Information, Communication & Society
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713699183

RECONCEPTUALIZING DIGITAL SOCIAL INEQUALITY

Susan Halford[a]; Mike Savage[b]
[a] School of Social Sciences, Southampton University, Southampton, UK [b] University of Manchester, Manchester, UK

Online publication date: 20 October 2010

To cite this Article Halford, Susan and Savage, Mike(2010) 'RECONCEPTUALIZING DIGITAL SOCIAL INEQUALITY', Information, Communication & Society, 13: 7, 937 — 955
To link to this Article: DOI: 10.1080/1369118X.2010.499956
URL: http://dx.doi.org/10.1080/1369118X.2010.499956

Susan Halford & Mike Savage

RECONCEPTUALIZING DIGITAL SOCIAL INEQUALITY

This paper discusses conceptual tools which might allow an elaborated sociological analysis of the relationship between information and communication technology on the one hand, and social inequalities on the other. The authors seek to go beyond the familiar idea of the 'digital divide' to develop a focus on digital social inequality, through discussing three bodies of literature which are normally not discussed together. The paper thus addresses issues in feminist theory; the sociological field analysis of Pierre Bourdieu; and the Actor Network Theory. This paper shows that there are unexpected commonalities in these three perspectives which allow the possibility of effective cross-fertilization. All seek to avoid positing the existence of reified social groups which are held separate from technological forces, and all stress the role of fluid forms of relationality, from which social inequalities can emerge as forms of stabilization, accumulation and convertibility.

Keywords sociology; social theory; digital divide

(*Received 2 June 2010; final version received 2 June 2010*)

1. Introduction

It is widely recognized that digital information and communication technologies (ICTs) are implicated in social inequalities associated with class, gender, race, ethnicity and age (among others). However, there are currently only limited, even restrictive, ways of exploring this interface analytically. In particular, the most influential account – that of the digital divide – separates technology, on the one hand, and social process, on the other. Inequality retains an independent dynamic which technology, as a separate phenomenon, may be related to. Furthermore, the notion of 'the digital divide' tends to imply a simple and singular boundary between the digitally engaged and those who are disengaged which glosses the possibility of more complex processes of stratification. At the same time – beyond debates about the digital divide – most sociological analyses of stratification separate social inequalities from technical processes. This remains

Information, Communication & Society Vol. 13, No. 7, October 2010, pp. 937–955
ISSN 1369-118X print/ISSN 1468-4462 online
http://www.tandf.co.uk/journals DOI: 10.1080/1369118X.2010.499956

Routledge
Taylor & Francis Group

true even in recent 'cultural class analysis' which develops a subtle and complex account of class identities but has not – to date – related these to technical capacities and affordances, despite the ubiquity of ICT in key aspects of contemporary everyday life. Meanwhile, although science and technology studies (STS) suggests some important conceptual and theoretical resources for exploring socio-technical relations, so far, these have been developed largely as a *critique* of 'mainstream' sociological concerns with class, gender, race and other forms of inequality (see the discussion in Law 2008). Indeed, Latour (2005) (and others) take particular issue with the 'sociological aggregates' (class, gender, etc.) that have pre-occupied sociology and promotes instead an 'associational sociology', elaborated through the Actor Network Theory (ANT), which denies any *a priori* assumptions about the existence of social categories or aggregates.

In sum, there has been a serious disconnection – and even some outright hostility[1] – between forms of analysis which surely need to be in dialogue if we are to grasp the nature of relations between ICT and inequality. The aim of this special issue of *Information, Communication & Society* is to open up a space for more fruitful exchange between theoretical approaches which – we suggest –will allow us to explore 'digital social inequality' more adequately. The papers in this issue offer a variety of innovative approaches to this task but are united in their commitment to developing more complex awareness of the dynamic processes of social differentiation and classification linked to digital technologies. Our aim in this introductory paper is to sketch our own route through the theoretical issues and possibilities for theoretical development, as we see them. We begin with a necessarily brief overview of existing research on the digital divide. This clearly indicates that the internet and the web are related to social inequality in important ways but that we need better understandings of the processes that link them. To develop these understandings, further theoretical work is required. To do this, we draw first on feminist approaches to science and technology, which currently offer the most sophisticated debate in this area. We then take the unusual path of suggesting that Bourdieu's field analysis, and more particularly his concept of technical capital, has the potential to add to feminist accounts by developing our understanding of the processes of accumulation and transmission of assets, including technical assets, in the making of difference and inequality. However, as it stands, we note that this concept is underdeveloped and tends towards an overly instrumental account of both technology and social agency. Here, we suggest that ANT may allow us to extend our analysis.

In elaborating these issues, we also contextualize the papers included in this special issue. Each of these takes up the challenge for improved understandings of digital social inequality in its own way. Some dig deeper into particular questions of gender and/or race (see Gilbert, pp. 1000–1018, Kvasny *et al.*, pp. 1040–1061 and Kirkpatrick, pp. 976–999) while others focus on particular fields of practice, specifically healthcare (Andreassen & Dyb, pp. 956–975) and democratic participation (Zhang, pp. 1019–1039) to explore ways of conceptualising

relations between technology and inequality. To do so, a range of theoretical resources are brought into play from feminist theory to dance theory, political theory, ANT and Bourdieusian concepts of capital. Taken together, we hope that these papers open up the terrain for thinking about digital social inequalities in new and exciting ways, which we hope that will contribute to the shaping of research agendas for the future.

2. From digital divide to digital social inequality

We know that there is differential access to the internet both within and between nations. The stark fact is that the majority of the world's citizens – still – do not have access to the internet and this is clearly associated with inequalities of income and class, gender, race and age (see, e.g. DiMaggio *et al.* 2001; National Telecommunications and Information Administration [NTIA] 2004; Department for Communities and Local Government 2008) often in compound forms, not least for citizens of developing nations. This lack of access has been understood as a form of social exclusion, reproducing or even exacerbating, the social inequalities that produce it, as those without access are (increasingly) denied information, for example about jobs, healthcare or welfare, and miss out on new opportunities for political engagement, social networking and consumption. In this formulation, then, digital ICTs are positioned as a neutral good, access to which can be converted into 'other valued goods services and life outcomes' (DiMaggio *et al.* 2001, p. 312). Accordingly, policy interventions often imply that, somehow, access to the internet will transform life chances.

Yet, there is now important research which shows that *access per se* does *not* confer equal advantages to the users of ICT (Lawson-Mack 2001; Warschauer 2004; Hargittai 2008) and that we need to focus our attention on questions of *practice*. One way of rendering this (in economistic fashion perhaps) is to say that there are inequalities in *returns* from gaining access to ICT (DiMaggio & Hargittai 2001). Hargittai (2008) formulates this as follows:

> A refined approach to digital inequality recognises that people's socio-economic status influences the *ways in which* they have access to *and use* the internet.
>
> (p. 939, emphasis added)

Since, she suggests, 'some uses are more likely to yield beneficial outcomes than others' (p. 940), it is also necessary to trace whether there is a 'loopback' from use to socio-economic position and, if so, 'what are the processes through which ... uses of ICT may privilege some users over others' (Hargittai 2008). Here 'processes' refers to the different kinds of internet use that give greater or lesser access to 'the types of assets, resources, and valued goods that underlie

stratification systems' (p. 940). The suggestion is that certain types of use increase access to 'human capital, financial capital, social capital and cultural capital, while other types of use may downright disadvantage the uninformed' (Hargittai 2008). The critical distinction lies in possession of the appropriate resources to enable informed, effective and secure use of ICTs including, for example, the skills to navigate the quality and quantity of information available effectively, to make enterprising use of information, to protect oneself from fraud and other potential harms and to use the knowledge and information accessed via the internet as a marker of social status. The acquisition and possession of these skills is not conceived in solely individual terms, but is connected to wider processes both in terms of pre-existing social inequalities (for example, inequalities of education (Robinson *et al.* 2003), race (Lawson-Mack 2001), place (Gilbert *et al.* 2008)) and in terms of the contexts of use (whether educational, institutional or policy/political) that may support or inhibit 'meaningful social use' (Warschauer 2004, p. 34). Thus, as Lawson-Mack (2001) argues, we need to have a good understanding of the contexts in which technologies operate, including social-structural relations, institutional and organizational practices, in order to understand how to overcome inequalities of use. For Lawson-Mack (2001):

> The overall policy challenge is not to overcome a digital divide but rather to expand access to and use of ICT *for promoting social inclusion*.
>
> (Lawson-Mack 2001, p. 212, emphasis added)

The message, then, is that the transformational potential of ICT requires capacity building to overcome the effects of other, independent, structural sources of disadvantage.

This more 'refined' approach emphasizes that there are more or less effective uses of ICT and in doing so, takes an important step forward in our thinking about the differential *use* of technology, rather than *access per se*. However, there are two interconnected problems with the revised account, as we have described it so far. First, it continues – largely[2] – to position ICT as a neutral good and is based on assumptions about 'rational' or 'normal' use of the internet/web to which we should all aspire. This tends towards fixing technology as if it has pre-determined or set capacities and affordances that are knowable in advance. At the same time, it assumes an input–output model, where the social input – race, for example – shapes how technologies are used, which in turn shapes output, most likely (in this example) the reproduction of racial inequality. In other words, particular technologies (here the web) and inequality are taken as independent entities which may or may not impact on each other, but there is no attention to the processes which link them together or the ways in which each might shape what the other becomes. To the contrary, we suggest that we must explore, for example, how classed processes shape what the web becomes as well as how the web might shape what class means. As Lawson-Mack (2001)

concludes, we must explore the '... complex and *mutually evolving* relationship between a technology and broader social structures' (p. 202, emphasis added).

To take this forward, we turn first to feminist debates of technology which highlight the ways that technologies *themselves* are implicated in the very constitution of gender differentiation and inequality.

3. The co-constitution of technology and gender

The place of technology in shaping and maintaining gender differentiation and inequality has long been debated by feminist scholars and activists (see Faulkner (2001) and Wajcman (2004, 2007) for excellent reviews). In these debates, we find some echoes of our discussion above about the limits to concepts of the digital divide. For example, policies promoting science and engineering education for girls and women – to ensure inclusion and therefore, it is assumed, equality – have been critiqued for their conceptualization of technology as fundamentally neutral (Wajcman 2007). Indeed, it is argued, the limited success of these programmes is explained by the failure to conceptualize technology *itself* and to get to grips with more embedded relations between science, masculinity and male power (Henwood 2000; Faulkner 2001). Specifically, the argument runs, the problem is not simply a question of access to a neutral set of skills, practices and opportunities but – rather – that science and technology are produced by, and constitutive of, masculine identities and male power. This kind of claim has been the subject of much debate within feminist theory, which has taken issue with essentialized conceptualizations of gender, whereby fixed attributes and identities are attached to 'man' and 'woman' as if these are objective and static categories, and this is a point taken up by Kirkpatrick later in this issue, in his provocative exploration of the gendering of computer games. Nonetheless, in more sophisticated claims, the broad argument persists that science and technology have emerged in ways that ally them with masculinity – albeit not in any fixed or pre-determined way – and that this will persist unless and until there is a fundamental shift in the power relations that produce the forms of scientific practice, technology design, control and management of technology, and so on, whether women have access to science and technology, or not.

Some have claimed that the emergence of the internet and specifically the web may mark such a fundamental shift. Specifically, it has been argued that ubiquity and (relative) ease of access to the web offers virtual possibilities for the establishment of radical new expressions of identity, forms of social relations, free from the binary distinctions of human/machine, male/female that characterize life off-line (Plant 1998). Famously, Haraway (1991, 1997) has urged us to embrace these new cyborg possibilities – new hybrid worlds, part-machine, part-human – and their potential to take us beyond essentialized categorizations of gender difference embedded in earlier feminist theory. This said, at a basic level,

cyberfeminist arguments such as these may present their own form of *technological* essentialism in which the internet and web are accorded a fixed – in this case liberatory – meaning and value, and deterministic assumptions are made about the effects of such technologies (Wajcman 2007). This universal and positive scenario leaves questions about the exploitative and oppressive iterations of web use and functionality – the spread of internet porn and cybercrime, for instance – as well as the pervasiveness of older forms of inequality – race, for example – in cyberspace and virtual worlds (Back 2002; Nakamura 2007). Furthermore, to treat 'the web' as a single technology with singular and specific outcomes is to deny the complexity of applications, uses and relations made in the human-technology interactions of everyday life on the world wide web. Surfing e-Bay is qualitatively different in terms of skill, status and reward to editing Wikipedia or running a web-design business.

In this context, Wajcman (2004, 2007) makes the argument for a 'third way' that avoids both the gender and the technological essentialism of earlier perspectives. While keeping the proposition that gender and technology may be co-constitutive – that each is implicated in making the other – she insists that we pay attention to the fluidity and flexibility with which these co-constitutions emerge. With this proposition, we are able to understand gender–technology relations as both 'contingently stabilized and contestable' (Wajcman 2007, p. 294): to explore the repetitive and entrenched inequalities as well as the fluid and unstable relations that may neutralize, invalidate or weaken gender inequalities in particular contexts. In other words, Wajcman (2007) argues that the outcomes particular technologies-in-use cannot be 'read off from fixed sets of power relations'. Rather, that what a technology becomes and how relations with gender emerge are neither fixed nor independent, but performative and relational.

This account has much in common with the more general direction of travel that feminist theory has taken in recent years, not least the insistence that gender is something that we 'do' rather than something that we 'have'. Of course, this is not simply a matter of free choice. Rather, as Judith Butler argues, gender is performative within powerful regulatory norms and – in turn – through the repeated citation of these norms, gender identity is reproduced as a naturalized and entrenched power structure (Campbell & Harbord 1999; Butler 2004). However, as Butler (2004) also argues, this should not blind us to the think-ability of disrupting the entrenched binaries of masculinity and femininity, to possibilities for alternative expressions of gender. At the same time, we should be attentive to the times and places where gender may have limited relevance or not be relevant at all (Lorentzen & Muhleisen 2006). Similarly, in avoiding technological determinism, we should not conceptualize technology as simply a free choice, only socially constructed with infinite potential for interpretive flexibility (cf. Pinch & Bijker 1989) and we return to this point shortly in our discussion of ANT.

For now, in sum, the emphasis here is on the relationality of gender and technology and the contingency of outcomes while – at the same time – allowing

for us to be attentive to potential for (at least temporary) stabilization of relation between gender and technology, such that they might come to be seen as normal or even natural. We suggest that this theoretical proposition might also apply to other forms of inequality and, indeed, to inter-sectionalities whereby apparently distinct forms of inequality, e.g. gender and race, become bound with each other and – in this case – with technologies. However, while this is a useful framework, it offers few conceptual tools with which to explore how particular configurations emerge in practice (Faulkner 2001; Wajcman 2007). In what follows we suggest that we might develop some useful concepts by drawing first on recent debates about stratification and second on ANT. In seeking to conceptually elaborate these concerns, we explore these two literatures in turn, seeking to show certain symmetries across their rather different conceptual vocabularies.

4. Capitals, assets and resources

In recent years, there has been growing conceptual interest in how social inequalities can be understood in relation to forms of social and cultural 'capital', as popularized by theorists such as Putnam (2000), Bourdieu (1985) and Coleman (1991). This work is controversial, since it is sometimes seen as relying on an economic logic in which capital is a device for securing instrumental advantage, and hence can be seen as complicit with theories of the digital divide which we have criticized above. However, before endorsing this critique, it is important to understand why this theorising has proven attractive to researchers of stratification. In place of the large scale, unwieldy mobilization of social categories, embedded – for instance – in concepts of the 'class structure', or 'patriarchy', it is more concerned with the contexts in which capitals can operate and hence can be more interested in the mutable and contested ways by which capitals are both formed and become operational. Or to put this even more simply, it marks an increasing interest in the micro, rather than macro dynamics of social inequality, which is a terrain closer to the feminist arguments discussed previously.

It is helpful to delineate the three distinctively different ways in which the notion of capital is deployed in this body of work (see more generally, Savage *et al.* 2005). For American 'mainstream' sociologists such as James Coleman, the concept is embedded in a rational choice perspective, in which the possession of capital allows individuals to gain advantage over others. This is rather similar to the perspective which has been deployed by proponents of the digital divide. The problem with this account is a tendency to tautology, in which anything which bestows advantage can be called a form of 'capital' (Devine 2004).

A second perspective has been deployed within Marxist analyses of exploitation, notably by Wright (1985; see the subsequent debate in Wright (1996) and Crompton *et al.* (2000)). Whereas Marxist theories of class had

previously relied on the labour theory of value (in which surplus value was deemed to be extracted from productive labourers), Wright argued that exploitation could better be defined using the terms of game theory, in which those with certain assets (organizational, economic and skill) exploited those without them (see the discussion in Savage *et al.* 1992). The problem with this perspective is that axes of exploitation proliferate as it becomes possible to identify numerous assets which bestow differential advantage (e.g. right-handedness, the ability to drive cars and so on). Wright himself seeks to rein in this tendency in a rather unsatisfactory way by positing – arbitrarily, given that he has dispensed with the labour theory of value – that only assets linked to employment can be deemed as forms of exploitation. The result is conceptual fudge that has disabled this perspective from extensive empirical elaboration in recent years.

A third possibility, in our view more productive, is Bourdieu's conceptualization of capital, which has been taken up in different ways by several of our contributors (see papers by Gilbert, Kvasny *et al.* and Zhang, this issue) who show the potential for the concept to be developed in ways that elaborate sensitivity towards the in-egalitarian aspects of ICT. For Bourdieu, capitals are forms of asset – economic, social or cultural – understood to operate within fields, which are seen as (semi-) autonomous arenas of social life. Thus, music can be conceived as a field if both producers and consumers of music identify different genres and artists as competing with each other for relative position and advantage (see more generally, Bennett *et al.* 2009). Bourdieu's elaboration of this argument offers one way forward for operationalizing our concerns with the relationality and stabilization, which we have discussed above. Specifically, his general approach to the study of inequality repudiates the idea of pre-defining social groups (such as social classes) as bounded entities, focusing instead on how boundaries are themselves constructed and mobilized. The notion of 'capital' is critical here, because it moves us away from the idea of fixed advantages associated with pre-defined groups and focuses instead on 'the set of actually usable resources and powers' (Bourdieu 1984, p. 122) that can be mobilized to achieve advantage and classify social distinctions (Weininger 2004). These capitals are only effective within contexts – or fields – that allow them to be accumulated. Thus, rather than depending on a notion of exploitation, as Wright does, for Bourdieu, assets can be defined in terms of their scope for allowing *accumulation*. This can take two forms. First, it can involve the accentuation of given advantages within any specific field – for example, as capitalists can accumulate more money through investment (hence, emphasising its autonomy over other fields). Secondly, it can take the form of converting an advantage in one field into advantages in other fields – for example, as a successful artist opens up an art gallery business – through a process of *convertibility* (hence, involving heteronomy between fields). This approach re-conceptualizes capital not as an entity in its own right, the possession of which allows certain people

to gain advantages over others, but as a process which allows the storing and accumulation of advantage.

We think that this perspective might assist an analysis of the relationship between technology and inequality. Certainly, it avoids the problematic logic of arguments about capital that are based on exploitation (e.g. Wright, above) since it is no longer necessary to focus on whether those with technical skills exploit those without them, something would it be difficult to demonstrate. Nor does it involve the claim that access to technical skills in and of itself necessarily conveys advantage. It is the access to contexts in which these can be used effectively that is important. At the same time, this approach does allow us to explore how technical skills might allow the accumulation of other capacities – for instance, in terms of reputation among peers, and also the potential to convert these skills into other areas – for instance, in the labour market or political participation. In short, this approach allows a non-dogmatic framework that does not seek to define inequalities in categorical terms (where one predefined social group is held to exploit or gain advantage over another predefined group) and offers a context specific awareness of how advantaged social position is generated through the accumulation of particular resources and capacities.

Of course, Bourdieu's substantive focus is on economic, social and cultural forms of capital and he does not address the role of technology in any detail. Nonetheless, in *On the Social Structures of the Economy* (Bourdieu 1986), he does introduce the notion of 'technical capital' as a sub-set of cultural capital. For Bourdieu, this is rather a specific notion used to explore how skilled manual workers were able to deploy their distinctive technical resources to gain certain kinds of advantage, as Bennett *et al.* (2009, p. 206) explain:

> The most affluent, the most male, the whitest, and the most British section of the working class, with the strongest sense of class identity and working-class political affiliation, the lower technicians look very much like the remnants of the traditional, skilled, male working class that had provided the labour movement with much of its core support and a good deal of its industrial leadership. Their resources are perhaps best described as consisting in a stock of 'technical capital' comprising both vocational qualifications and technical forms of 'know how' acquired through a mixture of schooling and the acquisition of technical skills once transmitted as a form of capital from father to son.

Thus, while Bourdieu's arguments about technical capital here are suggestive, they cannot be simply translated into thinking about digital social inequality. Specifically, Bourdieu sees technical capital as akin to traditional handicraft skills, whereby a 'labour aristocracy' accrues advantages over less-skilled workers. He does not elaborate on the overlap between these skills and forms

of masculine power, although – as has been shown by feminist researchers (e.g. Cockburn 1981) – this is an important question. Furthermore, this definition of technical capital is not obviously appropriate for ICT, given its distributed and networked capacity (in which skills cannot be possessed individually but are co-produced through the involvement of numerous other players, gamers and associates, and their devices).

Clearly, it is necessary to move beyond the conceptualization of technical capital as a residue from the handicraft skills of a previous historical formation. Furthermore, as the feminist critique of skill has demonstrated, some tasks requiring technical skills, such as cooking or domestic work, may not command resources in any obvious way and we need to be alive to the way that the capacity of technical capital to convey advantage depends on the contextual dynamic. When technologies become ubiquitous, they stop being a source of capital. However, we want to avoid a logic which suggests that technical capital is simply another form of social closure, in which assets can only be claimed to be forms of technological capital when certain kinds of barriers are put in place to prevent widespread use. Such a reading would draw us back towards the rational choice framings which we have criticized above. Furthermore, it has been shown that only in rare cases are clear social barriers to skill acquisition put in place – notably in certain skilled manual trades, such as in the nineteenth century printing industry. In such situations, a given technology itself does not exclude others, but institutional regulations (notably regarding apprenticeship) can prevent people from learning to use it.

We would suggest that it is more common for actual technological forms to differentiate between people according to their capacity (itself the product of myriad factors) to use them and, furthermore, that uses can be unpredictable and/or produce unintended outcomes (see Andreassen & Dyb, this issue). The ability to deploy technological capacities – to make technology perform – requires an analysis of their socio-technical organization. Here, it is their networked character which is important and it is here that we turn to ANT. In short, while we think there is much potential in Bourdieu's deployment of the concept of field, his actual conceptualization of the role of technology as a possible source of capital remains under-developed, and seems to hark back to older notions of artisanal craft skills.

5. Socio-technical networks

The journey from Bourdieu to the ANT is certainly not commonly made and, indeed, might be seen as a perverse route to take since ANT identifies its opposition to structural sociological accounts of inequality while Bourdieu has been widely used to enhance such accounts, specifically in class analysis. Nonetheless, we suggest that the presumption of opposition between the

two perspectives might be more to do with popular/dominant interpretations of both Bourdieu and ANT, which have tended to emphasize particular readings of each argument. Alternatively, in what follows, we want to draw attention to some basic complementarities between the two approaches which we believe might offer some promising ways forward in understanding digital social inequality. We begin however by picking up where we left off in our discussion of Bourdieu above, with the question of the technology itself – more specifically, the artefacts and devices that constitute particular technological formations such as the web.

A foundational principle for ANT is that we cannot conceive of a social world independent from the material world. The social is always material, as Latour (1991) argues:

> We are never faced with objects or social relations. We are faced with chains which are associations of humans ... and non-humans ... power is not a property of any of these elements but of a chain.
>
> (Latour 1991, p. 110)

It is important not to understate the radical nature of this claim. Objects are not marginal to human existence, and nor is it a one-way relation, whereby humans produce artefacts, but rather ANT suggests that our world is at once composed of human and non-human actors and that the non-human shapes what the human becomes just as much as the other way around. In the context of this paper, then, technologies exercise effects that are not only socially constructed, they are not only what we – as human actors – make them (although this is important) but have their own capacities and effects, and shape what we can become. This is important because it means that we must pay attention to the qualities, characteristics and agencies of *particular* technologies rather than making generalized claims about technology *per se*. However, for ANT, these qualities do not inhere in particular technologies in any objective sense, but are produced as objects come into relations with other actors in particular networks, echoing points made by feminist theory, above. From this perspective, what we call 'the web' is the outcome of a network of heterogeneous actors – servers, protocols, users, websites, fibre optic cables and so on – none of which has an independent existence outside the networks of which it is part. It follows then that this is a performative theory – again, echoing both feminist and Bourdieusian theory. Particular socio-technical networks persist in so much as they continue to be enacted. Networks are held together by repetition of the practices that produce them. Furthermore, because there is nothing essential that pre-exists the network, it is only in performance of the network that entities are produced:

> Technologies, knowledges and work may be understood as the effects of materially, socially and conceptually hybrid performances. In these

> performances, different elements assemble together and act in certain ways to produce specific outcomes.
>
> (Law & Singleton 2000, p. 774)

Thus, what we might see as the social becomes, in this way of thinking, a 'temporarily stabilized effect' of heterogeneous networks or associations (Law 2008, p. 634). In this formulation, nothing is fixed or certain:

> Power is the final result of a process and not a reservoir, a stock or a capacity that will automatically provide an explanation. Power and domination have to be produced, made up, composed. Asymmetries exist, yes, but [the question is] where do they come from and what are they made out of?
>
> (Latour 2005, p. 63)

This formulation has points in common with the critique of what might be termed 'variable' based accounts. Gilbert, in this issue, shows how it is necessary to move beyond demographic accounts of the digital divide, which reifies notions such as race and gender as if they were ontological 'things' and to see these instead as social processes.

Now let us elaborate a little further on the points of contact between ANT and Bourdieu, which we have begin to intimate above. Specifically, both are concerned to avoid pre-determined notions of social category or relations between actors, emphasising instead that what counts is process and action: it is through these that outcomes – categories or effects – are produced. For Bourdieu, social inequality is understood as the outcome of mobilization and position taking by diverse actors, rather than in terms of social categories which are pre-defined and act as social entities. The formation of social groups, such as social classes, it then the product of practices, and – just as ANT argues – might be seen as a 'temporarily stabilized effect' of heterogeneous networks or associations (Law 2008, p. 634). For ANT, there are no social groups, *per se*, only group formation (Latour 2005), which means that:

> The choice is clear: either we follow social theorists and begin our travel by setting up at the start which kind of group and level of analysis we will focus on, or we follow the actors' own ways and begin our travels [with] the traces left behind by their activity of forming and dismantling groups.
>
> (p. 29)

Here, 'actors' own ways' are not determined by pre-existing social relations but rather it is these actions that are understood to produce both the actors themselves and wider social formations. These radically anti-essentialist foundations mean tracing networks and phenomena in particular case-studies to see effects, rather than assuming pre-existing social categories or processes. This emphasizes

the value of empirical investigation over categorical debate (Suchman 2007, p. xii) insisting that abstraction must come from the concrete, rather assuming that we can understand the concrete by beginning with abstraction. Thus, Latour argues that we may continue to talk about class, capital etc., where we are looking at *established* networks with some proven durability which have already produced these outcomes. Terms such as class, gender and race may capture well enough relations of domination in what has already been assembled – in stable networks – but do not '... work so well to collect anew the participants in what is not – not yet – a sort of social relation' (Latour 2005, p. 12). But, he argues:

> ... in situations where innovations proliferate, where group boundaries are uncertain, when the range of entities to be taken into account fluctuates, the sociology of the social is no longer able to trace actors new associations. At this point, the last thing to do would be to limit in advance the shape, size, heterogeneity and combination of associations.

This means that we can only see class, etc. as the outcome of specific networks. We should not ask questions about class– for example – in advance of our empirical research because 'it' does not exist outside the networks that may – or may not – produce this particular social outcome. Again, this has striking similarities with Bourdieu's own observations:

> The capacity for bringing into existence in an explicit state, ... of making public (i.e. objectified, visible, sayable, even official) that which, not yet having obtained objective and collective existence, remained in a state of individual or serial existence.... Represents a formidable social power, that of bringing into existence groups by establishing ... the explicit consensus of the whole group.
>
> (quoted in Weininger 2004, p. 132)

Bourdieu here avoids a substantialist definition of social entities, and is quite open to the suggestion that the boundaries and nature of such groups are open to contestation.

Here, we might suggest that Latour's emphasis that class (etc) was not important in innovatory situations is a somewhat contrived analytical contrast, since it misses the way that innovations always take place in historical context in which they emerge out of more durable formations.

Both Latour and Bourdieu, in somewhat different ways, explore the potential accumulations of effects from multiple networks, or say how effects from one network might feed into the operations of another. Class, for example, may be an outcome of a number of networks within the fields of education, the labour market, work organizations, etc. – depending on how class is defined. We might see class as a form of 'crystallization' of such heterogeneous networks.

Therefore, the arguments of ANT about socio-technical relations need not be pitched as a critique of the sociology of stratification. To the contrary, we suggest that there is analytical space for examining inequalities in established/durable networks, and through seeking to develop more worked-through examples of how ANT might contribute to our understanding of these entrenched inequalities. This said, ANT's relegation of inequality to durable, established networks undermines its ability to grasp inequalities in emergent, innovative and fluid or short-term networks and this requires more thought. As Law (2008) himself has argued recently from within ANT perspective, we need to understand how domination might operate in 'non-coherent structures':

> There is . . . a sensibility to inequality that we have not yet quite managed to articulate. That is that domination is often not a system effect, the consequence of a coherent order. Rather it is a result of non-coherence. Of elements of structuring, ordering, than only partially hang together. Of relations of subordination that are relatively invulnerable precisely because they are not tightly connected. Invulnerable because one is pulled down the others are not pulled down with it.
>
> (Law 2008, p. 641)

6. Discussion and conclusions

With these reflections in mind, how might we develop our understanding of the relationship between technology and social inequality? First, to repeat ourselves, we need to avoid reifying technology, as if it can be defined as an objective entity which has independent causal powers. To be sure, we must understand technologies as actors – not reducible to social construction alone – but they *become* actors in socio-technical networks, not on their own. Secondly, and related to this, the issue is not to consider how those with access (hardware and the skills to use it effectively) to a technology exploit or gain advantage over those without such access. This also imparts objective properties to technology itself: having 'it' alone is enough. Rather we should instead consider how technologies are associated with the crystallization of social relations of different kinds, in which they generate capacities for making social relations durable, enduring and thus able to store and accumulate practices and activities of various kinds (Latour 1991).

There are several ways in which this idea can be developed. One possibility is to follow Judith Butler's injunction to follow Foucault's archaeological method (see Halford *et al.* (2010) for an extended account of this argument). Focussing at the discursive level, Butler argues that our first task should be to trace the knowledge/power relations that establish 'a set of subtle and explicit criteria for thinking about the world' (Butler 2004, p. 215) so that we can 'grasp what

constitutes acceptability within the system' (Foucault 1997, p. 53). In other words – in thinking about technology and inequality – we must trace the particular knowledge/power relations that establish the hegemonic norms of gender (or race, class, age, sexuality and so on) and technology in particular contexts. Second, we should be attentive to the breaking points in this: 'the moments of its discontinuities and the sites where it fails to constitute the intelligibility it promises' (Butler 2004, p. 216). In short, we need to understand:

> ... how the terms of gender are instituted, naturalized and established as pre-suppositional but [also] to trace the moments where the binary system of gender is disrupted and challenged, where the coherence of the categories are put into question, and where the very social life of gender turns out to be malleable and transformable.
>
> (Butler 2004, p. 216)

This approach keeps differentiation and inequality in play as non-essential, dynamic and performative, emphasising possibilities for new configurations without losing focus on the repetitive practices of gender, class, race and so on within powerful regulatory norms. Both Butler (2004) and Haraway (1997) emphasize a notion of the heterotopic in the everyday, that:

> ... the shapes the world takes are conventional and revisable, if also eminently solid and full of consequences for un-equally distributed chances of life and death
>
> (Haraway 1997, p. 269)

This takes us far from Latour's (2005) concerns about the use of terms such as gender, class or race. In sharp contrast to his characterization of the ways in which such terms are used, it does not suggest 'functionalist accounts appealing in a tired old way to pre-formed categories of the social such as race, gender and class' (Haraway 1997, p. 35) but rather validates the work of critical anti-racist, feminist and class-aware scholars in exploring racial formation, gender-in-the-making, the forging of class, the discursive production of sexuality and so on. We can begin to see how this might work in analysing digital social inequalities in Boltanski's (1985) study of *Cadres*, whose aim is to show how technical skills and competences can be taken up as part of the identities of durable social groups – in his case, the French managerial classes. Through this means, the socio-cultural formation of a distinctive group is itself dependent not only on political organization but also on the capacity to mobilize technical skills. Patrick Joyce (2010) has made a related argument about the way that the British upper class was defined though its 'administrative' habitus, dependent critically on its

capacity to read and write fluently. Hence, rather than the assumption that preformed social groups 'use' (or do not use) technologies, we can identify a more complex process of mutual interaction and stabilization. This kind of perspective would indicate the potential of reflecting on how technical identities – such as the computer 'nerd', the technically incompetent manager, and the like – also embed social distinctions and inequalities.

Developing this perspective would address how other social groups are organized through these kinds of the mobilizations. Here again, the focus is not on identifying which groups are 'left out', of the reach of certain technologies, but rather how they can be organized in marginal ways. Issues such as the way that technological forms differentially involve the organization of repair, maintenance activities, their relationship to the developers of the technology, as well as how technologies are implicated in differentiating consumers and producers, are all subjects for ripe analysis. Modern ICT increasingly bundles expertise into the design of code, to seek to allow a wide range of consumers' reasonable ease of use, thus appearing to create an open flat field of undifferentiated social consumers, who stand in contrast to technical 'experts' such as software engineers and programmers. ICT thus becomes deployed into complex relational identities in which managers, experts, users and consumers are constructed in pervasive ways.

It is well known that social differentiations are routinely generated through the processing of consumers through sorting algorithms which prioritize and differentiate, though in ways which are often covert and do not draw attention to themselves. Whereas the traditional bank manager was a public figure of authority who drew upon his masculinity and respectability as part of the judgement-making process, credit scoring methods hide social indicators of this kind (Halford *et al.* 1997). In this way, the coding of social relations can appear to reduce the visibility of hierarchical social groups. Yet, just as Burrows and Gane (2005) have shown that software helps generate class inequalities through encouraging people with certain common properties to cluster together using ICT devices, so we need to more critically reflect on how social differentiations can be generated by specific kinds of information system. Here, the arguments of MacKenzie (2007) regarding the way that those in the financial trade mobilize the 'Black–Scholes' formula, and through these technical devices gained the potential to generate huge financial rewards, is an interesting pointer of the possibilities of this perspective.

Once we open up the question of digital social inequalities in this way, we can begin to see the scale of the agenda that we are setting ourselves and – at the same time – how important it is that we address this agenda if we are to grasp the evolving and socio-technical nature of inequality in contemporary societies. We need new perspectives and new tools which will enable us to go beyond established approaches to both technology and inequality and to find new ways of thinking, analysing and researching that get inside the complex and evolving nature of digital social inequalities. All the papers in this special issue take up this challenge.

Notes

1 For example, we note the personal hostility in France between 'classic' sociologists of inequality notably Pierre Bourdieu, on the one hand, and those working in STS, such as Bruno Latour, on the other hand. These two groups rarely engaged with each others' work except through sniping critique and snide asides. See notably Bourdieu's dismissive comments on Latour in *Sociology of Science and Reflexivity* and Latour's (2005) critique of Bourdieu's concepts of habitus and field in *Assembling the Social*.

2 There is some attention to the biased content of the web, specifically the dominance of the English language, the operation of search engines, and the fact that the vast majority of hits focus on a very small number of sites produced by global corporations, e.g. the BBC, etc. However, in the debate on digital inequality itself these points are heavily underplayed in comparison with the question of effective use and there seems to be an implicit assumption that the question of content will be fixed later.

References

Back, L. (2002) 'Aryans reading Adorno: cyber-culture and twenty-first century racism', *Ethnic and Racial Studies*, vol. 25, no. 4, pp. 628–651.

Bennett, T., Savage, M., Silva, E. B., Warde, A., Gayo-Cal, M. & Wright, D. (2009) *Culture, Class, Distinction*, Routledge, London.

Boltanski, L. (1985) *Cadres*, Cambridge University Press, Cambridge.

Bourdieu, P. (1984) *Distinction*, Routledge, London.

Bourdieu, P. (1986) 'The forms of capital', in *Handbook of Theory and Research for the Sociology of Education*, ed. J. Richardson, Greenwood, New York, pp. 241–258.

Burrows, R. & Gane, N. (2005) 'Geodemographics, software, and class', *Sociology*, vol. 40, no. 5, pp. 793–812.

Butler, J. (2004) *Undoing Gender*, Routledge, New York.

Campbell, J. & Harbord, J. (1999) 'Playing it again: citation, reiteration or circularity?', *Theory, Culture and Society*, vol. 16, no. 2, pp. 229–240.

Cockburn, C. (1981) *Brothers*, Pluto Press, London.

Coleman, J. (1991) 'Social capital in the creation of human capital', *American Journal of Sociology*, vol. 94, pp. 95–120.

Crompton, R., Scott, J., Devine, F. & Savage, M. (2000) *Renewing Class Analysis*, Blackwell, Oxford.

Department for Communities and Local Government (2008) *Delivering Digital Inclusion*, Department for Communities and Local Government Publications, Wetherby.

Devine, F. (2004) *Class Practices*, Cambridge University Press, Cambridge.

Di Maggio, P. & Hargittai, E. (2001) 'From the digital divide to digital inequality: studying internet use as penetration increases, centre for arts and cultural policy studies', Working Paper 15, Princeton University.

Di Maggio, P., Hargittai, E., Neuman, R. & Robinson, J. (2001) 'Social implications of the internet', *Annual Review of Sociology*, vol. 27, pp. 307–336.

Faulkner, W. (2001) 'The technology questioning feminism: a view from feminist technology studies', *Women's Studies International Forum*, vol. 24, no. 1, pp. 79–95.

Foucault, M. (1977) 'What is Critique?', in *The Politics of Truth*, M. Foucault (ed. S. Lotringer), Semiotext(e), Los Angeles, CA, pp. 41–82.

Gilbert, M., Masucci, M., Homko, C. & Bove, A. (2008) 'Theorizing the digital divide: information and communication technology use frameworks among poor women using a telemedicine system', *Geoforum*, vol. 39, pp. 912–925.

Halford, S., Lotherington, A.-T., Dyb, K. & Obstfelder, A. (2010) 'Un/doing gender with ICT', *NORA – Nordic Journal of Feminist and Gender Research*, vol. 18, no. 1, pp. 20–37.

Halford, S., Savage, M. & Witz, A. (1997) *Gender, Careers and Organizations: Current Developments in Banking, Nursing and Local Government*, Macmillan, Basingstoke.

Haraway, D. (1991) 'A Cyborg Manifesto: science, technology and socialist feminism in the late 20th century in Haraway', in *Cyborgs and Women: The Reinvention of Nature*, ed. D. Simians, Routledge, New York, pp. 149–181.

Haraway, D. (1997) *Modest_Witness@Second_Millennium.FemaleMan©_Meets_Onco Mouse*™, Routledge, London.

Hargittai, E. (2008) 'The digital reproduction of inequality', in *Social Stratification*, ed. D. Grusky, Westview Press, Boulder, pp. 936–944.

Henwood, F. (2000) 'From the woman question in technology to the technology question in feminism: rethinking gender equality in IT education', *The European Journal of Women's Studies*, vol. 7, no. 2, pp. 209–227.

Joyce, P. (2010) *Technostate*, Mimeo.

Latour, B. (1991) 'Technology is society made durable', in *A Sociology of Monsters: Essays on Power, Technology and Domination*, ed. J. Law, Routledge, London, pp. 103–131.

Latour, B. (2005) *Re-assembling the Social: An Introduction to Actor Network Theory*, Oxford University Press, Oxford.

Law, J. (2008) 'On sociology and STS', *Sociological Review*, vol. 56, no. 4, pp. 623–649.

Law, J. & Singleton, V. (2000) 'Performing technology's stories', *Technology and Culture*, vol. 41, no. 4, pp. 765–775.

Lawson-Mack, R. (2001) *The Digital Divide: Standing at the Intersection of Race and Technology*, Carolina Academic Press, Durham, NC.

Lorentzen, J. & Mühleisen, W. (2006) 'Kjønnet får hvile [Gender at rest]', in *Kjønnsforskning* [*Gender Research*], eds Lorentzen, Jørgen Ludvig & Mühleisen, Wencke, Universitetsforlaget, Oslo, pp. 277–285.

MacKenzie, D. (2007) *An Engine Not a Camera*, MIT Press, Boston, MA.

Nakamura, L. (2007) 'Race in/for cyberspace: identity tourism and racial passing on the net', in *The Cybercultures Reader*, eds B. Kennedy & D. Bell, Routledge, London, pp. 297–304.

National Telecommunications and Information Administration (NTIA) (2004) *A Nation Online: Entering the Broadband Age*, NTIA, Washington, DC.

Pinch, T. & Bijker, W. (1989) 'The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other', in *The Social Construction of Technological Systems*, eds W. Bijker, T. Hughes & T. Pinch, MIT Press, Cambridge, MA, pp. 17–50.

Plant, S. (1998) *Zeros and Ones: Digital Women and the New Technoculture*, Fourth Estate, London.

Putnam, D. (2000) *Bowling Alone*, Simon and Schuster, New York.

Robinson, J., DiMaggio, P. & Hargittai, E. (2003) 'New social survey perspectives on the digital divide IT and society', *IT & Society*, vol. 1, no. 5, pp. 1–22.

Savage, M., Barlow, J., Dickens, P. & Fielding, A.J. (1992) *Property, Bureaucracy and Culture: Middle Class Formation in Contemporary Britain*, Routledge, London.

Savage, M., Warde, A. & Devine, F. (2005) 'Capitals, assets and resources: some critical issues', *British Journal of Sociology*, vol. 56, no. 1, pp. 118–139.

Suchman, L. (2007) *Human and Machine Reconfigurations: Plans and Situated Actions*, Cambridge University Press, Cambridge.

Wajcman, J. (2004) *Technofeminism*, Polity Press, Cambridge.

Wajcman, J. (2007) 'From women and technology to gendered technoscience', *Information, Communication & Society*, vol. 10, no. 3, pp. 287–298.

Warschauer, M. (2004) *Technology and Social Inclusion: Re-thinking the Digital Divide*, MIT Press, Cambridge, MA.

Weininger (2004) 'Pierre Bourdieu's theory of class', in *Perspectives in Class Analysis*, ed. E. O. Wright, Cambridge University Press, Cambridge.

Wright, E. O. (1985) *Classes*, Verso, London.

Wright, E. O. (1996) *Class Counts*, Cambridge University Press, Cambridge.

Susan Halford is Professor of Sociology at the University of Southampton, UK. She has broad ranging interests in the sociology of work and organization with a particular focus on the interface between work, technology and inequality. *Address*: School of Social Sciences, Southampton University, Southampton, UK. [email: susan.halford@soton.ac.uk]

Mike Savage was appointed Professor of Sociology at the University of York in 2010, having previously been Professor at Manchester from 1995 to 2010. He was founding Director of the ESRC Centre for Socio-cultural Change (CRESC) and the recent author of *Identities and Social Change in Britain since 1940: The Politics of Method* (Oxford, 2010). *Address*: University of Manchester, CRESC, 178 Waterloo Place, Manchester, M13 9PL, UK. [email: mike.savage@manchester.ac.uk]