Knowledge Gap and the Information Environment

More informed citizens or a growing divide?

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Table of Contents

Foreword

The rapid digitisation and the increase in the amount of information available provides us with various opportunities, for instance in the form of innovative data-driven business models.

Similarly, individual citizens face more and more choice when seeking the daily news and other information crucial for understanding the modern society.

Several scholars have noted that due to a rapidly growing freedom of choice in our contemporary information environment there is an increasingly differential distribution of knowledge between different socioeconomic groups. This knowledge gap may have adverse societal implications. It is argued that in some cases citizens have completely wrong perceptions of how different policy options would affect their well-being, which leads them to make harmful decisions.

The distribution of knowledge is not always fair. Some pundits have offered open data as a way to solve the question of fair distribution of knowledge. There has been an increasing hype about big data and open data and how radical changes in information environment will affect our everyday lives and create a democratic information society where everyone can participate in meaningful ways.

Sadly, there are several flaws in this reasoning. Open data, when properly used, can be a seed for innovation and, to some extent, may provide economic and democratic benefits. Yet, open data is always means towards an end, not an end in itself. Why would the benefits from the use of digital information distribute any fairer than the benefits from other resources? It is well-tested that wealth and wellbeing does not distribute fairly in the society if all regulation is lifted. There is a good reason for certain regulations and that is to advance equity and fairness in the society. It is worth asking whether and what kind of regulations and incentives we need in the contemporary information environment.

We have to go beyond the rhetorics of openness and tackle the very core issues behind the diffusion of knowledge. What motivates people to find information and use it? Who is capable of doing so? What kind of policies promote fair access to information?

We have started this work by looking into the very basics of the topic at hand and commissioned an extended literature review before providing any tangible policy suggestions. This report is a vital tool for us in order to keep questioning why citizens decide to look for certain kind of information and how the uneven distribution of knowledge affects our society.

I want to express my thanks to Kristofer Jäntti who has done meticulous job in going through excessive amounts of research, picking up the relevant information and presenting them in an enjoyable and well-structured manner.

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Head of Society Programme

Executive Summary

Summary

This work identifies the most important findings about the media effects on the Knowledge Gap (henceforth 'KG'). We draw together the best academic evidence spanning the disciplines of Communications, Social Psychology and Political Science. We recognise the value and importance of these research traditions in telling us how people seek and gain knowledge. Our review collates the best studies and offers tangible areas for future research.

Knowledge Gap

The Knowledge Gap is the differential distribution of *knowledge* between different socioeconomic groups, often defined by education level. The media is the primary medium through which people gain knowledge. Within the literature there are three competing views on the media's effects: (1) The Virtuous Circle hypothesis, (2) the Media Malaise hypothesis and (3) Differential Effects hypothesis.

The Virtuous Circle hypothesis holds that the media increases knowledge, whereas the Media Malaise hypothesis predicts the media decreasing knowledge. The Differential Effects hypothesis predicts different effects of different media on knowledge levels. Knowledge is increased based on the interaction between exposure to the media and individual characteristics (e.g. motivation and capability).

Findings

- The media reduces the KG when there is high interest (e.g. high level of social conflict) in an issue across socioeconomic groups, as predicted by the Virtuous Circle hypothesis.
- Our current information environment exhibits considerable selective exposure to either sources of entertainment or knowledge (e.g. news) leading to a widening KG, as predicted by the Media Malaise Literature.
- Selective exposure may lead to the rise of common misperceptions.

- The evidence for a differential effect between television and newspapers is inconclusive.
- The release of government data to public scrutiny has positive effects in countries with low levels of transparency or high levels of corruption.
- The utility of Open Government Data (OGD) is contingent on its form and quality.
- There are iatrogenic effects to releasing OGD.

1. Introduction: Objectives and methodology

1.1. Background

Society is stratified through a KG between the knowledge rich and knowledge poor. This division had consequences for the quality of democratic deliberation as well as sustaining social inequities. A *growing* gap may even increase social inequality as those who are better informed have the ability to use information (e.g. computerized databases or government leverage) not only to secure their own social position but also to prosper relative to those with less knowledge (Gaziano 1997, 254).

We live in an information environment radically different to the one that existed only a few decades ago; the Internet has exponentially increased both the amount of information and the sources we get it from. It has meant that the barriers to creating and distributing content have been lowered, and this content can easily be accessed at a click of a button – a development with consequences to society.

With increasing education levels, our contemporary information environment can potentially help to foster various forms of open knowledge: releasing open data, placing culture in the public domain, increase democratic deliberation and enhance the interaction between government and civil society.

Keeping in mind these great prospects for both democracy and the well-being of citizens, one needs to consider what is the potential damage of this new information environment. Political apathy is rife, with falling levels of political participation, and evidence shows great disparities in knowledge in important social issues.

As such, the knowledge gap and media effects literature is closely linked to research on *political mobilisation*, and is mostly studied by academics working within the nexus of Political Science and Communication Studies. Therefore, this survey deals primarily with *civic knowledge*.

1.2. Overall aim and objectives

The overall aim of this review is: firstly, to critically evaluate the academic research into the KG hypothesis and the theories to why it is widening; and secondly, outline its implications to overall well being and society. In order to achieve this there are three specific survey objectives: (1) introduce the knowledge gap hypothesis, (2) critically evaluate the theories that underpin it, and (3) evaluate its implications to personal well-being and society.

1.3. Outline of Structure

The structure for this review is as follows: in chapter 2 we begin by describing what is the KG hypothesis. This is followed by a critical appraisal of three competing perspectives on media effects which will be given their own chapter: Chapter 3, Virtuous Circle hypothesis, Chapter 4, Media malaise hypothesis; and Chapter 5, the Differential Effect hypothesis. Chapter 6 will provide a summary of the findings and a list of tangible areas for future research.

2. The Knowledge Gap and how it emerges

2.1. What is the 'Knowledge Gap' and 'Digital Divide'

The 'knowledge gap hypothesis' was originally formulated in the 1970s by Tichenor et al. who argued that knowledge, like wealth, is unevenly distributed and is linked to socioeconomic status (SES) (Tran 2013, 831). A related term is the 'digital divide' which denotes the 'gap between those who do and those who do not have access to new forms of information technology' (van Dijk, 2006, 221-222).

2.2. How does the Knowledge Gap emerge?

Tichenor et al. (1970) originally developed their straightforward hypothesis in the context of communication campaigns:

> As the infusion of mass media information into a social system increases, segments of a population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease (Cited in Eveland & Scheufele 2000, 216).

This basic correlation between socioeconomic status has been later verified in two American surveys conducted in 1988 and 1989 that show the '…exceptionally close fit between political knowledge and socioeconomic status' (Carpini 2005, 34). However, the second part of their hypothesis whether or not the gap is *increasing* is debated. Moreover, there is a disagreement about the effect the media has on knowledge as well as the exact causal mechanisms. For example, Bonfadelli (2002) identifies five possible causal mechanisms: (1) communication skills, (2) prior knowledge, (3) relevant social contacts, (4) selective use, acceptance and storage of information, (5) structure of the media system (ibid. 68).

As such, the literature on media effects can be categorized within a spectrum between two theoretical models: instrumental and psychological (Xenos & Moy 2007, 706). The former views availability and costs of information as key determinants for acquiring information, implying that the increase in volume and decrease in costs to

information should lead to more informed citizens (Bimber 2001, 56-57). The psychological approach, on the other hand, views 'motives, characteristics, and social contexts' of individuals as having a greater impact (Xenos & Moy 2007, 706).

Since the KG hypothesis is concerned with how different socioeconomic groups acquire knowledge from the media, it would be useful to adopt Fraile's (2011, 165) tripartite division of competing perspectives on media effects: (1) the media having a positive effect (Virtuous Circle hypothesis), (2) the media having a negative (Media Malaise hypothesis) and (3) differential effects between media (Differential Effect hypothesis).

3. The Virtuous Circle hypothesis

This perspective views the media as potentially having a benign effect in people's levels of knowledge and democratic deliberation. Pippa Norris suggests that there is an interactive process, 'virtuous circle', whereby those who are interested in current affairs will seek current affairs content from the media. This repeated media exposure will eventually increase their level of knowledge (Holtz-Bacha & Norris 2001, 138).

Others are optimistic about the potential of (new) media of not only increasing knowledge in those who are already interested, as suggested by Norris, but also in groups that have the least amount of prior knowledge. This section will explore the Virtuous Circle hypothesis with respects to three domains: changing content of media, how context matters in media effects, and the impact of new technology.

3.1. Content of Media

The mass media is the main source of important information for the public in developed countries (Hendriks Vettehen 2004, 416) , for example empirical evidence from Germany shows that almost every citizen is exposed to mass communicated messages during election campaigns (Schulz 1997: 58). Correspondingly, research findings show that those who consume news and current affairs programming have high levels of political participation (Norris 1996, 477), and that media consumption is more effective than personal networks in exposing people to views unlike their own (Mutz & Martin, 2001).

The virtuous circle research literature has conflicting views on how the content of media affects levels of civic knowledge. De Vreese & Boomgaarden (2006) find that the consumption of political news, irrespective of medium, has a positive effect on people's knowledge and participation. Mcleod et al. (1996), however, find that it is the consumption of specifically *local* 'hard news' that shows the greatest increase in knowledge.

Television media consumption has been blamed for its malign effects on people (see discussion in chapter 4). The Virtuous Circle scholars, however, argue that the content of media is what matters as opposed to the media *per se*. McLeod et al.

(1979) conducted a study that examined the media effects of the American presidential debate of 1976, which was the first time in 166 years that the confrontation of two strong candidates was being directly transmitted to the public via the media. They found that even though exposure was non-equivalent between different socioeconomic groups, the effect of watching the debate was to increase political interest and knowledge. They argued that watching the debates stimulated further consumption of subsequent media analyses (McLeod et al. 1979: 478).

In the same vein, Petersson's (2006, 133) study on the media effects of the 2006 Swedish parliamentary elections shows that the consumption of political news from 'morning newspapers' and public broadcasters has a positive correlation with political trust and knowledge. Conversely, those who use tabloids and commercial newscasts display the opposite correlation. These findings suggest that the content and style of reporting plays a crucial role in imparting knowledge.

Most studies argue that the consumption of 'hard news', defined as the 'coverage of breaking events involving top leaders, major issues, or significant disruptions in the routines of daily life' (Patterson 2000, 3), has positive effects on knowledge. However, there are those who argue that explicitly entertainment-centred media consumption may also contribute to knowledge gains. For example, Baum (2002) has argued that 'soft news', defined as a story-orientated format with 'the absence of a public policy component, sensationalized presentation, human-interest themes, and emphasis on dramatic subject matter' (Baum 2002, 92), has positive effects on knowledge. Similar effects have been shown with regards to talk shows (e.g. Oprah and Leno) which increased knowledge in the most politically inattentive individuals (Baum & Jamison 2006, 958).

Undoubtedly being exposed to content about current affairs increases overall knowledge and therefore it may play a role in decreasing the knowledge. Though, unequal exposure or motivation to consume relevant information may increase gap, as argued by Tichenor et al. (1970). To understand how the media can alter the gap between the knowledge poor and the knowledge rich depends on the *context* of media consumption, the subject of the next subchapter.

3.2. Context matters

The media is best understood as embedded in society (Newton, 2006), therefore the social context determines how the media affects general knowledge. The most straightforward example how context matters is the contrast between media poor and media rich environments. For example, in 1992 Pittsburgh went through a period of eight months without a major local newspaper which coincided with a drop in knowledge levels (Mondak 1995, 525).

Another contextual factor is the level of social conflict. Tichenor et al. (1975, 21) hypothesised that the greater the social conflict in a community, the more the media will reduce the knowledge gap. For example, De Vreese & Boomgaarden (2006, 332) found that the conflict-driven style of reporting on EU affairs account for higher political participation in the Netherlands than in Denmark, even though the latter had more EU news items.

A high level of social conflict increases the motivation for knowledge, especially in times of political campaigns. Kwak (1999, 403) develops, on the basis of his study of the 1992 American presidential elections, a 'three-way' interaction model that accounts for education, campaign interest and newspaper attention for people's acquisition of knowledge. In particular, he argues that when campaign interest was high more attention was given to newspapers and the knowledge gap between groups decreased. Conversely, when campaign interest was low the gap widened (ibid. 403).

Similarly, Strömbäck & Shehata (2010) develop, on the basis of a three-wave panel study, a model that shows the relationship between political interest, news media exposure and attention to political news. They find a causal and reciprocal relationship between political interest and attention to political news, and between political interest and public news media exposure (Strömbäck & Shehata 2010, 592).

In sum, the social context is crucial to understanding the relationship between motivation and media exposure. When there is generally a high level of motivation across different social groups, for example due to heightened social conflict, the media helps to reduce knowledge gap. When there is a differential in motivation, Strömbäck and Shehata's (2010) model shows how the gap increases. One of the

greatest changes to our information environment has been the adoption of new technology, the subject of the next sub-chapter.

3.3. Impact of New Media

The Internet has been the most profound technology to enhance our ability to communicate across space and time since the printing-press (Weber et al. 2003, 27). It has done this by greatly lowering the barriers to the access and the creation of information (Hargittai & Walejko 2008, 239). Therefore, our current information environment is highly conducive for increasing knowledge. Empirical evidence from the USA shows that as the costs of using the Internet have decreased, the more it is being used to look for information (Xenos & Moy 2007).

The Internet provides new channels to acquire political knowledge. The proliferation of news sites, blogs, e-mail lists and online discussion groups have provided new ways to participate and engage with fellow citizens (Ward & Vedel 2006, 213). Tolbert & Mcneal (2003, 184) find in their two-stage regression analysis on the impact of Internet on voter turnout, using *data* from the 1996, 1998 and 2000 American Election Studies (NES), that Americans were increasingly bypassing traditional media and turning to the Internet for political information. Likewise, McDonald (2008, 61) finds that online news increases political sophistication *even* when controlling for traditional media use.

In particular, the Internet has been lauded for its potential to reach out to politically inattentive groups, such as the young (Delli Carpini, 2000). For example, an experiment conducted by Lupia & Philipot (2005) indicate a good way to increase the political interest in the young (18-25) is to design websites that are specifically catered to them; presenting 'political news that is more like MTV than *The Economist*' (Lupia & Philpot 2005, 1137). Moreover, survey evidence from the UK suggests that the Internet has been especially good in mobilizing groups that are politically inactive offline (e.g. women, young, less-educated), implying that 'e-stimuli and developing experience of the Internet increase the likelihood that one will engage in organisational contacting and online participation' (Gibson et al. 2005, 578).

Lastly, the Internet has been credited for increasing political interest. Shah et al. (2005, 551) find that online information seeking and civic interaction have a greater influence on civic engagement than either traditional media or personal communication. McDonald (2008, 61) hypothesises that the interactivity and the use of visual images account for the fact that those who use online news express more interest in politics when other variables are held constant.

In sum, the Internet has made it easier to access and create information. Evidence shows that the Internet can be used to reach groups that are inattentive, therefore possibly decreasing the knowledge gap. Using the right 'vehicles' to transport important information, like 'soft news', can do this. Though, it is unlikely to have an impact, as only a small proportion of the population is likely to tune into this kind of content (Prior, 2003).

3.4. Conclusions and Suggestions

In conclusion, the Virtuous Circle literature shows how the media can either increase or decrease the knowledge gap. The increase in the availability of information has the potential to increase general knowledge levels depending on the social context. Trying to 'untangle' causal and reciprocal relationships between variables like interest, exposure and media attention is fraught with difficulties. Nonetheless, attempts to identify specific conditions for increasing knowledge levels is a more nuanced approach to the KG 'problem' than purely instrumental models that predict a straightforward relationship between the increasing availability of information and increasing knowledge levels.

After reviewing the literature there are a few possible ways to decrease the KG. Firstly, broadcast media can increase the amount of informative entertainment in order to inadvertently increase knowledge in an otherwise inattentive section of the population. For example, in the UK such shows would be 'Mock the Week' or 'QI'.

Secondly, the Internet is a key medium to disseminate knowledge. It is important that access and the ability to use the Internet is further fostered. Moreover, it would be good to design websites according to different demographic groups to try to increase,

say, their political interest. This would, admittedly, be a very difficult task to do as these pages would have to compete against an endless amount of other web pages.

Lastly, having localised media (e.g. newspapers) may provide content likely to be important and *interesting* for people. By subsidising these newspapers it would be possible to upgrade the quality (entertainment and 'hard facts'), and a competitive price (if not for free) would help spread the newspapers.

4. The Media Malaise hypothesis

This view sees the media as decreasing knowledge levels and having positively *harmful* effect on democratic deliberation (Newton, 1999; Norris, 2000). Recent popular books (Dobelli, 2010; Johnson, 2012) have expounded the harmfulness of the amount of information in the news media and have recommended seriously circumscribing the amount of news people should consume.

4.1. Content of media

Many scholars see the content and nature of television media as being particularly corrosive for democratic participation and knowledge acquisition. For example, Putnam (1995) places part of the blame for low civic engagement and trust in government on the increasing consumption of television as it erodes social capital through occupying people's time that would otherwise be used in collective pursuits.

The content of typical television media has been blamed for increasing political cynicism through displaying news items conveying conflict and political distrust (Robinson 1976, 70). It has also been seen as a 'vicarious' form of entertainment which posits easy explanations to sensational news and therefore breeds a sense of political participation when it actually promotes ignorance of important non-sensational issues and political passivity (Hart, 1996).

In addition to content, the way television media is displayed has been blamed for misleading viewers. For example, the 'episodic nature' of television has been blamed for making viewers less likely to attribute blame and responsibilities to public officials and therefore '...decreases the public's control over their elected representatives and the policies they pursue' (Iyengar 1994, 2-3).

Lastly, Graber (2004) notes that typical television programmes are presented in a way that ignores the 'neurophysiological' realities of humans. For example, the small breaks between news items are too brief for people to absorb new information effectively, or sometimes they are even filled 'with distracting advertising information' (ibid. 2004, 559)

4.2. Context and Media Systems

The change in media content is partly determined by the great structural change in the information environment. These changes are determined by two factors: the change in society and the adoption of new technology (e.g. television and the internet).

As aforementioned, the media is best conceived as embedded in society (Newton, 2006). This means changes in society are also reflected in the media. Modern societies have seen the erosion of traditional social ties that acted as stable sources of meaning and identity – such as conventional religious affiliation, party affiliation and social class (Blumler 1997, 398). This means that citizens are increasingly having fluid identities constructed from 'disparate' sources (Miller 1995, 432) . It is at this point that citizens are increasingly relying on the media to help them 'navigate across a more complex landscape of competing structured and symbolic realities' (Blumler 1997, 397).

In political life this change has manifested itself with increasing partisan de-alignment, decreasing party-membership and greater electoral volatility. This means that conventional political socialization has become less effective (ibid. 1997, 397). As a response, political advocacy has become more professionalized with traditional electioneering being transformed into political marketing in order to capture floating voters (ibid. 1997, 398).

The effect of this, according to Blumler (1997, 399), is that journalists resent that political news is being fed to them by professional spin doctors and therefore started to shift their focus from the substance to the process of politics. The resultant 'race horse journalism' tends to neglect the ideological differences between candidates and parties and, instead, concentrates on individuals and campaign tactics (Petersson 2006, 127).

The change in society has, at least in Europe, coincided with great changes in the media system with the growth of commercial channels. For example, in 1980 Europe had 38 public television stations versus 5 commercial ones, but in 1997 commercial channels (55) outnumbered public stations (Holtz-Bacha & Norris 2001, 123).

This commercialisation has been blamed for increasing the knowledge gap and political cynicism (Schulz, 1997). This is because public service television and commercial systems have different priorities. The objective of the former is best summarized by Lord Leith's classic aim for the BBC: 'to entertain, inform and educate' (Holtz-Bacha & Norris 2001, 126). However, the key priority of commercial channels is to make a profit (Curran et al. 2009, 19).

The consequence of commercialisation is two-fold: the media system becomes more fragmented with increased programme choice (Schulz 1997, 62) and the quality of content of the media deteriorates with greater competition (ibid. 67). In other words, the more fragmented and commercialized the media system is, the wider the knowledge gap. Curran et al. (2009) find that media systems dominated by public service companies (Finland and Denmark) report more 'hard news' and have a more knowledgeable public when compared to the market model (USA) or dual model (UK). Their findings corroborate earlier research that find similar results for EU countries (Holtz-Bacha & Norris, 2001).

There are several reasons why this may happen. Pfetsch (1996) notes that commercial channels have aired less informational programming, for example in Germany the proportion of news has decreased from 10% in 1986 to 4% in 1993 (Pfetsch 1996, 438). Curran et al. (2009, 19) hypothesise that commercial media target a high-spending audience and therefore would neglect lower socioeconomic groups, which would help explain why there is a knowledge gap between disadvantaged groups (low socioeconomic status and ethnic minority) in the USA whereas there is none in Finland (ibid. 17-18).

4.3. Motivation and Selective Exposure

Our current information environment has seen the rise of a plethora of media outlets specifically catering to the media desires of particular groups. The possible effect of this is a growing gap between groups. This sub-section will discuss the importance of motivation in acquiring knowledge and how it interacts with our fragmented media system.

A strand in the KG literature sees motivation (e.g. salience, interest, involvement, or functionality) as the key variable for the acquisition of knowledge (Ettema & Kline, 1977). For example, Horstmann (1991) tested the effects of six different variables with three panel studies from Western Germany and found that motivation had by far the largest impact for the acquisition of civic knowledge. Similarly, Viswanath et al. (1993) ,using a cross-sectional sample from the Diet Intervention Project (CANDI), found the most motivated group acquired more knowledge than the least motivated, though higher education in the motivated group did correlate with increased knowledge.

The corollary to these findings, of course, is that if people lack the motivation for important knowledge they will not seek it. Prior (2005) provides a forceful argument on the effects of the structural change that has happened in our information environment. He notes that we used to live in a 'low-choice broadcast environment' that is characterised by only a few choices for media. In this 'restricted' environment people were often inadvertently exposed to important news, ensuring that even some of the people least likely to be interested in the political process received a rudimentary level of civic knowledge.

Now in our 'high-choice environment', with a plethora of media outlets catering to different interests, ensures that those who are least interested in current affairs are less likely to be 'accidentally' exposed to important news – or bypass them altogether. Conversely, those who are most interested in current affairs are now in a better position than ever before to increase their knowledge.

His argument is backed by evidence that shows that in America there has been an increase in television consumption but not in news (Hooghe, 2002). Even events that one would assume would elicit social conflict have not increased news consumption. For example, Althaus (2002) finds that the September 11 Terror attacks and the ensuing War on Terror has been accompanied by a general decline in news consumption.

Some commentators have suggested that low knowledge about public affairs is a form of 'rational ignorance'. For example, Somin (2010) notes that in the USA the chance that a single vote would be decisive in the presidential elections is 1 in 60 million and,

therefore, the 'incentive to accumulate political knowledge is therefore vanishingly small so long as the only reason for doing so is to cast better informed votes' (Somin 2010, 259).

If our information environment enables the least interested to avoid news, it also means that it can exacerbate the political polarization in those who are most interested in current affairs. The 'selective exposure' literature explores this question by investigating how our political biases affect our choice of media consumption. As such, this line of inquiry is based on Festinger's (1957) seminal theory of cognitive dissonance which posits that (a) information that is congruent with prior opinions elicits positive feelings, and that (b) information that is inconsistent with prior opinions causes dissonance, 'a state of mental discomfort and unease '(Cited in Garrett 2009, 680). Therefore, people will seek out information that reinforces their prior opinions (reinforcement seeking) and avoid information that challenges their opinions (challenge avoidance) (ibid. 680).

Recent studies have verified this tendency, at least in the USA. Iyengar & Hahn (2009) find that people's political leanings affect their choice of 'hard' and 'soft' news. Likewise Natalie Stroud finds, using rolling cross-sectional surveys and panel studies, that political leanings affect their choice of media source irrespective of media type (Stroud, 2007), and that selective exposure increases political polarization (Stroud, 2010).

Strong political partisanship itself contributes to widespread misperceptions (Kuklinski et al. 2000). Bullock (2006) finds that false beliefs influence people's opinions even after they have been shown to be false. Similarly, Nyhan & Reifler (2010) devised an ingenious experiment to understand why political misperceptions were so persistent. They made subjects read out mock newspaper articles containing statements which reinforced popular misperceptions in US society: the existence of Iraqi WMDs, the effects of Bush tax cuts and the belief that the Bush administration banned stem cell research (ibid. 311). The effect of providing test subjects with 'corrective' information was that the most politically partisan had their misperceptions reinforced (ibid. 323).

Some psychological research shows that dissonance is painful because it challenges people's self-identity that is tied to their beliefs (Cohen et al. 2000). There is evidence that bolstering people's self-worth makes it easier for them to be able to receive information that contradicts their beliefs (Geoffrey L Cohen et al., 2007; Correll et al., 2004; Nyhan & Reifler, 2011). Though, this measure is unfeasible from the point of view of public policy.

Lastly, emotions play a key role in human cognition, helping to sort out salient information from our environment (Bradley 2009, 10). Therefore, McGinnes & Elandy (2012) argue that news which elicit the strongest emotional reaction remain better in people's memories than 'neutral' news. This, they argue, is behind some of the greatest irrational media hypes in recent memory, such as the swine flu 'panic' in 2009. This helps to explain evidence that shows that the more people are exposed to crime-related television news stories, the higher their fear of crime is, irrespective of where they live (Callanan 2012, 106)

In summary, motivation plays a key role in sustaining or widening the KG. The interaction between motivation and the proliferation of media sources means that a sizeable portion of the population can easily bypass current affairs news altogether. Moreover, the selective exposure literature highlights how it is now easier to stick to consuming media that reflects one's biases and, therefore, has the effect of increasing polarization.

4.4. Impact of new technology

As aforementioned, the explosive expansion of the Internet and concomitant Information and Communication Technologies (ICTs) has increased access to information and has opened up new avenues for democratic deliberation. Nonetheless, the vast majority of the content on the web is 'about sex, sport and shopping' (Ward & Vedel 2006, 210). For this reason many scholars remain sceptical about great hopes placed on it to increase knowledge and improve deliberation.

First, it vastly exacerbates the fragmentation of media system (Sunstein, 2001). The consequence of this is that it will lead to 'cyberbalkanization': people will 'purposefully communicate with others who share their beliefs, screening out

information that challenges their predispositions' (McDonald 2008, 50). If before the broadcast and print media potentially exposed people to diverse views the Internet makes it easy to stick to sites containing content that confirms one's biases (ibid. 51). This notion has been backed by Garrett (2009) who finds that strongly partisan voters will use the Internet to explicitly increase their exposure to 'opinion-reinforcing information' (Garrett 2009, 692).

Moreover, there is empirical evidence that the Internet contributes to a growing knowledge gap, as suggested by Prior. For example, the initial stages of adopting the Internet increased the KG. Bonfadelli (2002) finds with data from Switzerland that Internet use increased by 200% from 1997 to 2000 but its use was highly unevenly distributed; the average Swiss user of the Internet at the time was 'well educated, affluent, young and male' (Bonfadelli 2002, 75). He also finds that those with higher education used the Internet instrumentally (e.g. for information) and those with less education used it primarily for entertainment (ibid. 81).

Even when the Internet has reached a level of technological maturity and widespread use it has contributed the widening of the gap. McAllister & Gibson (2011) find, using evidence form the Australian Elections Studies from 1996 to 2010, that even when the average levels of political knowledge have remained the same, the growing importance of the Internet in elections is manifesting itself as a growing gap between those who actively use the Internet and those who do not. For example, those who did not have access to the Internet in 2010 had *worse* knowledge levels than the same group in 2001 (ibid. 15). Indeed, they note that those citizens who primarily used television as their main source for news have *less* knowledge than the average citizen (ibid. 13).

Second, Morozov (2011, 136) argues that the decentralized nature of the Internet, whereby anyone can publish content, has contributed to the 'urban myths' such as the view that anthropogenic climate change is a hoax or the common misperception of the existence of 'death panels' in the recent Obama administration's health reforms (Nyhan, 2010).

It is the relative ease of access to content online that contributes to what Caplan (2001, 4) calls 'rational irrationality' which explains why people hold highly biased

beliefs with high certainty based on little information. In other words, people will implicitly weigh the costs of self-delusion with the benefits of holding 'irrational beliefs' (ibid. 4). For example, for highly partisan Republicans the private costs for accessing and agreeing with web sites supporting the notion of Iraqi WMDs are far less than the psychological benefits of holding the belief which underpinned the Bush administration's war in Iraq.

Third, the Internet has not necessarily empowered disenfranchised groups and improved democratic deliberation. Morozov (2011) argues forcefully against the notion that the Internet is a revolutionary force fomenting democratic revolutions around the globe. Instead he notes how authoritarian governments (e.g. Iran, Russia, etc.) have become technologically sophisticated in not only in online censorship but also in harnessing the Internet for surveillance and propaganda.

Even in mature liberal democracies the use of the Internet for political change by disempowered groups has been challenged. Scholars arguing from the point of view of the 'normalisation thesis' suggest that the Internet will be adopted and adapted by mainstream political forces, as in the case of previous communication technologies (Ward & Vedel 2006, 216; Agre 2002, 318). For instance, Lusoli et al. (2005, 39) find, using survey evidence in the UK, that those who use the 'e-channels' of political influence largely resemble traditional political participants and activists.

Similarly, Davis (2009) argues, using a hundred semi-structured interviews, that the 'New media' (Internet and ICTs) has increased the knowledge and communication gap in the UK between the political centre and the periphery. This, he argues, happens for two reasons: (1) enhanced communication between political elites (via popular blogs, think tanks and politicians) and (2) media competition has reduced resources for political content for the masses (Davis 2009, 756-757).

Even online voting, which one would assume would significantly reduce the barriers to voting, has not shown to have a positive effect in increasing political participation. Empirical evidence from Estonia, the pioneer of e-democracy, shows that voting online did not improve the participation of politically disadvantaged groups. Instead, it was mostly used in the wealthy ethnic majority areas, and it mostly substituted for votes at the polls (Bochsler 2009, 1).

In summary, the Media Malaise literature sees the widespread adoption of the Internet as exacerbating the fragmentation of the media system. This leads to an increasing KG as people consume entertainment over news. The effects of this on the most politically partisan is that it can reinforce their biases as they seek content that reaffirms their political beliefs and contributes to public misperceptions.

The effect of polarization and the anarchic nature of the Internet is that it helps to generate some of the most widespread misperceptions. Sometimes trying to 'correct' erroneous views reinforces them in the people most vested in them, either due to 'rational ignorance' or to avoid 'dissonance' in their world-view. The literature paints a bleak view on the effects of the Internet as it continues to occupy a greater place in media consumption.

4.5. Conclusions and Suggestions

In conclusion, the Media Malaise literature shows how the fragmentation of the media system contributes to an increasing KG. Scholars who blame the nature and content of televisions as creating passive uninformed citizens remain unconvincing as those people living in countries with a public service model have higher levels knowledge compared to other media system models.

In fact, a way to minimise the KG is to create a well-funded independent public service company that would be premised on the idea of both entertaining and informing all citizens. This way it would be possible to retain a media source that remains relatively 'objective' yet broadly informative.

Aspiring to present the best possible knowledge, without political spin, would help curb (though not eliminate) some of worst instances of selective exposure. Though, presenting a 'balanced' view, presenting both sides of an argument, on controversial political topics are unlikely to be effective in eventually harmonizing debates between the most politically partisan (see Lakoff 2002).

The spread of the Internet has enabled the widespread adoption of popular misperceptions. Measures of trying to control to the anarchic nature of the Internet

would likely be unpalatable for liberal democracies, as it would involve censorship or steering discussions – measures that are used in authoritarian states (see Morozov 2011). However, there is some evidence which shows that providing corrective information via visual means (e.g. graphs) is more effective than written text to dispel some misperception (see Nyhan & Reifler 2011). For example, graphically juxtaposing the amount of foreign nationals receiving social benefits with the amount in the work force in order to dispel the misperception of 'benefit tourism'.

5. Differential Effects hypothesis

The previous sections have mostly analysed the overall effects of the media in either increasing or decreasing levels of knowledge. This section, however, reviews the literature that argues for a differential effect between the different mediums. It will examine the cases for newspapers, television, and Open Data.

5.1. Newspapers as a knowledge widener?

The research literature has often emphasised the superiority of newspapers over other media to increase knowledge (Jenssen 2012, 21). It is for this reason that the original KG hypothesis argued that newspaper consumption widens the gap as higher socioeconomic groups consumed more newspapers than lower socioeconomic groups (Tichenor, Dnonohue, & Olien, 1970).

There have been some recent studies that confirm this hypothesis. For example, Jerit et al. (2006) find, after analysing 41 cross-sectional studies from the USA that increasing media exposure increases general levels of knowledge among the population, but that the educated acquired knowledge faster from newspapers than the less educated. Likewise, Kim (2008) finds a similar result from South Korea. He hypothesises two causal mechanisms for their results: (1) people with higher education read more newspapers and (2) the more highly educated learn at a faster rate than the less educated (ibid. 203).

Some scholars argue that the complexity of the content of newspapers relative to television combined with the lower capabilities of the less educated explains the existence of the KG. For example, Moore (1987: 189) used two telephone panel studies to assess the effects of the political campaigns that were implemented for the 1987 Gubernatorial elections in New Hampshire. He found that there was an increase of the KG when the issues were more complex (Moore 1987: 186). Moore's findings are corroborated by Kleinnijenhuis (1991) who found similar results from the Netherlands.

These findings are disconcerting for those who hope to bridge the KG as newspaper articles have become longer and more complex in the last fifty years (Barnhurst & Mutz, 1997). Moreover, newspaper articles in the USA are often written for the level

of comprehension of an eighth or twelfth grader even though the majority of Americans 'do not function comfortably above a sixth-grade level' (Graber 2004, 558).

Even though the research literature does stress newspapers' superiority, the evidence is not unequivocal. The different media systems in place may help to explain why newspapers are 'superior' in South Korea and the USA (Market Model) but not in other countries which have a public service dominated media. For example, Jenssen 's (2012) analysis of Norwegian election survey panels finds a weak support for the newspaper superiority, narrowly reaching statistical significance (ibid. 29). He notes that a possible reason for this is that in Norway there is no division between 'high-brow' newspapers and 'low-brow' television, as there may be in market model dominated countries (ibid. 32).

Intriguingly, Fraile (2011) finds an inverse relationship in Spain. Her analysis of the European Social Survey (ESS) data on Spain from the years 2004 and 2006 shows that newspapers increased knowledge the most in the least educated group, thus exhibiting a KG narrowing effect (ibid. 177). She suggests that the pluralist ensemble of newspapers relative to the highly concentrated and polarized broadcast media is more trusted by citizens and, therefore, 'increases their interest and predisposition to learn about politics' (ibid. 178).

In sum, the evidence is mixed about newspaper superior effect to increase knowledge. The literature suggests that there are great differences between countries when it comes newspaper consumption. The highly educated are more capable to process complex texts and do consume more newspapers and therefore may be more exposed to more public affairs content. However, evidence from Norway does not support the idea that newspapers are vastly superior in imparting knowledge when compared to other forms of media, and the study on Spain seems to suggest a knowledge levelling effect of newspaper consumption.

5.2. Television as knowledge leveller?

Tichenor et al. (1970) initially hypothesised that there is a possibility that television could play a role in narrowing the gap: 'Since television use tends to be less

correlated with education, there is a possibility that television may be a "knowledge leveller" in some areas' (Cited in Jenssen 2012, 20).

This notion that television content is easier to understand and therefore more effective for those with a lower education level, as suggested by Kleinnijenhuis's (1991) study, has been backed by some empirical evidence. For example, Eveland & Scheufele (2000) find, after analysing cross-sectional data from the American National Election Study (ANES), that within the group which consumed the most television the KG was narrower between education groups compared to light users of television.

Correspondingly, Freedman et al. (2004) studied the effects of televised political advertisements on people's political knowledge during the 2000 US presidential elections. They find, using data on political advertisements in the US with the National election survey data, that those citizens with the least amount of background knowledge (e.g. lower socioeconomic groups) gained the most (Freedman et al. 2004, 734). Though, when a similar research design was applied to Canada the effect of political campaigns was to increase the knowledge gap between socioeconomic groups (Nadeau et al. 2008).

With the lack of a meta-analysis on television's effects on the KG it is difficult to ascertain its general effect. The best designed studies have shown that television does have a positive effect in increasing general knowledge levels and that it does not, at least, exacerbate the knowledge gap between socioeconomic groups (see Jerit et al. 2006; Jenssen 2012). Therefore, television should not be seen as a poor source of information, but as a valuable way to reach different social strata of society.

5.3. Open data and enhanced public governance?

Recently, the UK government has opened up their data to increase transparency in order to achieve three specific 'democratic' aims: accountability, participation, and informing (Cites in Worthy 2013, 7). In the UK data 'ranging from crime statistics to transport data, school locations to government-wide spending data' (Davies 2010, 7) have been placed online free for anyone to use and distribute. A logical extension to this is to combine the use of Open Data with ICTs in order to transition to 'e-

government', the aim of making public agencies communicate seamlessly with businesses and citizens (Bekkers & Homburg 2007, 374)

There is evidence that increasing transparency can have a positive impact on efficiency of public services. Alt & Lassen (2006) found in their analysis of 19 OECD countries that a high level of fiscal transparency is associated with lower levels of deficit spending and public debt, implying more efficient allocation of resources. Similarly, Glennerster & Shin (2008) find after analysing data from 1999-2002,when the IMF introduced new protocols for governments to increase their transparency, that those countries which had provided frequent and more accurate information were able to borrow at lower rates compared to less meticulous countries.

Even beyond immediate economic benefits there has been evidence that transparency has other positive effects on society. Björkman & Svensson (2009) conducted an experiment in Uganda charting the effect of community surveillance on health outcomes. They first devised a 'report card' that showed the performance of the local health facilities against others. Then they organised two-afternoon information sessions in order to disseminate this knowledge to a group consisting of people from different social strata (ibid. 741-743). They found that in the treatment localities health outcomes improved dramatically relative to the control group. They hypothesise that their treatment increased the knowledge of what to expect from health providers in the community, which ensured that the community was in a better position to monitor and pressure health providers to improve their services (ibid. 765-767) Similar results have been noted in Uganda with regards to education, where increased transparency through public access to government data was shown to reduce the amount of the funds being 'captured', leading to higher enrolment rates in primary education (Reinikka & Svensson, 2011).

Moreover, transparency also impacts voting behaviour. Ferraz & Finan (2008) made an intriguing finding with their regression analysis of voting patterns in Brazilian municipalities following the Brazilian government's decision to randomly audit municipality spending of Federal funds. They showed that in the municipalities that received the public audit the incumbent's share of the votes was lower compared to non-audited municipalities, especially when there was more than one case of corruption.

However, there are many problems that pertain to increasing transparency and the attempt to transition to e-government. First, increasing transparency may also come with negative consequences. Bauhr & Grimes (2013) suggest, after analysing data from the World Values Survey for the years 2005-2007, that in countries that have low levels of corruption transparency will actually *lower* citizens' trust in government. They conjecture that it is especially lack of an institutional mechanism of holding officials accountable that decreases civic engagement (ibid. 20).

Furthermore, Performance Data (PD) based on OGD has been used in the UK as a way to improve public service, such as school rankings. The empirical evidence of their efficacy has been scant, and in some cases their use may have had iatrogenic consequences. McGinnes & Elandy (2012) note that there are many problems with collecting and presenting the performance data in the first place. First, they often cannot measure contextual factors that have a major impact on outcomes, such as socio-economic make-up in an area. Second, often the quality of data is poor and is often presented without regard to statistical uncertainty. Third, rankings are based on a composite of variables, meaning they are often very sensitive to changes in the weighting system.

These factors can have major behavioural outcomes, whereby a small error in measurement can have a major influence where, for example a school is ranked and its relative popularity. There is evidence that it is especially middle-class parents who use this data, and they are likely to read the performance data in a way that interprets the top performing schools as 'good' and the bottom as 'bad'(McGinnes & Elandy, 2012). This may lead to increased popularity of certain schools leading to a stratification into middle-class and working-class schools, a process that may even exacerbate the gulf in outcomes between schools as school performance is heavily influenced by socio-economic background (McGinnes & Elandy, 2012).

Second, the aspiration to provide 'one-point of entry' for citizens when they deal with public authorities has not been a seamless process. Bekkers & Homburg (2007: 377) argue that the adoption of new ICTs comes with considerable resistance in the 'back-offices', often being a stumbling block for the cooperation between different authorities. Moreover, they note that the problem is not necessarily 'technical' in

nature (e.g. the use of different software) but something pertaining to 'institutional design': '...actors, their interests, their power bases and resources, their relationships and their strategies, and conflict and compromises' (ibid. 377).

Third, OGD does not necessarily make governance more democratic or empower the disempowered. It has similar limitations as we have previously discussed with the KG, namely that a certain portion of the population is able to use OGD effectively (Gurstein, 2011). Benjamin et al. (2007) found, in their detailed ethnographic study of Bangalore's digitization of land records, that OGD led to the 'capture' of land from poorer citizens to the wealthy. The wealthy were able to use their pre-existing financial and social capital to effectively use the digitized information for their own advantage by hiring lawyers, disputing land titles and errors in documentation, and targeting bribes.

A sinister view is offered by Bates (2012) in her analysis of the forces leading the UK's Open Government Data Initiative. She identifies the roots to the initiative with the neoliberal policies of 1980's whereby the UK's cash-starved public sector turned increasingly to selling Public Service Information (PSI) to third parties. This policy 'backfired' as the government's insistence on outsourcing led public bodies 'buying back' the refined information from these third parties. This was further exacerbated when the government insisted that public bodies provide information at reduced costs in order to spur innovation in the PSI-reuse sector.

Underlying these developments, Bates (2012) argues, is the intense lobbying of the PSI-reuse industry that includes small firms and 'civic hackers' as well as large corporations, such as Google and the Daily Mail. She fears that a public resource like PSI interpretation will be monopolised by companies like Google which has a corporate aim to 'organise the world's information'. Another concern is that PSIs will be used for products that shield individuals and companies from social problems (e.g. climate change), thus increasing social inequities. For example, Lloyds of London is lobbying to improve to its access meteorological data, that is currently too expensive, in order to develop insurance policies for extreme weather events (Bates, 2012).

5.4. Conclusions and Suggestions

In summary, the evidence for a differential effect of newspapers and television on the knowledge gap is mixed. The complexity of the content in newspapers as well as the greater propensity for higher socioeconomic people to read them means that newspapers may in certain countries, such as the USA and South Korea, increase the KG. Though in other countries, such as Spain, it is associated with *decreasing* the KG.

The notion of television as a 'knowledge leveller' is something that intuitively makes sense, especially if its content is deemed as inherently easier to grasp than newspapers. The studies, however, show also mixed results for the notion. In certain countries, such as Norway, it is as informative for lower socioeconomic groups as higher ones implying that while it increases general knowledge levels it does increase the KG.

Increasing transparency has had positive effects in developing countries with high levels of corruption. However, the move to e-democracy has not become the panacea to increase efficiency of public services and responsiveness to the needs of all citizens. Those accessing OGD still tend to be educated white males (Davies 2010, 22) and the raw data needs to be made into a format that is easy to interpret for a wide audience. There are also concerns about the negative externalities about publishing OGD as they may lead to faulty inferences, or that commercialisation of PSI's may lead to new 'gatekeepers' to knowledge.

A way to reduce the KG would be to ensure that newspapers are written in a simpler way as to maximise knowledge transfer. One possible reason why the KG has widened in the US through newspapers is due to their education system's relative inability to provide a high enough base-line literacy capability across socioeconomic groups. Curbing the education-based capability differences would help mitigate the gap.

Lastly, having politically 'neutral' media may increase people's trust in what is reported and therefore their propensity to pay attention to news. This may be especially important with television as it is a medium where socioeconomic differences are less pronounced.

5.4.1. Case Study: Public Health Communication

Much work has been done examining the social determinants of health (see Wilkinson & Pickett 2010; Marmot & Wilkinson 1999; Wilkinson 1996).
This section, however, will provide a quick case study on how health inequalities are being tackled in the realm of public health communication. It will do this elucidating some of the commonalities with public health campaigns and other forms of communications.

A tangible area where health knowledge gap may impact well-being is the ability of different social groups to be informed and access vital information about their health. A common finding in the public health literature is low-literacy groups have the worst health outcomes (Nutbeam 2008, 2072).

Public health communication is a way to narrow the health knowledge gap between socioeconomic groups, using the same mediums as discussed so far. For example, educational soap operas have been used to increase knowledge about family planning in India since the 1980 (Maibach & Holtgrave 1995, 228), a somewhat analogous development with the increased consumption of infotainment in the USA during the 2000's.

Similarly, public health campaigns are increasingly using 'tailored' information utilising databases of information to find out characteristics of their 'target' population. For example, in the 1990's the US-based National Cancer Association used data from the Nutritional Marketing Services for their '5 A Day for Better Health' campaign in order to gain a better profile of their target population of people who eat 2.5 to 3.5 servings of fruit (ibid. 221-222).

However, Guttman & Salmon (2004) highlight several prescient ethical dilemmas that pertain to health communication, if not all forms of public communication. First, 'targeting' certain groups always involves limiting intervention to a group that fulfils specific criteria. Sometimes groups will not be targeted because they are deemed 'hard to reach' (ibid. 535). Furthermore, targeting specific demographics

may lead to a situation where 'certain groups that are not provided with culturally-specific messages may feel excluded or short changed' (ibid. 536).

Second, trying to create effective and informative messages for those with lower-literacy levels may have some negative repercussions. For example, the target group may be embarrassed to be accessing such content and therefore they may 'want to distance themselves' from it (ibid. 537).

Third, effective messages may involve contradicting other public values. In other words, certain campaigns may use offensive or stereotype-reinforcing messages to help them reach their intended target audience (ibid. 540). For example, the Israeli government was criticised for publishing an image-laden pamphlet to help elderly Ethiopian immigrants with diabetes because it contained a scene that was deemed to reinforce patriarchal gender norms (ibid 532).

In summary, the knowledge gap has repercussions in the realm of health outcomes. Similar sophisticated campaigns are being used by public health professional to those working in advertising or political marketing with detailed information about 'target audiences'. Though, these measures are likely to arouse ethical dilemmas, such as reinforcing stereotypes.

6. Conclusions and Suggestions

6.1. Conclusions

In conclusion, the research literature suggests that there are differences between countries when it comes to the media effects. This makes it difficult to make generalized accounts on the efficacy of different mediums that would hold across different countries. Moreover, methodologically trying to discern interaction effects between different variables is difficult at best. Even asking the right survey questions is difficult, trying to devise 'objective' questions that do not 'trigger' guessing, and to differentiate between generalized knowledge and campaign specific knowledge.

The Virtuous Circle hypothesis stresses the importance of the media as the primary source where citizens get information. The sheer explosion in the amount of media outlets, especially with the maturation of Internet and concomitant ICTs, means that has greatly increased the possibility for those who are most motivated to increase their knowledge. The literature has specified *how* and under *what* conditions the media is likely to lead to a narrowed gap as well as how it is being used to reach otherwise marginalised groups, hence potentially improving the health of democratic society.

The Media Malaise hypothesis emphasises the negative effects of exposure of modern media. The studies showing that television is particularly corrosive for knowledge gains and democratic participation remain unconvincing. However, the effect of greater media choice (Prior, Sunstein) does suggest our current media environment feeds our innate cognitive biases. For example, selective exposure to either entertainment or conducive political views means that a large portion of the population is getting more ignorant while others are under the grip of misperceptions that complement their political world-view. What is particularly interesting is how even providing 'corrective information' can itself reinforce misperceptions in the most partisan portion of the population. This implies that it may be very difficult to counter evidently wrong information via public broadcasts, for example.

The Differential Effect literature does not provide conclusive evidence for 'differential effects' for neither newspapers nor television for either being culprits for increasing or decreasing the knowledge gap. They do suggest, however, that television may be the medium through which knowledge may be increased equally in all socioeconomic groups, provided that they are exposed to the same content.

The attempt to make government more transparent by releasing public documents for public scrutiny has beneficial effects in countries that have high level of corruption. The attempts to effectively use 'Open Data' (OGD and PSI) depend, of course, on the quality of the data and what it is being used for. In some cases the unintended effects of OGD may even increase social inequalities through inadvertently empowering the powerful.

One issue that has emerged during this survey is that the type of media model has an effect on a country's general knowledge level. Countries with a public service dominated media have generally more knowledgeable publics and the gap between groups is narrower when compared to countries with market or mixed models. Interestingly, the evidence presented in this survey also suggests that public service dominated countries also have less of a division between print and broadcast media.

Lastly, there is also the issue of the researcher's underlying assumptions of *what* 'well-informed' citizens should know (see Graber 2004). For example, deliberative models of democracy require that citizens have the requisite knowledge to actively 'deliberate' about important social issues. Extensive evidence shows that people often fall short of such requirements. It may be the case that modern states and societies are too complicated for people to acquire detailed knowledge about all important policy-decisions (Somin 2010, 260).

6.2. Tangible suggestions for future surveys

1. To what extent the Internet has displaced traditional media outlets for people's source of news.
2. To what extent have online communities challenged the social standing of traditional sources of authority (e.g. science and health establishment)?
3. Where do immigrant populations get their source of information in our information environment?
4. How should the semi-anarchic nature of the Internet be regulated? What are plausible ways to do this?

5. To what extent can education help to curb the knowledge gap?
6. What are the ethical implications for targeting disadvantaged groups to increase their knowledge?
7. Is curbing the knowledge gap desirable?
8. How has 'open data' helped to either increase or decrease the knowledge gap?
9. How has the change in the information environment impacted on people's health knowledge?
10. Is there an 'analogic divide'?
11. Are there differences between formal and informal learning on the Knowledge Gap?

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