WHAT IS THE "DIGITAL DIVIDE" AND WHY IS IT IMPORTANT?

COLIN SPARKS

Abstract

This article begins with a consideration of the different meanings that have been given to the digital divide, and to the normative concerns that researchers have brought to its investigation. It then examines three major traditions of research into the subject: that which stresses issues of physical access; that which adds to the discussion of technical availability a stress upon some of the cultural competences and skills necessary to utilise the technologies fully; and a third which examines situations in which technical availability is almost universal but in which social and cultural factors play a determinant role in the kinds of usage adopted. Building upon the existing state of knowledge, the article goes on to consider its implications both for future research and for the kinds of policies which might be adopted to address the problems of social inclusion today and in the future.

Colin Sparks is Professor of Media Studies in the Department of Journalism, Hong Kong Baptist University; e-mail: sparksc@hkbu.edu.hk.

Introduction

The term 'digital divide' is used to cover a broad range of social differences in access to and use of digital equipment and services, most notably personal computers, and the ability to access the internet in terms of both physical connection and facility of use. The investigation of this phenomenon has a technical aspect concerned with measuring the degree to which particular technologies and practices have been taken up in any society, but it also raises some quite general issues of both theory and policy. This issue is a relatively 'new' phenomenon, which has emerged in parallel with the immense increase in the scale and importance of the internet itself during the last two decades. It should, therefore, be a leading indicator of the emergent society, however we may choose to categorise its defining characteristics. If we are indeed entering a world marked by a breakdown of the old social determinants which characterised industrial capitalism, as claimed by many social theorists, then this new liquidity should be most evident in the field of internet use and access. Similarly, if the governmental terrain has moved beyond the constraints imposed by such obsolete categories, then we would expect to find the greatest degrees of success with policies designed to accelerate these emerging social trends. The study of the digital divide, then, certainly *is* a matter of relatively narrow problems of definition and measurement, but the findings of such studies have significant implications for the validity of the general propositions advanced by social theorists and the efficacy of the strategies adopted by politicians and officials.

There are several ways in which the digital divide can be conceptualised, and different approaches lead researchers to emphasise different aspects of the problem (Yu 2011). Different conceptualisations in turn lead to differences in analysis and measurement and despite intense debate no clear and agreed solution is in sight (Vehovar et al. 2006). Rather than identify with one or other conceptualisation it is better to begin from a non-prescriptive working description such as the one provided by the Organisation for Economic Co-operation and Development (OECD): "the term 'digital divide' refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the internet for a wide variety of activities" (OECD 2001). This is sufficiently broad a definition as to allow a fruitful engagement with many, if not all, of the contributions to what remains a lively field of enquiry and debate.

The range of activities that are discussed in terms of the digital divide is very large, including as it does factors that affect the individual citizen, economic entities, and the institutions of government. Furthermore, the term as used by the OECD in the above quotation represents an attempt to measure the distribution of internet resources, both in terms of physical access and facility of use, within societies, but it has also been used to measure differences between states. Aggregating together a range of factors, it is possible to construct measures of the extent to which any particular state has progressed along a road in which information and communication technologies are embedded in the daily life of its citizens. One such attempt, sponsored by the World Economic Forum, produces a "Networked Readiness Index" (NRI) which ranks countries on a wide range of activities including policy and regulation, take up of technologies, impact of technologies and so on. The most

recent version of this index, produced in 2013, reveals that there remains a very substantial divide between groups of nations. On the one side, there is a small group of advanced economies, headed by the Nordic countries, which have high scores in the NRI, and on the other is the rest of the world: "The contrast between advanced economies … and the rest of the world is stark and betrays the inability or limited capacity of a vast majority of countries to fully reap the benefits of ICTs" (Bilbao-Osorio et al. 2013, 17–18).

This paper will concentrate upon more modest goals and will mostly be concerned with the situation in advanced economies, and only with one aspect of access even in those cases. While access to, and use of, new information and communication technologies (ICTs) in the workplace is clearly central to understanding the experience of labour in the 21st century, and the policy issues involved in putting greater physical bandwidth in place are a major pre-occupation of both the telecommunications industry and government, we will here confine ourselves to the narrower issues of familial and individual access and usage. This is a well-established, perhaps the best established, tradition of research into the nature of digital divides and it has so far yielded more rigorous results than attempts to address broader issues. The methodologies of some of the attempts to rank countries along an informational axis remain somewhat underdeveloped and the quality of the data used is frequently unproven. With regard to individual usage, and the availability of home access, there is much more, and much more robust, material available. Equally importantly, access in the home and individual usage are the point at which the usage of ICTs intersects with the consumption of the legacy media (print, broadcasting, cinema, recorded music, etc.). It is in the familial and individual determination of cost and time budgets that choices between new and legacy media, and choices within new media, must be made.

Even within this constrained perspective, however, the range of issues involved is still enormous. The individual user of ICTs has a role as a citizen, as a consumer, as someone who must live and work in what is variously termed the "network society," the "knowledge society" or the "information society." Whatever terms one employs, this reality is central to discussions of our common future, and competitive advantage in these terms is seen as dependent upon the universal, or at least very widespread, access to, and facility in the use of, the internet. Socially, increasing international mobility, the provision of leisure and entertainment services, changing patterns of education, and coping with the impact of ageing are all seen as examples of how these technologies are increasingly woven into the fabric of daily life. In terms of governance, the twin interests of equity and efficiency imply that more and more services are provided in electronic format, and that access is available to all citizens. From the individual point of view, ICT skills are increasingly a requirement for many types of employment and a necessary part of social life, for example in the formation and maintenance of patterns of friendship (European Commission 2010, 3).

From this perspective, the continued existence of a digital divide, however defined, is an obstacle to any agenda of social inclusion. If societies are today partly, and will in the future be more or less completely, structured around the internet, then the demands of economic efficiency as well as social and political equity require that no social group finds itself excluded from participation. Research in this area

has therefore often had a normative bias towards the benefits of digital inclusion and strong links with policy formation.

This article begins with a consideration of the different meanings that have been given to the digital divide, and to the normative concerns that researchers have brought to its investigation. It then examines three major traditions of research into the subject: that which stresses issues of physical access; that which adds to the discussion of technical availability a stress upon some of the cultural competences and skills necessary to utilise the technologies fully; and a third which examines situations in which technical availability is almost universal but in which social and cultural factors play a determinant role in the kinds of usage adopted. Building upon the existing state of knowledge, the article goes on to consider its implications both for future research and for the kinds of policies which might be adopted to address the problems of social inclusion today and in the future.

Divide, Divides, Spectrum, Continuum?

The concept of the 'digital divide' is widely used by politicians, policy makers, the press and public, and even some scholars, but its appropriateness has been subject to searching criticisms for almost as long as it has been current. The term has a history which now spans almost two decades, apparently having been coined in the USA in the 1990s as part of the early discussions over the diffusion of the internet (van Dijk 2006). When it first entered official discourse, it was primarily concerned with physical access to computing and telecommunications services and this remains a central theme in contemporary discussions of the issue. Rather rapidly, however, it was realised that the issues at stake could not be discussed with reference to a single dimension. The OECD Secretariat, for example, argued in 2000 that: "there is no single, clearly defined divide, but rather a series of gaps, brought about by a variety of factors, which often come together, many of which do not have their roots in technology" (OECD Secretariat 2000, 51). Over time, concern has broadened to include less tangible factors that affect the technical skills needed to participate in the online world and the nature, type and quality of the usage made of the resources provided by these technologies. As Selwyn put it: "there needs to be a political recognition that the crucial issues of the digital divide are not just technological – they are social, economic, cultural and political" (Selwyn 2004, 357). As attention has shifted from access to a particular technology towards issues of skills and usage, some of the limitations of the concept of a digital divide have become apparent (Tsatsou 2011, 321–22). Access implies a polarity of connection/non-connection, but issues of skills and usage are better understood using a graduated scale of engagement. At the very least, the concept of a binary 'digital divide' needs supplementing with what is often variously termed a 'digital spectrum' or 'digital continuum' (Guerrieri, Bentivegna & Meliciana 2010, 14–16; Livingstone & Helsper 2007).

Whatever term one chooses, and this paper has retained the familiar 'digital divide' for reasons of simplicity and convenience, one is obliged to recognise that the discussion necessarily involves a number of factors, none of which can easily be reduced to a simple 'on/off' dimension. As we shall show in some detail, there do still remain substantial numbers of people, even in places like the USA, who remain without connection to the internet in any of its forms, and one may certainly consider

them as lying on one side of a single, technologically driven, divide. For the majority of the population, however, access can mean a number of things, involving both the nature of the connections available (super-fast landlines carried by cable connections of various kinds, broadband landlines over copper wires, dial-up landlines over copper wires, mobile access carried by wireless technologies of various generations, and so on). The same is true, to an even greater extent, with the less tangible issues of the skills possessed by individuals within the population and the kinds of usage with which they feel comfortable and which they use on a regular basis.

It still makes sense, however, to speak of a 'divide,' or at the very least of 'divides,' because the evidence reviewed below seems to suggest rather strongly that positions on these various scales tend to cluster, and further to be closely related to endogenous social factors of a familiar kind. To anticipate our subsequent argument, demographic factors appear strongly to influence physical access, the possession of skills, and the kinds of usage to which these technologies are put. At the individual level, it makes good sense to see a continuum of access, skills and usage, but from a sociological point of view the picture that emerges is better understood as one in which there are marked divisions between different social groups with respect to all of the aspects of under consideration.

The Need for Normative Transparency

For a variety reasons, the majority of studies, particularly those which are closely articulated with policy formulation, take a strongly normative stance towards digital inclusion. Social groups that currently do not have high participation rates are seen as problematic and, in the words of the British government, will be "targeted" as part of programme of "driving digital participation" (Department for Business, Innovation and Skills 2010). The digital divide is conceptualised as a social problem that needs to be eradicated or at least minimised through the adoption of a range of policy initiatives. So, for example, the Consumer Panel appointed by the UK Office of Communications (Ofcom) commissioned a study for which: "the overarching objective of the research was to provide insight into the journeys individuals take towards digital participation, including what facilitates that journey and the barriers that they encounter" (Essential 2010). There are many more or less celebratory reports of projects aimed at showing how those barriers might be overcome on the road to achieving the goal of universal participation (Broadbent & Papdopoulos 2013; Newholm et al. 2008).

Such coercive rhetoric may be appropriate in policy proposals but an unreflective normative approach is an obstacle to a properly social scientific research agenda. However much we, as individuals, may share this belief that access to the internet, and the ability to use it with facility, is valuable both in itself and as an aid in one's life course, we must recognise that this is not a statement of fact about what *is* but an opinion, albeit a majority opinion, of what *should be*. The respondent who ticks the box in the questionnaire that states "I have no use for the internet" is not necessarily someone who is ignorant of the advantages that it might bring them and who stands in need of remedial education designed to alter their estimation of its benefits. Neither are the users who spends their time on a massively multiplayer online role-playing game (an MMPORG) necessarily wastrels who are in need of a short sharp shock that will push them into fruitful self-improvement.

The motivations and pleasures of social groups who choose not to have physical access to the internet, and those who do have access but decide to use it for entertainment rather than self-improvement, can only properly be understood if they are studied as authentic human cultures rather than simply as problems to be targeted for correction. The enthusiastic embrace of computers and the internet are readily accepted as understandable activities that bring both practical and emotional rewards, and a similar recognition should be extended to their rejection. The latter attitude is as much rooted in a complex of values and practices as the former. As one respondent told an investigator, who was concerned to understand rejection, the reason for not using a computer was: "A computer? Why don't I use one? Well, it's not much when it comes to shovelling snow and it's just in the way when carrying firewood" (Hakkarainen 2012, 1206). Particularly for those researchers and policy makers who are committed to finding ways to extend digital inclusion as far as is possible, an accurate and sensitive understanding of the meanings that rejection of the internet has for those citizens who exclude themselves from it is an essential starting point. It is only on the basis of such an understanding that it will be possible to formulate effective policies to achieve the goals of inclusion.

More critical approaches also tend to rely upon a strong normative framework. Many writers, following Bentham and Foucault, have argued that the widespread adoption of the internet leads to the perfection of a 'digital panopticon' in which every action is subject to computerised surveillance and analysis. It is argued that government and business gain unprecedented knowledge of citizens and customers, and are thus able to exercise more effective political and marketing control (Campbell & Carlson 2002; Marwick 2012; Taekke 2011; Andrejevic 2011). In its extreme form, it is argued, we are all implicated in this process through our acceptance of, and participation in, such technologies: "the ultimate public panopticon can be achieved by convincing the population to spy on itself" (Kietzmann & Angell 2010, 137).

Again, there is an alternative normative approach which argues that the vast accumulation of information about individuals and their social behaviour, aggregated into 'big data,' permits a much fuller and more accurate understanding of social life and thus the development of policies better suited to achieving desirable goals. This field has so far been most explored by natural and medical scientists, but it is also the case that big data: "seems to be promising a golden future, especially to commercial researchers" (Mahrt & Scharkow 2013, 25). Whether the compulsive collection of data by Google or other commercial operators constitutes a treasure trove which will allow corporations to service their customers more efficiently or transforms audiences into marketable commodities remains a contentious issue (van Dijk 2009). Similarly, whether governmental collection of data on everything from medical records to social media use constitutes an advance towards more individualised health and social services or an instrument for social control continues to provoke controversy (Werbin 2011). These differences of approach, in the end, boil down to a normative argument over the relative merits of, and the ways to achieve a balance between, liberty and efficiency, upon which there can, quite legitimately, be major differences of opinion.

This, of course, is nothing new. All researchers bring normative frameworks to their investigations: from Karl Marx and Max Weber to Jürgen Habermas, Anthony Giddens and Manuel Castells, prominent social scientist have worn their ideological

hearts on their sleeves. Indeed, it might well be argued that such commitments are precisely what make some of these authors enduring milestones in the field when they have been in their graves for a century or more. These normative frameworks need not cause problems provided they are acknowledged, so that the extent of their influence on the reported research can be assessed by the reader. What is problematic is when the overall research agenda into a complex human phenomenon is subordinated to one single un-theorised normative framework that is, in turn, closely linked to policy. No matter how worthwhile the drive for digital inclusion might seem to an investigator, and the current author holds to that view as part of a more general commitment to human equality, to conduct research into the digital divide on the premise, usually unspoken, that those who resist the latest policy in some way need to have their behaviour and attitudes corrected is surely mistaken.

Patterns of Physical Access

From the earliest studies of access to the necessary technological apparatus, it was apparent that the digital divide mapped very closely on to some of the standard sociological variables. One of the earliest studies, *Falling Through the Net*, published in July 1995 by the US National Telecommunications and Infrastructure Authority (NTIA), showed that among the rural poor only around 1 per cent had access to the technology then needed to go online (i.e. a telephone connection, computer and modem), while for well-off urban households the figure was around 30 per cent. Such results were repeated in country after country: income, age, gender, education, location and so on were all powerful predictors of access to the physical infrastructure necessary for internet use. A study by UK National Statistics, published in December 2000, for example, demonstrated that while 7 per cent of the lowest income decile group had home internet access, 62 per cent of the highest decile group had the facility. As Norris put it: "the heart of the of the problem of the social divide in Internet access lies in the broader patterns of socioeconomic stratification that influence the broader distribution of household consumer durables and participation in other common forms of information and communication technologies, as well as in the digital world" (Norris 2001, 234). Early studies of the international distribution of internet connectivity demonstrated an equally unsurprising pattern of inequality. In general, internet connectivity closely correlated with per capita gross domestic product: more developed countries tended to have higher access than developing countries (Hargittai 1999).

For many commentators, these findings were to be expected, since studies of the diffusion of new technologies very often show a propensity for early adopters to come from relatively wealthy and educated groups. From this theoretical perspective, it was only a matter of time before the spread of the technology to poorer and less well-educated groups more or less evened out these crude sociological inequalities. The diffusion of the internet, it was thought, would be very like that of television: a new and expensive technology was adopted first by the wealthy but later, as the cost fell, it became close to universally available, with only very few households remaining without the means to receive a signal. The main difference, it was argued, was that the rate of diffusion of the internet was much higher than for earlier technologies and therefore more or less universal access would be achieved relatively quickly.

To some extent, these predictions have been borne out, at least in the developed world. A range of studies has shown that, over time, the internet does indeed become a much more pervasive feature of social life and that the stark gaps that were observed in the earliest period are eroded. As early as 2002, Katz and Rice argued that: "concerning access, on all the dimensions considered here – gender, age, household income, education, and race and ethnicity – the digital divide is shrinking" (Katz & Rice 2002, 65). This trend has continued: the most recent NTIA report, from February 2010, for example, demonstrated that while 29.2 per cent the poorest group reported (with family incomes of less than $US15,000) were using the internet in the home, amongst those in the richest group reported (with family incomes of more than $US150,000) usage was 88.7 per cent. This is still a substantial difference, but it is much lower than that recorded in the first report back in 1995. Similarly, Figure 1, illustrating the most recent data from Europe, shows that, at least within the developed world, national differences in access remain, but are reducing over time. On this account, the digital divide is closing and may one day effectively disappear, in the same way as difference in access to broadcast television effectively disappeared in the past.

Figure 1: Percentage Household Internet Penetration in Europe 2007 and 2012
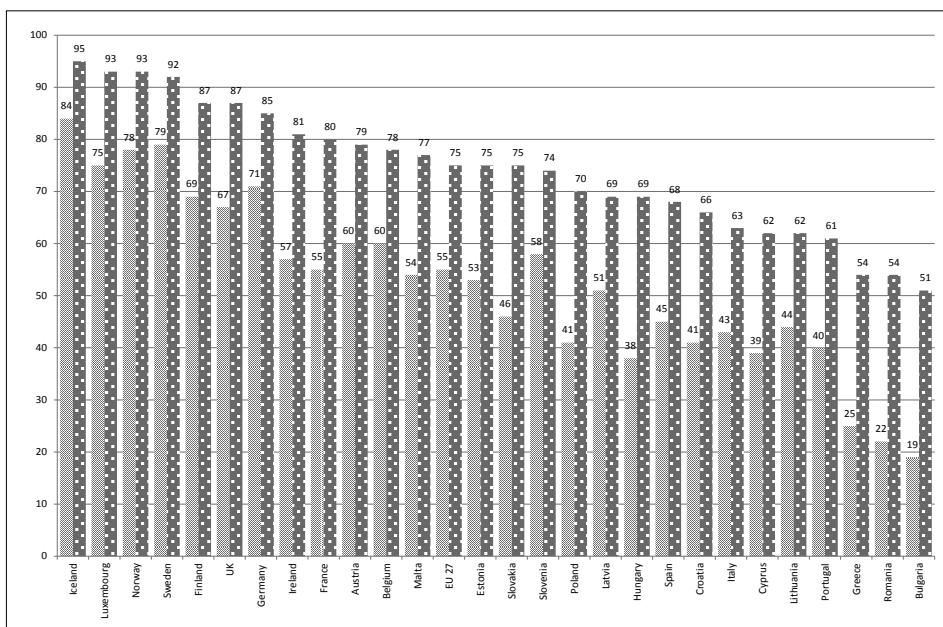
Source: Eurostat http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_ci_in_h&lang=en

The process is more protracted outside of the developed world, but even in the developing world wireless telephony means that it is possible to foresee a future in which simple physical access to the relevant technologies will be, if not universal, at least very much more widely diffused. In many European countries, the ownership of a (fixed) telephone connection was still in the 1980s a socially and economically divisive factor. Today, the situation has dramatically changed: the number of mobile telephones in Europe exceeds the number of people. In 2011,

there were 120 cellular mobile subscriptions per 100 people in Europe. Even in Africa, where access to fixed line telephony has been severely restricted, the spread of mobile connections has been phenomenal: in 2011, while only 1.4 per cent of the African population had access to fixed-line telephone, 53.6 per cent had a mobile connection and this is projected to reach 63.5 per cent in 2013. As a consequence, wired broadband subscriptions stood at 0.2 per cent of the population in 2011 but a total of 12.4 per cent of Africans were using the internet in the same year, with an anticipated rise to 16.3 per cent in 2013 (ITU 2013a). This is still low compared to the 69 per cent of Europeans and very low indeed compared to the 94 per cent of Norwegians using the internet, but it nevertheless offers the promise of much higher levels of connectivity and usage in the foreseeable future (ITU 2013b).

Considered in more detail, however, there is one very important reservation to such a view: even in countries where the technical means of internet access are widely available, and where policy initiatives designed to ensure universal take-up have long been in place, there remains a substantial proportion of the population that are unconnected. A recent NTIA publication, *Exploring the Digital Nation: Computer and Internet Use at Home* investigated this issue in some detail. In the USA, more than 20 per cent of the population remain without internet access, and "the results indicate that households with lower incomes and less education, as well as Blacks, Hispanics, people with disabilities, and rural residents were less likely to have home Internet access service" (NTIA 2011, 11). This finding confirms more than a decade of previous research about the demographic factors that influence access, but further analysis demonstrated that these factors did not explain all of the differences between social groups. At the survey date, March 2010, 29 per cent of US households did not have internet access at home. When asked the reason for this, by far the largest group (47 per cent) stated that their reason was that they did not need it or were not interested in it (NTIA 2011, 35). In other words, nearly 14 per cent of US households have made a more or less conscious decision not to connect to the internet.

Factors in Digital Inclusion

These findings suggest that the availability of technology is not adequate to explain even physical access to the internet and that the digital divide can only be fully understood as a complex and multi-dimensional phenomenon that involves a strong sociological dimension. It has long been recognised that, unlike television, the internet enables an enormous range of different activities and the uses to which it is put are multiple (Mossberger, Tolbert & Stansbury 2003; Sparks 2001; Jung, Qui & Kim 2001). There can, therefore, be substantial differences in the way that digital technologies are used even when physical access is very widespread if not universal.

The second main line of approach to the digital divide begins from the recognition of this complexity and examines the divergences present in the social capital available to actual and potential users which would allow them to enjoy 'meaningful' internet usage (Gangadharani & Byrum 2012). Following this line of thinking, Guerrieri and his collaborators developed a "European index of digital inclusion" (EIDI) which combined measures of the availability of broadband infrastructure, of facility in usage and of impact, understood as the range of uses to which the internet is put. The evolution of the components of this index demonstrated that, as time

passes, patterns of internet usage are less and less a matter of physical access and much more a matter of the range of skills and social resources available to users (Guerrieri, Bentivegna & Meliciana 2010, 115).

The EIDI study of the countries of the European Union arrived at striking conclusions. At the national level, differences both in the components of the index and of the index itself, are significant and enduring over time, although there is a general 'improvement' in the levels overall. A similar set of findings applies to the distribution of the index with regard to those groups (e.g. the elderly, women, rural dwellers, etc.) who have long been known to be less likely to have even simple physical access. For these groups, too, although the overall levels are rising, there remain significant differences in their performance against the overall index. The authors go on to analyse the reasons for these enduring phenomena and argue that the main reasons for the differences in what they call 'e-inclusion' are to do with the level of economic development and social inequality. From this perspective, the aim of digital inclusion can only be realised if governmental policy is directed towards developing "a social system that promotes the economic development and social welfare of its citizens by reducing inequality in all its various aspects" (Guerrieri, Bentivegna & Meliciana 2010, 139).

Internet Usage and Social Reproduction

A third approach shares a great deal with the second, but accords even greater importance to social inequality and shifts attention further away from physical access. Even with populations in which all or most individuals both have access to the internet and the skills to use it, there nevertheless remain significant differences in what they use it for, and: "insofar as Internet use can enhance people's life chances, it is the types of activities for which people use the medium that will be most important in examining potential divides" (Hargittai & Hinnant 2008, 617–18). In this account, best exemplified in the work of van Dijk and van Dursen, the focus of enquiry shifts from seeing inequalities of access and usage as *resulting from* social inequality towards one in they are seen as *contributing to* such inequalities.

Basing their work on the situation in the Netherlands, which has a very high level of internet penetration, and where issues of physical access are of relatively limited importance, they investigated a much wider range of the skills that may be, in this context, taken to constitute digital competence. In particular, they distinguished between what they term "operational and formal internet skills" of the kind investigated by Guerrieri and his colleagues, which allow people simply to use the internet with a greater or lesser degree of facility, and what they call "information and strategic internet skills" (van Deursen & van Dijk 2010, 908). These latter, they argue, permit particular kinds of usage, and a high level of such skills permits usage for news, information and personal development. They argue that there are distinct patterns of usage emerging that map, once again, on to familiar social indicators. These patterns demonstrate that there is emerging a "structural usage gap." This gap is between different social groups, some of whom habitually "take advantage of the serious Internet activities they engage in, while others only use the Internet for everyday life and entertaining activities" (van Dijk & van Deursen 2012). The conclusion which they draw from these findings is that the digital divide not only reflects social inequalities but that it is increasingly coming to be an element in their

reproduction. To borrow the framework developed by Pierre Bourdieu, "serious" online activities are ones that increase the social and cultural capital of the user and which, as with other forms of cultural capital, can be brokered into an increase in material capital. Other authors have reached similar conclusions: as one study of internet news put it: "it is probably more essential to think of the digital divide not as a new problem peculiar to the online world, but, rather, as an old problem that might be worsened by the Internet" (Nguyen 2012, 260). On this account, very far from fading away, the digital divide will persist and may well deepen.

The Digital Divide Today

The extensive research that has been conducted at least since the 1990s seems to confirm the continuing reality of the digital divide. White and Selwyn (2013, 18), in their recent longitudinal study of the UK, conclude that: "while levels of Internet access and use among the UK adult population have increased steadily over the decade, engagement with key Internet activities is structured by individuals' social, occupational and educational backgrounds." This study found that occupational class and educational background were the most important variables in explaining both access to and use of the internet. In the UK case, at least, the evidence appears to demonstrate that some other fundamental variables, notably sex and ethnic background, are of relatively limited, and perhaps diminishing, importance in explaining access and most kinds of usage. These findings require further elaboration, since these variables, and particularly the latter, have been seen as particularly important in studies of the US evidence (Hacker & Steiner 2002; Jenkins 2002). Rather than conceiving of any social indicator as a fixed and measurable quantity, it is better to think in relative terms: different social structures place different stresses upon the same categories and they generate greater or lesser advantages or disadvantages according to their place in each structure.

It is important not to overstate this finding, however, since there are some forms of digital exclusion which operate irrespective of such determinants. The best-researched of these is that related to disability, in which studies show that, even controlling for factors like income and education, a significant divide can certainly be detected between the general population and disabled groups (Dobransky & Hargittai 2006). According to one study, not only are disabled people in general poorer than the population as a whole but "even among individuals with the same income level, many people with disabilities are still less likely to use the Internet because they have to incur the extra costs of the adaptive technology for accessing the Internet" (Vicente & Lopez 2010, 59). In this case, the overall patterns of inclusion and exclusion which are familiar from studies of earlier societies are supplemented by significant additional exclusions that can be traced to the social stigmata that have long been associated with disability. Overall, it seems to be the case that what Sassi called the "strong hypothesis" which suggests that "the emergence of the information society will create new social cleavages and strengthen old ones" has been strongly supported by the available empirical evidence (Sassi 2005, 686).

Most recently, the range of developments known as Web 2.0 have greatly expanded and supplemented the communication and display functions that characterised the earlier days of the internet as a mass phenomenon. In particular, important elements of this new functionality, embedded notably in Facebook and

YouTube, have allowed individual web users not only to consume the content of the text but also to produce it, giving rise to the phenomenon often referred to by the ugly terms 'prosumer' and 'produser' (Bird 2011; J. van Dijk 2009; Ritzer, Dean & Jurgenson 2012). The number of studies on this phenomenon from the point of view of the digital divide is so far rather small, but nevertheless the findings that are available paint what is by now a familiar picture (Hargittai & Walejko 2008). Among the most enthusiastic participants in this new culture are members of what has been called the "new global middle class," who use its potential to enhance their position in the managerial market place (Polson 2011). In terms of the promise of the technology for revitalising political democracy, which is one of the most enticing promises held out by the internet, what evidence there is points to the continuing, indeed increased, domination of political discourse by elite groups: "as creative content applications and uses have grown, the poor and working class have not been able to use these production applications at the same rate as other uses or users, creating a growing production divide based on these elite creative functions" (Schradie 2011, 165). There is also evidence that the pattern of different kinds of usage reflecting different social determinants is also present in the creation of content, with political content being significantly related to income and education while social and entertainment content is less likely to be produced by those with higher incomes (Blank 2013). The propensity for the poor to be less attentive than the rich to official politics, as expressed for instance in voting patterns, appears to be translating itself into the online world.

The overall conclusion that must be drawn from any survey of the available evidence is that the digital divide remains a reality even in the most developed online economies. It is neither an artefact of the pattern of diffusion, nor of the relative scarcity of technical resources. Rather, it is a function of deep-seated and enduring social inequalities and, the evidence strongly suggests, has come to act as a significant factor in the reproduction of these same inequalities.

Implications for Research and Policy

These findings make uncomfortable reading for those social theorists who have proclaimed digital technology in general, and the internet in particular, as tools that will transform societies. The diffusion and use of the internet does indeed have a technological dimension, but the most powerful factors in determining its take up and usage are the same ones that explain the access to, and affordances of, all sorts of other devices and practices. Indeed, they also suggest that social relations remain much more stable and obdurate than theories that stress the 'liquidity' of contemporary society might suggest. Very far from rendering concerns about the relatively limited degree of intergenerational social mobility that characterises societies like the USA and UK, and which depends so heavily on inequalities in parental economic and educational capital, an irrelevance, the probability is that patterns of internet diffusion and usage will serve to prolong and perhaps intensify them (Blanden, Bregg & Machin 2005; Causa & Johansson 2009).

They also make uncomfortable reading for policy makers who have tried a range of different strategies to overcome the various aspects of the digital divide. In Europe and the USA, the initial impetus for policy came from what Selwyn calls the 'centre-Left' governments that held office in a number of the key states (Selwyn

2004, 343). For these politicians, it was a matter both of social justice and economic efficiency that the whole of society had the opportunity to participate equally in the new world that the internet had opened up and they made modest efforts to improve access for all. The new century saw a change in the political colour of the government in several countries. Whether as a result of these changes or as a consequence of the limitations of the policies adopted in the preceding years, the general direction of policy in both the USA and the EU became one of relying more and more on the workings of the market to overcome these inequalities (Stewart, Gil-Egui & Tian 2006). From the evidence cited here, it appears that all of these policies, whether promulgated by the centre-left or right, have failed to make any fundamental difference to the overall picture of digital inequality.

This perhaps should not be surprising since, if economic and social inequalities are among the key determinants of the digital divide in all of its manifestations, internationally these have certainly not been significantly reduced, and in some important cases have increased, during the same period as the internet was undergoing development and diffusion. The average Gini coefficient of the original 15 members of the European Union was estimated at .31 in 1995 and recorded as .308 in 2011 (Eurostat 2013a). It was, perhaps, naïve to think that the digital realm would display a different logic to all other areas of social life. If the root cause of the digital divide is inequality then, obviously, any serious policy designed to reduce that divide must address the elimination, or at least the substantive amelioration, of economic and social inequalities as central priorities.

Such an outcome is, at the time of writing, highly improbable given the enduring domination of what is termed 'neo-liberalism' over public life in the developed world. It is hard to imagine the government of any major country embarking upon the kind of radical programme of economic democracy and social equality that would address the central issues at stake in the digital divide, short of quite drastic changes in the social and political order. As an inevitable consequence, the digital divide will remain a central reality of the coming society, however much its leaders proclaim it to be driven by information, knowledge, or networks.

Despite this rather bleak overall outlook, there remain some serious opportunities both for researchers and concerned policy makers: eliminating the digital divide in its totality might not appear feasible at the moment, but it may be possible to ameliorate some of its more egregious manifestations without the need for fundamental social change. An example to hand is the relative disadvantages experienced by disabled people, which were discussed briefly above. A great deal of this disadvantage has been traced to the cost involved in purchasing the additional equipment necessary to make the standards of access and usability acceptable for members of this group (Macdonald & Clayton 2012). While these authors are pessimistic that the current British government can be persuaded to implement such a policy, since it would inevitably involve extra money being directed towards disabled people, there is nevertheless scope for detailed research into the ways in which the standard equipment would need to be modified and supplemented in order to ensure that different groups of people could enjoy the same access as others.

A similar case can be made for education in digital competence. The overall evidence on the determinants of the digital divide suggest that while, over the life-span, differential education helps to produce and reproduce the digital divide, formal education might provide an arena in which at least some of these divisions

could be addressed and perhaps ameliorated. At least some basic aspects of ICT use are shared across social differences amongst young people during their educational years (Tondeur et al. 2010). There are, however, observable differences in the ways in which this usage contributes to educational achievement, and the patterns of digital accomplishment tend to reproduce other forms of cultural capital (Angus, Snyder & Sutherland-Smith 2004; McDougal & Sanders 2012; Paino & Renzulli 2012). There is evidence that, whilst many educationalists are aware of this problem, at present educational institutions do not have in place policies that can assist their students to overcome prior disadvantages in the kinds of skills that are needed to address the divide in terms of on-going use of the available technology (Goode 2010, Neuman & Celano 2013).

These findings confirm the more general result that while some of the issues involved have been partially addressed by the diffusion of the basic technologies involved, and are particularly attenuated in an environment like education which attempts to provide as much of a level playing field as possible, there remain strong elements in the institutional culture that tend to reproduce and reinforce the existing unequal distribution of skills and competences. Finding ways of remedying such deficiencies in schools and universities requires further research to determine which policies might prove effective, but does not necessarily imply the kind of substantial investment that would be unlikely in the present circumstances, since the problems could be at least partially addressed by changes in pedagogical practice.

The availability of current technologies has often also been a matter of public concern and thus of public policy: the insistence upon universal services in telecommunications is an obvious example. The pace and direction of technological innovation is unpredictable, but it will certainly impact upon availability and usage. Two current examples are the deployment of technologies of control like IP6 and the shift to wireless access to the internet through mobile phones. The former has provoked debates over the continuation of "net neutrality," in which all messages are treated equally, versus the implementation of systems whereby additional payments ensure priority treatment (Noam 2011; Yoo 2010; Bendrath & Mueller 2011). Mobile access has re-kindled debates over, for example, pricing policies that have a direct and obvious impact upon internet usage: unlimited access encourages a wide range of usage; metered access tends to limit it. More generally, it is argued that the implementation of mobile connectivity poses a very broad challenge to the current modes of internet governance (Goggin, Dwyer & Martin 2013, forthcoming). Both these and future developments in technological hardware and the kinds of services available raise questions whose impact upon the digital divide in terms both of access and usage requires investigation.

There are, in other words, many ways in which policy makers, and those researchers who are closely linked to such activities, can hope to develop their understanding of the factors that impede access to, and usage of, the internet in different situations that do not demand a wholesale assault upon the structural inequities of contemporary society.

The Future of the Digital Divide

Since current political realities, at least in the advanced world, seem to preclude the kinds of substantial and transformative interventions that might address the

root causes of the digital divide, and that therefore it will remain a reality, and perhaps a deepening reality, for the foreseeable future, it remains as urgent a task to track its development. There is a range of reasons why such research, although it is unlikely to identify startling changes in the fundamental features of the digital divide, stands a good chance of producing fresh and provocative results.

The first of these is that technological innovation will certainly continue and therefore the nature of the digital divide will be subject to modification. Simply because there is a mountain of evidence that technological change in itself does not transform access and utility, it does not necessarily follow that innovation cannot produce some startling local effects. A case in point comes from China, where the digital divide is as stark as it is anywhere in the developed world. In large measure, access through fixed line telephony of various kinds has been the province of the young, the educated and the urban, particularly those inhabiting the great cities of the eastern seaboard. The introduction of cheap mobile phone services into the Chinese market on a mass scale did not remove the digital divide, but together with cybercafés and other mechanisms, it did allow large numbers of workers, mainly migrants from the countryside who follow a precarious existence in the cities, to have for the first time at least some way of accessing the internet. While this did not compare to the kind of facilities available to, say, students at Fudan university, it nevertheless significantly altered the pattern of inclusion and exclusion in China (Qiu 2007; 2008). It is true that China is a society experiencing very rapid social and economic change, so that changes in one aspect of social reality tend to become noticeable much more quickly than in more settled societies, but it would be an example of the kind of normative blindness criticised above not to recognise that similar impacts might result from technological change even in Europe and the USA.

The second main feature that makes continued research a viable project is that despite the fact that they are much more settled societies, the processes of social change continue, albeit at a relatively slow pace, in even the most developed countries. One obvious example, particularly prominent in Europe, is that the current, rather protracted, economic crisis has produced unemployment that is much more widespread and prolonged than that which was experienced during the preceding quarter century. The evidence about the gradual erosion of that aspect of the digital divide that depends upon physical access was gathered in circumstances of relative prosperity, in which all but the most marginal groups enjoyed a certain degree of economic stability and disposable income. In at least some countries, notably in Southern Europe, those conditions no longer apply: they are characterised by falling living standards and mass, long-term, unemployment. In 2011, nearly a quarter (24.2 per cent) of the population of the 27 countries of the European Union were living in conditions that put them 'at risk of poverty or social exclusion' and this figure has been growing, albeit relatively slowly, since 2008 (Eurostat 2013b). It remains an open question as to what the effects of this phenomenon will be. One view would be that a decline in disposable income will see payments for access and equipment, which may have seemed relatively modest during periods of relative prosperity, become one of the aspects of household expenditure that has to be sacrificed in hard times. An alternative view is that intense competition for employment will drive individuals to acquire more sophisticated internet skills in order to improve their chance of finding work, despite the fact that what evidence

there is suggests that such skills are not in themselves a decisive advantage in the labour market (Rodino-Colocino 2006).

For this group, it might be argued that the measure of home access which is often taken as indicative of a physical digital divide is relatively less important, given that being unemployed allows such individuals the time to use public access terminals in libraries. The evidence, however, is that public library budgets are under strain due to exactly the same economic reasons. In the UK, for instance, library expenditure fell by 5.2 per cent between financial years 2010–11 and 2011–12. It is projected to fall by a further 4.4 per cent in the current financial year. The decline in the number of terminals with internet access has been much smaller, at 0.2 per cent, but it is extremely unlikely that provision will expand to cater for increased demand (Chartered Institute of Public Finance and Accountancy 2012). Whatever is true of this group, the more general point remains that the future of internet access and usage will need to be analysed in the context of the changing social and economic positions of different groups in society.

The most important future research issues, however, do not arise from the digital divide as narrowly conceived in terms of access and usage but are a function of the increasing centrality of these technologies to many aspects of social life. Mobile access technologies are a case in point. With the saturation of our everyday life by mobile telephony and online connectivity – especially for the younger generations – there have developed expectations of their democratising influence. The new kinds of social networks are assumed to create new kinds of sociability and engagement, with fresh cultural and political implications – new solidarities and new social identities. Some examples of the political potential of these networks are the big political protest movements of the last years – the Arab Spring, the Occupy movement, the Los Indignados movement and many others, which owe at least part of their impact to the use of online resources. The shape and structure of these new social movements, and the role played in them by technological developments, is a major new research theme (Harlow 2012; Gustaffson 2012; Mercea 2011; Wolfsfeld, Segev & Sheafer 2013; Hussain & Howard 2013; Bennett & Segerberg 2012).

The more general implication of the increasing importance of the internet in all aspects of social life lies in its effect on the interplay between public policy and private provision. Historically, there has been widespread concern to ensure the universal availability of a range of information and opinion about public matters, since these are considered essential to any version of democratic political life. To that end, governments have established policies designed to ensure the plurality of sources and universality of availability, particularly with regard to broadcasting. The rise of the internet as a means of distribution disturbs the often-delicate balance that has permitted these mechanisms to function: for example, the advertising subsidy to commercial newspapers seems to be in danger of disappearing in many countries. It is at present not known what effect this shift will have on the plurality of provision, on the independence of the providers, or the availability of such material (Collins 2011). As access to the information and organisational forms appropriate to the exercise of the citizen's rights and duties in a democratic society become more and more exclusively available in online form, a continuing digital divide risks embedding a deep division between the informed and connected citizens and the excluded population. Similarly, while it is well-established that

the internet provides opportunities for a variety of new forms of political activity, these will necessarily fall short of realising their democratic potential if effective participation is restricted to only a portion of the population (Fuchs 2008, 225–47; Dahlberg 2011). A technology which is widely agreed to hold out the promise of greater democratic participation could, in such circumstances, become a major mechanism for further restricting the proportion of the population that plays an active role in political life.

Conclusions

Increasingly, it will no longer be adequate to formulate problems in social investigation in terms of "the digital divide AND this or that social phenomenon." Rather, the shape of social life itself will be in increasing measure structured around the internet. The agenda for "digital inclusion" formulated by the European Commission and cited above certainly rests upon unstated normative assumptions and is basically conceived of in terms of international economic competition, but it is not mistaken in identifying the ways in which access and usage are coming to permeate social life. A fully networked society is unlikely, in the foreseeable future, to be one in which every last aspect of social life depends upon using information and communication technologies, but the range of significant activities which do so depend will almost certainly increase. So far, discussion has been focused on how the coming of the internet impacts upon existing social structures but, if the research discussed above is to be credited as accurate, it is already the case that the internet is helping to form and reproduce social structures. The issues of who has what kinds of access, knowledge, experience, confidence and opportunity to sustain an acceptable standard of life will become increasingly central to all social enquiries as well as to the distribution of power and resources within society itself.

Acknowledgements

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