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Informing voters in the Scottish Independence Referendum: how successful was Twitter as an information source in comparison with other forms of media?

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Abstract

This study examines how successful the social media application Twitter was in informing voters in the Scottish Independence Referendum, in comparison with other forms of media. I created a survey which recorded the respondents' self-attested media use and tested their knowledge of the Scottish Independence Referendum through a series of factual questions. Respondents' answers to these knowledge questions were then combined to create a knowledge index ranging from 0 -11, which was the dependent variable used in the statistical analysis. Two dependent variables were used; Information source used most frequently and campaign activity. The relationships between these variables were tested using ANCOVA, with gender, education and age acting as control variables. As expected, a statistically significant relationship was found between referendum knowledge and both independent variables. Results showed that when Twitter was the information source used most often, respondents' knowledge scores were higher than when other forms of media were used, the exception being blog users. A knowledge gap between respondents who had actively campaigned in the referendum and those who had not was evident for every type of media tested; the exception being Twitter. This study demonstrates that Twitter, and social media generally, were on average more successful in informing voters in the Scottish Independence Referendum than other traditional media.

Contents

Introduction

"Widespread political ignorance and representative democracy make a poor match"

(Mondak and Davis, 2001: 200).

Normative democratic theory stipulates that informed and knowledgeable voters are of vital importance to an optimal democratic society (Sotirovic and McLeod, 2004:374). To this end, academic interest in how voters obtain and retain political knowledge has been, and continues to be, highly prolific. This dissertation aims to add to existing literature investigating which forms of media best facilitate voter learning. The sudden presence and rapid growth of social media applications have created a new dimension to the study of the media and voter knowledge. The role of social media in voter learning is a field of study which has become highly popular in recent years (Lee &Youn Oh 2013; Dabbagh & Kitsantas 2012; Prior 2005), however there has been very little research investigating how different forms of social media impact voter learning in a comparative perspective with other forms of media (Dimitrova et al. 2011:1). This study aims to help re-dress the balance, and will examine how successfully the social media application Twitter informed voters in the 2014 Scottish Independence Referendum, in comparison with other forms of media. Throughout this dissertation it is posited that the unique nature of the twitter application enables users to increase their levels of political knowledge more successfully than other forms of media.

The Scottish Independence Referendum took place on 18 September 2014, with the result that the Scottish public opted to remain a part of the United Kingdom. Although Scotland has not become an independent country, the referendum sparked a UK-wide discussion on the nature of democracy in this country (www.scvo.org.uk: 2014). As a politically knowledgeable citizenry is theoretically key to a successful democracy, this is a timely study as it seeks to examine how successful the relatively new form of media Twitter is at informing voters in a comparative perspective.

This study began on the day after the Scottish Independence Referendum (19 September 2014) and ran for one month. An anonymous online survey targeted

towards referendum voters aged 16 and over was completed by a total of 701 respondents, which after data cleaning was reduced to a valid sample of 592. Respondents were asked a series of questions about their media use when finding information on or learning about the referendum. This was then followed by seven questions which tested the respondent's knowledge of the Scottish Independence Referendum. The survey responses were analysed and tested with the aim of drawing conclusions about how comparatively successful Twitter was in informing voters on the referendum.

This study seeks to find how successful Twitter was as information source in the Scottish Independence Referendum, in comparison with other forms of media. It expands on the existing literature about the relationship between different types of media and voter learning to include Twitter. While a definitive answer as to what type of media best facilitates learning has yet to be found, examining the impact of Twitter on voter learning alongside other new and traditional forms of media will help enhance our understanding of the relationship between learning and the media, with the ultimate aim of contributing to a strong democratic society.

Chapter One: Literature Review

One of the primary functions of the media in a democratic society is to inform its voters (Dimitrova et al, 2011:4). This task is of particular importance during election campaigns, and arguably even more so during independence referendums, as in Scotland on 18 September 2014. As such, the relationship between the media and voter learning has been and continues to be of enormous interest to the academic community. The comparative success of different forms of media in increasing voter knowledge has been of particular interest, and will be the focus of this chapter. Previous studies on the relationship between voter learning and traditional media will be critically examined, before expanding to include the impact of the internet. This will be followed by a critical review of recent literature on the comparative role of social media in increasing voter knowledge. A recurring theme throughout this review is the difference in voter knowledge between voters who are actively engaged and interested in politics, and those who are less so. This theme will be discussed more fully when literature on the difference between voter learning in elections and referendums is examined. Through critically discussing previous studies on the relationship between different forms of media and voter learning, this chapter aims to develop and illustrate four key hypotheses which when tested will allow this study to draw conclusions on how comparatively successful the new social media application Twitter was in informing voters in the Scottish Independence Referendum.

Throughout the last century, news media tools have evolved and grown at an astonishing rate, from newspapers to radio, television, the internet and now social media. As the tools of media have evolved, the academic world has kept pace, providing rich and extensive research on the use, effectiveness and success of each new media. In the late 20th and early 21st Centuries there was extensive research undertaken on the differences between how the comparatively new media of television and the more traditional media of newspapers influenced voter learning. While results vary, prominent research by Druckman (2005), Weaver (1996), Drew and Weaver (1995 & 2006) and McLeod et al (1996) found that the traditional media of newspapers was more successful in comparison to the newer media of television in terms of informing the electorate.

During the 2000 Minnesota Senate campaign Druckman (2005) aimed to find how newspaper news and television news cover campaigns, inform and influence voters. He used content analysis to research how two local newspapers and four local television stations covered the campaign and then used an election day exit poll to test for the effect of coverage on learning. His findings suggest that, in comparison to television, newspapers have a much more significant role in informing the electorate. In the study it was seen that while newspapers and television contained similar content, newspapers had a greater quantity of coverage (Druckman, 2005:470). It is posited by Druckman (2005:470) that newspapers have a more significant impact on voter learning both because of this greater quantity of information, but also because newspapers allow readers to process content at their own pace, unlike television viewers. Earlier research by McLeod et al (1996) reached similar conclusions, finding that newspapers were more successful in increasing knowledge on the campaign than television. Moreover, both media had far more influence in voter learning than nontraditional media, such as talk shows and political advertisements (McLeod et al, 1996: 412). At the same time, however, McLeod et al (1996:413) found that these nontraditional forms of media were "closer to the discourse of average citizens" and therefore may have produced increased levels of enthusiasm for the 1992 Presidential election, resulting in a high voter turnout despite "widespread public disdain for politics". Weaver and Drew (1995) also conducted a study on the impact of traditional vs. nontraditional media on voter learning in the 1992 Presidential election. Like McLeod et al, they found that watching television news contributed to an increased knowledge of candidate issue stands, particularly in comparison with nontraditional media such as talk shows, which did not contribute to voter learning in their study (Weaver & Drew, 1995:14). This is consistent with research conducted by Weaver (1996) the following year, which found that voters do learn "more detailed information about issue positions" from newspapers and television, and that evidence of this kind of learning from media such as talk shows is notably weaker" (Weaver:1996:45).

Weaver and Drew collaborated again in 2004. Once again they conducted a study on the role of media in voter learning during a Presidential election. In this study, however, they included the internet as a media and also compared their findings with their previous studies of the 1988, 1992, 1996 and 2000 U.S presidential elections

(Weaver & Drew: 2006). Including the internet as a media in their study was an appropriate measure to take as the percentage of the adult American population who used the internet to get political news and information had increased by more than 50% between 2000 and 2004 (Weaver & Drew, 2006:25). They found that over the course of this time period, generally television news, televised debates and Internet information were the most important media in predicting voter learning of the issue positions of the leading candidates (Weaver & Drew, 2006:38). Weaver and Drew's (2006:38) findings additionally suggested that the importance of newspapers in voter learning had decreased between the 2000 and 2004 elections. Their results also indicated that those who had a higher interest in the campaign and who sought news more often and paid more attention to campaign information on the Internet were generally more knowledgeable about the campaign than their less interested and information seeking counterparts (Weaver & Drew, 2006:30-31).

While providing no definitive answers as to which form of media is most effective in increasing voter knowledge, collectively these studies indicate that by the early twenty-first century newspapers, though previously the most informative, were falling behind television news and the internet as the leading media in voter learning. As indicated by Weaver and Drew (2006), with this increase in choice of media voters who were interested in politics were taking advantage of the available information sources to become more informed, whereas those with lower interest in politics became less informed, as they could self-select the news they were exposed to, thus producing a political knowledge gap. The rise of the internet, and in recent years, social media, has arguably contributed to this knowledge gap by providing new platforms for voters to find their news. One of these new platforms is the social media application Twitter, which fulfills a dual function of social interaction and information sharing.

The launch of Twitter in 2006 has created a medium through which the public can directly connect to each other, news sites, politicians, the government, celebrities and just about any group imaginable. In 140 characters or less, information and web-links can be shared and read by anyone. The potential of Twitter as a political tool came to the limelight during the Arab Spring in 2011, when alongside other internet applications such as blogs and Facebook, it was used as a notable platform for dissent,

finding and sharing news information and aiding in organising protest (Tufekci & Wilson: 2012). It has since become an ever more popular tool of politicians, activists, governments and, of course, voters themselves (Cheng et al: 2009).

Researching the relationship between politics and Twitter is currently a hot topic, with vast recent and ongoing literature on the subject. However, my dissertation aims to add to a niche in this area that is currently under explored. Extensive research by Lee and Youn Oh (2012, 2013) discusses how personalised vs. depersonalised Tweets from politicians affect public reactions and also to what extent Twitter contributes to knowledge gain. These studies provide great insight on the best way for politicians to convey information on Twitter and about what kind of knowledge (hard or soft news) users retain from the application. However my dissertation will take a step away from this and strip the issue back to basics. By focusing their research on Twitter as a stand-alone medium, Lee and Youn Oh cannot examine how Twitter contributes to voter knowledge in a comparative perspective with other forms of media. Largely focusing a study on one form of media has strong merits; it allows researchers to focus their work and look in-depth at a particular area. But it is argued here that for campaign directors, politicians and activists allocating their promotion resources promotion to different kinds of media, and for voters who want to keep informed, it is first important to know which kind are the most effective. Therefore my dissertation will look at how comparatively successful Twitter was at informing voters in the Scottish Independence Referendum.

Dimitrova et al. (2011:1) similarly identified that there has been little research investigating the use of *different forms* (emphasis in the original) of media and their relative effects on political knowledge and participation. Their study examined the effects of digital media on political participation and knowledge and whether different forms of media affect people differently. They found that online news sites were the most widely used digital media, and when controlling for other factors this was the only type of digital media that influenced voter learning (Dimitrova et al, 2011:11-12). Dimitrova et al. acknowledge that the unique interactivity of social media platforms provides opportunities for connecting voters and politicians and that the internet offers access to a wealth of information about politics which has the potential to contribute to a more informed electorate. That said however, in their study they concluded that social media had no effect on learning (2011:14), and that what

matters most for political learning is political interest, previous political knowledge and paying attention to traditional media forms (Dimitrova et al, 2011:16).While their conclusion about the importance of political interest echoes the research discussed previously, their assertion that traditional media have more of an impact on learning than online media sits in contrast.

Research by Prior agrees with Dimitrova et al.'s findings to a certain extent. In his study, Prior (2005: 587) finds that politically interested people use the new forms of media available to increase their knowledge, while other people take advantage of the greater choice and "tune out of politics completely", thus creating a knowledge gap in the population. In contrast to Dimitrova et al.'s research, Prior finds that for those who have an existing interest in politics social media does increase political knowledge (Prior, 2005:587).

Recent studies by Junco et al. (2011) and Dabbagh and Kitsantas (2012) examine the effect of social media in formal learning. Both studies advocate the use of social media as a learning tool in formal education. Junco et al.'s (2011:128) results indicated that encouraging the use of Twitter for educationally relevant purposes has a positive effect on grades. Each of these studies is comprised of students who are actively choosing to learn, therefore it does not immediately follow that Twitter and other social media use generally will have any impact on learning. However, Junco et al. (2011:129) note that the give-and-take nature of Twitter, where users are both the receivers and givers of information, increased students active responses and interaction with each other about the information posted. This was in contrast to students using the Ning platform; they received the same information, but in a static bulletin board form (Junco et al. 2011:129). This suggests that the format of Twitter could possibly also contribute to learning among general users as it encourages discussion and interaction between users. This idea is supported by Dabbagh and Kitsantas (2012:3), who note that learning 'on demand' is becoming a part of the modern lifestyle, and that to do so people take advantage of social media not only to seek information but also to share information. While both of these studies acknowledge that learning from social media requires motivation from the user to do so, they also go a long way to refuting Dimitrova et al.'s assertion that social media has no effect on learning.

As has been discussed previously, learning from the media is often considered to be an active process, where learning is largely dependent on the user's motivation to do so. Conversely, Baresch et al. (2011:70) argue that "incidental exposure has repeatedly been found to generate learning". Tewksbury et al. (2001: 536-537) posit that for many people 'news seeking' is not a primary goal; however these people may encounter news more frequently online than they would offline. A possible explanation for this is the active and participatory nature of social media. Baresch et al. (2011:69) use interviews and recent surveys as examples to posit that social media users tend to be not just consumers of news and current events, but act as conduits as well, posting and sending links to their social network. This then leads to incidental exposure; following links suggested by fellow social media users resulting in finding unexpected sites and information (Baresch et al. 2011:70). Prior (2005: 577) disagrees with the theory of incidental exposure online; he argues that as media choice increases, the likelihood of "chance encounters" *with any political content* (emphasis in the original) declines significantly. However, it is important to note that Prior was writing in 2005, one year before the launch of Twitter. Research by Kwak et al. (2010:591) reveals that any re-tweeted tweet will reach an average of 1'000 users no matter how many social media followers if the original poster. They find that once a tweet has been re-tweeted further diffusion of the information is very fast (Kwak et al. 2010:591). This indicates that Twitter users who have a low level of political interest may be more likely to experience incidental exposure to political information, which can then generate learning, than voters who primarily use other forms of media. Therefore it is possible that a political knowledge gap may be less evident among Twitter users than users of other media.

Academic literature discussing the political knowledge gap amongst voters almost always uses Presidential, general or local elections as case studies - very few use Referendums. While within the context of a Referendum it is probable that a political knowledge gap will still exist between the politically motivated and those less so, it is possible that the difference may be smaller than during standard elections. This is potentially because referendums differ from general elections in several ways. LeDuc (2002: 719) argues that when the issues of a referendum are new to the voter, "predispositions will be weaker and the learning process of the campaign will be more critical for deciding how to vote". He claims that in these situations most individuals

can only form an opinion after information on the issue has become available and accessed (LeDuc, 2002: 720). This is in contrast to 'normal' elections, where most voters make up their minds following clear partisan or ideological cues (LeDuc, 2002: 720). Voter turnout in the Scottish Referendum was a record high of 84.6 percent (BBC: 2014) of the electorate, indicating a greater than average interest, in comparison with general or local elections. If LeDuc's theory is correct, this could suggest that voters in the Scottish Independence Referendum may have been more generally informed on the issues of the debate, in comparison to knowledge levels during general elections. Therefore the politically-motivated knowledge gap, while still in existence, may be less in evidence.

Collectively, the literature discussed here allows us to determine four hypotheses to test in order to find how successful Twitter was in informing voters in the Scottish Independence Referendum in comparison with other information sources. Firstly, as demonstrated by Druckman (2005), McLeod et al (1996), Drew and Weaver (1995 & 2006) and Dimitrova et al. (2011), it is predicted that different information sources will impact Scottish Independence Referendum learning differently. According to Druckman (2005:470), newspapers have a significant impact on voter learning in part because they allow readers to process content at their own pace. Twitter is similar in this respect. It is a media which facilitates the receiving and sharing of information, which can then be rapidly spread through re-tweets, thus increasing the likelihood of incidental exposure to referendum information. As with newspapers, users can than process this information at their own pace, potentially leading to an increase in knowledge. Therefore, drawing on the work of Junco et al. (2011), Dabbagh and Kitsantas (2012), Baresch et al. (2011) and Kwak et al. (2010), it is posited that when Twitter is the main information source used, voters will have greater knowledge on the referendum than when other media are the principal information source. LeDuc's research on the differences between learning in referendums and elections is compelling, however the findings presented by Prior (2005), Dimitrova et al. (2011) and Weaver and Drew (2006) illustrating the knowledge gap are too strong and consistent to ignore. Therefore while referendums may have smaller knowledge gaps than general elections, it is posited that a knowledge gap between voters who actively campaigned in the referendum, demonstrating political interest, will have greater knowledge of the referendum than there less active counterparts. Lastly, by drawing

the previous three hypotheses together, it is posited that when Twitter is the information source used most often, the knowledge gap will be less significant than when other media are the principal information sources. To sum, the four hypotheses drawn from the literature reviewed are as follows:

Hypothesis 1: There will be a significant relationship between the information source used most frequently and Scottish Independence Referendum knowledge.

Hypothesis 2: When Twitter is the principal information source, Scottish Independence Referendum knowledge will be higher than when other information sources are utilised.

Hypothesis 3: There will be a significant relationship between campaign activity and Scottish Independence Referendum knowledge.

Hypothesis 4: When Twitter is the principal information source used, campaign activity will have a less significant effect on Scottish Independence Referendum knowledge than when other information sources are utilised.

By using the Scottish Independence Referendum as a case study I am adding to the voter-learning debate in the context of traditional vs. new media and applying it to a political situation which has gone largely unmentioned in this debate. Voter-learning in an independence referendum is arguably even more crucial than in general elections, as the future of a nation is at stake. If Scotland is to follow the example of Quebec, it is possible that there will be another referendum in Scotland within the next 15 - 20 years. It is therefore of great importance that both voters themselves and political parties understand the best media through which to learn and project their message to voters. My study aims to contribute to earlier literature on the media and voter learning by analysing how successful Twitter was in informing voters in the Scottish Independence Referendum in comparison with other forms of media.

Chapter Two: Methodology

The purpose of this study is to examine how successfully Twitter informed voters on the Scottish Independence Referendum, in comparison with other information sources. This chapter aims to describe the methods adopted to test the hypotheses outlined in the literature review. An online survey was chosen as the method through which to conduct this research; this choice of procedure will be justified and the method of participant recruitment explained. A detailed description of the survey will follow, and this chapter will conclude by discussing the tests used to answer the hypotheses and research question.

Conducting surveys online can have methodological pitfalls, the most prominent being that there is no way to test the validity of the respondents' answers. The information provided could be inaccurate due to respondents intentionally providing false information, or unintentionally; for example a respondent may believe that they use newspapers most often to find political information, but scientific study of their behaviour could reveal that they actually use television most often for this purpose. However, surveys conducted online also have distinct advantages over those distributed by other means, for example by post, telephone or face to face (Wright:2005). They have the potential to reach large sums of people for a fraction of the time and cost of other distribution methods, as well as offering complete anonymity to participants, which can encourage participation and while can allow false information to be given, generally produces more honest responses (Wright:2005). Distributing my survey online was appropriate in this instance as by the beginning of 2014 eight in ten homes in Scotland had internet access (Ofcom, 2014:7) and 73 percent of adults in Britain accessed the internet everyday (Government Digital Service:2014), meaning that the majority of potential respondents had the means to access and complete my survey. The non-funded nature of this research also made online distribution the most viable and cost-effective methodology.

The survey was launched on 19 September 2014, the day immediately following the Scottish Independence Referendum, and was open for one month until 19 October 2014. It was distributed by a variety of means:

1. Through the 'whole office' email of companies such as St James' Place Wealth Management; Prudential Craigforth; and Directorate of Planning and Environmental Appeals.
2. Directly contacting friends, family and associates who were then asked to share the survey with their own contacts.
3. Sharing the survey on social media service Facebook.
4. Tweeting the survey on social media service Twitter.

When sharing my survey on Twitter, I aimed my Tweets particularly at notable figures in the Scottish Independence Referendum, such as Alex Salmond, Alistair Darling, Blair Jenkins, Blair McDougall and Nicola Sturgeon. I did this in the hope that they would re-tweet my survey, which would potentially increase the survey's exposure to referendum voters, thus increasing my number of eligible respondents. Of these, Blair Jenkins (Chief Executive of the Yes Campaign) and Blair McDougall (Campaign Director of Better Together) re-tweeted my survey, generating a chain reaction where my survey was then re-tweeted a further 110 times. This undoubtedly contributed to my unexpectedly large number of respondents, however may have resulted in a disproportionately large number of Twitter users (55.6 percent) in my sample.

Respondents took part in the survey on a voluntary basis, totalling 701 voting age adults, ranging in age from 16 to 81. The minimum age accepted for this survey was lowered from the UK standard of 18 years old because the minimum voting age in the Scottish Independence Referendum was lowered to age 16 (The Scottish Government). The sample size was reduced by 15.6% after eliminating non-completed surveys and those where the respondent was ineligible to vote in the referendum, producing a sample size of 592 respondents. As the research question aims to find how successfully voters in the referendum were informed by different information sources, those ineligible to vote were excluded. For control purposes, the survey also measured age (M = 36 years, SD = 15.17), gender (53.4 percent female) and education (56.9 percent university or more). While the mean age was 36, it is important to note that 40.4 percent of respondents were aged 16-25. This demographic information indicates that that females, young people and university graduates are somewhat over-represented in the sample (Scotland's Census:2011). The maximum sampling error for this survey is plus or minus 4.1 percentage points at the 95% level of confidence.

This study examines the effects of different forms of information sources on Scottish Independence Referendum learning. The survey was comprised of thirty questions which were chosen in the days and weeks directly preceding the referendum. These were approved by the University of Glasgow Ethics Committee for Non Clinical Research Involving Human Subjects on 15 September 2014 (see Appendix). Respondents were first asked a series of demographic questions (age, gender, education level), which were then followed by questions about the respondent's media use when finding information on the referendum. Respondents were asked what types information sources they used to find out about the referendum, and which of these they used most often for this purpose. Options included blogs, conversations with friends and family, Facebook, internet news sites, newspapers, public debates, TV and Twitter. These were listed in alphabetical order to ensure that the survey did not influence the respondent towards any media in particular. Respondents were asked how knowledgeable they felt on the issues surrounding the independence debate, and to rank on a scale of $1-10$ to what extent each of the information sources informed them on the referendum. Additionally, respondents were also asked if they had actively campaigned during the referendum. It was made clear that 'actively campaigning' included canvassing, speaking publically in favour of either side at events about the referendum and/or by promoting independence related articles on social media.

The final section of the survey was designed to measure the respondent's knowledge of the independence referendum. According to Zaller (1992:21) political knowledge is best measured by simple tests of neutral factual information about politics. The reason being that "tests of political information, more directly than any of the alternative measures capture what has actually gotten into people's minds, which, in turn, is critical for intellectual engagement with politics" (Zaller, 1992:21). Adhering to this principal, I created 7 neutral factual questions: four covered the most hotly discussed topics in the referendum debate; oil, the pound, finance, and which policy areas may be further devolved in the event of a 'No' vote; two questions tested respondent's knowledge of the two campaigns themselves by asking respondents to identify the Director of the Better Together Campaign and the Chief Executive of the Yes Campaign; a final question tested general knowledge of Scottish politics, asking respondents to identify which policy areas were currently devolved to Scotland. In

order to capture political learning during the campaign, the knowledge questions predominantly focus on new information that had made news in major national news media in the weeks before the referendum, and were supplemented by a measure of subjective political knowledge. The predominant focus on newly available information directly related to the independence debate entails that knowledge gains must have taken place in these final weeks (Dimitrova et al, 2011:9) before the referendum.

These questions were posed in a variety of ways, including multi-choice, 'tick all that apply' and one open ended question. A 'don't know' option was provided for each non-multi-choice question, the assumption being that multi-choice questions would prompt the respondent to provide an educated guess if they did not initially know the answer. Respondents' results were coded into correct and incorrect, and then summed to from an additive index ranging from 0 (*no correct answers*) to 11 (*all questions answered correctly*). The final knowledge score represented a respondent's summary score across a series of neutral, factual tests (Zaller, 1992:43) of Scottish Independence Referendum knowledge. Respondents were offered the opportunity to comment at the end of the survey. A full list of the questions posed in the survey and a breakdown of how the knowledge testing questions were 'marked' is available in the appendix.

At the closure of the survey time frame, the answers provided by the total 701 respondents were manually coded and then transferred into Statistical Package for the Social Sciences (SPSS) software. In total, 80 variables were created. The data was cleaned to limit the respondents to only those who had both been eligible to vote in the referendum and who had completed the survey, reducing the valid sample to 592 respondents.

The four hypotheses presented in the literature review were tested using a Two-way ANCOVA test. The dependent variable was the respondent's referendum knowledge score, and the two independent variables tested were the information source used most often to find out about the referendum, and campaign activity. Education, age and gender were entered as covariate variables, in order to control for their possible impact on knowledge scores. Frequency tables were produced for each of the dependent and independent variables. The Two-way ANCOVA allowed the

interactions between the knowledge score and the independent variables to be tested both individually and together, while simultaneously controlling for the demographic variables. This was therefore the most efficient method through which to test the four hypotheses with the ultimate aim of finding how successfully Twitter informed voters on the Scottish Independence Referendum, in comparison with other information sources.

Chapter Three: Findings

The tests outlined in the methodology allow conclusions to be drawn about how comparatively successful Twitter was as an information source in the Scottish Independence Referendum. This chapter will report the statistical findings of these tests, beginning by re-stating the research hypotheses. The frequencies of the dependent and independent variables used will then be reported, followed by an analysis of the ANCOVA (Univariate Analysis of Covariance) tests which were used to test the hypotheses.

Hypothesis 1: There will be a significant relationship between the information source used most frequently and Scottish Independence Referendum knowledge.

Null Hypothesis 1: There will not be a significant relationship between the information source used most frequently and Scottish Independence Referendum knowledge.

Hypothesis 2: When Twitter is the principal information source, Scottish Independence Referendum knowledge will be higher than when other information sources are utilised.

Null Hypothesis 2: When Twitter is the principal information source, Scottish Independence Referendum knowledge will not be higher than when other information sources are utilised.

Hypotheses 3: There will be a significant relationship between campaign activity and Scottish Independence Referendum knowledge.

Null Hypothesis 3: There will not be a significant relationship between campaign activity and Scottish Independence Referendum knowledge.

Hypothesis 4: When Twitter is the principal information source used, campaign activity will have a less significant effect on Scottish Independence Referendum knowledge than when other information sources are utilised.

Null Hypothesis 4: When Twitter is the principal information source used, campaign activity will not have a less significant effect on Scottish Independence Referendum knowledge than when other information sources are utilised.

A total of 701 respondents took part in the study, of which 84% were both eligible to vote in the referendum and fully completed the survey, creating a valid sample of 592 respondents. The main independent variable in this study was the type of information source used most often to find out about the referendum. The results illustrated in figure 1 show that internet news sites were the type of information source used most often to find out about the referendum by 28.7% of the valid respondents. The next most popular was Twitter (15.9%), followed by television (14.5%), conversations with friends and family (12.5%), Facebook (9.6%), newspapers (7.4%), and public debates (5.7%). Blogs were the least common information source, with only 5.6% of the valid respondents using those most often to find out about the referendum. The second independent variable used in this study was campaign activity. Table 1 shows that 38.7% of the valid sample indicated that they had actively campaigned during the referendum, through canvassing, speaking publically at events and/or by promoting independence related articles on social media.
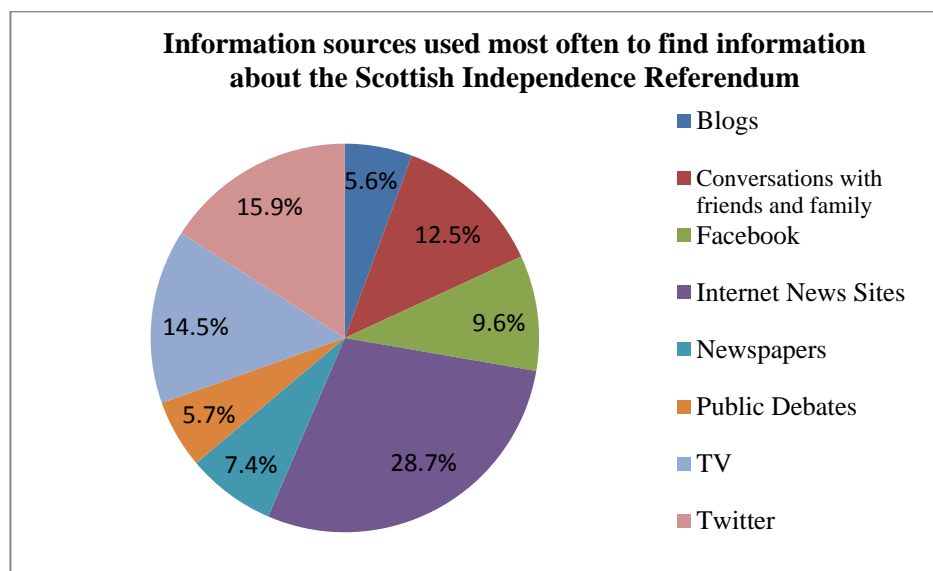
Figure 1.

Information sources used most often to find information about the Scottish Independence Referendum

Table 1. Central Tendency of Campaign Activity

Did you actively campaign for either side in the run up to the referendum?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	229	38.7	38.7	38.7
	No	363	61.3	61.3	100.0
	Total	592	100.0	100.0	

The dependent variable in this study was the respondent's knowledge score, which represented the respondent's summary score across a series of knowledge tests on the Scottish Independence Referendum (Table 2.). The mean knowledge score was 6.48 out of a possible 11. The standard deviation (2.77) is small in relation to the mean, indicating that this is likely to be an accurate representation of Scottish Independence Referendum knowledge levels in the population. This is further supported by the mode and median of the dependent variable both equalling 7, therefore only slightly larger than the mean (0.52 difference). These approximately equal values indicate that the distribution of knowledge scores can be assumed to be approximately symmetrical.

When asked to rate on a scale of 1-10 (1 = very uninformed; 10 = very informed) to what extent each information source had informed them on the issues in the independence debate (fig. 2.) Twitter came out on top with a median of 9, followed by internet sites (8), conversations with friends and family (7) and fellow SMS Facebook (7), with newspapers and television tied with a median of 6. This indicates that more respondents perceived Twitter to be informing them on the referendum better than the other information sources.

Testing the first hypothesis (H1) examines whether there is a significant relationship between the information source respondents used most frequently and their referendum knowledge score. A Two-way ANCOVA was conducted (Table. 3) which found that when controlling for age, gender and education, there is a significant interaction of the information sources used most frequently and knowledge score $F(7, 581) = 11.364$, $p = 0.000 < .05$, thus supporting H1.

Table 2. Central Tendency of Knowledge Score

Knowledge Score

N	Valid	592
	Missing	0
Mean		6.48
Median		7.00
Mode		7
Std. Deviation		2.777

Knowledge Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	≤0	16	2.7	2.7	2.7
	1	22	3.7	3.7	6.4
	2	31	5.2	5.2	11.7
	3	30	5.1	5.1	16.7
	4	40	6.8	6.8	23.5
	5	45	7.6	7.6	31.1
	6	78	13.2	13.2	44.3
	7	95	16.0	16.0	60.3
	8	74	12.5	12.5	72.8
	9	80	13.5	13.5	86.3
	10	60	10.1	10.1	96.5
	11	21	3.5	3.5	100.0
	Total	592	100.0	100.0	

Fig. 2 To what extent did these information sources inform you on issues in the independence debate?

To examine H2, the mean knowledge score of each information source was adjusted to account for the effect of the covariates. As shown in Table 4, respondents whose principal information source was blogs on average scored highest in the referendum knowledge tests (M=7.678). This was very closely followed by the average score of users whose principal information source was Twitter (M=7.664), and internet news sites (M=7.117). Facebook use produced the next highest mean (M=6.553). Offline information sources produced the lowest average referendum knowledge scores (newspapers M=6.296; public debates M= 6.143; conversations with friends and family M=5.790; television M=5.571). As the average knowledge score when blogs were the principal information source was higher than when Twitter was the information source used most often, H2 must be rejected and the null hypothesis (NH2) accepted.

Table 3. Analysis of variance of political knowledge

Tests of Between-Subjects Effects

Dependent Variable: Respondents total knowledge score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1849.335[a]	18	102.741	21.736	.000
Intercept	514.638	1	514.638	108.880	.000
Gender	193.665	1	193.665	40.973	.000
Education	95.817	1	95.817	20.272	.000
Age	216.368	1	216.368	45.776	.000
Information Source used most often	221.473	7	31.639	6.694	.000
Campaign Activity	140.855	1	140.855	29.800	.000
Information Source used most often * Campaign Activity	108.049	7	15.436	3.266	.002
Error	2708.380	573	4.727		
Total	29401.000	592			
Corrected Total	4557.715	591			

a. R Squared = .406 (Adjusted R Squared = .387)

To examine H$_2$, the mean knowledge score of each information source was adjusted to account for the effect of the covariates. As shown in Table 4, respondents whose principal information source was blogs on average scored highest in the referendum knowledge tests (M=7.678). This was very closely followed by the average score of users whose principal information source was Twitter (M=7.664), and internet news sites (M=7.117). Facebook use produced the next highest mean (M=6.553). Offline information sources produced the lowest average referendum knowledge scores (newspapers M=6.296; public debates M= 6.143; conversations with friends and family M=5.790; television M=5.571). As the average knowledge score when blogs were the principal information source was higher than when Twitter was the information source used most often, H$_2$ must be rejected and the null hypothesis (NH$_2$) accepted.

Table 4. Estimated Marginal Means: Which medium did you use most often to find out about independence?

Estimates

Dependent Variable: Respondents total knowledge score

Which medium did you use most often to find out about independence?	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Blogs	7.678[a]	.430	6.833	8.522
Conversations with friends and family	5.790[a]	.279	5.243	6.338
Facebook	6.553[a]	.296	5.971	7.135
Internet News Sites	7.117[a]	.183	6.758	7.476
Newspapers	6.296[a]	.348	5.613	6.979
Public Debates	6.143[a]	.426	5.306	6.980
TV	5.571[a]	.366	4.852	6.290
Twitter	7.664[a]	.242	7.187	8.140

a. Covariates appearing in the model are evaluated at the following values: Gender = 1.53, Level of Education = 4.23, age categories = 2.55.
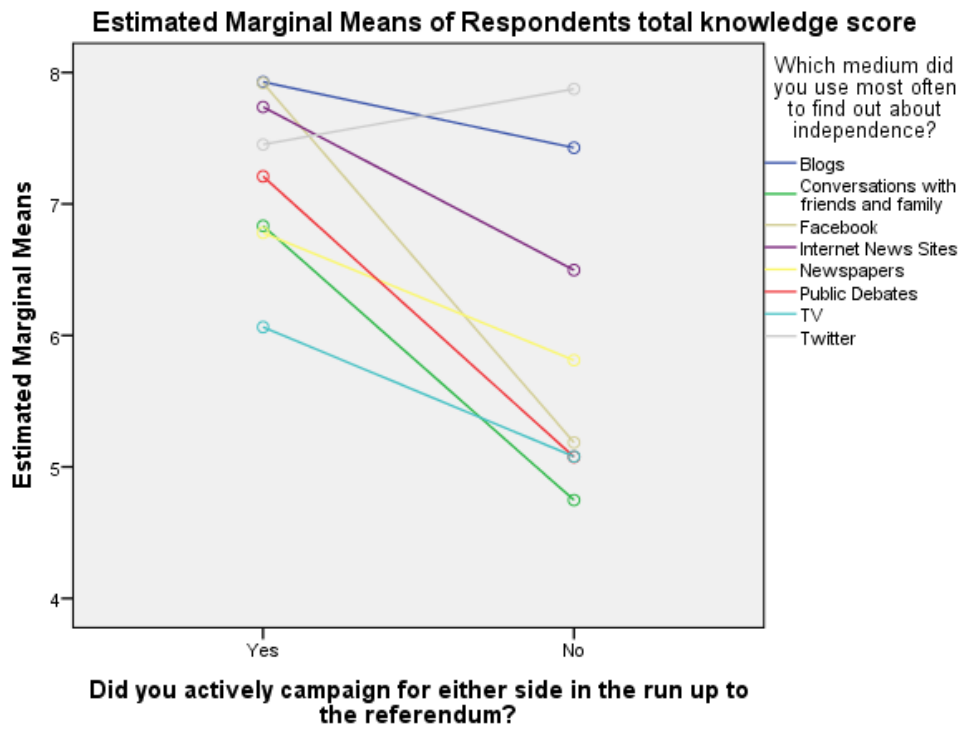
Supporting H3, campaign activity was significantly associated with Scottish Independence Referendum knowledge learning; $F(1, 581) = 29.800$, $p = 0.000 < .05$ (Table 3). Table 5 reveals that respondents who reported having actively campaigned during the referendum had a mean knowledge score of M=7.241. Respondents who did not promote referendum related articles on social media, go canvassing or speak publically at events about the referendum on average had a lower Independence Referendum Knowledge score (M=5.962). This knowledge gap supports the third hypothesis that there would be a significant relationship between campaign activity and Scottish Independence Referendum knowledge.

H4 examines if campaign activity will have a less significant effect on referendum knowledge if Twitter is the principal information source used, in comparison to when other information sources are utilised. Controlling for the demographic variables, the ANCOVA test (Table 3) found there was evidence of a significant interaction effect between campaign activity and information source on referendum knowledge; $F (7, 573) = 3.266$, $p = 0.002 < .05$. As shown in figure 3, respondents who actively campaigned during the referendum had on average a higher referendum knowledge

score, regardless of which information source they used most often. The only exception to this was when Twitter was the principal information source. In this scenario, respondents who did not actively campaign had on average higher referendum knowledge. H_4, therefore, was supported.

In order to find how comparatively successful Twitter was as an information source in the Scottish Independence Referendum, four hypotheses were tested using ANCOVA. The results found support for H_1, revealing a significant interaction between the information source used most frequently and Scottish Independence Referendum knowledge. When Twitter was the principal information source, Scottish Independence Referendum knowledge was not higher than when other information sources were utilised, therefore H_2 was rejected and the Null Hypothesis (NH_2) accepted. A significant interaction was found between campaign activity and referendum knowledge, thus supporting H_3. Finally, there was a significant interaction effect between campaign activity and information source on referendum knowledge. Respondents who actively campaigned had a higher knowledge score, except when Twitter was the principal information source, consequently supporting Hypothesis 4. Overall, the first, third and fourth hypothesis were supported, and the second null hypothesis was accepted.

Figure 3. Interaction effects of information source and campaign activity on Scottish Independence Referendum knowledge

Estimated Marginal Means of Respondents total knowledge score

Did you actively campaign for either side in the run up to the referendum?

Covariates appearing in the model are evaluated at the following values: Gender = 1.53, Level of Education = 4.23, age categories = 2.55

Table 5. The effect of actively campaigning in the Scottish Independence Referendum on respondents knowledge score.

Estimates

Dependent Variable: Respondents total knowledge score

Did you actively campaign for either side in the run up to the referendum?	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Yes	7.241[a]	.178	6.890	7.591
No	5.962[a]	.150	5.667	6.258

a.   Covariates appearing in the model are evaluated at the following values: Gender = 1.53, Level of Education = 4.23, age categories = 2.55.

Chapter 4: Discussion

The overall purpose of this study has been to investigate how successful Twitter was as an information source in the Scottish Independence Referendum, in comparison with other forms of media. As an aide to the reader, this chapter will begin by briefly summarising the relevance of the research question. The majority of this chapter, however, is devoted to a summary and discussion of the four study hypotheses and the test results in the context of the research question. The limitations of this study will also be discussed, followed by recommendations for future research and a concluding statement.

The traditional theory of democracy stipulates that informed and knowledgeable citizenry are indispensable and of vital importance to the health of a democratic society (Sotirovic & McLeod, 2004:374). It is widely debated that the by-products of an uninformed citizenry (the disintegration of civil order, weak political leaders and political alienation) may in the future cause a democratic crisis (Memoli, 2011: 79). It is therefore imperative that we know how best to inform citizens; the advent of social media in recent years has necessitated that we continue this field of study to include these new sources of information. The Scottish Independence Referendum was a useful case study through which to investigate how comparatively successful Twitter is at informing voters. If the Scottish public had voted for independence, a new state would have been created. It would have been of the utmost importance that this new state had a solid democratic foundation, and therefore an informed citizenry. Key to this would be deciding which form of media was most successful in increasing voter knowledge, which is the area of study my dissertation contributes to. Although Scotland voted against independence on 18 September 2014, the path to increased devolution and with it the promise of greater local power highlights the continued need for an increasingly informed citizenry (www.scvo.org.uk: 2014). Therefore this study is highly relevant as contributes to the debate on voter learning and the media in a highly topical context.

The first hypothesis argued that there would be a significant relationship between the information source used most frequently and Scottish Independence Referendum knowledge. Results from the ANCOVA fully supported this hypothesis. This indicates that the type of media that voters use most frequently had, in this case, an

impact on how much that voter learned about the referendum prior to casting their vote. This finding is consistent with most previous studies which examine the relationship between voter learning and types of media (Druckman: 2005; McLeod et al: 1996).

The second hypothesis contended that when Twitter was the principal source of information, voters would have a higher level of referendum knowledge than when other information sources were utilised. The results from the ANCOVA tests were unexpected, and proved the null hypothesis. The tests showed that respondents who used blogs most often to find information on the referendum were on average more knowledgeable than those who used other types of media, thus proving the null hypothesis. However, respondents who used Twitter most came a very close second behind blogs. In fact, there was only 0.014 difference in the means – less than one mark on the total knowledge scale, and the same score if the means were rounded to one decimal place. Therefore, while statistically speaking blog users had a higher knowledge score than Twitter users, in real terms the difference is negligible. It is also important to note Twitter was the most frequently used information source for almost three times as many people blogs. Therefore although the mean knowledge score for Twitter users was marginally smaller than that for blog users, information about the referendum reached more people in this study through Twitter than blogs, while at the same time producing very nearly the same score. This suggests that, although the second null hypothesis was proved, Twitter use did successfully increase voter knowledge on the referendum. Further in support of this theory is the median results when respondents were asked to rate to what extent each information source informed them on issues in the referendum. Again, Twitter received the highest score. This is in contrast to Dimitrova et al.'s (2011) research, which found that social media had no impact on learning.

The results from the ANCOVA test show that respondents who most frequently used internet news sites to find information on the referendum had the third highest knowledge score, followed by Facebook users. This reveals that, in this study, the four types of media which had the greatest impact on referendum voter learning were all forms of online media. This is somewhat similar to Weaver and Drew's (2006) study on the role of media on voter learning during the 2004 Presidential election. Their results indicated that, along with television and televised debates, the internet

was the most important media in predicting voter learning of the campaign issues (Weaver & Drew, 2006:38). In contrast, in this study television and public debates were the information sources with the two lowest scores. It is reasonable that this difference between the two studies is due to cultural factors. Weaver and Drew conducted their research using a US Presidential election as a case study. A main part of these Presidential election campaigns are the much-anticipated presidential debates, which attract a mass television broadcast audience (Turcotte & Goidel, 2014: 449). In contrast to this, televised election debates are a very recent phenomenon in the UK, with the first televised leader's debates taking place during the 2010 general elections (www.telegraph.co.uk). This therefore may explain why this study and Weaver and Drew's study both found the internet to be the most important predictor of voter knowledge, yet differed over the influence of television and debates.

The third hypothesis of this study predicted that there would be a significant relationship between campaign activity and referendum knowledge. Results from the ANCOVA fully supported this hypothesis. Respondents who identified themselves as having actively campaigned during the referendum had on average a higher knowledge score. Respondents who canvassed during the campaign, spoke publically in favour of either side at events about the referendum and/or by promoted independence related articles on social media were expected to have a higher level of political interest than those who did not. As in studies by Dimitrova et al. (2011), Prior (2005) and Weaver and Drew (2006), there was generally a knowledge gap between voters who had a high political interest and their less interested counterparts.

The final hypothesis tested in this study posited that when Twitter is the principal information source used, campaign activity will have a less significant effect on Scottish Independence Referendum knowledge than when other information sources are utilised. This hypothesis was also supported by the ANCOVA test. The results of the test revealed that Twitter was the only information source where respondents who did not actively campaign had on average a higher referendum knowledge score than those who actively campaigned. This was unexpected; it was predicted that there would be less of a knowledge gap when Twitter was the media used most often, however the researcher did not expect the knowledge gap to also be reversed in favour of the respondents who did not actively campaign. This finding is unusual; none of

the studies analysed in Chapter One reported one type of media producing a reverse knowledge gap.

Although the difference in knowledge scores between Twitter users who actively campaigned and those who did not is very tiny, smaller than any of the gaps visible when other media was used, the reverse knowledge gap is somewhat troubling as it falls outside of normal trends. It is possible that the reverse knowledge gap was the result of poor question choice in the survey. In hindsight, it would have been more appropriate to ask respondents about their level of interest in politics. It is possible, indeed likely, that the 'actively campaigned' variable excluded respondents who had a strong interest in politics but were either on the fence in the referendum and so did not campaign, or who just simply chose not to campaign and kept their views private. This is a flaw in the methodology of this study; should this survey design be used in further case studies, this question would need to be altered. As this trend occurred only when Twitter was the most frequently used information source, it would be useful if future studies examined if Twitter users are in general more politically informed, yet at the same time also less engaged in participatory politics.

Despite the unexpected result for H_4, hypotheses one, three and four were all supported by the ANCOVA test. Although the second null hypothesis was accepted, as has been discussed above the very small difference between the average knowledge score of blog and twitter respondents, coupled with Twitter's greater user numbers, allows us to argue that in real terms respondents who used Twitter most frequently to find information on the referendum had on average a higher knowledge score that respondents who principally used other information sources, excluding in statistical terms blog users. Overall, the results presented in this study indicate that when it came to informing voters in the Scottish Independence Referendum, Twitter was highly successful as an information source in comparison to other media.

Conclusion

This study has demonstrated that Twitter was very successful in informing voters in the Scottish Independence Referendum, in comparison with other forms of media. This paper began by discussing the previous research conducted on the relationship between different types of media and voter knowledge, where it was demonstrated that comparative studies on the role of social media on political knowledge were currently lacking.

I aimed to add to this limited body of literature through conducting an online survey which recorded the respondents' self-attested media use and tested their knowledge of the Scottish Independence Referendum. This method was used as it is generally understood that political knowledge is best measured by simple tests of neutral factual information about politics (1992:21). The relationships between the dependent variable (respondents' knowledge score) and two independent variables (information source used most frequently; campaign activity) were tested using ANCOVA, with gender, education and age acting as control variables.

My findings support previous literature in identifying a significant relationship between the type of media used most often and voter knowledge. I found that the use of online media was on average an indicator of higher referendum knowledge, thus supporting finding by Weaver and Drew (2006). Of these online media, when blogs were used as the principal information source respondents had on average higher knowledge scores. Twitter users had on average the next best knowledge score, although the difference between the two media was marginal. As almost three times as many respondents used Twitter in comparison to blogs, it is argued here that Twitter was highly successful in increasing voter knowledge as it was used most often by a larger number of voters, who then on average had very close to the highest average score. This study also found a significant relationship between campaign activity and knowledge score, supporting Dimitrova et al. (2011) and Prior's (2005) claims that politically interested individuals have an average higher levels of political knowledge than their less interested counterparts, creating a knowledge gap in the population. However, my results indicated that respondents whose principal information source was Twitter bucked this trend, finding that respondents who had not actively campaigned in the referendum had slightly higher referendum knowledge

scores. This was highly unexpected, and may be the result of the disproportionate number of Twitter users in this study, as a result of using Twitter to find participants. This method of participant recruitment was potentially flawed, as it may have resulted in this unexpected finding which goes against the basic theory of political knowledge gaps.

Collectively, my findings support much of the existing research on the media and voter knowledge, however also find that in this case study, social media and in particular Twitter, play a much more significant role in informing the electorate than previous studies such as those by Dimitrova et al. (2011) and Prior (2005) give them credit for. This is significant as in wake of the Scottish Independence Referendum citizens are becoming increasingly more interested politics (www.scvo.org.uk: 2014) and social media will almost certainly play a large role in keeping them informed on politics, thus contributing to a stable democracy (Sotirovic and McLeod, 2004:374).

In the future it would be beneficial to conduct a similar study during a local or general election in Scotland. This would allow comparisons to be drawn between the impact of different types of media on knowledge scores in referendums and elections, testing LeDuc's (2002) theory that referendum voters generally more knowledgeable on the issues involved than when voting in an election.

Overall, this study has illustrated that Twitter was a highly successful in informing voters in the Scottish Independence Referendum, in comparison with other forms of media.

Appendix A: Ethical Approval

![University of Glasgow | College of Social Sciences logo]

Ethics Committee for Non Clinical Research Involving Human Subjects

NOTIFICATION OF ETHICS APPLICATION OUTCOME – UG and PGT Applications

Application Type: **New**   **Date Application Reviewed:** 15.09.14

Application Number: CSS/SPS/2014/398/POL

Applicant's Name: Carolyn McKeown
Project Title: #IndyRef – in comparison with other forms of media, how influential was Twitter in shaping the view of users, and increasing knowledge on, the Scottish Independence Referendum?

APPLICATION OUTCOME

(A)   **Fully Approved   x☐** *Start Date of Approval: 15.09.14.*   *End Date of Approval: 2.03.15*

(*B*)   **Approved subject to amendments**
            If the applicant has been given approval subject to amendments this means they can proceed with their data collection with effect from the date of approval, however they should note the following applies to their application:

> **Approved Subject to Amendments without the need to submit amendments to the Supervisor**
>
> **Approved Subject to Amendments made to the satisfaction of the applicant's Supervisor**
>   ☐

            The College Ethics Committee expects the applicant to act responsibly in addressing the recommended amendments.

(C)   **Application is Not Approved at this Time**

> **Amendments must be made to the satisfaction of the School Ethics Forum (SEF)**
>   ☐
>
> **Complete resubmission required. Discuss the application with supervisor before resubmitting.**
>   ☐

            Please note the comments in the section below and provide further information where requested.

If you have been asked to resubmit your application in full, send it to your supervisor who will forward it to your local School Ethics Forum admin support staff.

Where resubmissions only need to be submitted to an applicant's supervisor.
This will apply to essential items that an applicant must address prior to ethics approval being granted. As the associated research ethics risks are considered to be low, the applicant's response need only be reviewed and cleared by the applicant's supervisor before the research can properly begin. For any application processed under this outcome, it is the Supervisor's responsibility to email socpol-pgt-ethics@glagow.ac.uk with confirmation of their approval of the re-submitted application.

APPLICATION COMMENTS

Major Recommendations:

Minor Recommendations:

Please retain this notification for future reference. If you have any queries please do not hesitate to contact your School Ethics forum admin support staff.

Appendix B: Survey Questions

#IndyRef – in comparison with other forms of media, how influential was Twitter in shaping the view of users, and increasing knowledge on, the Scottish Independence Referendum?

Online Survey Questions

Researcher: Carolyn McKeown

Supervisor: Dr Ana Langer

Undergraduate Politics Dissertation

1. What age were you on the day of the Scottish Independence Referendum (18 September 2014)

2. I identify my gender as…
   - Female
   - Male
   - Prefer not to disclose

3. What is the highest level of education you have attained?
   - No qualifications
   - Standard Grade or equivalent
   - Higher or equivalent
   - College
   - University and above

4. Do you use Twitter?
   - Yes
   - No
   - Sometimes

5. Before the Scottish Independence Referendum, for how long had you been using Twitter?
   - More than 1 year
   - Between 6 months and 1 year
   - Between 1 and 6 months
   - 1 month
   - A few weeks
   - I don't use Twitter

6. How often do you use Twitter?
   - Never
   - Less than once a week
   - Several times a week
   - Once a day
   - Several times a day

7. Do you follow politicians and/or the Scottish Independence debate on Twitter?
   - Yes
   - No
   - Sometimes

8. Which mediums did you use to find out about the independence debate? Tick all that apply
   - Blogs
   - Conversations with friends and family
   - Facebook
   - Internet News Sites
   - Newspapers
   - Public Debates
   - TV
   - Twitter

9. Which medium did you use most often to find out about independence?
   - Blogs
   - Conversations with friends and family
   - Facebook
   - Internet News Sites
   - Newspapers
   - Public Debates
   - TV
   - Twitter

10. Were you eligible to vote in the Scottish Independence Referendum?
    - Yes
    - No

11. Did you vote in the Scottish independence referendum?
    - Yes
    - No

12. Did you actively campaign for either side in the run up to the referendum? i.e knock on doors, speak publicly at events in favour of either side, or promote independence related articles on social media?
    - Yes
    - No

13. In the last year, did you change your stance on Scottish independence?
    - Yes
    - No

14. If yes, please rank the mediums below in order of which were most influential in altering your stance, with 1 being most influential and 8 being least influential.

If you did not change your stance on Independence, please move onto the next question.

    - Blogs
    - Conversations with friends and family
    - Facebook
    - Internet News Sites
    - Newspapers
    - Public Debates
    - TV
    - Twitter

15. One a scale of 1 to 10, how knowledgeable did you feel on the issues surrounding the independence debate prior to 18th September?
    - 1 = very unknowledgeable
    - 10 = very knowledgeable

16. On a scale of 1-10, to what extent did the Internet inform you on issues in the independence debate?
    - 1 = Using the Internet did NOT inform me on issues in the Independence debate
    - 10 = Using the Internet kept me very informed on issues in the Independence debate

17. On a scale of 1-10, to what extent did reading newspapers inform you on issues in the independence debate?
    - 1 = Reading newspapers did NOT inform me on issues in the Independence debate

- 10 = Reading newspapers kept me very informed on issues in the Independence debate
- 11 = I don't read newspapers

18. On a scale of 1-10, to what extent did conversations with friends and family inform you on issues in the independence debate?
- 1 = Conversations with friends and family did NOT inform me on issues in the Independence debate
- 10 = Conversations with friends and family kept me very informed on issues in the Independence debate
- 11 = I did not discuss the independence debate with friends and family.

19. On a scale of 1-10, to what extent did watching Television inform you on issues in the independence debate?
- 1 = Watching Television did NOT inform me on issues in the Independence debate
- 10 = Watching Television kept me very informed on issues in the Independence debate
- 11 = I don't watch television

20. On a scale of 1-10, to what extent did using Facebook inform you on issues in the independence debate?
- 1 = Using Facebook did NOT inform me on issues in the Independence debate
- 10 = Using Facebook kept me very informed on issues in the Independence debate
- 11 = I don't use Facebook

21. On a scale of 1-10, to what extent did Twitter inform you on issues in the independence debate?
- 1 = Using Twitter did NOT inform me on issues in the Independence debate
- 10 = Using Twitter kept me very informed on issues in the Independence debate
- 11 = I don't use Twitter

22. On a scale of 1-10, how confident were you in your vote choice on 18th September?
- 1 = I was not very confident in my decision
- 5/6 = I was on the fence
- 10 = I was very confident in my decision

Below are a series of questions about the Scottish Independence Referendum. Please do not search for answers on the internet or elsewhere, as this will create an inaccurate data sample.

23. From the list below, please identify the Chief Executive of the YES campaign:
    - Alex Salmond
    - Blair Jenkins
    - Fiona Hyslop
    - Kenny MacAskill
    - Nicola Sturgeon
    - Patrick Harvie
    - I don't know

24. From the list below, please identify the Campaign Director of the Better Together campaign:
    - Alistair Darling
    - Alex Fergusson
    - Blair McDougall
    - David Cameron
    - Nick Clegg
    - Nosheena Mobarik
    - I don't know

25. In the lead up to the referendum, which powers did the Better Together (No) campaign pledge would be further devolved to Scotland in the event of a 'No' vote? Tick all that apply.

    - Defence
    - Fiscal responsibility
    - Foreign affairs
    - Immigration
    - Oil legislation
    - Social security

26. From the list below, please identify which policy areas are currently devolved to the Scottish government. Tick all that apply.

    - Defence and national security
    - Education
    - Energy

- Environment
- Health
- Immigration
- Justice, policing and courts
- Trade and industry

27. In the event of a 'Yes' vote, negotiations would have begun on how to divide North Sea Oil fields. The majority of experts believe that these would have been divided on a geographical basis. Assuming this is the case, approximately what percentage of the current UK oil reserves would then be under Scottish jurisdiction?
    - 100%
    - 90%
    - 80%
    - 70%
    - 60%
    - 50%
    - 40%
    - I don't know

28. Which major Scotland-based financial company announced plans to re-locate out of Scotland in the event of a Yes vote?

29. If Scotland had voted 'Yes' to independence and chosen to keep the pound and enter into a currency union with the rest of the UK, who would be Scotland's 'lender of last resort'?
    - The Bank of Scotland
    - The Royal Bank of Scotland
    - The Bank of England
    - HSBC Bank
    - Lloyds Bank
    - Santander
    - I don't know

30. Did you watch the televised Independence debates between Alistair Darling and Alex Salmond?
    - No
    - Yes, I watched one
    - Yes, I watched both

*Questions 5, 6 & 7 were asked to Twitter users only

Appendix C: Frequency Tables for Control Variables

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Male**	**276**	46.6	**46.6**	46.6
	Female	**316**	53.4	**53.4**	100.0
	Total	592	100.0	100.0	

Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No qualifications	7	**1.2**	1.2	1.2
	Standard Grade or equivalent	21	**3.5**	3.5	4.7
	Higher or equivalent	140	**23.6**	23.6	28.4
	College	87	**14.7**	14.7	43.1
	University and above	337	**56.9**	56.9	100.0
	Total	592	100.0	100.0	

Do you use Twitter?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	329	55.6	55.6	55.6
	No	179	30.2	30.2	85.8
	Sometimes	84	14.2	14.2	100.0
	Total	592	100.0	100.0	

Bibliography

Baresch, B. Knight, L. Harp, D. Yaschur, C. (2011) 'Friends Who Choose Your News: An analysis of content links on Facebook'. International Symposium on Online Journalism. 1 (2), pp.65-85.

BBC News (2014) *Scotland Decides*. Available at: http://www.bbc.co.uk/news/events/scotland-decides/results [Accessed: 15/02/2015]

Caron, A. Curini, L. Lacus, S. M. Porro, G. (2013) 'Every tweet counts? How sentiment analysis of social media can improve our knowledge of citizens' political preferences with an application to Italy and France', New Media Society 1461444813480466, first published on April 4, 2013 doi:10.1177/1461444813480466

Cheng, A. Evans, M. Koudas, N. (2009) 'Inside the Political Twittersphere', Sysomos. Available at: <https://www.sysomos.com/insidetwitter/politics> [Accessed 15/02/2015].

Dabbagh, N. Kitsantas, A. (2012) 'Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning', Internet and Higher Education, 15. pp. 3-8.

DiGrazia et al (2013) 'More Tweets, More Votes: Social Media as a Quantitative Indicator of Political Behaviour'. PLOS ONE 8(11): e79449. doi:10.1371/journal.pone.0079449

Dimitrova, D. Shehata, A. Strömbäck, J. Nord, L. W. (2011) 'The Effects of Digital Media on Political Knowledge and Participation in Election Campaigns: Evidence From Panel Data', Communication Research, 20 (10). pp. 1-24.

Dobrzynska, A. Blais, A. and Nadeau, R. (2001) Do the Media Have a Direct Impact on the Vote? The case of the 1997 Canadian Election', International Journal of Public Opinion Research, 15 (1). pp. 27-43

Drew, D. and Weaver, D. (1995) 'Voter Learning in the 1992 Presidential Election: Did the "Nontraditional" Media and Debates Matter?', Journalism & Mass Communication Quarterly, 72 (7) pp. 7-17.

Drew, D. and Weaver, D. (2006) 'Voter Learning in the 2004 Presidential Election: Did the Media Matter?', Journalism & Mass Communication Quarterly, 83 (25). pp. 25-42

Druckman, J.N. (2005) 'Media Matter: How Newspapers and Television News Cover Campaigns and Influence Voters', Political Communication, 22 (4). 463-481

Fraser, D. (2014) 'Further declines in Scottish newspaper sales', BBC News. Available at: <http://www.bbc.co.uk/news/uk-scotland-scotland-business-26366464> [Accessed 15/02/2015].

Government Digital Service. (2014) 'Government Digital Inclusion Strategy', Government of the United Kingdom. Available at: https://www.gov.uk/government/publications/government-digital-inclusion-strategy/government-digital-inclusion-strategy. [Accessed 15/02/2015].

Junco, R. Heibergert, G. Loken, E. (2011) 'The effect of Twitter on college student engagement and grades', Journal of Computer Assisted Learning, 27. pp. 119-132.

Kwak, H. Lee, C. Park, H. Moon, S. (2010) 'What is Twitter, a Social Network or a News Media?', Proceedings of the 19th international conference on World wide web, pp. 591-600.

LeDuc, L. (2000) Referendums and Elections: How do Campaigns Differ? in Do Political Campaigns Matter? Campaign Effects in Elections and Referendums. edited by Farrell, D. M. and Schmitt-Beck, R. London: Routledge pp. 143-162

LeDuc, L. (2002) 'Opinion Change and voting behaviour in referendums', European Journal of Political Research 41. pp.711-732.

Lee and Youn Oh (2012) To Personalize or Depersonalize? When and How Politicians' Personalised Tweets Affect the Public's Reactions. Journal of Communication, 62. pp. 932-949

Lee and Youn Oh (2013) 'Seek and You Shall Find? How Need for Orientation Moderates Knowledge Gain from Twitter Use'. Journal of Communication. 63. pp.745-765.

McLeod et al (1996) 'The Impact of Traditional and Nontraditional Media Forms in the 1992 Presidential Election', Journalism & Mass Communication Quarterly 73 (401)

Ofcom (2014) 'The Communications Market Report: Scotland', Available at: < http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr14/scotland/>. [Accessed 15/02/2015].

Prior, M. (2005) 'News vs. Entertainment: How Increasing Media Choice Widens Gaps in Political Knowledge and Turnout', American Journal of Political Science. 49 (3). pp. 577-592.

Scotland's Census (2011) 'Key and Quick Data'. Available at: http://www.scotlandscensus.gov.uk/key-and-quick-data. [Accessed 15/02/2014].

Sotirovic, M. and McLeod, J. M. (2004) 'Knowledge as Understanding: The Information Processing Approach to Political Learning' in Handbook of Political Communication Research, edited by Kaid, L.L. Lawrence Erlbaum Associates Inc: London. pp.357-394.

STV News (2012) 'Scots use Facebook and Twitter more than other surfers across the UK'. Available at: http://news.stv.tv/scotland/103728-internet-surfing-habits-of-scots-reveal-we-love-social-networks/. [Accessed 15/02/2015].

Tewksbury, D. Weaver, A. J. Maddex, B. D. (2001) 'Accidentally informed: Incidental News Exposure on the World Wide Web', Journalism and Mass Communication Quarterly. 78. pp. 533-554.

The Scottish Government. (no date) 'Who can vote in the referendum?' Available at: < https://www.scotreferendum.com/questions/who-can-vote-in-the-referendum/> [Accessed 15/02/2015].

Tufekci, Z. and Wilson, C. (2012) 'Social Media and the Decision to Participate in Political Protest: Observations from Tahrir Square', Journal of Communication. 63. pp. 363-379.

Weaver (1996) 'What Voters Learn from Media', Annuals of the American Academy of Political and Social Science. 546. The Media and Politics. pp. 34-47.

Winkels, M. (2013) 'The Global Social Network Landscape. A Country-by-Country Guide to Social Network Usage'. eMarketer. Available at: https://icgstrategicteam.wikispaces.com/file/view/eMarketer_The_Global_Social_Network_Landscape-A_Country-by-Country_Guide_to_Social_Network_Usage.pdf [Accessed 15/02/2015].

Wright, K. B. (2005) 'Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services'. Journal of Computer-Mediated Communication. 10 (3).

Zaller, J. R. (1992) The Nature and Origins of Mass Opinion. University of Cambridge: Cambridge.