

Driving Democracy with Ethical AI

Andrew Gray for MP: Selby and Ainsty By-Election





Foreword

Dr. Simon Wallace - Founder and CEO



The interplay between data and politics is nothing new. Weekly opinion polls and the expert insights from psephologists such as Professor John Curtice have long shaped our understanding of the public mindset. Speaking as a fellow data enthusiast, my favourite part of election night is seeing the results, and the incredible accuracy, of Professor Curtice's exit poll analysis.

What excites me about the campaign Andrew is running is it uses data and technology to bring a voice to the 78,000 people whose voice is only heard once every five years or so. A fact that many might not know is that opinion polls are conducted with as few as 1,000 people due in part to "safe seats" like Selby and Ainsty being fairly predictable.

Used correctly technology like Pol.is can enable our elected representatives to hear the voice of the people they

represent, and give a voice to people like those in Selby and Ainsty who are not asked their opinion as often as those in other areas.

Too often of late politics has been focused on what divides us, and what you will see in this report is that there are areas of consensus in the responses we have received which have formed a key part of Andrew's manifesto.

I am excited to be a part of what is a truly groundbreaking campaign and I look forward to where we can take this technology moving forward.

Foreword

Andrew Gray – Candidate for the Selby and Ainsty By-Election



**Andrew
Gray** 

Politics has always been a part of my life, my parents were politicians, and I followed suit. However, throughout my political life I never found my home, party politics always seemed to miss the point, which is to represent the interest of the people not the interests of ones-self.

That's why when I saw the potential of Polis and the way in which we could use it with the recent advances in AI, I jumped in with both feet and realised the potential opportunity that we could realise by putting power in the hands of people.

Too often recently politics has focused upon the divisive part of society, and this is not just about Brexit, we have been focusing on what separates us rather than what unites us; and I think people would be surprised to find out that the old adage is true: there is more than unites us, than divides us.

As an MP I want to be a true leader and representative of my constituents, and I am using all the tools available to do so, which means I am labelled the "AI candidate" when actually I think I am more the people's representative as opposed to the person people think is the least worst.

I am thrilled to have found a partner in Demonstrandum and Simon who not only understands the vision that I am wanting to achieve, but sees the power and potential of what we can accomplish through driving democracy with ethical AI, combine that with democratising data to increase effectiveness and I think we are onto a winning formula.

This report is not just the culmination of weeks of work, but decades of progress in technology that enables us to listen, act, and unite what is an increasingly fractured country.

Andrew Gray for MP: Selby and Ainsty By-Election

Driving Democracy with Ethical AI

Summary

In just over four weeks, 275 constituents of Selby and Ainsty signed in to share their opinions. A total of 7,619 votes were cast at the time of analysis, with 589 statements created by the constituents.

This means that, on average, each voter shared their voice just over 36 times, and each author created approximately four statements that their fellow constituents could vote on.

The four voter profiles we created enabled us to identify policies and positions that would resonate with more than 60% of the voters, based upon their shared opinions.

By utilising AI and data, we were able to distill the views of the voters in Selby and Ainsty to create a manifesto that represents their views. This breakthrough shows how AI and data can be used to increase voter representation and engagement.

Key Takeaways

- Even though 58% of voters in Selby and Ainsty voted to Leave the EU, 77% of respondents now want a closer relationship with the EU, now that we have left.
- The financial worries caused by the current economic circumstances mean that 54% are not turning on their heating; 79% are worried about rising food costs, meaning that 26% are often going hungry.
- Voter apathy for the current political system is high. Only 14% of voters believe that traditional party politics is in the best interest of the country, with 11% thinking that we should explore alternative voting mechanisms as First Past The Post is no longer fit for purpose.
- With only 9% of respondents thinking that the country is on the right track, 52% believe that local matters need local representation through a Yorkshire government, thereby bringing devolution to England.



Approach



**Andrew
Gray**

“I will vote in Parliament in accordance with the consensus of the constituency” - Andrew Gray

In order to create a manifesto that reflects the needs of the Selby and Ainsty constituency, the campaign used the open source tool, Pol.is, to create conversations across the wider constituency and individual villages.

Totalling 50 conversations, the campaign engaged 275 constituents in just over 4 weeks. Each constituent was given the chance to vote on, and create, comments that highlight the needs they want Andrew to address as an MP in Westminster.

With 7,619 votes cast across 589 comments, the data was then analysed by Demonstrandum. The goal was to create insights through AI and Machine Learning modelling that would inform the creation of the manifesto.

In order for the insights produced by the model to have significance, only the comments and voters with the highest engagement were considered for modelling. The other conversations were analysed using Large Language Models to identify key problems and support the manifesto creation.

The democratic power behind this approach is that the voices of the constituents in Selby and Ainsty can be heard and acted upon. Given the traditional “safe seat” status of the constituency, the voters are often ignored by the opinion pollsters who typically only survey 1,000 - 2,000 voters on average. Even then with opinion polls they only monitor voting intent, not the issues that people are concerned and care about.

After the data selection and filtering process we had 93 voters and 107 comments which we analysed to create our voter personas which enable the identification of issues where there is a consensus and therefore the issues that are likely to resonate with the most voters possible in the run up to the by-election.

With most Machine Learning and AI processes it is critical that the quality of the data going in is high in order to achieve the best output. A key aspect of this data quality is ensuring that we aren't putting in columns of data which are very similar to another column.

This association between the columns can overwhelm the modelling process and ignore patterns in the data because the association between the data is essentially hiding the key patterns from discovery.

Out of the 107 comments we created 37 comment groups which accurately portrayed our users voting patterns and enabled us to create accurate and informative models without the interference caused by association, and once complete analyse all 107 comments using our final model.

Using our newly identified comment groups we created 4 scores for each user which summarises how they are likely to feel in response to a set of questions. Creating these groups enables us to use a wider range of modelling methods to find the best voter personas possible.

However, what defines the “best voter personas”? We are looking to create voter personas that are as distinct as possible that reflect the views and positions of voters that engaged with this revolutionary democratic process. From these differences we will then look to see the comments and areas where there is agreement, indicating to us that these are issues that are important. Since, if very different groups feel similarly about a topic and it crosses the political divide, this consensus is something that the people truly want.

These areas of consensus were then analysed by Andrew to inform and create the constituent's manifesto.



Voter Personas



**Andrew
Gray**

“My constituents are getting more democracy, more power in their hands” - Andrew Gray

As a result of the modelling and refinement the campaign was able to identify 4 distinct voter personas

In order to profile the voter personas and help understand what makes them distinct, we looked at the responses that were unique to each group.

We did so using audience segmentation and indexing in order to identify areas of distinction and difference, from which we can better understand their key drivers and motivations.

1. Revolutionary Pragmatists (24%)

A contradiction of terms, these voters are not happy with how things are but recognise that the world works in a certain way. These likely swing voters want to see change but also they want common sense to win out and the craziness of the modern world to cease. This pragmatism comes partially from the fact that they aren't as affected by the ongoing cost of living crisis. This group wants change and fair representation, but not if it means causing disruption.

2. Content Conservatives (40%)

Selby and Ainsty is, and most likely was, viewed as a safe seat based upon its demographics and voting history since the seat's creation in 2010. In the Brexit referendum 58% of this constituency voted to leave, and they want to keep it that way. This 41% of voters are likely to always align with the values and policies of the Conservative Party. Financially secure, this group is most likely upper middle class people nearing retirement age.

3. Social Conservatives (22%)

This persona is Conservative with a small "c". This group of socially conservative voters could be swayed by the "right" centre-right candidate. They are not strictly in line with the policies of the Conservative party, as

they do want to see some change but not at a social level. Some of their views might be considered socially unacceptable in modern society, but this group of small business owners want to see change that makes it easier for them to obtain the stability and security of previous generations.

4. Third Way Labour (14%)

Unsatisfied with the politics over the past decade the unique characteristics of this persona point towards the safe Labour votes that might have felt disenfranchised with Corbyn-era policies. They want to see Britain take its place again on the international stage by rejoining the EU and forging an even more special relationship with the USA to prevent, as they see it, the country from going even further backwards.

Voter Profiles

Converted to visualise 4 dimensions in 2 dimensions with Indicative Axis Labels



Profile

- Content Conservatives
- Revolutionary Pragmatists
- Social Conservatives
- Third Way Labour



Manifesto Policies



Andrew
Gray

“My only policy is to take my policies from the people!” - Andrew Gray

With clearly defined and distinct voter personas, Andrew used this information alongside analysis and insights provided by Demonstrandum to determine his manifesto policies.

Not all policies are going to appeal to all voters, however with our voter persona methodology and models we can identify which personas are going to align with each manifesto policy.

Through taking the index interpretation of each of our questions we were able to analyse and aggregate across

the voter personas to see where there is agreement. For example, all personas did not over or under index on the comment “Would you vote for a candidate if they were gay?” That is because there is a consensus across all personas with 71% of people agreeing.

Not everyone is going to agree with every statement, but with the combination of indexing and consensus identification we found similarities, not just differences, so Andrew could create the constituent’s manifesto enabled by AI and Data.

Challenges



**Andrew
Gray** 



“Perfection is the enemy of progress.” - Winston Churchill

Everyone involved in this project and campaign believes that this is just the beginning of how AI and Data can be used to bring the voice of the people closer to the wheels of power.

However, we recognise that there are some issues that we can address moving forwards. First and most obviously we are dealing with a small sample size. This is due in part to deploying this in one constituency from a cold start with limited resources, and we believe this can be easily remedied moving forward.

To counter this problem, Demonstrandum used appropriate methodologies and techniques to account for small sample size impacting statistical significance. You can read more about the methodologies employed in the Appendix.

Most importantly, AI and Data techniques were used to inform decision making, not replace them. Andrew took the learnings and insights and took decisions as the candidate accordingly.

Summary



**Andrew
Gray**



“Using Polis will revolutionise the way UK Elections are held” - Andrew Gray

2023 has seen a boom in the AI industry, with Large Language Models such as ChatGPT, Stable Diffusion, and businesses integrating these technologies into their day to day operations.

When Andrew approaches people about this project people are immediately interested, and the adoption rate in just 4 weeks speaks for itself. Pol.is enables candidates, MPs, and even governments to listen to the voice of the people and make better, more informed policy decisions.

The way in which we have used Pol.is and AI in this campaign is just the start, we are already discussing how we can build and improve upon our success in future elections; after all the next General Election is less than 18 months away at the time of publication.

What using Polis has enabled Andrew’s campaign to do is identify the issues that matter and create a manifesto that will resonate with voters. We did this not by letting AI do everything, but by using data and AI in a way that enabled us to see the signals within the noise.

In Summary

The campaign to elect Andrew Gray as MP for Selby and Ainsty used Pol.is, the real-time system for gathering, analysing, and understanding what large groups of people think in their own words to construct a manifesto that truly represents the interests of the constituents.

We did this through creating distinct voter personas that identified unique characteristics and voting patterns, which in turn enabled us to better identify not only the differences between groups, but the points of consensus around which a manifesto could be created.

This analysis and use of AI was done in an ethical manner which was designed to help drive democracy. AI and Data provided insights, trends, and patterns from which humans were able to make decisions.

You can find out more about Andrew Gray's campaign to be the MP of Selby and Ainsty at: <https://www.andrew-gray.org>

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Appendix: Research Methodology



Andrew Gray

The statistical analysis of the data was performed using R, SQL, and ChatGPT, in accordance with the UK GDPR.

After collecting and doing some primary preprocessing of the data within SQL; the vote data and comment data was read, cleaned, and processed using R and the tidyverse suite of packages.

In order to enable a cleaner and more robust analysis given the small sample size outlier points - users with low voting records, and comments with a low number of votes - were removed. After removal the comments were summarised and aggregated using

ChatGPT to identify which comments might have an existing match in the remaining data. Where possible these questions were then linked together, and in situations where this was not possible the summarisations were provided as an additional data point for decision making.

Given the high dimensionality of the data, the first analysis performed was a dimensionality reduction based upon the association between the variables. Given the data had 4 levels (Not Answered, Disagree, Neutral, and Positive) we used the Kendall association method to identify relationships within the data set.

Kendall's tau was used as the data type we were analysing was ordinal and one of the recommended ways to conduct the comparison of ordinal vs. ordinal data is through Kendall's tau. Given the high dimensionality of the data Benjamini-Hochberg False Discovery Rate analysis was performed on the association results at a significance level of 0.05.

Following this assessment of association, we utilised Demonstrandum's proprietary association dimensionality reduction algorithm to identify representative columns which minimised out of group association. This analysis resulted in a dimensionality reduction from 108 dimensions to 37.

The purpose for doing so is we intended to utilise Factor analysis with varimax rotation, and the presence of multicollinearity can impact the accuracy and calculation of the results. Given the sparse nature of the data we encountered warnings about the singularity of the correlation matrix, as well as the matrix not being positive definite and appropriate caution and steps were taken in any interpretation of the results accordingly.

A Scree plot analysis was utilised to determine the optimal number of factors to be 4, and then a final Factor

analysis was conducted to produce a set of scores which would be used in subsequent analysis.

Given the source of the data, in order to construct our voter profiles we employed k-Medoid clustering. We used this methodology because we wanted to obtain a representative from our sample rather than a mean point that we would have obtained should we have used k-Means. Whilst we could have utilised k-Means we were also concerned about the sphericity assumption of the method not holding given the sparse nature of the data.

We utilised the silhouette method to identify the optimal number of clusters, and refined it further based upon visual inspection of the results. We utilised a fixed seed to ensure reproducibility of the results and to ensure there was not an unexpected change in cluster membership during subsequent analyses.

Finally we utilised indexing to conduct our analysis and identification of differences and characteristics of both the voter profiles as well as between the voter profiles.

Future analyses will look to remedy issues caused by the sparse nature of the data and refine the calculation of consensus between voter profiles.

Revisions, Versions, and Amendments



13th July 2023: V1 - Initial Publication

13th July 2023: V1.1 - Grammatical and Spelling Error Correction