 (p. 1).

failure.⁴² Accordingly, continuity can be seen in the literature. However, literature produced in the 1970s also contained progressive methodological critiques. Indeed, in 1970, Abrams not only challenged the assertion that low turnout was responsible for the predictive failure, but also criticised polls for underestimating uncommitted and abstinent voters.⁴³ Additionally, in 1979, Bourdieu progressed criticism regarding survey response, holding that surveys were based upon the flawed assumption that every respondent has a political opinion and that all opinions have the same value.⁴⁴

The focus on the predictive accuracy of polls was also evident in literature produced in the 1970s. In 1978, Smith investigated the impact of methodological differences between pollsters, known as house effects, upon the predictive accuracy of polls.⁴⁵ Additionally, in 1979, Anderson, Kasper, and Frankel analysed non-response, measurement, and processing error in order to increase polling accuracy.⁴⁶

Thus, the literature of the 1970s was once again primarily concerned with introspective, post hoc methodological critique in the wake of predictive failure. Moreover, the focus on polling accuracy was also evident. However, no literature was produced which questioned whether the 1970 general election was less predictable than other elections, furthering the prominence of the lacuna.

⁴² David Butler and M. Pinto-Duschinsky, *The British General Election of 1970*, (London: Macmillan, 1971), p. 181; Richard Hodder-Williams, *Public Opinion Polls and British Politics*, (London: Routledge, 1970), p. 92; R. Rose, 'The Polls and the 1970 General Election', *University of Strathclyde Survey Research Centre, Occasional Paper No. 7*; F. Teer and J. Spence, *Political Opinion Polls*, (London: Hutchinson University Library, 1973), p. 207.

⁴³ Mark Abrams, 'The Opinion Polls and the 1970 British General Election', *The Public Opinion Quarterly*, 34.3 (1970), 317-324 (p. 321).

⁴⁴ Pierre Bourdieu, 'Public Opinion Does Not Exist', in *Communication and Class Struggle* ed. by A. Mattelart and S. Siegelau (New York, International General, 1979), pp. 124-130.

⁴⁵ Tom W. Smith, 'In Search of House Effects: A Comparison of Responses to Various Questions by Different Survey Organizations', *The Public Opinion Quarterly*, 42.4 (1978), 443-463 (pp. 443-463).

⁴⁶ Ronald Anderson, Judith Kasper, and Martin R. Frankel, *Total Survey Error*, (San Francisco: Jossey-Bass Publishers, 1979), pp. 1-296.

The 1980s saw a significant growth in pre-election polls due to telephone polling.⁴⁷ Despite this technological advancement, methodological criticism of polling was still prevalent within the literature and was largely characterised by continuity. Indeed, in 1980, Noelle-Neuman held that some respondents voice support for popular candidates when polled, irrespective of their true opinions, thereby undermining the predictive utility of polls.⁴⁸ Additionally, in 1984, Crespi and Morris addressed survey response, arguing not only that question order alters the answers given by respondents, but also that the inclusion of Likert statements in surveys was methodologically flawed, as respondents are more inclined to agree with statements that they possess little knowledge about.⁴⁹

Further continuity can be seen by the fact that the previous methodological critique of Bourdieu was advanced by Rosenberg in 1988 who held that public opinion could not exist independent of pollsters' attempts to ascertain it, rendering it useless as a predictive metric.⁵⁰ In the same year, Crespi re-addressed the work of the Social Research Council in 1948.⁵¹ Ultimately, he concluded that the issues identified in 1948 were still prevalent and furthered methodological critique by arguing that forecasts varied based on how pollsters defined likely voters.⁵² Additionally, Borrelli, Lockerbie, and Niemi addressed the impact of the house effect upon the variance of polls, thereby continuing the work of Smith.⁵³ Moreover, myriad literature was produced during the 1980s which continued methodological critiques

⁴⁷ Mark Blumenthal, 'Toward an Open-Source Methodology: What We Can Learn from the Blogosphere', *Public Opinion Quarterly*, 69.5 (2005), 655-669 (pp. 656-657).

⁴⁸ Elisabeth Noelle-Neuman, *The Spiral of Silence*, (Munich: R. Piper and Company, 1980), p. 59.

⁴⁹ Irving Crespi and Dwight Morris, 'Question Order and the Measurement of Candidate Preference in the 1982 Connecticut Elections', *Public Opinion Quarterly*, 48.3 (1984), 578-591 (pp. 578-591).

⁵⁰ Alexander Rosenberg, *Philosophy of Social Science*, (Boulder: Westview Press, 1988), pp. 102-103.

⁵¹ Irving Crespi, *Pre-Election Polling: Sources of Accuracy and Error*, (New York: The Russell Sage Foundation, 1988), pp. 1-220.

⁵² I. Crespi, p. 170.

⁵³ Stephen Borrelli, Brad Lockerbie, and Richard G. Niemi, 'Why the Democrat-Republican Partisanship Gap Varies from Poll to Poll', *The Public Opinion Quarterly*, 51.1 (1987), 115-119 (p. 118).

surrounding errors inherent within polls and was largely concerned with improving polling accuracy.⁵⁴

Despite primarily being a decade of continuity, the 1980s also saw progression within the literature regarding methodological critique. Indeed, in 1984, Lang and Lang were amongst the first to contend that the time at which a poll is conducted affects its utility, holding that if a poll is conducted too far in advance of an election, the answers given by respondents are unrepresentative of the final result.⁵⁵

Thus, the literature produced during the 1980s followed the theme of methodological critique, encompassing both continuity and progression. Moreover, it largely conformed to the literary focus on accuracy. However, once again the literature produced was universally introspective in focus, with no pieces adopting an extrospective stance and addressing whether certain elections are more predictable than others, thereby exacerbating the lacuna.

Literature produced in the 1990s was largely characterised by refutation of past arguments and progression of methodological critique. Indeed, in 1994, Lau questioned Smith and Borrelli, arguing that house effects did not appreciably affect the prediction of the 1992 U.S. presidential election.⁵⁶ Additionally, Erikson and Wlezien argued in 1999 that house effects only partially accounted for the variance between pollsters, holding that design error also varies and substantially impacts the variance of polls.⁵⁷ Furthermore, in the same year, Lewis-

⁵⁴ Philip E. Converse and Michael W. Traugott, 'Assessing the Accuracy of Polls and Surveys', *Science*, 234 (1986), 1094-1098 (pp.1094-1098); Burns W. Roper, 'Are Polls Accurate?', *The Annals of the American Academy of Political and Social Science*, 472 (1984), 24-34 (pp. 24-34); Burns W. Roper, 'Evaluating Polls with Poll Data', *The Public Opinion Quarterly*, 50.1 (1986), 10-16 (p. 15); William Buchanan, 'Election Predictions: An Empirical Assessment', *The Public Opinion Quarterly*, 50.2 (1986), 222-227 (p. 222).

⁵⁵ Kurt Lang and Gladys Engel Lang, 'The Impact of Polls on Public Opinion', *The Annals of the American Academy of Political and Social Science*, 472.1 (1984), 129-142 (p. 135).

⁵⁶ Richard R. Lau, 'An Analysis of the Accuracy of Trial Heat Polls During the 1992 Presidential Election', *The Public Opinion Quarterly*, 58.1 (1994), 2-20 (p. 4).

⁵⁷ Robert S. Erikson and Christopher Wlezien, 'Presidential Polls as a Time Series: The Case of 1996', *The Public Opinion Quarterly*, 63.2 (1999), 163-177 (p. 163).

Beck and Tien criticised intention-based questioning, arguing for methodological revision and the use of expectation-based questioning.⁵⁸ Belli et al. also progressed criticism regarding bias in 1999, holding that social desirability bias and over-reporting turnout affect polling accuracy.⁵⁹

Despite such progression, the literature of the 1990s also saw continuity. For example, in 1992, Zaller and Feldman continued methodological criticism surrounding survey response, positing that respondents do not possess opinions of an equal or greater level of specificity than the questions asked of them, undermining the usefulness of their responses.⁶⁰ Moreover, in the same year, Herbst continued in the same vein as Zaller and Feldman, arguing that the predictive accuracy of polls is affected by the fact that not every respondent has the same capacity to produce informed political opinions and that answers given to surveys are necessarily influenced by question wording and the context in which they are asked.⁶¹

In 1993, Gelman and King perpetuated criticism of survey response, holding that certain survey questions could not produce representative responses, ultimately concluding that no satisfactory theory of survey response existed.⁶² Gelman and King also built upon the earlier methodological critique of Lang and Lang by noting that polls conducted in U.S. presidential elections showed extraordinary variance when conducted months prior to election day, rendering them ineffective predictive methods when conducted so far in advance.⁶³

⁵⁸ Michael Lewis-Beck and Charles Tien, 'Voters as Forecasters: Micromodels of Presidential Election Prediction', *International Journal of Forecasting*, 15.2 (1999), 175-184 (pp. 175-184).

⁵⁹ R. F. Belli et al., 'Reducing Over-reporting in Surveys: Social Desirability, Memory Failure, and Source Monitoring', *Public Opinion Quarterly*, 63.1 (1999), 90-108 (pp. 90-108).

⁶⁰ J. Zaller and S. Feldman, 'A Simple Theory of Survey Response: Answering Questions versus Revealing Preferences', *American Journal of Political Science*, 36.3 (1992), 579-616 (p. 579).

⁶¹ Susan Herbst, 'Surveys in the Public Sphere: Applying Bourdieu's Critique of Opinion Polls', *International Journal of Public Opinion Research*, 4.3 (1992), 220-229 (pp.220-229).

⁶² Gelman and King, p. 410.

⁶³ Gelman and King, p. 409.

Additionally, in 1996, Morwitz and Pluzinski furthered past methodological criticism regarding the impact of polling upon respondents by holding that the bias inherent within polls influenced voters' decision-making.⁶⁴

Resultantly, the literature of the 1990s followed the theme of methodological critique. However, such critique was largely progressive, with refutations and revisions of past criticisms. Despite this, there was still considerable continuity regarding methodological critique and much literature concerned predictive accuracy. However, the 1990s once again saw no literature produced that explicitly focused on whether certain elections are more predictable than others. However, a reference to the characteristics of elections influencing the predictability of elections was made within the 1993 work by Gelman and King in a section entitled 'Why Are Some Elections Harder to Predict than Others?'.⁶⁵ Therein, Gelman and King identify the closeness of the race, the visibility of elections, the impact of multi-party competition, and uneven campaigns as characteristics that can make some elections harder to predict than others.⁶⁶ Thus, ostensibly it would appear that Gelman and King have already addressed the issue that this paper intends to tackle, but upon closer inspection it is clear that they have not. Ultimately, the characteristics remarked upon by Gelman and King are identified with specific reference to their impact upon prediction using fundamental models and consequently do not address characteristics that may influence prediction by other means, such as pre-election polls.⁶⁷ Additionally, and most importantly, the work conducted by Gelman and King merely constitutes a small section of a larger piece that is not

⁶⁴ Vicki G. Morwitz and Carol Pluzinski, 'Do Polls Reflect Opinions or Do Opinions Reflect Polls? The Impact of Political Polling on Voters' Expectations, Preferences, and Behaviour', *Journal of Consumer Research*, 23.1 (1996), 53-67 (p. 53).

⁶⁵ Gelman and King, p. 419.

⁶⁶ Gelman and King, pp. 419-420.

⁶⁷ Ibid

explicitly dedicated to exploring the impacts of the characteristics of elections upon their predictability and has not been built upon by subsequent scholarly work. Consequently, it is clear that the work of Gelman and King is fundamentally different to what is being attempted herein and that a distinct lacuna still exists within the literature.

The rise of the internet in the 2000s facilitated methodological revision in the form of aggregation. Although aggregation of forecasts previously existed in other disciplines, often referred to as combining or pooling,⁶⁸ the internet boom of the 2000s brought aggregation to a place of prominence vis-à-vis polling. Ultimately, aggregation emerged as a response to the sampling error and bias present in single poll results.⁶⁹

The emergence of aggregation began with the establishment of RealClearPolitics.com in 2002 as a website which aggregated U.S. election polls.⁷⁰ Later, in 2004 and 2006, the Princeton Election Consortium and Pollster.com emerged as further poll aggregation websites.⁷¹ However, the most significant development vis-a-vis poll aggregation came with the emergence of Nate Silver's FiveThirtyEight.com in 2008.⁷² Not only did Silver correctly predict the 2008 U.S. presidential election,⁷³ but he correctly predicted the outcome of the

⁶⁸ Robert T. Clemen, 'Combining Forecasts: A Review and Annotated Bibliography', *International Journal of Forecasting*, 5 (1989), 559-583 (pp.559-583); J. Scott Armstrong, 'Combining Polls', in *Principles of Forecasting: A Handbook for Researchers and Practitioners* ed. by J. Scott Armstrong, (Norwell: Kluwer Academic Publishers, 2001), pp. 1-15.

⁶⁹ D. Sunshine Hillygus, 'The Evolution of Election Polling in the United States', *The Public Opinion Quarterly*, 75.5 (2011), 962-981 (p. 698).

⁷⁰ Samuel Wang, 'Origins of Presidential Poll Aggregation: A Perspective from 2004 to 2012', *International Journal of Forecasting*, 31.3 (2015), 898-909 (p. 898).

⁷¹ Wang, p. 898.

⁷² Ibid

⁷³ Stephanie Clifford, 'Finding Fame with a Prescient Call for Obama', *The New York Times*, 9 November 2008 <<http://www.nytimes.com/2008/11/10/business/media/10silver.html>> [accessed 15/07/2017].

2012 election in all fifty states.⁷⁴ Through this, Silver seemingly vindicated aggregation as the predictive method par excellence.

In spite of this success, aggregation was still the focus of methodological critique.

Aggregation was criticised for being overly affected by house effects, resulting in averages that were dominated by a minority of pollsters.⁷⁵ However, pollsters revised their methodologies to account for house effects and reduce their impact.⁷⁶ Despite this, methodological criticism of aggregation is not confined to house effects. Indeed, analysts hold that herding can cause aggregation to yield inaccurate results.⁷⁷

In addition to affording prominence to aggregation, the rise of the internet in the 2000s facilitated methodological revision with the emergence of non-probability sampling. Non-probability sampling primarily emerged through opt-in internet-based surveys and facilitated the decline of probability sampling, which became the subject of methodological critique due to issues of non-response and the declining number of landlines rendering telephone polling problematic.⁷⁸ Despite this, internet-based surveys were the subject of methodological critique due to the difficulty of distinguishing between good and bad surveys due to extreme

⁷⁴ Chris Taylor, 'Triumph of the Nerds: Nate Silver Wins in 50 States', *Mashable*, 7 November 2012 <<http://mashable.com/2012/11/07/nate-silver-wins/#FBY5rx205uqG>> [accessed 15/07/2017].

⁷⁵ Nate Silver, *House Effects in Da House* (2008), <<https://fivethirtyeight.com/features/house-effects-in-da-house/>> [accessed 15/07/2017]; Nate Silver, *Calculating 'House Effects' of Polling Firms* (2012), <<https://fivethirtyeight.com/features/calculating-house-effects-of-polling-firms/>> [accessed 15/07/2017]; Nate Silver, *House Effects* (2008), <<https://fivethirtyeight.com/features/house-effects-in-action/>> [accessed 15/07/2017].

⁷⁶ Ibid

⁷⁷ Nate Silver, *Here's Proof Some Pollsters Are Putting a Thumb on the Scale* (2014), <<https://fivethirtyeight.com/features/heres-proof-some-pollsters-are-putting-a-thumb-on-the-scale/>> [accessed 15/07/2017].

⁷⁸ Robert M. Groves, 'Nonresponse Rates and Nonresponse Bias in Household Surveys', *Public Opinion Quarterly*, 70.5 (2006), 646-675 (p. 647); David Yeager et al., 'Comparing the Accuracy of RDD Telephone Surveys and Internet Surveys Conducted with Probability and Non-Probability Samples', *Public Opinion Quarterly*, 75.4 (2011), 709-747 (pp. 737-738).

proliferation.⁷⁹ Thus, methodological revision and critique were still evident within the literature.

Continuity of past methodological critique was also evident in literature produced in the 2000s. For example, in 2000, Burden continued in the same vein as Belli et al and posited that declining response rates were resulting in turnout being over-reported and undermining the accuracy of polls.⁸⁰ Additionally, in 2003, Kaplan and Barnett furthered the work of Gelman and King, holding that the predictive accuracy of polls increases the closer to election day that they are conducted,⁸¹ a finding that was corroborated by Soumbatiants, Chappell, and Johnson in 2006,⁸² and Rothschild in 2009.⁸³ Moreover, in 2004, Erikson, Panagolopoulos, and Wlezien built upon the earlier critique of Crespi and found that Gallup's method of screening likely voters during the 2000 U.S. presidential election was flawed and accounted for a nineteen-point error.⁸⁴

Thus, it is clear that the literature produced during the 2000s conformed to the literary theme of methodological critique, encompassing both revision and continuity. Moreover, no literature was produced during this period that addressed whether certain elections are more predictable than others, thereby exacerbating the lacuna. Ultimately, the literary theme of methodological criticism continued into the 2010s due to the rise of the fourth and potential fifth waves of methodological critique.

⁷⁹ Mick P. Couper, 'Web Surveys: A Review of Issues and Approaches', *Public Opinion Quarterly* 64.4 (2000), 464-494 (p. 465).

⁸⁰ Barry Burden, 'Voter Turnout and the National Election Studies', *Political Analysis*, 8.4 (2000), 389-398 (pp. 389-398).

⁸¹ Edward Kaplan and Arnold Barnett, 'A New Approach to Estimating the Probability of Winning the Presidency', *Operations Research*, 51.1 (2003), 32-40 (pp. 32-40).

⁸² Souren Soumbatiants, Henry Chappell, and Eric Johnson, 'Using States Polls to Forecast US Presidential Election Outcomes', *Public Choice*, 127.1 (2006), 207-223 (pp. 207-223).

⁸³ Rothschild, pp. 895-916.

⁸⁴ Robert S. Erikson, Costas Panagopoulos, and Christopher Wlezien, 'Likely (and Unlikely) Voters and the Assessment of Campaign Dynamics', *Public Opinion Quarterly*, 68.4 (2004), 588-601 (p. 588).

The Fourth and Potential Fifth Waves of Methodological Critique

Despite the continuity of the 2000s, literature produced in the 2010s has come to be characterised by progression and refutation of methodological critique. For example, in 2011, Rogers and Aida refuted the work of Perry on survey response, contending that many individuals who state that they do not intend to vote on election day actually end up doing so.⁸⁵ In the same year, Hillygus progressed methodological criticism by positing that polling accuracy is negatively affected by data quality issues.⁸⁶ However, the most significant post hoc methodological critique came in 2016 with the report by the British Polling Council investigating the failure of polls to predict the outcome of the 2015 general election in the United Kingdom. Despite addressing myriad putative causes of polling inaccuracy, the report focused on unrepresentative sampling techniques, deeming them to be responsible for the predictive failure.⁸⁷ Ultimately, the report was indicative of the rise of a fourth wave of methodological critique.

Owing to the failure of polls to predict the election of Donald Trump and the United Kingdom's decision to leave the European Union in 2016, the theme of post hoc methodological critique has once again come to the fore. Owing to the inherent lag present within the production of academic literature, little scholarly work presently exists in reference to these failures. However, post-mortem analysis has been conducted online. Such online

⁸⁵ T. Rogers and M. Aida, 'Why Bother Asking? The Limited Value of Self-Reported Vote Intention', *Harvard Kennedy School Faculty Research Working Paper Series*, RWP12-001 (2011), 1-40 (p. 2).

⁸⁶ Hillygus, p. 974.

⁸⁷ Sturgis Baker et al., *Report of the Inquiry into the 2015 British General Election Opinion Polls* (London: Market Research Society and British Polling Council, 2016), p. 69.

analyses address non-response bias,⁸⁸ shy voters,⁸⁹ sampling error and issues of turnout.⁹⁰ Accordingly, such analyses follow the trend of post hoc methodological critique in the wake of predictive failure and could be said to exist as precursors to the next wave of academic literature, heralding a potential fifth wave of critique. Indeed, credence can be seen to be given to this notion the post-mortem analyses produced in the wake of the failure of polls to predict the outcome of the 2017 general election in the United Kingdom. Such analyses primarily focused on issues of data adjustment,⁹¹ thereby conforming to the theme of post-hoc methodological critique.

In addition to conforming to the theme of post-hoc methodological critique, the online analyses conducted in the wake of the predictive failures of 2016 and 2017 are exclusively introspective, with no pieces electing to question whether the elections were less predictable than others. Thus, if the theme inherent within such analyses, and indeed past literature, is borne out in future scholarly work, the lacuna surrounding the study of predictability of elections will be further exacerbated.

Alternative Methods of Electoral Prediction:

I would be remiss of this review not to address alternative forms of electoral forecasting in order to provide a full account of the literature. The most prominent alternative form of

⁸⁸ Peter K. Enns et al., *Why the Polls Missed in 2016: Was it Shy Trump Supporters After All?* (2016), <<https://www.washingtonpost.com/news/monkey-cage/wp/2016/12/13/why-the-polls-missed-in-2016-was-it-shy-trump-supporters-after-all/>> [accessed 16/07/2017].

⁸⁹ Harry Enten, *Shy Voters Probably Aren't Why the Polls Missed Trump* (2016), <<https://fivethirtyeight.com/features/shy-voters-probably-arent-why-the-polls-missed-trump/>> [accessed 16/07/2017].

⁹⁰ The Economist, *How Did the Polls Get It Wrong?* (2016), <<https://www.economist.com/blogs/economist-explains/2016/11/economist-explains-3>> [accessed 16/07/2017].

⁹¹ Peter Kellner, *General Election Polls 2017: How the Pollsters Got it Wrong* (2017), <<https://www.standard.co.uk/news/politics/general-election-polls-how-the-pollsters-got-it-wrong-a3560936.html>> [accessed 16/07/2017]; Malnick, *How the Pollsters Got it Wrong*; Kirk, *How Did the Pollsters Get the General Election So Wrong Again?*.

electoral prediction concerns the use of prediction markets. Stocks have been traded on the likelihood of candidates winning elections since the Cleveland versus Harrison U.S. presidential election of 1892.⁹² Despite this, Rhode and Strumpf hold that prediction markets have only recently been used as official predictive measures.⁹³ Ultimately, the first pieces of academic literature pertaining to electoral prediction markets were published by Hanson in 1990,⁹⁴ 1991,⁹⁵ and 1992.⁹⁶ 1992 also saw the genesis of the first literature to address the Iowa Electronic Markets.⁹⁷ Following this, the first studies of the use of prediction markets to forecast national elections were conducted in Germany,⁹⁸ Austria,⁹⁹ Sweden,¹⁰⁰ and Canada.¹⁰¹ Additionally, further literature was written on the Iowa Electronic Markets in 1996 and 1997.¹⁰² Up until 1998, academic literature regarding prediction markets was largely confined to the aforementioned works. However, after 1998 there was a sharp rise in the quantity and diversity of literature addressing electoral prediction markets. Notably, this

⁹² Nate Silver, *The Signal and the Noise*, (London: Penguin Books, 2012), p. 334.

⁹³ Paul W. Rhode and Koleman S. Strumpf, 'Historical Presidential Betting Markets', *The Journal of Economic Perspectives*, 18.2 (2004), 127-141 (pp. 127-141).

⁹⁴ Robin Hanson, 'Could Gambling Save Science? Encouraging an Honest Consensus', *Proceedings of Eight International Conference on Risk and Gambling*, (1990), 1-17 (pp.1-17); Robin Hanson, 'Market-based Foresight: A Proposal', *Foresight Update*, 10 (1990), 1-14 (pp. 1-4).

⁹⁵ Robin Hanson, 'More Market-based Foresight', *Foresight Update*, 11 (1991), 1-23 (pp. 1-23).

⁹⁶ Robin Hanson, 'Idea Futures: Encouraging an Honest Consensus', *Extropy*, (1992), 1-15 (p. 3).

⁹⁷ Robert Forsythe et al., 'Anatomy of an Experimental Political Stock Market', *American Economic Review*, 82.5 (1992), 1142-61 (pp. 1142-1161).

⁹⁸ K. Beckmann and M. Werding, 'Passauer Wahlbörse: Information Processing in a Political Market Experiment', *Kyklos*, 49 (1996), 171-205 (p. 171); B. Kuon, 'Typical Trading Behaviour in the German Election Markets 1990', *Universität Bonn Discussion Paper No. B-204*, (1991), 1-11 (p. 2).

⁹⁹ G. Ortner, A. Stepan, and J. Zeckner, 'Political Stock Markets: The Austrian Experiences', *Zeitschrift für Betriebswirtschaft*, (1995), 123-135 (p. 123).

¹⁰⁰ P. Bohm and J. Sonnégard, 'Political Stock Markets and Unreliable Polls', *Scandinavian Journal of Economics*, 101 (1999), 205-222 (pp. 205-222).

¹⁰¹ W. Antweiler and T. W. Ross, 'The 1997 UBC Election Stock Market', *Canadian Business Economics*, 6 (1998), 15-22 (p.15); Robert Forsythe et al., 'Using Market Prices to Predict Election Results: The 1993 UBC Election Stock Market', *Canadian Journal of Economics*, 28 (1995), 770-794 (p. 771); Robert Forsythe et al., 'Markets as Predictors of Election Outcomes: Campaign Events and Judgement Bias in the 1993 UBC Election Stock Market', *Canadian Public Policy*, 24 (1998), 329-351 (p. 332).

¹⁰² Joyce Berg et al, 'What Makes Markets Predict Well? Evidence from the Iowa Electronic Markets', in *Understanding Strategic Interactions: Essays in Honour of Reinhard Selten*, ed. by Albers Guth et al., (New York: Springer, 1996), pp. 444-463.

gave rise to new methodologies, such as Pennock's dynamic pari-mutuel framework,¹⁰³ aimed at increasing the accuracy of market-based forecasts. Thus, despite its exploratory nature, early work pertaining to prediction markets can be seen to address predictive accuracy and methodological revision.

The early 2000s saw the emergence of literature focusing on the predictive accuracy of market-based approaches, with scholars arguing that markets produced more accurate forecasts than polls.¹⁰⁴ Indeed, literature regarding the efficient market hypothesis held that, under specific circumstances, it was impossible for other methods to render more accurate forecasts than markets,¹⁰⁵ but such work is contested.¹⁰⁶ Despite assertions of superiority, substantial debate existed within the literature regarding the accuracy of market-based approaches. In 2001, Berg et al. reaffirmed that prediction markets rendered more accurate forecasts than polls,¹⁰⁷ but this was refuted by Erikson and Wlezien in 2008 when they demonstrated that the superior accuracy of market-based forecasts vanishes when polls are corrected for biases.¹⁰⁸ In the same year, Arrow et al. discovered that the average error of prediction markets was 1.5 percentage points, whereas polls exhibited an average error of 2.1 percentage points. However, they also noted that the predictive accuracy of markets decreases

¹⁰³ David M. Pennock, 'A Dynamic Pari-Mutuel Market for Hedging, Wagering, and Information Aggregation', *Proceedings of the Fifth ACM Conference on Electronic Commerce*, (2004), 1-10 (pp. 1-10).

¹⁰⁴ K. Y. Chen et al., *Information Markets vs. Opinion Polls: An Empirical Comparison* (Vancouver: ACM Press, 2005) pp. 1-10; J. Wolfers and E. Zitzewitz, 'Prediction Markets', *Journal of Economic Perspectives*, 18 (2004), 107-126 (pp. 107-126).

¹⁰⁵ Eugene F. Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work', *The Journal of Finance*, 25.2 (1970), 383-417 (pp. 383-417); Eugene F. Fama, 'The Behaviour of Stock-Market Prices', *The Journal of Business*, 38.1 (1965), 34-105 (pp. 34-105).

¹⁰⁶ Sanford J. Grossman and Joseph E. Stiglitz, 'On the Impossibility of Informationally Efficient Markets', *American Economic Review*, 70 (1980), 393-408 (pp. 393-408); Michael Rasches, 'Massively Confused Investors Making Conspicuously Ignorant Choices', *Journal of Finance*, 56.5 (2001), 1911-1927 (pp. 1911-1927).

¹⁰⁷ Joyce Berg et al., 'Results from a Dozen Years of Election Futures Market Research', *Handbook of Experimental Economic Results*, (2001), 742-751 (p. 742).

¹⁰⁸ Robert S. Erikson and Christopher Wlezien, 'Are Political Markets Really Superior to Polls as Election Predictions?', *Public Opinion Quarterly*, 72 (2008), 190-215 (p. 192).

as the time before the election increases.¹⁰⁹ Conversely, in 2009, Rothschild argued that market-based forecasts were more accurate than polls-based forecasts during the 2008 U.S. presidential election.¹¹⁰

In addition to this debate conforming to the literary themes of predictive accuracy and methodological critique, the works it comprises are inherently introspective, with none adopting an extrospective standpoint and addressing whether certain elections are more predictable than others using market-based approaches. Accordingly, the previously identified lacuna is evident.

Another alternative form of electoral prediction is social media data analysis. In 2008, Williams and Gulati identified a direct correlation between Facebook likes and votes, arguing that this could be utilised to predict elections.¹¹¹ Moreover, the first literature to explore the predictive capacity of Twitter was published in 2010 and comprised Tumasjan et al's study of the 2009 federal election in Germany and O'Connor et al's study of the 2008 U.S. election.¹¹² Despite O'Connor concluding that Twitter sentiment does not correlate with votes, Tumasjan et al. corroborated the earlier work of Williams and Gulati and held that there was a correlation between mentions and votes. Indeed, Tumasjan et al. doubled down on this conclusion in 2011.¹¹³

¹⁰⁹ Kenneth J. Arrow et al., 'The Promise of Prediction Markets', *Science*, 320 (2008), 877-878 (p. 877).

¹¹⁰ Rothschild, p. 895.

¹¹¹ Christine Williams and Girish Gulati, 'What is a Social Network Worth? Facebook and Vote Share in the 2008 Presidential Primaries', *Papers Presented in Annual Meeting of the American Political Science Association*, (2008), 1-17 (p. 4).

¹¹² A. Tumasjan et al., 'Predicting Elections with Twitter: What 140 Characters Reveal About Political Sentiment', *ICWSM*, 10 (2010), 178-185 (p. 178); B. O'Connor et al. 'From Tweets to Polls: Linking Text Sentiment to Public Opinion Times Series', *ICWSM*, 11 (2010), 1-2 (pp. 1-2).

¹¹³ A. Tumasjan, 'Election Forecasts with Twitter: How 140 Characters Reflect the Political Landscape', *Social Science Computer Review*, 29.4 (2011), 402-418 (p. 402).

Despite confident conclusions, such literature gave rise to methodological critique. Indeed, in both 2011 and 2012, Gayo-Avello, Metaxas, and Mustafaraj criticised previous work, arguing that it did not constitute prediction, but rather existed as post hoc analysis. Moreover, they raised the methodological issues of over-representation of younger demographics, and self-selection bias born of social media data only being produced by politically active individuals.¹¹⁴ Further methodological critique can be seen in the wake of Franch's attempt to retrodictively predict the 2010 UK general election in 2013,¹¹⁵ as scholars criticised his over-reliance on counting the frequency of search queries.¹¹⁶

A focus on predictive accuracy can also be seen in literature pertaining to social media data. Indeed, literature produced in 2011 showed that Twitter sentiment analysis was insufficient to accurately predict elections in Ireland¹¹⁷ and Singapore.¹¹⁸ Moreover, Lui, Metaxas, and Mustafaraj concluded in 2011 that forecasting elections using Twitter data is so inaccurate that it fares little better than relying on chance.¹¹⁹ Resultantly, Gayo-Avello argued in 2012 that the predictive ability of Twitter had been exaggerated and that it was an inaccurate forecasting tool.¹²⁰ Burnap et al's attempt to predict the 2015 UK general election vindicated

¹¹⁴ Daniel Gayo-Avello, P. Metaxas, and E. Mustafaraj, 'How (Not) to Predict Elections', *Privacy, Security, Risk and Trust*, (2011), 165-171 (p. 165); Daniel Gayo-Avello, P. Metaxas, and E. Mustafaraj, 'Limits of Electoral Prediction Using Twitter', *AAAI*, (2011), 490-493 (p. 490); Daniel Gayo-Avello, 'I Wanted to Predict Elections Using Twitter and All I Got Was This Lousy Paper – A Balanced Survey on Election Prediction Using Twitter Data', *CoRR* (2012), 1-13 (p. 2).

¹¹⁵ Fabio Franch, 'Wisdom of the Crowds: 2010 UK Election Prediction with Social Media', *Journal of Information Technology and Politics*, 10.1 (2013), 57-71 (pp. 57-71).

¹¹⁶ R. Macdonald and X. Mao, 'Forecasting the 2015 General Election with Internet Big Data: An Application of the TRUST Framework', (2016), 1-23 (pp. 1-23).

¹¹⁷ Adam Bermingham and Alan F. Smeaton, 'On Using Twitter to Monitor Political Sentiment and Predict Election Results', *CLARITY: Centre for Sensor Web Technologies*, 2011, 1-9 (pp. 1-9).

¹¹⁸ Marko M. Skoric et al., 'Tweets and Votes: A Study of the 2011 Singapore General Election', *System Science (HICSS)*, 1 (2012), 1-10 (pp. 1-10).

¹¹⁹ Catherine Lui, Panagiotis T. Metaxas, and Eni Mustafaraj, 'On the Predictability of the U.S. Elections Through Search Volume Activity', *Proceedings of the IADIS International Conference on e-Society*, 2011, 1-9 (pp. 1-9).

¹²⁰ Daniel Gayo-Avello, 'No, You Cannot Predict Elections with Twitter', *IEEE Internet Computing*, 16.6 (2012), 91-94 (p. 91).

this standpoint as it proved inaccurate.¹²¹ In the same year, Huberty concluded that social media data will likely never provide accurate forecasts.¹²² MacDonald and Mao built upon this in 2016, holding that social media cannot be addressed independent of the influence of traditional media and therefore has a diminished ability to produce accurate forecasts.¹²³

Ultimately, the use of social media data has been the subject of introspective methodological critique and concerns regarding accuracy. However, once again no literature has been produced addressing whether certain elections are more predictable than others using social media, further exacerbating the identified lacuna.

Much literature addresses the influence of political campaigns and campaign fundamentals upon the predictability of elections.¹²⁴ Such literature is characterised by disagreement. Indeed, in 1991, Popkin posited that campaigns affect predictability, insofar as they steer elections towards deterministic outcomes that can be foreseen in advance.¹²⁵ However, in 1992, Lewis-Beck and Rice argued that elections can be predicted by fundamentals that are in place prior to elections, rendering campaigns uninfluential.¹²⁶ In the same year, Johnston et al. put forth a competing view, arguing that campaigns directly determine electoral

¹²¹ Pete Burnap et al., '140 Characters to Victory? Using Twitter to Predict the UK 2015 General Election', *Electoral Studies*, 41 (2016), 230-233 (pp. 230-233).

¹²² Mark Huberty, 'Can We Vote with Our Tweet? On the Perennial Difficulty of Election Forecasting with Social Media', *International Journal of Forecasting*, 31.3 (2015), 992-1007 (pp. 992-1007).

¹²³ MacDonald and Mao, p. 3.

¹²⁴ Peter K. Enns and Brian Richman, 'Presidential Campaigns and the Fundamentals Reconsidered', *The Journal of Politics*, 75.3 (2013), 803-820 (pp. 803-820); Thomas Holbrook and Scott McClurg, 'Living in a Battleground: Presidential Campaigns and Fundamental Predictors of Vote Choice', *OpenSIUC Publications*, 5 (2009), 1-35 (pp. 1-35); James E. Campbell, 'The Fundamentals in US Presidential Elections: Public Opinion, the Economy and Incumbency in the 2004 Presidential Election', *Journal of Elections, Public Opinion and Parties*, 15.1 (2005), 73-83 (pp. 73-83).

¹²⁵ Samuel L. Popkin, *The Reasoning Voter: Communication and Persuasion in Presidential Campaigns*, (Chicago: University of Chicago Press, 1991), pp. 1-332.

¹²⁶ Michael Lewis-Beck and Tom Rice, *Forecasting Elections*, (Washington D.C.: Congressional Quarterly Press, 1992), pp. 1-163.

outcomes.¹²⁷ However, in 1993, Gelman and King again put forth the argument that political campaigns deliver the fundamentals and thus guide elections towards deterministic outcomes in a process known as enlightenment.¹²⁸

In addition to enlightenment, the literature holds that campaigns influence voters through priming.¹²⁹ Priming has been addressed with reference to partisanship,¹³⁰ gender,¹³¹ and race.¹³² Ultimately, in 2009, Vavreck contended that the issues that voters choose to emphasise due to priming affects electoral predictability.¹³³ The literature also emphasises the role of persuasion. Numerous works have shown that political campaigns can alter voters' preferences and affect the predictability of elections.¹³⁴

Thus, it is clear that the impact of political campaigns and campaign fundamentals upon the predictability of elections has been explored extensively. However, no literature pertaining to campaigns or campaign fundamentals extrapolates its findings to substantively address

¹²⁷ Richard Johnston et al., *Letting the People Decide: Dynamics of a Canadian Election*, (Kingston: McGill-Queen's University Press, 1992), pp. 245-246.

¹²⁸ Robert Anderson, James Tilley, and Anthony F. Heath, 'Political Knowledge and Enlightened Preferences: Party Choice Through the Electoral Cycle', *British Journal of Political Science*, 35.2 (2005), 285-302 (pp. 285-302); Kevin Arceneaux, 'Do Campaigns Help Voters Learn? A Cross-National Analysis', *British Journal of Political Science*, 36.1 (2006), 159-173 (pp. 159-173); Gelman and King, p. 434-435.

¹²⁹ Jon A. Krosnick and Donald R. Kinder, 'Altering the Foundations of Support for the President Through Priming', *The American Political Science Review*, 84.2 (1990), 497-512 (pp. 497-512); Larry M. Bartels, 'Priming and Persuasion in Presidential Campaigns', in *Capturing Campaign Effects* ed. by Richard Johnston and Henry Brady, (Michigan: University of Michigan Press, 2009), pp. 78-112; Joanne M. Miller and Jon A. Krosnick, 'News Media Impact on the Ingredients of Presidential Evaluations: A Program of Research on the Priming Hypothesis', in *Political Persuasion and Attitude Change*, ed. by Diana Carole Mutz, Paul Sniderman, and Richard Brody, (Michigan: University of Michigan Press, 1996), pp. 79-100.

¹³⁰ Bernard Berelson, Paul Lazarsfeld, and William McPhee, *Voting: A Study of Opinion Formation in a Presidential Election*, (Chicago: University of Chicago Press, 1954), pp. 1-322.

¹³¹ Kim Fridkin Kahn and Edie N. Goldenberg, 'Women Candidates in the News: An Examination of Gender Differences in U.S. Senate Campaign Coverage', *Public Opinion Quarterly*, 55.2 (1991), 180-199 (pp. 180-199).

¹³² Tali Mendelberg, 'Racial Priming Revived', *Perspectives on Politics*, 6.1 (2008), 109-123 (pp. 109-123).

¹³³ Lynn Vavreck, *The Message Matters: The Economy and Presidential Campaigns*, (Princeton: Princeton University Press, 2009), p. 155.

¹³⁴ D. Sunshine Hillygus and Todd G. Shields, *The Persuadable Voter: Wedge Issues in Presidential Campaigns*, (Princeton: Princeton University Press, 2008), pp. 82-107; Richard Johnston, Michael Hagen, and Kathleen Jamieson, *The 2000 Presidential Election and the Foundations of Party Politics*, (New York: Cambridge University Press, 2004), pp. 174-187; Gregory Huber and Kevin Arceneaux, 'Identifying the Persuasive Effects of Presidential Advertising', *American Journal of Political Science*, 51.4 (2007), 957-977 (pp. 957-977).

whether certain elections are more predictable than others, exacerbating the associated lacuna.

Many other methods of electoral prediction have been studied in the literature, such as the use of biographical information,¹³⁵ expectation-based measures to gauge voter perceptions,¹³⁶ and studying the impact of candidates' aesthetics.¹³⁷ However, such methods exist as novel outliers. Chief amongst the methods of electoral forecasting that have not yet been addressed herein are fundamental models and the use of Google Trends data.

Fundamental models emerged in the 1970s and are broadly referenced in the literature.¹³⁸

Such models supplement polling with politico-economic metrics, such as GDP grow rate,¹³⁹ changes in inflation,¹⁴⁰ job sector growth,¹⁴¹ and fluctuations in wealth.¹⁴² However, debate

¹³⁵ J. Scott Armstrong and Andreas Graefe, 'Predicting Elections from Biographical Information about Candidates: A Test of the Index Method', *Journal of Business Research*, 64.7 (2011), 699-706 (pp. 699-706).

¹³⁶ Andreas Graefe and J. Scott Armstrong, 'Forecasting Elections from Voters' Perceptions of Candidates' Ability to Handle Issues', *Journal of Behavioural Decision Making*, 25.1 (2012), 41-48 (pp. 41-48).

¹³⁷ Anthony C. Little et al., 'The Faces of Leaders: Sexual Dimorphism, Perceived Traits, and Voting in Context', *Evolution and Human Behaviour*, 28.1 (2007), 18-27 (pp. 18-27).

¹³⁸ Alan Abramowitz, 'Forecasting the 2008 Presidential Election with the Time-for-Change Model', *Political Science and Politics*, 41.4 (2008), 691-695 (pp. 691-695); Alberto Alesina, John Londregan, and Howard Rosenthal, 'The 1992, 1994, and 1996 Elections: A Comment and a Forecast', *Public Choice*, 88.1 (1996), 115-125 (pp. 115-125); Larry M. Bartels and John Zaller, 'Presidential Vote Models: A Recount', *Political Science and Politics*, 34.1 (2001), 9-20 (pp. 9-20); James E. Campbell, 'The Trial-Heat Forecast of the 2008 Presidential Vote: Performance and Value Considerations in an Open-Seat Election', *Political Science and Politics*, 41.4 (2008), 697-701 (pp. 697-701); Alfred G. Cuzán and Charles M. Bundrick, 'Forecasting the 2008 Presidential Election: A Challenge for the Fiscal Model', *Political Science and Politics*, 43.4 (2010), 639-641 (pp. 639-641); Ray Fair, 'Presidential and Congressional Vote-Share Equations', *American Journal of Political Science*, 53.1 (2009), 55-72 (pp. 55-72); Stephen E. Haynes and Joe A. Stone, 'Guns and Butter in U.S. Presidential Elections', *Economics Bulletin*, 1 (2004), 1-11 (p. 5); Douglas A. Hibbs Jr., 'Implications for the Bread and Peace Model for the 2008 US Presidential Election', *Public Choice*, 137 (2008), 1-10 (pp. 1-10); Thomas Holbrook, 'Presidential Elections in Space and Time', *American Journal of Political Science*, 30.3 (2000), 483-506 (pp. 483-506); Michael Lewis-Beck and Charles Tien, 'The Job of a President and the Jobs Model Forecast: Obama for '08?', *Political Science and Politics*, 43.4 (2008), 687-690 (pp. 687-690); Brad Lockerbie, 'Election Forecasting: The Future of the Presidency and the House', *Political Science and Politics*, 41.4 (2008), 713-716 (pp. 713-716).

¹³⁹ Alan Abramowitz, 'When Good Forecasts Go Bad: The Time-for-Change Model and the 2004 Presidential Election', *Political science and Politics*, 3.74 (2004), 745-746 (pp. 745-746).

¹⁴⁰ Michael Lewis-Beck, 'Election Forecasting: Principles and Practice', *British Journal of Political Science*, 7.2 (2005), 145-164 (pp. 145-164).

¹⁴¹ Michael Lewis-Beck and Charles Tien, 'Jobs and the Job of President: A Forecast for 2004', *Political Science and Politics*, 37.4 (2004), 753-758 (pp. 753-758).

¹⁴² Thomas Holbrook, 'Good News for Bush? Economic News, Personal Finances, and the 2004 Presidential Election', *Political Science and Politics*, 37.4 (2004), 759-761 (pp. 759-761).

exists as to which supplementary metric should be utilised. The first utilisation of a fundamental model for electoral prediction came in 1979 with Whiteley's attempt to predict the UK general election.¹⁴³ Despite the failure of Whiteley's model, efforts to further the predictive accuracy of fundamental models continued through the work of Sanders in 1991,¹⁴⁴ 1993,¹⁴⁵ 1995,¹⁴⁶ and 1996.¹⁴⁷ The work of Sanders encompassed methodological revision, insofar as it revised the autoregressive model of Whiteley.¹⁴⁸ Moreover, Sanders identified new fundamental factors to improve accuracy.¹⁴⁹

Fundamental models have emerged again in recent literature,¹⁵⁰ with scholars espousing the predictive benefits of following a theory of voter behaviour.¹⁵¹ However, fundamental models are also the subject of methodological critique due to inaccuracy born of variable selection and model specification,¹⁵² along with failing to account for the impact of the internet upon electoral predictability.¹⁵³ Consequently, it is clear that literature pertaining to fundamental models encompasses both methodological critique and a focus on accuracy, thereby

¹⁴³ Paul Whiteley, 'Electoral Forecasting from Poll Data: The British Case', *British Journal of Political Science*, 9.2 (1979), 219-236 (pp. 219-236).

¹⁴⁴ David Sanders, 'Government Popularity and the Next General Election', *The Political Quarterly*, 62.2 (1991), 235-261 (pp. 235-261).

¹⁴⁵ David Sanders, 'Forecasting the 1992 British General Election Outcome: The Performance of an Economic Model', *British Elections and Parties Yearbook*, 3.1 (1993), 100-115 (pp. 100-115).

¹⁴⁶ David Sanders, 'Forecasting Political Preferences and Election Outcomes in the UK: Experiences, Problems, and Prospects for the Next General Election', *Electoral Studies*, 14.3 (1995), 251-272 (pp. 251-272).

¹⁴⁷ David Sanders, 'Economic Performance, Management Competence and the Outcome of the Next General Election', *Political Studies*, 44.2 (1996), 203-231 (pp. 203-231).

¹⁴⁸ MacDonald and Mao, p. 4.

¹⁴⁹ Ibid

¹⁵⁰ M. Lebo and H. Norpoth, 'The PM and the Pendulum: Dynamic Forecasting of British Elections', *British Journal of Political Science*, 37.1 (2007), 71-87 (pp. 71-87); R. Nadeau, M. S. Lewis-Beck, and E. Bélanger, 'Election Forecasting in the United Kingdom: A Two-Step Model', *Journal of Elections, Public Opinion and Parties*, 19.3 (2009), 333-358 (pp. 333-358); H. Norpoth, 'Forecasting British Elections: A Dynamic Perspective', *Electoral Studies*, 23 (2004), 297-305 (pp. 297-305); David Sanders, 'Popularity Function Forecasts for the 2005 UK General Election', *British Journal of Politics and International Relations*, 7 (2005), 174-190 (pp. 174-190); Paul Whiteley, 'Evaluating Rival Forecasting Models of the 2005 General Election in Britain – An Encompassing Experiment', *Electoral Studies*, 27.4 (2008), 581-588 (pp. 581-588).

¹⁵¹ Lewis-Beck, 2005, p. 148.

¹⁵² Sanders, 1995, p. 271; MacDonald and Mao, 2016, p. 5.

¹⁵³ MacDonald and Mao, 2016, p. 5.

perpetuating the identified literary themes. Moreover, the literature does not address whether certain elections are more predictable than others using fundamental models, exacerbating the associated lacuna.

Google Trends data emerged as a form of internet big data utilised for electoral prediction in 2008 with the work of Schonfeld.¹⁵⁴ Ultimately, Schonfeld utilised the volume of search queries for candidates to predict the 2008 U.S. presidential election. However, in the wake of his work, methodological critique once again emerged in the literature. Indeed, in 2011 Lui et al. argued that using the volume of search for candidates is insufficient for accurate prediction.¹⁵⁵ Moreover, in 2012, Chen et al. argued that Google Trends forecasts were inaccurate and employed machine learning to improve it.¹⁵⁶ Interestingly, MacDonald and Mao successfully utilised Google Trends data to predict the 2014 Scottish independence referendum,¹⁵⁷ attributing their success to methodological revision.¹⁵⁸ Thus it is evident literature pertaining to Google Trends data focuses on methodological critique and revision, along with predictive accuracy. However, once again no literature has been produced addressing whether certain elections are more predictable using Google Trends data, further evidencing the lacuna.

The More Things Change, the More They Stay the Same:

Despite the abundance and variety of literature pertaining to electoral prediction, common themes exist throughout it, namely post hoc methodological critique, especially in the wake

¹⁵⁴ Erick Schonfeld, *Can Google Trends Predict the Election?* (2008), <<https://techcrunch.com/2008/06/07/can-google-trends-predict-the-election/>> [accessed 18/07/2017].

¹⁵⁵ Lui, Metaxas, and Mustafaraj, pp. 1-9.

¹⁵⁶ Y. Chen, F. Zhang, and Y. Yue, *Predicting U.S. President Election Result Based on Google Insights* (2012) <<http://cs229.stanford.edu/proj2012/ChenZhangYue-PredictingUSPresidentElectionResultBasedOnGoogleInsights.pdf>> [accessed 18/07/2017].

¹⁵⁷ R. MacDonald and X. Mao, 'Predicting the Outcome of the Scottish Independence Referendum: The Information from the Ether', *University of Glasgow Working Economic Papers*, No. 2015-05.

¹⁵⁸ MacDonald and Mao, 2016, pp. 9-35.

of predictive failures, and a focus on predictive accuracy. These themes were established by literature produced in the wake of the failure of the *Literary Digest* in 1936 and were perpetuated by subsequent predictive failures in 1948, 1970, and 2015. In the wake of these failures, no discrete literature could be found addressing whether certain elections are more predictable than others. Additionally, despite the wider literature addressing many different methods of electoral prediction, such approaches also conform to the identified literary themes and reinforce the identified lacuna. Consequently, although the methodology of approaches to electoral prediction has been iteratively improved over time to increase accuracy, no attempt has been made to substantively ascertain whether certain elections are more predictable than others. Thus, the more things change with regards to methodologies, the more they stay the same both thematically and with regards to the lacuna.

Ultimately, it is this lacuna that this paper intends to fill in an attempt to facilitate a paradigm shift vis-à-vis the prevailing approach to addressing electoral prediction. This has the potential to be extremely influential, as such a paradigm shift could have profound implications that transcend the discipline. However, in order to conduct the requisite analysis to facilitate such a shift, it is necessary to establish both a theoretical framework and testable hypotheses which the following theory section intends to do.

Chapter Two: Theory and Hypotheses

This section will endeavour to provide the theoretical framework and hypotheses to facilitate later analysis. It will begin by engaging in a conceptualisation of predictive accuracy, progressing to address what accuracy is understood to be with regards to pre-election polls. With regards to the accuracy of polls, it will primarily focus on two metrics: the disparity between predicted and actual vote share, and correctly calling the overall winner. Once this conceptualisation is complete, the defined measures of accuracy will be applied systematically to identified independent variables. Ultimately, the independent variables addressed in this paper will be: the effective number of parties in an election, proximity to the present, election type, the strength of partisan sentiment, the extent to which election data is known in advance, and the closeness of the race. Owing to the lack of substantive literature pertaining to whether certain elections are more predictable than others from which to derive testable hypotheses, works, theories, and trends have been identified within the broad discipline of political science to lead to hypotheses generation.

Conceptualisation and Dependent Variables:

What is Predictive Accuracy?

Although predictive accuracy could blithely be defined as the closeness of a prediction to the actual outcome of a phenomenon, to do so would be to engage in a superficial definition of the term which ignores its multi-faceted nature. Indeed, to understand predictive accuracy, one must first understand the nature and limitations of predictability. The debate between predictability and unpredictability has its roots in the historical disagreement between Saint Augustine and Thomas Aquinas.¹⁵⁹ Augustine held that life followed a predestined path and

¹⁵⁹ Silver, *The Signal and the Noise*, p. 112.

was therefore predictable.¹⁶⁰ However, Aquinas refuted this and held that individuals possessed free will which rendered their lives unpredictable.¹⁶¹

The debate continued into the Enlightenment, at which time scientific determinism replaced the predestination espoused by Augustine. Scientific progress, notably the advent of Newtonian mechanics, fundamentally altered how the world was conceived.¹⁶² From the discovery of such defined scientific laws, individuals came to believe that they could control the world and, by extension, their destinies. Consequently, life came to be perceived as a predictable entity. Nowhere was this made more evident than in Laplace's demon, wherein it was held that if an individual possessed a perfect understanding of the laws that govern nature, they could make perfect predictions.¹⁶³

Despite the rise of determinism, probabilism existed as a counter theory. Probabilism held that humanity could never truly understand the world, replacing notions of scientific certainty with predictions based on probabilities.¹⁶⁴ Ultimately, such probabilism received scientific vindication through the discovery of wave-particle duality and advances in quantum physics which afforded credence to the notion that the universe behaves probabilistically, as opposed to deterministically.¹⁶⁵ Ultimately, the vindication of probabilism gave rise to Heisenberg's uncertainty principle which undermined Laplace and held that it was impossible to attain a perfect knowledge of the universe, thereby precluding perfect predictions.¹⁶⁶ Despite the impossibility of perfect predictions, it is eminently possible to make good predictions.

¹⁶⁰ Saint Augustine of Hippo, *Selected Writings on Grace and Pelagianism*, (London: New City Press, 2011), p. 440.

¹⁶¹ Saint Thomas Aquinas, *Summa Theologica*, (Glasgow: Burns Publishing, 1922), p. 151.

¹⁶² Silver, *The Signal and the Noise*, p. 112.

¹⁶³ Pierre-Simon Laplace, *A Philosophical Essay on Probabilities*, (New York: Springer Publishing, 1995), p. 2.

¹⁶⁴ John Watkins, *Science and Scepticism*, (Princeton: Princeton University Press, 1984), pp. 39-78.

¹⁶⁵ Silver, p. 113.

¹⁶⁶ Paul Busch, Teiko Heinonen, and Pekka Lahti, 'Heisenberg's Uncertainty Principle', *Physics Reports*, 452.6 (2007), 155-176 (p. 155).

Equally, it is possible to make bad predictions. The distinction between these polar extremes surrounds predictive accuracy, which exists as a contested concept that is necessarily affected by the characteristics of the phenomenon that is being predicted.

The concept of predictive accuracy is the subject of bifold contestation. On one hand, predictive accuracy is held to be a dichotomous measure. By this definition, a prediction has two outcomes: either it is correct or it is incorrect.¹⁶⁷ Thus, the distinction between accurate and inaccurate predictions is black and white. A correct prediction is deemed to be accurate whereas an incorrect prediction is deemed inaccurate. On the other hand, predictive accuracy is held to be a continuous measure. By this definition, the accuracy of a prediction is measured on a scale.¹⁶⁸ Specifically, accuracy is gauged according to the proximity of a predicted value to the actual outcome. Despite the fact that a degree of logical overlap can be expected between these two measures, insofar as a high degree of continuous accuracy would logically lead to dichotomous accuracy, this is not always the case. Indeed, they can often exist as distinct entities, as will be shown when they are applied to pre-election polling.

Irrespective of definition, predictive accuracy is affected by the characteristics of the phenomenon that is being predicted, as certain phenomena are inherently more difficult to predict than others. All phenomena occur within systems, and all systems are subject to Lorenz's chaos theory.¹⁶⁹ At the heart of chaos theory is the butterfly effect, which holds that a small change in initial systemic conditions can have profound repercussions at a later

¹⁶⁷ Robert E. Hill Jr., 'An Investigation of the California Psychological Inventory Empirically Keyed or Dichotomous Prediction of Student Teacher Excellence, *The Yearbook of the National Council on Measurement in Education*, 18 (1961), 107-109 (p. 107); Laerd Statistics, *Types of Variable* (2013), <<https://statistics.laerd.com/statistical-guides/types-of-variable.php>> [accessed 01/08/2017].

¹⁶⁸ Laerd Statistics, *Types of Variable*.

¹⁶⁹ Edward N. Lorenz, 'Deterministic non-periodic flow', *Journal of the Atmospheric Sciences*, 20.2 (1963), 130-141 (p. 130); Vladimir Ivancevic and Tijana Ivancevic, *Complex Nonlinearity: Chaos, Phase Transitions, Topology Change, and Path Integrals*, (New York: Springer, 2008), p. 1.

stage.¹⁷⁰ For the purposes of this piece, the most significant type of system that chaos theory applies to is the dynamic system. Dynamic systems are additive systems in which behaviour at one point in time has a direct impact upon future systemic behaviour.¹⁷¹ This negatively affects the predictability of such systems, as inaccuracy at one stage goes on to inform and distort subsequent stages.¹⁷² This is of significance, as elections exist as dynamic systems predicated on chain reactions, rendering them difficult to predict.

Certain phenomena are also more predictable than others based upon the interactions and rules that they comprise. For example, weather systems are based upon established scientific laws which increases their predictability, as their progression follows scientifically mandated patterns.¹⁷³ However, other phenomena, such as the spread of infectious diseases, are necessarily predicated on human interaction and behaviour.¹⁷⁴ Owing to the unpredictable nature of human behaviour, such phenomena are difficult to predict.¹⁷⁵ Accordingly, phenomena can be further grouped into two broad categories: those that are based upon scientific laws and those based upon human behaviour, with the former being more predictable than the latter. Ultimately, elections fall into the latter category, increasing their unpredictability. Thus, when considered as a whole, elections are dynamic systems which are based upon human behaviour, rendering them more difficult to predict than other phenomena. However, the contested nature of predictive accuracy necessarily complicates matters.

¹⁷⁰ Edward N. Lorenz, *The Essence of Chaos*, (Seattle: University of Washington Press, 1993), p. 179; Geoff, Boeing, 'Visual Analysis of Nonlinear Dynamical Systems: Chaos, Fractals, Self-Similarity and the Limits of Prediction', *Systems* 4.37 (2016), 1-18 (pp. 1-2).

¹⁷¹ Silver, *The Signal and the Noise*, p. 118.

¹⁷² Silver, *The Signal and the Noise*, pp. 119-120.

¹⁷³ Silver, *The Signal and the Noise*, p. 120.

¹⁷⁴ Ibid

¹⁷⁵ Silver, *The Signal and the Noise*, pp. 220-221.

Indeed, the complications of the dichotomous/continuous contestation extend into the predictive accuracy of pre-election polls which will be addressed next.

The Predictive Accuracy of Pre-election Polls

The dichotomous/continuous definitional division vis-à-vis predictive accuracy is strikingly evident when studying pre-election polls. Moreover, the relationship, or lack thereof, between these competing conceptualisations is also apparent. For example, the polls conducted for the second round of the 2017 French presidential election correctly called Emmanuel Macron as the victor, but incorrectly called his margin of victory by an average of ten percentage points.¹⁷⁶ Additionally, a poll conducted by Fox News during the 2004 U.S. presidential election correctly predicted John Kerry's vote share, despite incorrectly forecasting him as the victor.¹⁷⁷ It is evident that the former example exhibited a high degree of dichotomous accuracy, but a low degree of continuous accuracy. Likewise, the latter example had perfect continuous accuracy, but was dichotomously inaccurate. Thus, it is clear that dichotomous and continuous measures of accuracy can exist as distinct entities with regards to pre-election polling, with a high degree of one form of accuracy not necessarily leading to a high degree of accuracy in the other.

The distinction between dichotomous and continuous measures of accuracy has also led to tension within both literature regarding polling and its popular perception. Indeed, as was evidenced in the literature review, although much methodological work focuses on continuous measures of accuracy, the impetus for their production is almost invariably

¹⁷⁶ Harry Enten, *Macron Won, But the French Polls Were Way Off* (2017), <<https://fivethirtyeight.com/features/macron-won-but-the-french-polls-were-way-off/>> [accessed 01/08/2017].

¹⁷⁷ Real Clear Politics, *General Election: Bush vs. Kerry* (2004), <https://www.realclearpolitics.com/epolls/2004/president/us/general_election_bush_vs_kerry-939.html> [accessed 01/08/2017].

provided by failures of dichotomous prediction.¹⁷⁸ Additionally, failures of dichotomous prediction are deemed more egregious and remembered more prominently in the public consciousness than failures of continuous prediction.¹⁷⁹ As a result of the clear distinction between dichotomous and continuous measures of polling accuracy, it is necessary for both to be addressed herein in order to provide a complete picture. Accordingly, we will begin with continuous measures.

Continuous Measures of Polling Accuracy

The earliest and most comprehensive attempt to define polling accuracy was conducted by the Social Research Council in the wake of the 1948 U.S. presidential election. Therein, Mosteller established eight measures through which the accuracy of pre-election polls could be assessed.¹⁸⁰ The Mosteller measures range from broadly addressing the predicted and actual proportions of the total vote share received by candidates, to specifically measuring the disparity between the predicted and actual share of the major party vote that they receive.¹⁸¹ Additionally, the measures also implement the chi-squared test to gauge the congruence between estimated and actual vote distributions, calculate the average unsigned difference between predicted and actual vote shares, and represent accuracy as the difference between a ratio for each candidate's estimated vote share and the number one.¹⁸² Thus, although the methodological approach taken by each measure varies, they all focus upon using the disparity between predicated and actual vote share to gauge polling accuracy. Thus, the

¹⁷⁸ Gallup, pp. 16-22; Hanse, Hurwitz, and Mafow, pp. 1-77; Cochran, pp. 290-330; Baker et al., p. 69; Smith, pp. 443-463; Crossley and Crossley, p. 1; Butler and Duschinsky, p. 181; Hodder-Williams, p. 92; Teer and Spence, p. 207.

¹⁷⁹ Clark, *The 2015 Election Disaster Doesn't Mean We Should Give Up On Polling*; ITV, *Times the Election Polls Got it Wrong*; Malnick, *Revealed: How the Pollsters Got it Wrong – Again*.

¹⁸⁰ Mosteller et al., pp. 41-84.

¹⁸¹ Mitofsky, p. 232.

¹⁸² Ibid

Mosteller measures established the disparity between predicted and actual vote share as a primary determinant of polling accuracy. Ultimately, it is still widely utilised in contemporary analyses to ascertain the accuracy of pre-election polls.¹⁸³

Another prominent measure of continuous polling accuracy is seat error, which refers to the disparity between predicted party seat share and the actual number of seats received on election day.¹⁸⁴ Many approaches to deriving seat shares exist, such as the cube rule,¹⁸⁵ econometric models,¹⁸⁶ and projections based on polls.¹⁸⁷ Despite this, not only is the use of seat error as a measure of accuracy not as ubiquitous as vote error,¹⁸⁸ but it exists as a secondary level of analysis, as it is based upon, and therefore comes after, the prediction of party vote shares. Thus, seat error will not be utilised as a measure of predictive accuracy in this piece. Instead, the continuous accuracy of pre-election polls will be defined as being the disparity between predicted and actual vote shares. However, such a definition of accuracy lacks a degree of chronological specificity and requires a degree of time bounding. In order to

¹⁸³ D. S. Broder, 'Did I Say That?', *The Washington Post*, 28 December 1998; E. Costikyan and L. A. Kaplan, 'Why Trust the Polls?', *The New York Times*, 5 November 1984, p. 4; R. Morin, 'We Pollsters Had It Coming', *The Washington Post*, 13 November 1989, p. 3; K. B. Richburg, 'Every Poll Had Right Winner; Their Margins Varied Widely', *The Washington Post*, 8 November 1984, p. 6; Burns W. Roper, 'Election Poll Errors: A Problem for Us All', *AAPOR News*, 1983, p. 1.

¹⁸⁴ Nadeau, Lewis-Beck, and Bélanger, p. 347.

¹⁸⁵ Paul Whiteley, 'Forecasting Seats from Votes in British General Elections', *British Journal of Politics and International Relations*, 7 (2005), 165-173 (pp. 165-173).

¹⁸⁶ M. Lebo and H. Norpoth, 'Yes, Prime Minister: The Key to Forecasting British Elections', *Electoral Studies*, 30.2 (2011), 258-263 (pp. 258-263); Paul Whiteley et al., 'Aggregate Level Forecasting of the 2010 General Election in Britain: The Seats-Votes Model', *Electoral Studies*, 30.2 (2011), 278-283 (pp. 278-283); Lebo and Norpoth, 'The PM and the Pendulum', pp. 71-87.

¹⁸⁷ J. Curtice, *Translating Poll Results into Seats* (2005), <<http://www.britishpollingcouncil.org/wordpress/wp-content/uploads/2013/11/john-curtice.pdf>> [accessed 02/08/2017]; J. Curtice, *The Lesson of 2010? Ignore All the Forecasts Except for the Exit Polls* (2010), <<http://www.independent.co.uk/news/uk/politics/john-curtice-the-lesson-of-2010-ignore-all-the-forecasts-except-for-the-exit-polls-1968201.html>> [accessed 02/08/2017].

¹⁸⁸ Matthew Wall, Maria Laura Sudulich, and Kevin Cunningham, 'What are the Odds? Using Constituency-level Betting Markets to Forecast Seat Shares in the 2010 UK General Elections', *Journal of Elections, Public Opinion and Parties*, 22.1 (2012), 3-36 (p. 5).

acquire this specificity, it is necessary to address the work of Crespi and dichotomous measures of polling accuracy.

Dichotomous Measures of Polling Accuracy

Crespi addressed the necessity of chronological specificity when defining polling accuracy in 1988.¹⁸⁹ He did not dispute predicted vote share as a measure of polling accuracy, but held that it was necessary to distinguish between polls conducted at the beginning of an election cycle and those conducted towards the end.¹⁹⁰ This is due not only to the fact that polls conducted far in advance of election day are extremely volatile, but leaving a large time gap between prediction and confirmation leaves too great a window for voter intention to change.¹⁹¹ Consequently, the possibility for such change must be accounted for. Crespi held that the only way to sufficiently account for this, and thus produce a dependable measure of accuracy, is to measure the difference between the vote share projected by the last polls conducted before election day and the final results.¹⁹² Indeed, other academics corroborate this stance and hold that polls conducted closer to election day are more representative of final results.¹⁹³

Crespi's stance vis-à-vis the representativeness of polls comes down to the distinction between dichotomous and continuous approaches to polling. The view espoused by Crespi is dichotomous, insofar as it draws a black and white distinction between the predictive accuracy of polls, holding that only the final polls conducted before election day are representative, dismissing the predictions of all others. However, the predictive accuracy of

¹⁸⁹ I. Crespi, pp. 4-5.

¹⁹⁰ Ibid

¹⁹¹ Lang and Lang, p. 135; Gelman and King, p. 409.

¹⁹² I. Crespi, p. 5.

¹⁹³ Robert S. Erikson and Christopher Wlezien, *The Timeline of Presidential Elections*, (Chicago: The University of Chicago Press, 2012), p. 23; Lang and Lang, p. 135; Gelman and King, p. 409.

pre-election polls could also be viewed through a continuous lens. Through this lens, all polls conducted throughout an election cycle render valid predictions, with the final polls conducted proffering the best predictions. Despite this, Crespi's dichotomous stance on the predictive utility of pre-election polls will be utilised herein. This is due to that fact that the focus of this paper is the predictability of elections, not the accuracy of pre-election polls. To adopt the continuous view of polls would place too much emphasis on their changing accuracy over time and would detract from the focus of this piece.

When dichotomous measures of polling accuracy are considered broadly, they can be seen to have different meanings in different electoral systems. For example, presidential elections in the United States are predicated on simple plurality voting, meaning that the dichotomous call simply surrounds a winner and a loser. However, in French presidential elections, a two-ballot electoral system is used with a secondary runoff election.¹⁹⁴ Consequently, a correct dichotomous call in the first-round election is of diminished significance, as it does not guarantee a correct dichotomous call in the second-round runoff. Additionally, in general elections in the United Kingdom, the dichotomous call not only surrounds calling the winning party, but is also concerned with which party has a parliamentary majority.¹⁹⁵

Despite this variation, the most prominent dichotomous measure of polling accuracy is whether or not polls correctly call the overall winner of an election. This is arguably more important for perceptions of polling accuracy than vote error, as not only is it the most publicly visible metric,¹⁹⁶ but it is also the metric by which the success and failure of pre-

¹⁹⁴ Josep M. Colomer, *Handbook of Electoral System Choice*, (Basingstoke: Palgrave-Macmillan, 2004), p. 155.

¹⁹⁵ Colomer, pp. 294-309.

¹⁹⁶ C. Anthony Broh, 'Horse-Race Journalism: Reporting the Polls in the 1976 Presidential Election', *The Public Opinion Quarterly*, 44.4 (1980), 514-529 (p. 514); Gabriel Weimann, 'The Obsession to Forecast: Pre-Election Polls in Israeli Press', *Public Opinion Quarterly*, 54 (1990), 396-408 (p. 403); Suzanna Linn, Jonathan Moody, and Stephanie Asper, 'Explaining the Horse Race of 2008', *Political Science and Politics*, 42.3 (2009), 459-465 (p. 459).

election polls has been determined historically.¹⁹⁷ Moreover, often when the winner of an election is correctly called, polls are deemed to be accurate irrespective of whether they failed to correctly predict the vote share by a considerable margin, as was the case with polls conducted for the 2017 presidential election in France.¹⁹⁸

Despite the primacy afforded to correctly calling the overall winner, dichotomous and continuous measures of accuracy often exist as discrete entities, as previously discussed. Resultantly, for the purposes of this piece, polling accuracy is the subject of a bifold definition. Not only is it defined as being the disparity between the vote share predicted by the last polls conducted in an election cycle and the actual results, but it is also defined as correctly calling the winner of an election. Ultimately, these dichotomous and continuous measures of accuracy will serve as the dependent variables in this study. Now that the dependent variables have been established, it is necessary to identify independent variables and state their relationship to the dependent variables for the purposes of hypotheses generation.

Independent Variables and Hypotheses:

Owing to the lack of substantive literature pertaining to whether certain elections are more predictable than others from which to derive testable hypotheses, works, theories, and trends within the broad discipline of political science have been identified which lead to the generation of the hypotheses stated herein. Ultimately, the independent variables addressed in

¹⁹⁷ Squire, p. 126; Gosnell, p. 108; Katz and Cantril, pp. 167-168; Crossley, p. 27; Mosteller et al., pp. 41-84; Butler and Pinto-Duschinsky, p. 181; Teer and Spence, p. 207; Abrams, p. 321; Baker et al., p. 69.

¹⁹⁸ Huffpost Pollster, *Poll Chart: France Presidential Runoff: Le Pen vs Macron* (2017), <<http://elections.huffingtonpost.com/pollster/france-presidential-runoff-le-pen-vs-macron>> [accessed 02/08/2017]; Harry Enten, *Le Pen is Just a Gargantuan Polling Error Behind Macron* (2017), <<https://fivethirtyeight.com/features/le-pen-is-just-a-gargantuan-polling-error-behind-macron/>> [accessed 02/08/2017].

this paper will be: the effective number of parties in an election, proximity to the present, election type, the presence of partisan sentiment, the extent to which election data is known in advance, and the closeness of the race. Accordingly, these variables will be addressed systematically, beginning with the effective number of parties.

Effective Number of Parties

As per the effective number of parties model devised by Laakso and Taagepera, the degree of vote fragmentation in an election directly correlates with the effective number of political parties contesting it.¹⁹⁹ Consequently, if an election is contested by a greater number of effective parties, it can be expected that vote share distribution will be more difficult to predict, as the total vote will be the subject of a higher degree of fragmentation. Additionally, owing to this fragmentation, it will also be more difficult to confidently call the overall winner. Thus, the greater the number of effective parties contesting an election, the less predictable it can be expected to be with regards to both dichotomous and continuous measures of accuracy. Accordingly, the following hypothesis can be drawn:

H1) The greater the effective number of parties in an election, the less predictable both its vote share distribution and overall winner will be.

Proximity to the Present

As evidenced by the literature review, methods of electoral prediction are the subject of constant methodological revision. Not only this, but technological advancements have occurred, most notably the use of telephone polling and the rise of the internet. Consequently, polling can be seen to be the subject of iterative improvement over time to improve its

¹⁹⁹ Markku Laakso and Rein Taagepera, 'The Effective Number of Parties: A Measure with Application to West Europe', *Comparative Political Studies*, 12.1 (1979), 3-27 (p. 12).

efficacy. Thus, the more proximal an election is to the present, the more time has elapsed in which iterative improvements can take place, and the more predictable it can be expected to be.

Owing to the fact that iterative methodological revision surrounds the elimination and mitigation of errors,²⁰⁰ the refinement of technique,²⁰¹ and the improvement of accuracy,²⁰² it will not only increase the accuracy of vote share prediction, but will also improve the ability of polls to call the overall winner. Consequently, the closer an election is to the present, the more predictable both its vote share distribution and overall winner can be expected to be. Thus, the following hypothesis can be drawn:

H2) The more proximal an election is to the present, the more predictable both its vote share distribution and overall winner will be.

Type of Election and the Presence of Partisan Sentiment

Despite some scholars espousing the thesis of partisan decline and holding that partisanship is decreasing in modern elections,²⁰³ it is more broadly held that partisan sentiment is still a prominent feature of modern party politics and has a considerable impact upon the way in which individuals vote,²⁰⁴ thereby rendering their votes, and by extension elections, largely

²⁰⁰ Hansen, Hurwitz, and Madow, pp. 290-330; Kish, pp. 1-297; Anderson, Kasper, and Frankel, pp. 1-296; Converse and Traugott, pp. 1094-1098.

²⁰¹ Gallup, p. 16; Mosteller et al., pp. 41-84.

²⁰² Crossley, p. 24; Mosteller et al., pp. 41-84; Gallup, p. 16; Perry, p. 534; Smith, pp. 443-463; Anderson, Kasper, and Frankel, pp. 1-296; Belli et al., pp. 90-108; Herbst, pp. 220-229; Hillygus, p. 974.

²⁰³ Martin P. Wattenberg, *The Decline of American Political Parties: 1952-1994* (Cambridge: Harvard University Press, 1996), p. ix.

²⁰⁴ Alan S. Gerber, Gregory A. Huber, and Ebonya Washington, 'Party Affiliation, Partisanship, and Political Beliefs: A Field Experiment', *The American Political Science Review*, 104.4 (2010), 720-744 (p. 720); Larry M. Bartels, 'Partisanship and Voting Behaviour: 1952-1996', *American Journal of Political Science*, 44.1 (2000), 35-50 (p. 35); Marc J. Hetherington, 'Resurgent Mass Partisanship: The Role of Elite Polarization', *American Political Science Review*, 95.3 (2001), 619-631 (pp. 628-630); David E. Campbell, 'The Party Faithful: Partisan Images, Candidate Religion, and the Electoral Impact of Party Identification', *American Journal of Political Science*, 55.1 (2011), 42-58 (p. 42); Ronald N. Rapoport, 'Partisanship Change in a Candidate-Centred Era', *The Journal of Politics*, 59.1 (1997), 185-199 (p. 185).

predictable. Accordingly, elections with a greater degree of strong partisan identification amongst the electorate can be expected to be more predictable than those in which strong partisan identification is less prevalent.

Although this can be expected of general elections, it has been noted in academic literature that partisanship does not play a prominent role in referenda, as it is occluded by the complexity of the matters being decided and cue uncertainty amongst the electorate,²⁰⁵ along with the fact the referenda are not contested by traditional political parties. Indeed, the lack of partisan sentiment in referenda is evidenced by the impact of political campaigns upon the decision-making of referendum voters,²⁰⁶ as campaigns usually fail to substantively alter the vote.²⁰⁷ However, it must be noted that there are fewer ways for referenda to be dichotomously inaccurate than general elections, as referenda are necessarily binary, comprising two potential outcomes, whereas general elections have several. Despite this, referenda can be expected to be broadly less predictable than general elections, as both the vote share and eventual winner will become more difficult to predict due to the absence of predictable party loyalties amongst the electorate.

²⁰⁵ Matthew Wall, Rory Costello, and Stephen Lindsay, 'The Miracle of the Markets: Identifying Key Campaign Events in the Scottish Independence Referendum Using Betting Odds', *Electoral Studies*, 46 (2017), 39-47 (p. 40).

²⁰⁶ Sara Binzer Hobolt, *Europe in Question: Referendums on European Integration*, (Oxford: Oxford University Press, 2009), p. 127; Samantha Laycock, 'Is Referendum Voting Distinctive? Evidence from Three UK Cases', *Election Studies*, 32.2 (2013), 236-252 (p. 241); Lawrence LeDuc, 'Referendums and Elections: How Do Campaigns Differ?', in *Do Political Campaigns Matter? Campaign Effects in Elections and Referendums* ed. by D. Farrell and R. Schmitt-Beck, (London: Routledge, 2002), p. 137; Claes H. de Vreese, 'Context, Elites, Media and Public Opinion in Referendums: When Campaigns Really Matter', in *The Dynamics of Referendum Campaigns: An International Perspective* ed. by Claes H. de Vreese, (Basingstoke: Palgrave Macmillan, 2007), pp. 1-20; Claes H. de Vreese and H. A. Semtko, 'News Matters: Influences on the Vote in the Danish 2000 Euro Referendum Campaign', *European Journal of Political Research*, 43.5 (2004), 699-722 (pp. 699-722); Andreas Schuck and Claes H. de Vreese, 'The Dutch No to the EU Constitution: Assessing the Role of EU Scepticism and the Campaign', *Journal of Elections, Public Opinion and Parties*, 18.1 (2008), 101-128 (pp. 101-128).

²⁰⁷ Romain Lachat and Pascal Sciarini, 'When Do Election Campaigns Matter, and to Whom? Results From the 1999 Swiss Election Panel Study', *Routledge Studies in European Political Science*, 25 (2002), 41-57 (p. 41).

Thus, although the type of election and the presence of partisan sentiment can be seen to be theoretically distinct, insofar as they both impact upon the predictability of elections, they cannot be said to be mutually exclusive, as there is considerable empirical interplay between them. Resultantly, the following hypotheses can be drawn:

H3) The vote share distribution and overall winner of referenda will be less predictable than those of general elections.

H4) The vote share distribution and overall winner will be more predictable in general elections with a greater degree of strong partisan identification.

The Extent to Which Information Pertaining to the Election is Known in Advance

Since the Parliament Act of 1911, parliaments in the United Kingdom have dissolved after a maximum of five years, necessitating a general election after this time.²⁰⁸ Additionally, the Fixed Term Parliament Act of 2011 mandated quinquennial general elections.²⁰⁹ Resultantly, regularly scheduled elections have long been a mainstay of the British political system. However, many snap elections have been called earlier than required as a result of votes of no confidence and political leaders pressing perceived advantages.²¹⁰ Consequently, British politics is characterised by two forms of general election: scheduled and snap. This distinction has profound implications for the extent to which information pertaining to the election is known in advance.

²⁰⁸ Alfred L. P. Dennis, 'The Parliament Act of 1911', *The American Political Science Review*, 6.2 (1912), 194-215 (p. 195).

²⁰⁹ The National Archives, *Fixed-term Parliaments Act 2011* (2011), <<http://www.legislation.gov.uk/ukpga/2011/14/contents/enacted>> [accessed 21/08/2017].

²¹⁰ Peter Joyce, *Politicos Guide to UK General Elections 1832-2001*, (London: Politicos Publishing, 2004), pp. 1-410.

Owing to the fact that scheduled elections occur at regular, predictable intervals, they tend to have longer campaigns.²¹¹ Resultantly, information pertaining to scheduled elections is available far in advance of election day. Conversely, snap elections in the United Kingdom have historically had shorter campaign periods than scheduled elections.²¹² Despite this holding true for the majority of cases, not all snap elections are accompanied by shorter campaigns than regularly scheduled elections. Indeed, the campaign for the 2017 snap election was longer than many past elections.²¹³ Owing to these generally shorter campaigns, information pertaining to snap elections is not available as far in advance as that pertaining to scheduled elections.

When considered through the lens of Crespi's dichotomous definition of polling accuracy, this disparity has clear theoretical ramifications for electoral predictability. Given that it is widely held that the predictive accuracy of polls increases over time,²¹⁴ the length of time that information pertaining to elections is known for directly impacts their accuracy and, thus, the predictability of elections. Elections in which information is known significantly in advance will necessarily provide more time for polls to develop into more accurate and indicative predictive measures than elections in which it is not. Resultantly, given that pre-election polls render both dichotomous and continuous predictions, the length of time available for pre-election polls to mature necessarily affects not only their ability to accurately predict the overall winner of an election, but also the vote share distribution. Thus, the greater the length of time that information pertaining to an election is known in advance, the more predictable

²¹¹ Oonagh Gay and Isobel White, 'Election Timetables', *House of Commons Research Paper 13/27*, (15 May 2013), p. 13.

²¹² Smith, p. 401.

²¹³ Anushka Asthana and Peter Walker, *Theresa May Calls for General Election to Secure Brexit Mandate* (2017), <<https://www.theguardian.com/politics/2017/apr/18/theresa-may-calls-for-general-election-in-bid-to-secure-brexit-mandate>> [accessed 21/08/2017]; Gay and White, p. 13.

²¹⁴ Erikson and Wlezien, *Timeline of Presidential Elections*, p.23; Crespi, pp. 4-5; Gelman and King, p. 409.

both its vote share distribution and eventual winner can be expected to be. Consequently, the following hypothesis can be drawn:

H5) The greater the length of time that information pertaining to an election is known for, the more predictable its vote share distribution and overall winner will be.

Closeness of the Race

The closeness of the race is of significance for both dichotomous and continuous measures of predictive accuracy. If the race in an election is close, the ability of pre-election polls to correctly predict the eventual winner necessarily becomes more difficult, as even a small shift in voter intention can alter the victor. However, a close race has altogether different ramifications for accurately predicting the distribution of vote share. A close race largely precludes any major shift in the distribution of vote share. Indeed, close races are held in the literature to be decided by such fine margins that prediction is largely predicated on luck,²¹⁵ with vote share deviating within the margin of error.²¹⁶ Resultantly, the vote shares of close elections are unlikely to deviate greatly from those predicted by polls, rendering them less impactful with regards to continuous accuracy. However, the same cannot be said of accurately calling the overall winner. Given the extremely fine margins that characterise close elections, even a small deviation in vote share can change the overall winner of the election. Consequently, small deviations can fundamentally alter the victor of an election and are thus of extreme consequence regarding this dichotomous measure of polling accuracy. Therefore, it can be expected that the overall winner of elections in which the race between

²¹⁵ Michael J. Pitts, 'Heads or Tails? A Modest Proposal for Deciding Close Elections', *Connecticut Law Review*, 39.2 (2006), 739-748 (p. 739); David Lee, 'Randomized Experiments from Non-Random Selection in U.S. House Elections', *Journal of Econometrics*, 142 (2008), 675-697 (pp. 675-697); Justin Grimmer et al., 'Are Close Elections Random?', *Mimeograph Harvard University School of Government*, (2011), 1-43 (p. 3).

²¹⁶ Hennessy and Hennessy, p. 411.

parties is extremely close will be less predictable than vote share distribution. Thus, the following hypothesis can be drawn:

H6) In elections in which the race between parties is extremely close, the overall winner of the election will be less predictable than vote share distribution.

Ultimately, the veracity of the six hypotheses stated herein will be tested in the forthcoming analysis. However, before such analysis can take place, the independent variables of the study must necessarily be operationalised and the method of analysis explicated. It is with these two aims that we move into the methodology chapter.

Chapter Three: Methodology

Before substantive analysis can be conducted, it is necessary for the both the dependent and independent variables to be operationalised and for the method of analysis to be explicated. Additionally, the scope of the study must be explicitly stated and rationalised. With these factors in mind, this chapter will begin outlining and justifying the scope of the paper, addressing both its time-bounding and the focus. Thereafter, the independent variables of this study will be operationalised in order to facilitate later quantitative analysis. Necessarily, decisions regarding the manner of operationalisation will be justified herein. Finally, the methods of analysis that will be utilised to ascertain the predictability of elections will be outlined, taking into account the analytical limitations of the gathered data.

The Scope of the Paper

This paper will address British national elections from 1945 to 2017. The United Kingdom has been selected as the focus of this paper for two principal reasons. The first of these concerns the ease of data collection. As this paper is being written in the United Kingdom, British electoral information far more conveniently accessible than those of other countries. The second reason concerns the limitations of a dissertation. Not only must dissertations be completed in a relatively short timeframe, but their length is necessarily limited. These limitations necessitated the selection of a case that would not only allow sufficient data to be gathered and synthesised in time, but that could also be satisfactorily addressed within a dissertation. Consequently, it was necessary to select a single, manageable case, resulting in the selection of the United Kingdom.

The limitations imposed by a dissertation also factored into the time-bounding of the paper. Ultimately, the paper addresses British national elections from 1945 to 2017. The decision to

begin in 1945 was based upon three considerations. The first of these concerned the need for the analysis to fit into the confines of a dissertation, thereby necessitating the selection of a limited sample of data. The second consideration surrounded the need for the sample to not only fit within the scope of a dissertation, but also be expansive enough to facilitate meaningful analysis. The final, and arguably most important, consideration concerned the availability of information. 1945 marked the first year in which British general elections were the subject of substantive study.²¹⁷ Consequently, it was the first year in which significant information regarding British general elections was readily available for academic consumption. Thus, beginning in 1945 not only allows for effective data collection, but also provides an acceptable range of elections to conform to the limitations of a dissertation.

Finally, the decision to focus on national elections within the United Kingdom concerned not only engaging in a sufficiently limited study to fit within a dissertation, but also issues of comparability. If this paper had attempted to address all the elections that occurred within the United Kingdom between 1945 and 2017, it would have been extremely difficult to gather sufficient data and engage in meaningful analysis within the temporal and spatial constraints of a dissertation. Additionally, such an approach would necessarily have comprised both local and national elections, which would have been largely incomparable and would not have been conducive to effective analysis. Consequently, it was necessary to study elections of the same kind in order to facilitate meaningful comparison and analysis. With the scope of the paper established, it is necessary to operationalise the variables addressed herein.

²¹⁷ British Election Study, *'The Evolution of British Electoral Studies' by David Butler* (2014), <http://www.britishelectionstudy.com/bes-impact/the-evolution-of-british-electoral-studies-by-david-butler/> [accessed 07/09/2017].

Operationalisation of Variables

The identified dependent variables of this study are the dichotomous and continuous measures of polling accuracy. The former comprises correctly calling the overall winner of an election and the latter involves correctly predicting the vote share distribution. In order for these dependent variables to be utilised in later quantitative analysis, they must be operationalised. However, before this can be done, it must be established where information pertaining to vote share distribution and the overall winner of elections, with regards to both predictions and results, is going to be taken from and how its selection is going to be rationalised.

The results of the studied general elections between 2017 and 2010 will be taken from the House of Commons Library and BBC election reports,²¹⁸ whereas the results for elections from 2005 to 1945 will be taken from House of Commons election statistics and the UK political information archive.²¹⁹ Additionally, the results of the studied referenda will be taken from the results published by the Electoral Commission,²²⁰ BBC political reports,²²¹ and the ARK database.²²² Predictions regarding the vote share distribution and overall winner

²¹⁸ House of Commons Library, *General Election 2017: Full Results and Analysis* (2017), <<http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7979>> [accessed 10/09/2017]; BBC, *Election 2017: Results* (2017), <<http://www.bbc.co.uk/news/election/2017/results>> [accessed 10/09/2017]; BBC, *Election 2015: Results* (2015), <<http://www.bbc.co.uk/news/election/2015/results>> [accessed 10/09/2017]; BBC, *Election 2010: National Results* (2010), <<http://news.bbc.co.uk/1/shared/election2010/results/>> [accessed 10/09/2017].

²¹⁹ House of Commons Library, *UK Election Statistics: 1918-2017* (2017), <<http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7529>> [accessed 10/09/2017]; UK Political Info, *Political Data From 1945 to the Present* (2017), <<http://www.ukpolitical.info/Historical.htm>> [accessed 10/09/2017].

²²⁰ The Electoral Commission, *EU Referendum Results* (2016), <<https://www.electoralcommission.org.uk/find-information-by-subject/elections-and-referendums/past-elections-and-referendums/eu-referendum/electorate-and-count-information>> [accessed 10/09/2017].

²²¹ BBC, *EU Referendum Results* (2016), <http://www.bbc.co.uk/news/politics/eu_referendum/results> [accessed 10/09/2017].

²²² ARK Elections, *The Referendums of 1973 and 1975* (2002), <<http://www.ark.ac.uk/elections/fref70s.htm>> [accessed 10/09/2017].

of the studied elections will be taken from pre-election polls. These polls will be derived from a multiplicity of sources including the UK Polling Report,²²³ media outlets,²²⁴ freely accessible polling databases,²²⁵ and the Nuffield electoral studies.²²⁶ Owing to the aforementioned adherence to logic of Crespi, only the polls conducted closest to each of the studied elections will be utilised. Primarily, polls conducted on the eve of the studied elections will be utilised. However, polls conducted two days before the election will be utilised in cases in which those conducted on the eve of election day are scarce or non-existent. This necessarily limits the sample size of polls utilised in this paper, but ultimately ensures that they are representative.

With the sources of data ascertained, operationalisation can take place. The dichotomous accuracy of polls can be operationalised by representing it as total dichotomous error. Ultimately, total dichotomous error will be calculated by enumerating the number of polls that incorrectly called the winner of an election and representing this as a percentage by dividing it by the total number of polls gathered for that election and multiplying by one hundred. Despite this representing dichotomous accuracy on a continuous scale, it allows for

²²³ UK Polling Report, *Voting Intention* (2017), <<http://ukpollingreport.co.uk/voting-intention-2>> [accessed 10/09/2017]; UK Polling Report, *Alternative Vote* (2011), <<http://ukpollingreport.co.uk/av-referendum>> [accessed 10/09/2017].

²²⁴ The Economist, *No Hope for AV Say the Polls* (2011), <https://www.economist.com/blogs/blighty/2011/05/av_referendum> [accessed 10/09/2017].

²²⁵ Mark Pack, *Pollbase: Opinion Polls Database from 1943-Today* (2017), <<https://www.markpack.org.uk/opinion-polls/>> [accessed 10/09/2017]; The Guardian, *All Guardian/ICM Poll Results* (2016), <<https://docs.google.com/spreadsheets/d/1oHcxIAbkTJmqfOxYQM22cvjjjRf5pETIF30x7L-gybc/edit#gid=0>> [accessed 10/09/2017].

²²⁶ R. B. McCallum and Alison Readman, *The British General Election of 1945*, (London: Oxford University Press, 1947), pp. 242-243; H. G. Nicholas and David Butler, *The British General Election of 1950*, (London: MacMillan, 1951), pp. 284-285; David Butler, *The British General Election of 1951*, (London: MacMillan, 1952), p. 238; David Butler, *The British General Election of 1955*, (London: MacMillan, 1955), p. 156; David Butler and Richard Rose, *The British General Election of 1959*, (London: MacMillan, 1960), p. 105; David Butler and Anthony King, *The British General Election of 1964*, (London: MacMillan, 1965), p.208; David Butler, *The British General Election of 1966*, (London: MacMillan, 1966), p. 174.

delineation between similar cases that the binary nature of dichotomous measures would have precluded.

Before the operationalisation of vote share prediction can occur, it is necessary to address than manner in which vote share distribution will be approached in this paper, as it directly informs the calculation of total mean absolute error. For the studied general elections, the vote share predictions made by pre-election polls will be broken down in a quadripartite manner between the Conservatives, Labour, Liberal Democrats, and other parties. Ultimately, the figure stated for other parties will comprise the cumulative vote share of those parties not explicitly stated in the polls. However, owing to the binary nature of referenda, the vote share predictions made for them by polls will be broken down in a bifold manner between the opposing yes and no outcomes.

With the measures of vote share distribution established, the total mean absolute error for each poll will be calculated by first finding the absolute, and thus unsigned, vote share error for each party addressed by each poll. This will be accomplished by finding the absolute difference between the predicted party vote shares and the actual vote shares that they received. Following this, the mean absolute error of each poll will be calculated by adding the absolute error of each party prediction together and dividing by four in the case of general elections and two in the case of referenda. Thereafter, for each of the studied elections, the mean absolute error of each poll will be added together and divided by the total number of polls conducted for the election, thereby providing each election with a total mean absolute error value.

Now that the dependent variables have been operationalised, it is necessary to operationalise the independent variables. The first independent variable addressed in this paper is the

effective number of parties contesting an election. In order to effectively operationalise, and thus measure, this variable, the formula derived by Laakso and Taagepera will be utilised.²²⁷

The formula is best expressed as $N = \frac{1}{\sum_{i=1}^n p_i^2}$ wherein n is the number of parties which receive at least one vote in an election and p_i^2 is the square of the normalised vote share received by each party. To implement this formula, the vote share of all parties that received votes in the studied elections will be ascertained and then normalised. For example, if a party receives 42.4% of the vote, its normalised vote share will be 0.424. For a full account of normalised party vote shares, see Appendix B. Thereafter, the normalised vote shares of the parties contesting each of the studied elections will be added together to provide a total value. Subsequently, one will be divided by this total value in order to show the effective number of parties contesting each election. However, it must be noted that the effective number of parties will not be calculated for the studied referenda. This is due to the fact that referenda are not contested by traditional political parties and are instead contested by two competing camps.²²⁸ Thus, owing to the absence of traditional political parties and their fundamentally binary nature, it is unnecessary to calculate the effective number of parties for referenda.

After the effective number of parties, this paper will proceed to address the proximity of the studied elections to the present. The proximity of elections to the present can be operationalised by measuring the number of days between the date that an election was held and the present. The present will be defined herein as the date at which the data for this paper is collected. For more information, see Appendix A. Ultimately, days will be utilised as the metric for gauging proximity to the present rather than months or years, as they not only

²²⁷ Laakso and Taagepera, pp. 3-9.

²²⁸ LeDuc, p. 146.

provide a more accurate measurement of proximity, but also account for small changes between cases which may be missed by broader metrics.

Subsequently, the paper will analyse election type and the strength of partisan identification amongst the electorate. The former independent variable can be measured simply by ascertaining whether the studied election is a general election or referendum and labelling it appropriately. However, the latter variable requires a greater degree of operationalisation. The strength of partisan identification amongst the populace is routinely measured by pre-election polls and is a mainstay of their questioning.²²⁹ Additionally, it is the subject of both electoral studies and media attention.²³⁰ Consequently, it will be from these sources that information pertaining to the strength of partisanship in the studied elections will be gathered. However, a degree of specificity is required with regards to the information utilised to represent the strength of partisan sentiment. This is due to the fact that it is measured on a scale, with respondents to polls being asked whether they have very strong, fairly strong, not very strong, or no party identification.²³¹ Owing to this, the strength of partisan sentiment for the studied elections will be measured by taking the combined percentage of respondents who state that they have very or fairly strong partisan identification as reported by the British Election Studies conducted in their respective years.

Despite the seeming abundance of data, it must be noted that the strength of partisan

²²⁹ Harry Enten, 'Unskewing' Polls with Party ID is, Statistically Speaking, Bunk (2012), <<https://www.theguardian.com/commentisfree/2012/sep/27/unskewing-polls-party-id-bunk>> [accessed 10/09/2017]; Harry Enten, *Why Weighting Polls for Party Identification is Wishful Thinking* (2012), <<https://www.theguardian.com/commentisfree/2012/sep/17/weighting-polls-party-identification>> [accessed 10/09/2017].

²³⁰ Patrick Dunleavy and Chris Gilson, *Is the UK Electorate Disengaged?* (2010), <<http://blogs.lse.ac.uk/politicsandpolicy/is-the-uk-electorate-disengaged/>> [accessed 10/09/2017].

²³¹ British Election Study, *British Election Study 2014-2018: Combined Waves 1-13 Internet Panel Codebook* (2017), <http://www.britishelectionstudy.com/custom/uploads/2017/07/Bes_wave13Documentation_V1.0.pdf> [accessed 10/09/2017].

identification amongst the electorate was not systematically measured in the United Kingdom until 1964.²³² Accordingly, the strength of partisan sentiment cannot, and therefore will not, be addressed for elections prior to 1964 in this paper. Moreover, the strength of partisan sentiment will not be measured for the referenda addressed herein. Once again this is due to the fact that traditional political parties do not contest referenda. As a result of the absence of political parties, partisan sentiment does not play a prominent role in referenda,²³³ rendering its calculation unnecessary.

The penultimate independent variable addressed herein is the length of time that information pertaining to an election is known for. This variable can be operationalised by ascertaining when each of the studied elections was formally announced and counting the number of days between this announcement and election day. Ultimately, the date that each of the studied elections was announced will be derived from contemporary news reports.²³⁴ Once again, this variable will be measured in days in order to provide a more accurate measurement and allow for delineation between similar cases.

²³² David Sanders, 'The UK's Changing Party System: The Prospects for a Party Realignment at Westminster', *Journal of the British Academy*, 5 (2017), 91-124 (p. 107).

²³³ Wall, Costello, and Lindsay, p. 40.

²³⁴ BBC, *Theresa May to Seek General Election on 8 June* (2017), <<http://www.bbc.co.uk/news/uk-politics-39629603>> [accessed 10/09/2017]; BBC, *Referendum on Voting System Goes Ahead After Lords Vote* (2011), <<http://www.bbc.co.uk/news/uk-politics-12485084>> [accessed 10/09/2017]; BBC, *Election Race Begins as Brown Confirms 6 May Date* (2010), <http://news.bbc.co.uk/1/hi/uk_politics/election_2010/8603591.stm> [accessed 10/09/2017]; Matthew Tempest, *Blair Calls Election for May 5* (2005), <<https://www.theguardian.com/politics/2005/apr/05/election2005.uk5>> [accessed 10/09/2017]; BBC, *Blair Calls June Election* (2001), <http://news.bbc.co.uk/news/vote2001/hi/english/newsid_1319000/1319490.stm> [accessed 10/09/2017]; Howell Raines, *Thatcher Calls June 11 Elections Buoyed by a Big Lead in the Polls* (1987), <<http://www.nytimes.com/1987/05/12/world/thatcher-calls-june-11-elections-buoyed-by-a-big-lead-in-the-polls.html?mcubz=1>> [accessed 10/09/2017]; R. W. Apple Jr., *Elections Called 11 Months Early by Mrs Thatcher* (1983), <<http://www.nytimes.com/1983/05/10/world/elections-called-11-months-early-by-mrs-thatcher.html?mcubz=1>> [accessed 10/09/2017]; BBC, *1979: Early Election as Callaghan Defeated* (2008), <http://news.bbc.co.uk/onthisday/hi/dates/stories/march/28/newsid_2531000/2531007.stm> [accessed 10/09/2017]; BBC, *1974: Heath Calls Snap Election Over Miners* (2008), <http://news.bbc.co.uk/onthisday/hi/dates/stories/february/7/newsid_4054000/4054793.stm> [accessed 10/09/2017].

The final independent variable analysed in this paper is the closeness of the race between parties in the studied elections. The closeness of the race will be measured as the difference in percentage points between the vote share received by the two leading parties. Herein, the two leading parties will be defined as the parties who receive the greatest and second greatest vote share in an election. Ultimately, the operationalisation of these variables facilitates quantitative analysis. Thus, the methods by which this analysis will be conducted must be addressed.

Methods of Analysis

Owing to the decision to focus on British national elections from 1945 to 2017, this paper will address twenty-three elections. This is due to the fact that British national elections are defined herein as being those general elections and referenda which involve the entirety of the British electorate. Accordingly, local elections and specific referenda, such as the Scottish independence referendum, are excluded from this paper. As a result of this relatively small sample size, the primary method by which the relationship between the dependent and independent variables will be analysed is a series of bivariate analyses. However, prior to this, macro-level analysis will be conducted to provide a broad overview of the data. To facilitate this, the mean, standard deviation, and range of values for both total dichotomous and total mean absolute error will be derived, tabulated, and analysed. Ultimately, the Stata data analysis software will be used to facilitate this through the calculation of values and the production of graphs.

After the macro-level analysis, the in-depth bivariate analysis will occur. Specifically, the bivariate correlation between the total dichotomous and total mean absolute error exhibited by the polls conducted for the studied elections and the independent variables will be

ascertained through the use of the Stata data analysis software. Thereafter, the correlation coefficients derived from this process will be utilised to test the veracity of the hypothesised relationships. This will be facilitated by tabulating the correlations between both total dichotomous and total mean absolute error and the independent variables. Moreover, scatter graphs and statistical tests, such as the t-test, will be utilised to allow the correlations to be viewed in finer detail. The statistical significance of the derived correlation coefficients will also be established using the Stata star function to denote values that are statistical significant to one percent. This will allow for both the likelihood of correlations and the significance of conclusions to be ascertained. Ultimately, with the scope of the paper established, variables operationalised, and methods of analysis outlined, we can progress to the analysis chapter and attempt to establish whether certain elections are more predictable than others.

Chapter Four: Analysis

Utilising the operationalisation and parameters set out in the methodology, this chapter will present and analyse the independent and dependent variable measurements for the studied elections. It will begin by engaging in macro-level analyses of the total mean absolute and total dichotomous error present in predictions rendered for the studied elections to identify overarching trends. Once this is complete, bivariate analyses will be conducted between the dependent and independent variables. Firstly, the total dichotomous error of the studied elections will be analysed in relation to its correlation with the independent variables in order to systematically test the hypothesised relationships. Thereafter, the correlation of the total mean absolute error with the independent variables will also be analysed for the same purpose. Ultimately, these correlations will be analysed with the aid of both tables and scatter graphs in order to facilitate in-depth investigation of identified correlations. Moreover, in the event of surprising results, forms of statistical analysis, such as the t-test, will be utilised to enable substantive investigation.

Macro-level Analysis

The raw measurements of the independent and dependent variables can be found in Appendix A. From these, macro-level analyses of both the total mean absolute error and the total dichotomous error can be conducted. Indeed, Table 1 provides an in-depth look at the total mean absolute error of the studied elections in order to facilitate substantive macro-level analysis of trends and values.

Total Mean Absolute Error

Variable	Number of Observations	Mean Value	Standard Deviation	Minimum Value	Maximum Value
Total Mean Absolute Error	23	2.55	1.44	1.06	7.14

Table 1: Measurements of Total Mean Absolute Error

Table 1 shows that the total mean absolute error of the predictions made by pre-election polls for the studied elections had a mean value of 2.55. Additionally, the standard deviation of the total mean absolute error of these predictions was 1.44, showing that the majority of values did not vary too greatly from the mean. Ostensibly, this can be seen to denote a degree of predictability on the part of elections in terms of total mean absolute error, as the vote share of British national elections conducted between 1945 and 2017 was, on average, predicted to within 2.55% and did not deviate too greatly from this value. However, when the range of values is considered, it is clear that some elections existed as outliers in terms of total mean absolute error. Indeed, the minimum total mean absolute error value was 1.06, whereas the maximum value was 7.14. Although the former value does not exist too far beyond the mean value when standard deviation is accounted for, the latter value is a clear outlier. Thus, although some elections were predicted with a high degree of continuous accuracy, others were predicted with a greatly decreased level of accuracy. This is further evidenced when the distribution of total mean absolute error is viewed in terms of density. To facilitate this, Figure 1 shows the density of total mean absolute error values within the data set.

Figure 1: Density of Total Mean Absolute Error Values

In Figure 1, the density of error values can be seen to rise sharply and peak around a value of just over two, corroborating the fact that the majority of values exist around the mean.

Thereafter it declines sharply, ultimately reaching a value of zero just after an error value of four. Density does not then rise significantly until the outlying values of 6.18 and 7.14, which occurred in 2016 and 2011, are reached. This is significant, as there is no precedent for the extreme values, as no other total mean absolute error values exist beyond a value of four.

Indeed, from the complete measurements present in Appendix A, it is clear that no other elections had a total mean absolute error of over 3.18. Resultantly, the outlying values exist as anomalies. Ultimately, the extreme and anomalous nature of these values will be addressed in later bivariate analysis.

The total dichotomous error of the predictions rendered by pre-election polls for British national elections from 1945 to 2017 paints an altogether different picture to the total mean absolute error. Table 2 provides measurements of total dichotomous error to facilitate macro-

level analysis.

Total Dichotomous Error

Variable	Number of Observations	Mean Value (%)	Standard Deviation	Minimum Value (%)	Maximum Value (%)
Total Dichotomous Error	23	22.86	34.04	0	100

Table 2: Measurements of Total Dichotomous Error

Table 2 shows that the mean value of the total dichotomous error of pre-election polls conducted for British national elections from 1945 to 2017 was 22.86%. Ostensibly, this can be seen to indicate that, on average, just under 23% of the dichotomous predictions made by pre-election polls for the studied elections were incorrect. In turn, this would suggest that close to 77% of predictions were correct, leading to the broad assertion that elections are highly predictable by dichotomous means. However, when the standard deviation of 34.04 is considered, it is clear that the mean value is hardly representative, as the error values exhibit extreme variation from it. Indeed, it can be seen that the total dichotomous error of the predictions proffered for the studied elections varied to a far greater degree than the total mean absolute error. This can be seen to justify the utilisation of a bifold conceptualisation of predictive accuracy, as dichotomous and continuous measures can be seen to exist as discrete entities.

In addition to the standard deviation, the range of values displayed by Table 2 lends further credence to the notion that the mean is not a truly representative value, as the values present within the data set vary between two polar extremes. The minimum total dichotomous error exhibited by polls conducted for the studied elections was 0%, whereas the maximum error was 100%. Thus, pre-election polls universally correctly called the winner of elections in

certain years, but universally failed to call the winner in others. So, far from being a reliable predictive metric, it is clear that dichotomous predictive accuracy is subject to extreme variance. This variance becomes extremely apparent when the distribution of total dichotomous error values is viewed in terms of density, as it is in Figure 2.

Figure 2: Density of Total Dichotomous Error Values

Although the density of values in Figure 2 can be seen to decline as total dichotomous error increases, at no point does the density of values reach zero. Additionally, two distinct peaks in density are evident at around 0% and 75%. This can be seen to indicate that, unlike total mean absolute error, a wide and varied range of total dichotomous error values exists, resulting in none existing as extreme outliers. However, the fact that the most prominent peak in density occurs around 0% is of significance and necessarily affects the data set as a whole. As can be seen in the measurements contained in Appendix A, the majority of the studied elections were predicted with perfect dichotomous accuracy. Despite this, the predictions for

the other elections exhibited total dichotomous error that ranged from 12.5% to 100% with little replication of error values. Thus, not only does no clear pattern regarding total dichotomous error exist within the predictions for the studied elections, but the zero values necessarily distort the error values due to their abundance. Consequently, this results in an unrepresentative mean value and the flawed assertion that dichotomous predictions are a reliable metric.

Ultimately, macro-level analysis of total mean absolute and total dichotomous error not only shows that the two measures are distinct and vary to differing degrees, but also demonstrates that certain studied elections were predicted with a greater degree of accuracy than others. However, in order to confirm the variation between the two measures of accuracy and explain why certain elections were predicted with a greater degree of accuracy than others, it is necessary to engage in bivariate analyses between the dependent and independent variables. Moreover, bivariate analysis will allow for the individual impact of electoral characteristics upon the predictability of the studied elections to be ascertained.

Bivariate Analysis

The bivariate analysis will begin by addressing the correlation between total dichotomous error and the identified independent variables. However, before analysing these correlations, it is necessary to establish what correlation coefficients represent. If the value of a correlation coefficient is negative, it represents a negative correlation wherein an increase in one variable accompanies a decrease in the other.²³⁵ Conversely, a positive correlation coefficient

²³⁵ Investopedia, *What Does a Negative Correlation Coefficient Mean?* (2015), <http://www.investopedia.com/ask/answers/041015/what-does-negative-correlation-coefficient-mean.asp> [accessed 30/08/2017].

represents a positive correlation wherein two variables increase or decrease in tandem.²³⁶ The strength of the correlation between variables is then determined by the size of the correlation coefficient, with larger values representing stronger correlations.²³⁷

Total Dichotomous Error

	Total Dichotomous Error	Type of Election	Closeness of Race	Proximity to Present	Effective Number of Parties	Time Election Information Known For	Very/Fairly Strong Party Identification
Type of Election	-0.07	1.00					
Closeness of Race	-0.31	0.23	1.00				
Proximity to Present	0.07	-0.99*	-0.23	1.00			
Effective Number of Parties	-0.01	0.85*	0.37	-0.87*	1.00		
Time Election Information Known For	-0.04	0.24	0.59*	-0.24	-0.24	1.00	
Very/Fairly Strong Party Identification	0.25	-0.88*	-0.41	0.88*	-0.86*	-0.29	1.00

* = statistically significant to 0.01

Table 3: The Bivariate Correlation Between Total Dichotomous Error and Independent Variables

From Table 3, it is evident that the majority of correlations between total dichotomous error and the studied independent variables are either weak or largely non-existent. Moreover, none of the correlations are deemed to be statistically significant to within one percent, meaning

²³⁶ Steven Nickolas, *What Does It Means if the Correlation Coefficient is Positive, Negative, or Zero?* (2017), <<http://www.investopedia.com/ask/answers/032515/what-does-it-mean-if-correlation-coefficient-positive-negative-or-zero.asp>> [accessed 30/08/2017].

²³⁷ Explorable, *Statistical Correlation* (2015), <<https://explorable.com/statistical-correlation>> [accessed 30/08/2017].

that there is a less than ninety-nine percent certainty of the stated relationships existing. Despite the weakness of the majority of correlations, they are still significant in terms of testing the veracity of the stated hypotheses. As such, the findings in Table 3 will now be systematically compared to the six hypotheses put forth by this paper.

The first hypothesis stated herein posited that the greater the effective number of parties in an election, the more difficult it would be to predict the overall winner. Thus, a strong positive correlation would be expected between these two variables, with total dichotomous error increasing in tandem with the effective number of parties in an election. However, Table 3 shows that the bivariate correlation between total dichotomous error and the effective number of parties in an election is -0.01, indicating that no meaningful correlation exists between the two variables. Thus, these findings run counter to the expected relationship and indicate that the effective number of parties in an election has little appreciable impact upon the total dichotomous error of predictions and, thus, the dichotomous predictability of elections themselves.

The second hypothesis posited by this paper held that the more proximal an election was to the present, the more predictable its overall winner would be. Therefore, a significant negative correlation would be expected between the two variables, with total dichotomous error decreasing as the proximity of an election to the present increased. However, from Table 3, it is clear that no meaningful correlation exists between total dichotomous error and the proximity of an election to the present, as these variables have a correlation coefficient of 0.07. Accordingly, the negligible correlation between the two variables runs counter to expectations and leads to the conclusion that the proximity of an election to the present cannot be said to appreciably affect its prediction by dichotomous means.

The third hypothesis proffered herein held that the overall winners of referenda would be more difficult to predict than those of general elections. Accordingly, referenda would be expected to exhibit greater total dichotomous error. Table 3 shows that the bivariate correlation between total dichotomous error and election type is -0.07 which indicates that no significant correlation exists between the two variables. Ultimately, the lack of a meaningful correlation goes against the expected relationship and highlights that the type of election does not appreciably impact the total dichotomous error of predictions and, therefore, electoral predictability in dichotomous terms.

The fourth hypothesis put forth by this paper stated that the overall winner of elections which exhibited a high degree of strong partisan identification would be more predictable than those which did not. Consequently, a strong negative correlation would be expected between these two variables, with total dichotomous error decreasing as the strength of partisan identification increased. However, Table 3 shows that the bivariate correlation between these variables is 0.25, indicating a weak positive correlation. This correlation is of greater significance than the previous, negligible correlations, not only because it is stronger, but because it is the polar opposite of the expected relationship. Despite being weak, the correlation shown in Table 3 indicates that total dichotomous error actually increases, albeit slightly, in tandem with the strength of partisan identification. This is surprising, as increased partisan identification should logically make the prediction of the overall winner of an election easier, as it renders the votes of large percentages of the electorate predictable.²³⁸ However, on the basis of the correlation coefficient displayed in Table 3, this cannot be said to be the case. Indeed, the previously stated hypothesis must be refuted as increased partisan

²³⁸ Gerber, Huber, and Washington, p. 720; Bartels, p. 35; Hetherington, pp. 628-630; Campbell, p. 42; Rapoport, p. 185.

identification can be seen to increase total dichotomous error, thereby rendering the dichotomous prediction of elections more difficult.

Although the correlation displayed in Table 3 runs counter to expectations, the refutation of the stated hypothesis regarding the impact of partisan identification upon total dichotomous error must be tempered by the fact that the displayed bivariate correlation is weak. This undermines the degree to which the two variables can be said to influence one another. Consequently, although a positive correlation does exist between the two variables, increased partisan identification cannot be said to greatly impact total dichotomous error, and thus the dichotomous predictability of elections.

The fifth hypothesis posited herein held that the greater the length of time that information pertaining to an election is known for, the more predictable the overall winner of an election would be. Consequently, a negative correlation between total dichotomous error and the time that election information is known for would be expected, with the former decreasing as the latter increases. However, Table 3 shows that the correlation between these two variables is largely non-existent, with a coefficient of -0.04. Despite being negative, this ultimately indicates that no significant correlation exists between the two variables. Consequently, the expectations stated in the hypothesis have not been borne out and the length of time that information pertaining to the election is known for cannot be said to appreciably impact total dichotomous error and, by extension, the dichotomous predictability of elections.

The sixth and final hypotheses stated by this paper held that as the closeness of an election increased, it would become more difficult to predict the overall winner. Thus, elections in which the race is closer would be expected to exhibit increased total dichotomous error. Accordingly, a positive correlation would be expected between these two variables, with total

dichotomous error increasing in tandem with the closeness of the race. Despite this, Table 3 shows that a weak negative correlation exists between these variables, with a coefficient of -0.31. Ostensibly, this would indicate that the relationship between total dichotomous error and the closeness of the race is the reverse of that which was hypothesised, with the former decreasing as the latter increases. Consequently, from this finding it would be concluded that elections with closer races are more predictable than those with races in which one candidate or party is significantly ahead. However, the correlation in Table 3 and the conclusion that can be drawn from it are so surprising and counterintuitive they require further investigation before they can truly be accepted or rejected.

Despite the correlation in Table 3 showing that a weak negative relationship exists between total dichotomous error, it necessarily comprises all twenty-three observations made in this study. As was previously identified, the majority of total dichotomous error values exhibited by pre-election polls in the studied cases were zero. Owing to their preponderant nature, such values necessarily influence the data set as a whole and may result in unrepresentative or surprising correlations. Accordingly, removing the zero values and focusing on those cases in which dichotomous error was recorded will allow for a direct analysis of the impact of the closeness of the race upon total dichotomous error. To facilitate this, Table 4 represents a t-test in which the data pertaining to total dichotomous error and the closeness of the race is separated into two groups: cases in which no dichotomous error was observed and those in which exhibited dichotomous error.

Group	Number of Elections	Mean Closeness of Race (%)	Standard Error of the Mean	Standard Deviation	95% Confidence Interval
No Dichotomous Error	14	10.36	2.99	11.18	3.90 – 16.81
Dichotomous Error	9	4.97	1.21	3.63	2.18 – 7.75

Table 4: A T-Test of Total Dichotomous Error and the Closeness of the Race

Table 4 shows that fourteen of the twenty-three studied elections exhibited no dichotomous error, whereas nine did. Of the fourteen elections that exhibited no dichotomous error, the mean closeness of the race was 10.36%. In contrast, the mean closeness of the race in the nine elections that exhibited dichotomous error was only 4.97%. From these figures, it is clear that the elections which exhibited dichotomous error had significantly closer races than those which did not. Indeed, even when the standard error of these mean values is taken into account, it can be seen that elections which exhibited dichotomous error had closer races than those which did not. Moreover, the 95% confidence intervals of the data groups also show that the closeness of the race in those elections which exhibited no dichotomous error likely lies at a higher value than that of the elections which did.

In addition to these observations, the standard deviation of the two data groups displayed in Table 4 shows that the closeness of the race in elections which exhibited no dichotomous error varied from the mean value to a much greater degree than that of elections in which dichotomous error was observed. Indeed, it can be seen that elections which exhibited no dichotomous error had a standard deviation of 11.18, whereas those in which dichotomous error was observed had a much smaller standard deviation of 3.63. On one hand, this can be seen to support the notion that the closeness of the race in elections which exhibit no

dichotomous error is greater than that of elections in which no dichotomous error is observed. This is due to the fact that not only is the mean closeness of the race higher for elections which exhibit no dichotomous error, but certain values exist at a much higher percentage than the mean, further exacerbating the disparity between the two groups. However, such a high standard deviation necessarily cuts both ways. Accordingly, certain percentage values of the closeness of the race in elections which displayed no dichotomous error exist at significantly lower values than the mean. When this is considered in relation to the standard deviation exhibited by elections in which dichotomous error was observed, it is clear that a degree of overlap could occur between the values of both groups. Indeed, the measurements displayed in Appendix A show that this is the case, with the lower values for the closeness of the race in elections which displayed no dichotomous error overlapping with the higher values of elections which did.

Owing to the findings of the t-test, it cannot be said that the race is universally closer in elections which exhibit dichotomous error. However, it can be said that this is generally the case, resulting in the conclusion that elections with closer races are broadly more difficult to predict than those in which one candidate or party is significantly ahead. Consequently, the original hypothesis stated in this piece can be seen to have been largely vindicated, whilst the original correlation displayed in Table 3 can be seen to be unrepresentative and the subsequent refutation flawed.

Ultimately, the correlations between total dichotomous error and the independent variables studied in this paper have been varied. Despite the preponderance of correlations running counter to the hypotheses stated herein, the majority of correlation coefficients were negligible. However, two correlations were noticeably more than the others: the correlation between total dichotomous error and the strength of partisan identification, and the

correlation between total dichotomous error and the closeness of the race. The former was the polar opposite of the hypothesised relationship, whereas the latter conformed to expectations after significant investigation.

Although the findings in this section are interesting and significant in their own right, they only suffice to test the veracity of half of the hypothesised relationships. Accordingly, in order to test the other hypothesised relationships, and thus the overall veracity of the stated hypotheses, this piece must address the bivariate correlation between total mean absolute error and the stated independent variables.

Total Mean Absolute Error

Table 5 shows the bivariate correlation between the total mean absolute error exhibited by the pre-election polls conducted for the studied elections and the stated independent variables of this piece. It is immediately evident that the correlations between total mean absolute error and the independent variables are significantly stronger than those displayed by total dichotomous error. This can be seen to vindicate the use of both measures of accuracy herein, as they are demonstrably different entities. Moreover, three of the correlation coefficients shown in Table 5 are deemed statistically significant to one percent, meaning that there is at least a ninety-nine percent certainty of the stated relationships existing.

	Total Mean Absolute Error	Type of Election	Closeness of Race	Proximity to Present	Effective Number of Parties	Time Election Information Known For	Very/Fairly Strong Party Identification
Type of Election	0.61*	1.00					
Closeness of Race	0.41	0.23	1.00				
Proximity to Present	-0.60*	-0.99*	-0.23	1.00			
Effective Number of Parties	0.67*	0.85*	0.37	-0.85*	1.00		
Time Election Information Known For	0.42	0.24	0.59*	-0.24	-0.24	1.00	
Very/Fairly Strong Party Identification	-0.51	-0.88	-0.41	0.88*	-0.86*	-0.29	1.00

* = statistically significant to 0.01

Table 5: The Bivariate Correlation Between Total Mean Absolute Error and Independent Variables

The first hypothesis posited by this paper held that the vote share distribution of an election would become less predictable as the effective number of parties increased. Thus, elections with a greater number of effective parties, and thus a more fragmented vote, would be expected to exhibit higher total mean absolute error. Resultantly, a positive correlation between these variables would be anticipated, with both increasing in tandem. The correlation coefficient displayed in Table 5 ultimately vindicates this hypothesis, as total mean absolute error and the effective number of parties in an election display a strong positive correlation with a coefficient of 0.67, indicating that the variables increase in tandem. Furthermore, the correlation is deemed to be statistically significant to one percent, meaning that there is a ninety-nine percent certainty that the stated relationship exists.

Ultimately, the strong positive correlation between total mean absolute error and the effective number of parties in an election becomes strikingly evident when the two variables are plotted against one another on a scatter graph, such as that displayed in Figure 3. Moreover, plotting the two variables against one another on a graph allows for a detailed examination of their relationship.

Figure 3: A Scatter Graph Displaying the Bivariate Correlation Between Total Mean Absolute Error and the Effective Number of Parties in an Election

Figure 3 clearly shows that total mean absolute error generally increases in tandem with the effective number of parties in an election. Despite this, it must be noted that this is not universally the case, as certain elections with a greater number of effective parties can be seen to exhibit a lower total mean absolute error than elections with fewer effective parties. However, such variation is to be expected, as the correlation between the two variables is not perfect. It is also interesting to note that although the two variables can be seen to increase in tandem up until the effective number of parties reaches a value of 3.25, the graph can be seen

to plateau thereafter. This may indicate that the effective number of parties only affects the total mean absolute error of electoral prediction efforts up until a point. However, it is difficult to draw such a conclusion from the small sample of data utilised herein.

Consequently, the limitations of the relationship between total mean absolute error and the effective number of parties in an election may prove to be a fruitful avenue for future research.

Ultimately, when the correlation coefficient displayed in Table 5 and the relationship between the two variables shown in Figure 3 are taken into account, it is clear that a strong positive relationship exists between total mean absolute error and the effective number of parties in the studied elections, with the former largely increasing in tandem with the latter. This confirms the hypothesised relationship between these variables, as the vote share distribution of elections with a greater number of effective parties can be seen to be less predictable than those with fewer effective parties.

The second hypotheses stated in this piece posited that the closer an election occurred to the present, the more predictable its vote share distribution would be. Accordingly, the more proximal an election to the present, the less total mean absolute error it would be expected to exhibit. Thus, a strong positive correlation would be expected between these two variables, with total mean absolute error increasing as the number of days until the present increases. However, Table 5 shows a strong negative correlation between the two variables, with a correlation coefficient of -0.60. Although this correlation is seemingly counterintuitive, and runs completely counter to the hypothesised relationship, it is deemed to be statistically significant to one percent, meaning that there is a ninety-nine percent certainty that it exists.

In order to make sense of this extremely surprising correlation, Figure 4 plots total mean

absolute error and proximity to the present against one another on a scatter graph. Displaying the relationship between these two variables in this way not only better illustrates the negative correlation between them, but also facilitates an investigation into their relationship.

Figure 4: The Bivariate Correlation Between Total Mean Absolute Error and Proximity to the Present

When the relationship between the two variables displayed in Figure 4 is viewed, two things are immediately apparent. Not only can total mean absolute error be seen to broadly decrease as elections move further away from the present, but two results exist as extreme outliers and have been circled on the graph. Referring to the measurements displayed in Appendix A, it is clear that these anomalous results represent the referenda conducted in 2011 and 2016 respectively. This lends credence to the notion that referenda are more difficult to predict than general elections. However, for the purposes of addressing the current hypothesis, such outlying values could be affecting the results of the bivariate correlation due to their extreme nature. Accordingly, their removal would allow for an investigation into the impact, or lack

thereof, of the anomalous results upon the identified correlation, allowing for its veracity to be tested. To facilitate this, Table 6 displays the bivariate correlation between total mean absolute error and the independent variables in elections in which the total mean absolute error is less than four, thereby excluding the outlying referenda.

	Total Mean Absolute Error	Type of Election	Closeness of Race	Proximity to Present	Effective Number of Parties	Time Election Information Known For	Very/Fairly Strong Party Identification
Type of Election	0.59*	1.00					
Closeness of Race	-0.01	0.12	1.00				
Proximity to Present	-0.59*	-0.99*	-0.11	1.00			
Effective Number of Parties	0.67*	0.85*	0.37	-0.85*	1.00		
Time Election Information Known For	-0.34	-0.03	0.82*	0.03	-0.24	1.00	
Very/Fairly Strong Party Identification	-0.52	-0.88*	-0.41	0.88*	-0.86	-0.29	1.00

* = statistically significant to 0.01

Table 6: The Bivariate Correlation Between Total Mean Absolute Error and Independent Variables When Total Mean Absolute Error is Less than Four

Table 6 shows that even when the extreme outlying values presented by the two referenda are excluded, a strong negative correlation exists between total mean absolute error and the proximity to the present, with a coefficient of -0.59. Furthermore, the correlation is deemed to be statistically significant to one percent, once again indicating that there is a ninety-nine percent certainty that the identified relationship exists. Despite the fact that the removal of the two outlying results reduces the negative correlation between total mean absolute error and the proximity to the present, it does not do so to a significant degree, as a strong negative

correlation still exists. Consequently, this confirms the surprising negative correlation between the two variables and shows that total mean absolute error does indeed decrease as elections move further away from the present, irrespective of the influence of the outlying results.

Ultimately, these findings refute the hypothesis stated herein in which total mean absolute error was expected to be reduced in elections that occurred closer to the present due to incremental methodological improvement over time. Indeed, the findings displayed in Figure 4 and Table 6 suggest that elections have become more difficult to predict over time, with contemporary elections exhibiting higher total mean absolute error than those of the past. In order to understand why this is the case, it is necessary to address the relationship between other studied variables.

The correlation coefficients displayed in Table 6 offer a clear explanation for total mean absolute error increasing over time. It can be seen that there exists a very strong positive correlation between the proximity of an election to the present and strong partisan identification, with a correlation coefficient of 0.88. Additionally, the correlation between these two variables is deemed to be statistically significant to one percent, resulting in a ninety-nine percent certainty that the relationship exists. Accordingly, it can be seen that partisan identification increases as an election moves further away from the present. Thus, elections occurring further in the past exhibited a far greater degree of partisan identification than contemporary elections, rendering an increased proportion of their vote shares predictable and thereby reducing the total mean absolute error of predictions. Conversely, the strong positive correlation shows that partisanship has declined as elections have become more proximal to the present. This necessarily means that the vote share distribution of elections has become less predictable over time, resulting the increased level of total mean

absolute error displayed in Figure 4 and Table 6. Indeed, when the complete measurements in Appendix A are viewed, it can be seen that 84% of the electorate identified strongly with a political party in 1964, compared to only 58% in 2017. Therefore, a marked decline in strong partisan identification amongst the electorate can be seen to account for the negative correlation between total mean absolute error and the proximity of an election to the present.

It is not only the decline of partisanship that helps to explain the surprising increase of total mean absolute error over time. Indeed, Table 6 shows that a very strong negative correlation with a coefficient of -0.85 exists between the proximity of an election to the present and its effective number of parties. Once again, there is a ninety-nine percent certainty that this correlation exists as it is statistically significant to one percent. Thus, the effective number of parties in elections can be seen to decline as elections move further away from the present.

Consequently, elections conducted further from the present can be seen to have been contested by fewer effective parties and therefore had a less fragmented total vote.

Accordingly, vote share distribution was easier to predict in elections conducted further from the present, reducing the total mean absolute error of prediction efforts. However, the strong negative correlation between the two variables indicates that the effective number of parties increased as elections moved closer to the present. Thus, the fragmentation of the total vote of contemporary elections is necessarily greater than that of past elections, resulting in vote share distribution becoming more difficult to predict and causing electoral prediction efforts to exhibit higher total mean absolute error. Indeed, the measurements in Appendix A once again confirms this, as the effective number of parties contesting elections can be seen to rise from 1.83 in 1945 to 2.37 in 2017. Therefore, an increase in the effective number of parties contesting elections, and thus a greater degree of vote fragmentation, can be seen to further account for the negative correlation between total mean absolute error and the proximity of

an election to the present.

Ultimately, it is clear that the increase of total mean absolute error over time is not the result of a decline in the fundamental effectiveness of predictive efforts, but is rather due to the fact that elections have become harder to predict over time by virtue of their changing characteristics. Indeed, the reduction in partisan sentiment over time coupled with the increase in the effective number of parties contesting elections can be seen to have overridden iterative methodological improvements. Consequently, as the characteristics of elections have changed over time, they have become more difficult to predict, resulting in the increased total mean absolute error exhibited by prediction efforts.

The third hypothesis stated herein held that the vote share distribution of referenda would be less predictable than that of general elections. Consequently, predictions for referenda would be expected to display a greater total mean absolute error than those made for general elections. From the correlation coefficients for the entire data set displayed in Table 5, it is clear that a strong positive relationship exists between total mean absolute error and election type, with a coefficient of 0.61. Once again, the relationship is deemed significant to one percent, indicating a ninety-nine percent certainty that it exists. Ultimately, the displayed relationship indicates that the type of election does indeed increase the total mean absolute error exhibited by prediction efforts. The notion that referenda exhibit higher total mean absolute error, and are thus less predictable, can be seen to be corroborated by the earlier identified extreme total mean absolute error values exhibited by the referenda conducted in 2011 and 2016. However, extreme values such as these necessarily present problems when it comes to drawing conclusions.

Owing to their extreme and outlying nature, the values presented by the 2011 and 2016

referenda could be seen to be anomalous and not representative of the predictability of referenda at large, especially when considered alongside the fact that the 1975 referendum displayed a total mean absolute error of 1.23 which is considerably lower than many of the studied general elections. The issue of the potentially unrepresentative nature of these extreme values is compounded in this study due to the small sample of data utilised. Indeed, the sample utilised herein only comprises three referenda, therefore the outlying values account for two thirds of the findings regarding referenda. This means that they necessarily have a significant impact on the perceived predictability of referenda, as they substantially increase the total mean absolute error that they exhibit. Accordingly, although the findings of this paper can be seen to corroborate the stated hypothesis regarding the predictability of referenda, such corroboration is necessarily qualified by the extreme values. In order for a confident conclusion to be drawn, a greater sample of referenda would need to be studied in relation to general elections in order to mitigate the impact of extreme values and come to a balanced determination of their predictability.

The fourth hypothesis proffered by this paper held that vote share distribution would be more predictable in general elections which exhibited a greater degree of strong partisan identification. Thus, elections with stronger partisan identification would be expected to exhibit decreased total mean absolute error, with a negative correlation existing between the two variables. Ultimately, Table 5 shows that a negative bivariate correlation exists between total mean absolute error and strong party identification, with a coefficient of -0.51. This corroborates the hypothesised relationship between the two variables, as it indicates that the total mean absolute error of electoral predictions decreases as strong partisan identification increases. Indeed, the negative correlation between these two variables is clearly apparent

when they are plotted against one another on a scatter graph, such as that in Figure 5.

Figure 5: The Bivariate Correlation Between Total Mean Absolute Error and Strong Party Identification

From Figure 5, it can be seen that the total mean absolute broadly decreases as strong party identification increases, thereby confirming the expected relationship between these two variables. However, it must be noted that the decrease is slow and far from universal, as some elections in which 60% of the electorate identify strongly with a political party exhibit largely the same total mean absolute error as those in which 70% of the electorate claim strong party identification. Moreover, it is evident that even a ten percent increase in strong party identification amongst the electorate, such as that visible between 60% and 70%, only decreases total mean absolute error by less than one in the most extreme cases. Accordingly, the effect of the strength of partisan sentiment upon the predictability of elections by continuous measures cannot be said to be dramatic. Nevertheless, total mean absolute error can be seen to broadly decrease as strong partisan identification increases. Therefore, general

elections that exhibit a greater level of strong partisan identification can be said to be more predictable than those that do not, albeit slightly.

The fifth hypotheses put forth in this paper posited that the greater the length of time that information pertaining to an election is known for, the more predictable its vote share distribution would be. Consequently, elections in which pertinent information is known further in advance would be expected to display decreased total mean absolute error. Thus, a negative correlation would be expected between these variables. Despite this, Table 5 shows that a positive correlation exists between total mean absolute error and the time for which election information is known, with a coefficient of 0.42. Ostensibly, this would suggest that the total mean absolute error of electoral prediction actually increases in tandem with the length of time that information pertaining to the election is known for. Not only is this correlation the polar opposite of the hypothesised relationship, but it is also rather counterintuitive. Owing to its surprising nature, this correlation warrants further investigation.

Upon closer inspection, it is evident that election information was known much further in advance during the studied referenda than in the general elections. Indeed, from the complete measurements in Appendix A, it can be seen that information pertaining to the general elections studied herein was not known more than 51 days in advance, whereas information pertaining to the referenda in 2011 and 2016 was known 78 and 122 days in advance respectively. Moreover, both of these referenda exhibited extremely high total mean absolute error, as was previously identified. Consequently, the extreme values displayed by these referenda could be responsible for the surprising positive correlation between total mean absolute error and the time for which election information is known. Ultimately, their exclusion from the data set will allow this theory to be tested and for the correlation between

the two variables in the remainder of cases to be tested. To facilitate this, we must refer once again to the bivariate correlation between total mean absolute error and the studied independent variables when total mean absolute error is less than four displayed in Table 6.

Table 6 shows that when the outlying referenda are excluded from the data set, the correlation between total mean absolute error and the time for which election information is known changes dramatically. Indeed, with the exclusion of the referenda, the previous positive correlation can be seen to change to a negative correlation with a coefficient of -0.34. Such a correlation indicates that total mean absolute error decreases as the time for which election information is known increases. Thus, the outlying referenda can be seen to have had such a significant impact upon the correlation between total mean absolute error and the time for which election information is known that their exclusion reversed the bivariate correlation. Not only does this lend further credence to the notion that referenda are less predictable by continuous measures than general elections, but the correlation absent of the influence of the outlying referenda conforms to the hypothesised relationship between the two variables. Thus, when the outlying referenda are excluded, it can be said that the vote share of elections in which pertinent information is known further in advance is more predictable than those in which it is not.

The sixth and final hypothesis stated herein held that the closeness of the race in an election will have a greater impact upon the predictability of the overall winner than of the vote share distribution. Resultantly, a weaker correlation would be expected to be seen between the closeness of the race and total mean absolute error than was seen between it and total dichotomous error. Despite this, Table 5 shows that a moderate positive correlation with a coefficient of 0.41 exists between total mean absolute error and the closeness of the race. This is surprising, as it is ostensibly a more significant correlation than that which was seen

between total dichotomous error and the closeness of the race, and suggests that total mean absolute error increases in tandem with the closeness of the race. Whilst this is not inconceivable, it is extremely surprising and goes against the hypothesised relationship and the evidence utilised to derive it. Accordingly, it requires further investigation before being accepted.

Once again, the extreme total mean absolute error values presented by the 2011 and 2016 referenda can be seen to heavily influence the correlation between these two variables. Indeed, Figure 5 shows that when the referenda are excluded, the correlation between total mean absolute error and the closeness of the race is reversed. Ultimately, when the extreme total mean absolute error values of the referenda are excluded, the bivariate correlation between the two variables becomes negligible with a coefficient of -0.0010. Not only does the inordinate impact of the referenda upon the correlation further evidence the fact that referenda are far less predictable by continuous means than general elections, but the correlation absent of their influence conforms to the hypothesised relationship and shows that in the majority of studied cases, the closeness of the election had a far more pronounced impact on total dichotomous error than total mean absolute error. Thus, it can be concluded that the overall winner is less predictable than the vote share distribution in elections in which the race between parties is extremely close.

In sum, it is clear that the correlation between total mean absolute error and the studied independent variables varied. Despite this, only one of the stated hypotheses was refuted by the findings. The sole refutation came in the form of the surprising negative correlation between total mean absolute error and the proximity of an election to the present. It could be seen that the vote share of elections actually became more difficult to predict over time, which was the result of decreasing partisanship and an increasing effective number of parties.

Aside from this, the other correlations between total mean absolute error and the independent variables conformed to the hypothesised relationships, although some required extensive investigation. The positive correlation between total mean absolute error and the effective number of parties confirmed that the vote share of elections does indeed become more difficult to predict in elections with a greater number of effective parties. Moreover, it was confirmed that vote share distribution is easier to predict in elections with greater partisan sentiment, as a negative correlation was identified between total mean absolute error and strong partisan sentiment. Although these relationships were easily identified, the correlation between total mean absolute error and the remaining independent variables was obfuscated by the extreme error displayed by referenda. Ultimately, once the anomalous error values were excised from the data set, the remaining hypotheses could be corroborated. Indeed, it was confirmed that vote share distribution was more predictable in elections in which pertinent information is known further in advance, along with being more predictable in general elections than referenda. Finally, the hypothesised relationship between vote share distribution and the closeness of the race was corroborated, as it was found that the closeness of the race had a significantly reduced correlation with total mean absolute error than total dichotomous error.

Ultimately, now that the correlation of both total dichotomous error and total mean absolute error with the independent variables has been identified, the findings can be combined and summarised to test the veracity of the hypotheses stated in this piece and provide an answer to the research question addressed by this paper. It is with this aim that we move into the conclusion of this paper.

Conclusion

This chapter will summarise the findings of this paper in order to offer an answer to the stated research question. It will begin with a summation of the findings presented in the analysis section and how they confirm or refute the stated hypotheses. Thereafter, the findings of this paper will be utilised to ascertain whether certain elections are more predictable than others and, if so, which characteristics cause their predictability to vary. However, the conclusions drawn in this section will necessarily be qualified by the limitations of the utilised data set.

The Veracity of the Hypotheses

The first hypotheses put forth in this paper held that as the number of effective parties in an election increased, both the vote share distribution and the overall winner would become more difficult to predict. Whereas the analysis confirmed that total mean absolute error increases as the effective number of parties contesting an election increases, the correlation between total dichotomous error and the effective number of parties was negligible. Consequently, the number of effective parties contesting an election can be said to make the prediction of vote share distribution more difficult. However, from the findings stated herein, it cannot be said to have a significant impact on correctly calling the overall winner. Thus, elections which are contested by fewer effective parties can be said to be more predictable by continuous means than those contested by a larger number of effective parties.

The second hypothesis proffered herein posited that both the vote share distribution and overall winner would be more predictable in elections that are more proximal to the present. However, the findings of this piece showed that no meaningful correlation existed between total dichotomous error and the proximity of elections to the present, and that the total mean absolute error of electoral predictions has actually increased over time. Consequently, it

cannot be said that the vote share distribution and overall winner of an election becomes more predictable as the proximity of an election to the present increases. Indeed, from the findings herein, it must be concluded that vote share distribution actually becomes less predictable as the proximity of an election to the present increases, rendering elections conducted closer to the present less predictable by continuous means than those conducted further from it.

The third hypothesis stated herein held that both the vote share distribution and the overall winner of referenda would be less predictable than those of general elections. Although the analysis conducted in this piece confirmed that predictions for referenda exhibited greater total mean absolute error than those conducted for general elections, it was found that no meaningful correlation existed between total dichotomous error and election type. Thus, although it can be concluded that the vote share of referenda is less predictable than that of general elections, rendering them less predictable by continuous means, it cannot be concluded that the overall winner of referenda is less predictable than that of general elections.

The fourth hypothesis posited in this paper held that both vote share distribution and the overall winner would be more predictable in general elections that exhibited a greater level of strong partisan identification. The findings of this paper clearly showed a negative correlation between total mean absolute error and strong partisan identification, with the former decreasing as the latter increases. However, it was found that a positive correlation exists between total dichotomous error and partisan identification. Accordingly, although it can be concluded that vote share distribution is more predictable in elections that exhibit greater partisan identification, the same cannot be said for calling the overall winner. Indeed, from the findings of this paper, it must be concluded that greater partisan identification actually

makes the overall winner of an election less predictable. Thus, elections which exhibit a greater degree of strong partisan sentiment can be said to be more predictable by continuous means, but less predictable by dichotomous means. Despite this, such a conclusion is highly surprising and warrants further study.

The fifth hypotheses stated herein held that the greater the length of time that information pertaining to an election is known for, the more predictable both its vote share distribution and overall winner would be. Although analysis showed that, when the extreme values presented by the referenda were omitted, a negative correlation existed between total mean absolute error and the length of time that information pertaining to an election is known for, the correlation between total dichotomous error and the time that election information is known for was found to be negligible. Accordingly, although it can be concluded that vote share distribution is more predictable in elections in which pertinent information is known further in advance, the same cannot be said for calling the overall winner. Thus, elections in which pertinent information is known for a greater time can be said to be more predictable by continuous means than those in which information is known for a shorter length of time.

The sixth and final hypothesis put forth by this paper posited that the overall winner of elections in which the race between parties is extremely close will be less predictable than vote share distribution. Ultimately, the findings presented in the analysis section confirmed this hypothesis, as the closeness of the race was found to correlate more significantly with total dichotomous error than total mean absolute error. Accordingly, it can be concluded that in elections in which the race between parties is extremely close, the overall winner is less predictable than the vote share distribution. Therefore, elections in which the race is extremely close can be said be more predictable by continuous means, but less predictable by dichotomous means than those in which one party clearly leads the race.

In sum, it is clear that the hypotheses posited by this paper were both confirmed and refuted by the findings of the analysis section. Despite this, the findings do enable the stated research question to be answered. However, the answer to whether certain elections are more predictable than others provided herein must necessarily be qualified by the limitations of this paper.

Are Certain Elections More Predictable Than Others?

In light of the findings of this paper, the answer to whether certain elections are more predictable than others is yes. As for the impact of characteristics upon their predictability, it is clear that elections that occur further from the present, have fewer effective parties, exhibit a higher level of strong partisan sentiment, and about which pertinent information is known further in advance are more predictable by continuous means than those elections which do not possess these characteristics. Referenda can also be seen to be less predictable than general elections by continuous means. Additionally, elections in which one party is considerably ahead in the race are noticeably more predictable by dichotomous means than those in which the race is close.

Although some of the above conclusions may seem logical and self-evident, it must once again be noted that nobody has attempted a study such as this before, rendering even the most basic conclusions important to understanding the predictability of elections. Ultimately, not only is it evident from the findings herein that certain elections possess characteristics that make them more predictable than others, but that these characteristics impact the dichotomous and continuous predictability of elections differently. This vindicates the inclusion of both measures of accuracy in this paper and shows that the predictability of elections is a bifold consideration.

Despite the findings of this paper showing that certain elections possess characteristics that make them more predictable than others, the conclusions drawn herein can only be said to be indicative. This is due not only to the fact that the sample of data utilised in this paper was small, but also due to the fact that it focused solely on national elections in the United Kingdom. Accordingly, this paper can be said to have served as a test. It has shown how the predictability of elections can be ascertained and quantitatively measured, and has drawn indicative conclusions. However, in order for these conclusions to be corroborated, and for more substantive conclusions to be drawn, future studies would need to utilise a larger sample of elections and incorporate a multiplicity of states and electoral systems. This would not only facilitate multivariate analysis, but would allow any conclusions drawn to be reliably applied to multiple electoral systems, thereby increasing their credibility.

Ultimately, through its unique attempt to ascertain whether certain elections are more predictable than others, this paper has endeavoured to challenge the dominant paradigm and change the manner in which the electoral predictability is addressed. However, owing to the indicative nature of the conclusions drawn herein, this paper ultimately serves as a foundation to be built upon by future work which can continue to fill the literary lacuna surrounding the predictability of elections and further progress our understanding of whether certain elections truly are more predictable than others.

Appendices

Appendix A: Tabulation of Raw Variable Measurements

Election	Election Type	Closeness of Race (%)	Proximity to Present (days)*	Effective Number of Parties	Time Election Information Known for (days)	Very/Fairly Strong Party Identification (%)	Total Mean Absolute Error	Total Dichotomous Error (%)
2017	General election	2.4	72	2.89	51	58	2.37	0
2016	Referendum	3.8	422		122		6.18	60
2015	General election	6.5	835	3.60	38	57	2.39	60
2011	Referendum	35.8	2298		78		7.14	0
2010	General election	7.1	2262	3.72	30	51	2.75	0
2005	General election	2.8	4489	3.60	30	50	1.83	0
2001	General election	9.0	5917	3.33	30	54	2.85	0
1997	General election	12.5	7415	3.23	45	58	3.18	0
1992	General election	7.5	9263	3.07	29	57	3.1	80
1987	General election	11.4	11027	3.08	31	60	2.28	12.5
1983	General election	14.8	12490	3.12	31	61	3.03	0
1979	General election	7.0	13988	2.87	35	67	2.1	0
1975	Referendum	34.4	15416		133		1.23	0
1974	General election	3.6	15654	3.16	22	70	2.56	0
1974	General election	0.6	15878	3.14	21	72	2.3	100
1970	General election	3.4	17229	2.46	31	79	2.6	80
1966	General election	6.0	18769	2.43	31	84	1.73	0
1964	General election	0.7	19301	2.53	30	84	1.48	25
1959	General election	5.6	21135	2.28	30		1.1	0
1955	General election	3.2	22731	2.16	41		1.06	0
1951	General election	0.8	24040	2.13	36		1.65	0
1950	General election	2.8	24649	2.45	43		1.95	75
1945	General election	8.0	26343	2.54	43		1.83	33.3

* proximity to the present calculated on 19/08/2017

Appendix B: Normalised Party Vote Shares

	Conservatives	Labour	Lib Dems	SNP	UKIP	Green	U.U.
2017	0.424	0.400	0.074	0.030	0.018	0.016	
2015	0.369	0.340	0.079	0.047	0.126	0.038	
2010	0.361	0.290	0.230	0.017	0.031	0.010	
2005	0.324	0.352	0.220	0.015			
2001	0.317	0.407	0.183	0.018			
1997	0.307	0.432	0.168	0.020			
1992	0.419	0.344	0.178	0.019			
1987	0.422	0.308	0.226	0.013			
1983	0.424	0.276	0.254	0.011			0.011
1979	0.439	0.369	0.138	0.016			
1974	0.393	0.357	0.183	0.029			
1974	0.378	0.372	0.193	0.020			
1970	0.464	0.430	0.075	0.011			
1966	0.419	0.479	0.085				
1964	0.434	0.441	0.112				
1959	0.494	0.438	0.059				
1955	0.496	0.464	0.027				
1951	0.480	0.488	0.026				
1950	0.433	0.461	0.091				
1945	0.397	0.477	0.090				

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