



Generational affinities and discourses of difference: a case study of highly skilled information technology workers¹

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Abstract

Sociologists theorizing the concept of 'generation' have traditionally looked to birth cohorts sharing major social upheavals such as war or decolonization to explain issues of generational solidarity and identity affiliation. More recently, theorists have drawn attention to the cultural elements where generations are thought to be formed through affinities with music or other types of popular culture during the 'coming of age' stage of life. In this paper, we ask whether developments in computer technology, which have both productive and cultural components, provide a basis for generational formation and identity and whether generational discourse is invoked to create cultures of difference in the workplace. Qualitative data from a sample of Information Technology workers show that these professionals mobilize 'generational' discourse and draw upon notions of 'generational affinity' with computing technology (e.g. the fact that people of different ages were immersed to varying degrees in different computing technologies) in explaining the youthful profile of IT workers and employees' differing levels of technological expertise.

Keywords: Generations; Mannheim; computing technology; culture; work; ageing

Introduction

This paper examines the concept of generation (i.e. generational formation and identity) in relation to innovations in computing technology and assesses whether and how it is used to create cultures of difference in the workplace. Technology in general and computing technology in particular infiltrates almost every aspect of social life. For instance, technologies are productive resources in which companies invest to improve their competitiveness and productivity and workers need to master them in order to gain employment or

to remain employed. Owners and managers sometimes use technology to control workers and employee alienation can result. Yet, technology is also characterized as an 'indispensable medium' that may be used for the expression, transformation, and dissemination of culture (Castells 2000: 14). The spread of computing technology has led researchers to explore how technology is integrated into existing cultural fields and how it could facilitate the creation of new ones (Consalvo 2006; Edmunds and Turner 2005; Kubicek and Wagner 2002).

The dual character of technology is an important consideration in studies of work because technological exposure or expertise gained in the cultural realm (e.g. playing computer games, tinkering with electronic equipment) has the potential to translate into workplace skills. With the proliferation of paid employment requiring advanced computer skills and with the rise in computer gaming and internet media which are often embraced by youth, the link between generations and the cultural and productive aspects of computing technology is in need of further study.

In North America, few generations have received more attention than the Baby Boomers, born in the mid-1940s to the mid-1960s (Williams et al. 1997). Researchers argue that this group has forged strong generational symbols and emotive connections through rebellious rock music, youth-driven social movements and the consumption of goods and services (Burns 1996; Edmunds and Turner 2002; Turner 2002). Amidst social revolutions and technical innovations, the Baby Boomers came of age at a time of general economic prosperity and increasing transparency in long-standing social inequities. They have been characterized as a generation greatly invested in their own youthfulness, idealists turned 'yuppie' consumers. In contrast, the group labeled 'Generation X' (born mid-1960s to late 1970s) has been described as cynical individualists who have collectively retreated from the politics of the Baby Boomers. Gen-Xers came of age amidst economic stagnation, educational credentialism and the increasing penetration of information and communication technologies into daily life (Côté and Allahar 1994; Lopez 2002).

Recently, management gurus and academics, concerned about relations between Baby Boomers and Gen-Xers in the workplace, have examined whether there are differences in work values, work ethic and managerial strategies across these generations (e.g., Appelbaum, Serena and Shapiro 2005; Burke 2004; Smola and Sutton 2002). These studies often explore the degree to which popular generational stereotypes are present in the workplace. According to Appelbaum and his colleagues (2005), existing generational myths indicate that Baby Boomers and older generations are 'less adaptable and harder to train' than Gen-Xers and younger generations. Gen-Xers are also characterized as less committed than their predecessors, although they are said to be the first 'techno-literate' generation in the workforce (Losyk 1997: 41). Although researchers have found evidence of generational differences in work

values, the supposed productivity declines and the un-trainability of older workers are more myth than reality (Appelbaum, Serena and Shapiro 2005). Still, workers often draw upon these popular understandings of generation to make sense of their working lives.

These studies provide interesting assessments of differences between two generations that have been enshrined in popular culture, but in doing so their existence is perhaps unduly reified. Prevailing conceptions of the Baby Boomers and Generation X encompass many birth years. For instance, the Baby Boom group (born ~1946 to 1964) originated from a demographic assessment of fertility trends, which was then extended to include aspects of social and cultural sameness. While this categorization may make sense in some instances, uncritically assuming that a like-minded group of people exists by virtue of being born within a 20-year span is questionable. Doing so risks overlooking theoretically informed generational groupings within generations thereby under- or overstating generational differences.

Hence, drawing on a discussion of the generation concept as it was first theorized by Karl Mannheim and then expanded in studies of culture and paid work, we develop a set of objective generational locations based on the computing technologies that were popular when birth cohorts came of age. We then assess whether and how people within these objective locations invoke generational discourse in their discussions of information technology (IT) employment. In particular, we ask whether developments in computer technology provide a basis for generational formation and identity, and whether and how the generation concept is used to create cultures of difference in the workplace.

The generation concept

In 'The Problem of Generations,' Karl Mannheim (1952) generalizes Marx's conception of class to demonstrate the sociological significance of generations. Mannheim criticized previous assessments of generations for relying too much on chronological age or the biological fact that generations reproduce themselves. For him, these past treatments neglected the true sociological importance of generational relations. Although it is true that the sociological phenomenon of generations is based on the biological rhythms of birth and death, Mannheim argued that,

Were it not for the existence of social interaction between human beings – were there no definable social structure, no history based on a particular sort of continuity then generations would not exist as a social location phenomenon. (1952: 290–1)

Thus, Mannheim argued that a generation represents a unique type of social location based on the dynamic interplay between being born in a particular year and the socio-political events that occur throughout the life course of the

birth cohort, particularly while that cohort comes of age. For Mannheim, generational location is an objective fact similar to class position. Hence, all individuals, whether they acknowledge it, belong to a particular generational location within a given society.

Just as class consciousness does not necessarily accompany class position, Mannheim recognizes that generational consciousness does not arise because one is born in a particular year. To deal with this, Mannheim discusses *generation as actuality*. Two components comprise actual generations – the objective consideration of generational location and the subjective experience of historical consciousness. Whereas membership in a historical community is the widest criterion of generational location, actual generations form only when,

A concrete bond is created between members of a generation by their being exposed to the social and intellectual symptoms of a process of dynamic de-stabilization. (Mannheim 1952: 303)

So, just as Marx made the distinction between a class in itself and a class for itself, Mannheim recognized that under certain social conditions, generations could share a collective awareness and become politically motivated.

Generations and culture

Recent research has examined the generation concept through the lens of culture. For example, Eyerman and Turner (1998) draw upon Bourdieu's concept of habitus to theorize how cohorts build generational solidarity through shared cultural symbols such as music and fashion. Following Bourdieu, generations have the capacity to gain and control access to cultural capital and resources (Turner 1998). Eyerman and Turner (1998: 93) define 'generation' as '... a cohort of persons passing through time that come to share a common habitus, hexis and culture, a function of which is to provide them with a collective memory that serves to integrate the cohort over a finite period of time'. According to Vincent (2005: 583), these elements of culture include both the formation of identity and lifestyle attributes. As Gilleard (2004: 114) points out, '... generational style or consciousness can be treated ... as generational "habitus" – dispositions that generate and structure individual practices and which emerge and are defined by the forces operating in a particular generational field'.

Besides music and fashion, computing technology is also identified as a marker of culture through which generations may be formed. For example, Kubicek and Wagner (2002) explore how technological advancements influenced the development of 'technological generations' of community electronic networks. Computing technology enthusiasts in each era (i.e. mainframe 1970s, personal computing 1980s, and internet 1990s) utilized the latest technology to

build and disseminate their public counter-cultural electronic networks. According to Kubicek and Wagner (2002: 305), '... the first mainframes, then the first PCs, online services and web capabilities, can be interpreted as Mannheimian "collective events" that influenced the respective actor groups.' Within the framework of community networks, technology and actors stay linked and 'old' actors do not make the leap to new technologies; instead new technologies are taken up and disseminated by 'new' actors.

Generational differences in the usage of new technologies have been examined in two recent studies. Using German socio-economic panel data on technology usage, Korupp and Szydlik (2005) consider the potential for the spread of inequality and the extent of the 'digital divide'. In this work, they draw upon generational 'ideal types' in relation to technology, including: 'the pre-technical generation (born before 1939); the generation of the household revolution' (born between 1939 and 1948); the third generation of advanced household technology (born between 1949 and 1964) and the 'computer generation' (born after 1964) (Korupp and Szydlik 2005: 412). Although these broad technical generations encompass household technologies in general, the authors found strong generational differences in household computer usage, with the majority of computer users coming from the computer generation (52–64 per cent) and the advanced household technology generation (21–26 per cent). The authors argue that exposure to computers in the household at a young age is important because it amounts to higher social capital.

Given popular associations between youth and computing expertise, young people who are not exposed to computing technology or who lack expertise may be disadvantaged (Facer and Furlong 2001). McMillan and Morrison (2006: 89) find significant variance in computing expertise in their youthful sample: '... while the young participants in this study grew up with the internet, within their age cohort vast differences and skill levels are evident'. They examine how internet use constitutes a 'coming of age ritual' for many youth who were in their teens when the World Wide Web was launched in 1993. Respondents located themselves generationally as 'boundary spanners' between older and younger family members; more computer savvy than parents and grandparents but 'relative dinosaurs' compared to younger siblings (McMillan and Morrison 2006: 80). The authors conclude that '... technology so defines this generation of young adults that not using it means running the risk of being left out' (2006: 91). Indeed, a lack of technological skills at any age presents the potential for being 'left out', particularly in the realm of employment.

Generations at work

Although there has been a lot of research on differences between Baby Boomers and Gen-Xers (see introduction), it tends not to explore finer

generational breakdowns in relation to computing technology. Down and Reveley (2004) found that workers mobilized the concept of 'generation' in their formation of entrepreneurial identities in business with the older generation portrayed as 'old farts', compared to new entrepreneurial 'young guns'. Younger entrepreneurs drew on the notion of 'growing up together' in old economy firms amidst 'outmoded' business practices and managers and set themselves in contrast to this. The embracing of technology by the new generation was an important part of the generational distinction. The authors suggest that the uptake of technology is a form of Mannheim's 'fresh contact': '... with the introduction of new technologies and novel business practices people will adopt different strategies of use and acceptance as well as employ the new as emblematic of broader change processes ... clearly, the owner-managers align themselves with the new technology and identify the older technology with the older generation of business managers' (Down and Reveley 2004: 242). In this case, older managers are affiliated with 'older technologies' and therefore excluded or 'left behind' in the minds of the newer, technology-oriented entrepreneurs. Here we see that popular cultural dialogue linking 'younger' generations with 'techno-literacy' emerges in the productive realm.

Identifying computing technology generations: technological innovation and coming of age

Timing is an important factor in forging shared generational bonds and crafting a collective cultural milieu (Corsten 1999). Like Mannheim, Pilcher (1994) notes that the formation of generational consciousness tends to occur in relation to events and exposures experienced in youth, when people are 'coming of age'. This period of life, early adolescence to early twenties, is thought to be crucial to the development of generational attachments because of the centrality of identity formation during this phase (Cavalli 2004; Corsten 1999). Mannheim's (1952: 293) notion of 'fresh contact' is again relevant; those experiencing adolescence '... come into contact anew with the accumulated heritage' and formulate their own responses based on a shared socio-historical location. Corsten's (1999: 262) concept of the 'cultural circle', described as, 'people who spontaneously observe that other people use certain criteria for interpreting and articulating topics in a similar manner to themselves', serves to further explain how generational consciousness is actualized.

The importance of adolescent and young adult life phases is based in part on the volume of contact with like-aged individuals. Corsten (1999: 262) notes, '... people in the life phase of adolescence can meet generationally equally located people with similar discursive standpoints in several, sometimes almost all, of the social contexts in which they are involved'. While

generational consciousness is not frozen in adolescence, experiences and exposures during this time influence the development of socio-interpretive maps and reactions to social phenomena across the life course (Vincent 2005).

Table I outlines five generational locations based on the history of computing innovations, both cultural and productive, in the mid- to late twentieth century (The History of Computing Project (Robat 2006)). This timeline was selected because it was very detailed and did not appear to be related to corporate interests. In light of the importance of 'coming of age' to generational consciousness, the generational locations we develop here are linked to computing innovations that were popular as a particular cohort came of age.

This timeline and the subsequent, sometimes simultaneous, cultural diffusion of computing and interactive media suggest much finer distinctions in generational boundaries than those traditionally drawn upon in popular accounts (e.g. Baby Boomers versus Gen-Xers). Based on potential exposures to computing innovations in both the cultural and productive realms, we derived five generational locations in relation to computing technology. The generational locations reflect the historical timing of computing innovations and their diffusion into productive and cultural spheres, linked with the time period in which a cohort comes of age.

The *Pre-ATARI Generation* was born prior to 1955 and came of age before the mid-1970s; members were aged 51 and older in 2005 (the year in which the data for this study were collected). This was a generation that came of age before computing technology had widespread cultural appeal or was widely used as a productive resource when members were entering the labour market. The *ATARI Generation*, born between 1955 and 1963, came of age primarily during the 1970s and was aged 42 to 50 in 2005. As Table I shows, this generation came of age as ATARI home video games became popular and the first PCs were introduced in the workplace. Notably, the younger portion of this generation would have had the potential for exposure to new computing technology in the home.

Members of the *Console Generation* were born between 1964 and 1973, came of age largely in the 1980s with technologies such as the Commodore 64, TRS-80, Apple MacIntosh, Windows 3.0 and the game of Tetris and they were between the ages of 32 and 41 in 2005. This generation has the greatest potential for substantial encounters with early computing technologies at home. *Windows Generation* members were born between 1974 and 1978 and came of age in the late 1980s and late 1990s and they were aged 27 to 31 in 2005. The *Windows Generation* came of age with the dominance of Microsoft and the release of Windows 95/98, as well as gaming releases such as SimCity, Doom and the advent of Excel, Adobe pdfs and the acceleration of email communication environments.

The *Internet Generation* was born after 1978 and came of age in the mid-1990s onward; in 2005, the oldest among them was 26 years old. Although the

TABLE I: *Computing technology innovations*

Generational locations Coming of age years	Pre-ATARI (born before 1955)	ATARI (born 1955–63)	Console (born 1964–73)	Windows (born 1974–78)	Internet (born 1979 and later)
Prior to mid-1970s	FORTRAN, COBOL, IC technology computers, PONG video arcade games, HP calculators				
1970s		ATARI 2600 (home video game console), ATARI 400 and 800 PCs, Pac-man and Space Invaders			
1980s			Commodore 64, TRS-80, Apple MacIntosh, Tétris, Windows 3.0, Nintendo		
Late 1980s–late 1990s				SimCity, Doom, HTML, Mouse, Quick Basic, Excel, Linux.02, Adobe.pdf, Windows 95/98, email, PlayStation	
Mid-1990s–Millennium					Internet grown to 25 million users, Netscape, Yahoo, AOL, Intel Pentium processor, instant messaging, Windows XP, Java, CD-RW, PalmPilot, iMac, Google, Napster, eBay, Mozilla, iPod, X-box

Source: Robot (2006).

internet was launched in the mid-1990s, during the coming of age stage for the Windows Generation, it was not immediately or widely embraced. What distinguishes the Internet Generation was the increasing use of the internet through the introduction of Netscape, Yahoo, and later, Google. In addition, this generation saw the release of MSN Instant Messaging, Windows XP, and the increasing affordability of technology. Palm Pilots and iPods were also part of the landscape, thus presenting many opportunities for encounters with computing technologies.

Taking these objective generational locations as our starting point, the subsequent analysis assesses whether and how people within these generational locations invoke generational discourse in their discussions of IT employment. We ask whether generational formation and identity vary across generational locations and whether and how members of different generations use the generation concept to create cultures of difference in the workplace. To do this, we use data from a study of highly skilled IT workers.

Method

The data are drawn from an international study of information technology work, 'Workforce Ageing in the New Economy'. The larger study entails web-based surveys and intensive ethnographic studies of selected IT firms in Australia, Canada, the European Union and the USA. In this analysis, we examine interview data from three Canadian locales.

The analysis is based on semi-structured qualitative interviews with 141 IT workers from small firms employing between 4 and 21 workers. Questions were open-ended, focusing on IT work experiences; work-life balance and ageing in IT. Questions about generations and generational relations were not asked explicitly; thus, generational dialogues were emergent.

The average age of interview respondents is 37 years. More than three-quarters are male (77 per cent); less than one-quarter (23 per cent) is female. Just over half (54 per cent) of our respondents have children; two-thirds (67 per cent) are married/common-law, 8 per cent separated/divorced, and 25 per cent single/never married. It is a relatively homogenous group with 7 per cent visible minorities. The sample largely reflects the profile of IT workers gathered in Canadian national surveys (Wolfson 2004). Considering the computing technology generations outlined in Table I, 10 per cent of our respondents are members of the pre-ATARI Generation, 27 per cent are ATARI, 29 per cent are Console, 24 per cent are Windows, and 10 per cent are part of the Internet Generation.

The analytic strategy presupposes that discourse is critical in making sense of our social world and that attending to individuals' interpretations of their experiences can generate key insights into social relations (Gubrium and

Holstein 1997). A qualitative data analysis software package, NVivo, facilitated the analysis which proceeded in three phases: the organizational coding of interview transcripts (Lofland and Lofland 1995), generation-specific analytical coding of interview passages, and in-depth analysis of generation-themed material. One organizational category from the first phase, 'age', was selected for further analytical coding and intersected with six relevant thematic categories: 'class, gender, education and pathways to IT, personal history, work practices/ideals and workplace culture'. The concept of generation was raised directly by several respondents and a text search for related terms, such as 'generation', 'growing up/grew up', 'baby boomer' and 'generation X', yielded additional interview segments. Finally, from fieldwork recollections and themes contained in the node 'education and pathways to IT', computer gaming emerged as a significant feature in the collective memory of many of the workers. Thus, a text search for passages containing 'games' and 'gaming' was conducted.

Consistent with the literature, analytical codes relating to generational and life course bonds, inequality, diversity and conflict became apparent in the data. The following themes also emerged: technological affinity by generation and discourses of difference. These generational themes were further refined and collapsed into two analytical categories: 1) technological affinity ('growing up' with technology) – references to generationally-linked technological affinities (e.g., computer gaming, first computer) were prevalent, and; 2) discourses of difference (skills, adaptability and innovation) – respondents invoked generational differences in technical aptitude, frequently along generational lines. In this paper, our focus is on the links between generation and technological affinity, particularly how participants characterize specific technologies in relation to generational groups.

Results

'Growing up' with technology: generations of gaming cultures

The proliferation of computer gaming and the internet, which began in earnest in the 1980s, has accelerated (Carmel 1997; Consalvo 2006). In 2001, the gaming industry was worth over \$6 billion in the USA alone, outstripping the market for business to consumer e-commerce (Bryce and Rutter 2003). Although computer games are typically associated with a masculine and youthful demographic, a recent study reports that 42 per cent of gamers are over the age of 35 (Bryce and Rutter 2003). Though gamers who began in the 1980s are now entering their thirties, few studies have examined computer gaming culture in the context of 'human' generations, although technological advancements are sometimes conceptualized in generational terms.

In response to queries about early interests in computing technology, respondents in the Console, Windows, and Internet Generations discussed 'growing up' with technology and invoked generational discourse to set their experiences apart from older generations of workers. As one programmer from the Windows Generation put it,

I grew up with computers . . . I guess it's our generation, our age. We had computers in the home from the time we were able to punch on a keyboard. (Man, aged 28)

Indeed, most of the IT professionals from the Windows Generation discussed 'growing up' with computers and seemed to identify with specific computing innovations. For instance, Windows Generation members cited computer games in reference to their interest in IT careers. One company owner from the Windows Generation says,

Actually, that's a common way that 25–30 year olds who are in IT, that's a common story of how they got into it. It was really the gaming aspect of things. (Man, aged 28)

The introduction of gaming computers into the home was instrumental in fostering an early interest in IT for respondents from the Console Generation as well. For example, one programmer from the Console Generation says,

Well, we, the family got one of the earlier, small, kind of gaming computers but it was good for more than just gaming but that's what I got into . . . I was like 13, 14, at the most, and something to do, to play with. (Man, aged 36)

Similarly, another programmer from the Console Generation notes,

Um, well then we're going WAY BACK to the introduction of consoles. Console gaming back in the early 80s, I guess that would be my first introduction to it. Of course, my parents bought my brother and I one of those and we played that and that started that whole revolution. (Man, aged 33)

The importance of 'growing up' with a particular computing technology was pervasive and this was seen by some to account for the youth of the IT industry. As one programmer from the Internet Generation puts it,

I think a major thing is that generations prior to mine, like I know my generation is pretty big into the technology now, I think a major reason that the IT workforce is younger than, I don't know, different workforces is just that the *younger generations* have just had a lot more exposure to the technology than some of the older guys have. And, I guess we just pick it up easier just because we've had so much experience using it. I've been using computers probably since I was three or four years old . . . so I think that's the major thing. . . . The younger guys have had more experience and

they've kind of *grown up* with it, whereas the older generations kind of had to integrate it into their existing skills. (Man, aged 19)

Besides attributing IT industry youthfulness to generational exposure to certain types of computing technology, this respondent also links exposure and skill development, noting that younger generations 'pick up' computing skills more easily than older ones as a result of early exposure. This view was held by many of the IT workers in our sample.

Unlike members of the Console, Windows, and Internet Generations, members of the Pre-ATARI and ATARI Generations did not discuss growing up with computing technology. This speaks to the distinction that Mannheim made between objective and subjective generational locations. Objectively, computer technology generations are formed through the dynamic interplay between being born in a particular period and the technological advances that occur throughout the life course of the cohort. Generational consciousness, on the other hand, is formed through subjective experiences as one type of technology gives way to another. The data suggest that our respondents form a generational consciousness based on technological innovations introduced in the home and at school. The importance of this consciousness is manifested in discourses of difference that may lead to material consequences in the lives of different generations of IT workers.

Generational discourses of difference

Besides discussions of growing up with technology, IT workers also spoke of differences in skill, adaptability and innovation, which have implications for inequality in the workplace.

Skill, adaptability, and innovation

IT workers from each objective generational location discussed generational differences in skill, adaptability and innovation. One owner from the Console Generation suggests that just as skills vary according to educational level, so too do they vary across generations:

I'm sensitive to the differences between college and university programs and I'm sensitive to the differences, generationally, in terms of what skills people are likely to have. (Man, aged 40)

The commonly held view that children are better able to learn a second language than are adults infiltrates the discourse around generations and skill. Within this context, there is a naturalized equation between youth and technological expertise, as one Internet Generation programmer says,

. . . technically in the IT world if you're a young person and you've heard of it [a form of technology] that means you do know it 'cause you can learn it. . . . I mean someone who's grown up on the computer all day or someone who has never seen any computer until they're thirty; it's a huge difference just because of the educational development stages of a younger person compared to an older person. (Man, aged 19)

This respondent attributes being young and learning new technologies to the process of learning itself, whereby youth are considered to have an advantage. This affinity is attributed in part to the notion that technology, similar to literacy, is best learned young. Hence, exposure to technology in childhood is taken to herald computing savvy and technological adaptability. This view was echoed among IT workers in other generations as well. As these members of the Console Generation put it,

. . . the skill sets seem to maybe be *brighter* at a younger age. 'Cause they're learning more, they're reading more and as you get older in life you really just don't learn as well . . . so the younger I think are more adept to learning the new skills and change and able to go with it. (Man, aged 37)

. . . the new age of people coming out of school have been embraced in technology whereas people who are elderly in the workforce may not have had that opportunity. So it's more stressful for them to have to re-learn again . . . I mean if I look at people going through school today even Kindergarten for crying out loud they're on computers . . . we never had that opportunity. (Man, aged 38)

Similarly, in the eyes of many of the Windows Generation programmers, having 'grown up' with certain forms of technology confers an advantage that older generations do not have. While older IT generations are viewed as having to learn, un-learn and re-learn computing skills, the common perception among our respondents is that younger generations innately know how new technologies work. Hence, the timing and extent of exposure to technology is viewed as relevant to one's level of technological expertise and the ability to adapt easily to new technologies. The following quotation from an IT manager from the Windows Generation illustrates this view,

Well I mean a lot of the technology we're working with is . . . really new and from what I know, the younger you start with something, the more accustomed you are to it, the easier it is for you to use . . . I mean we're working with console video games, the first consoles that ever came out I was a kid. *I grew up* with a console . . . and so a console to me is just another device I'm used to. Whereas somebody who's ten years older than me, they don't have quite the same jump. If they're twenty years older than me, it's still a fairly

new bit of tech to them . . . again I think it's more of just what you *grew up* with. (Man, aged 29)

Another Windows Generation IT manager hints at the advantage that the Internet Generation might have in being raised with MSN instant messaging in the home and at school,

And it's 'cause they're of that generation where they're on the computer doing MSN and when I went to school for IT there were a lot of computer things that were also still very new to me . . . that's definitely why it caters to this younger generation . . . because it just wasn't around for people that are even just a bit older than I am, unless you're going into like a hardcore computer science degree. (Man, aged 29)

Older generations of IT workers are also attuned to the relationship between their life course and the timing of technological change. For example, one IT manager from the Pre-ATARI Generation, recounting his experience in high school, describes his generation as 'tactile':

We're the last generation to buy newspapers really . . . that need to touch it and feel and see it . . . a lot of people that I went to school with who are certainly in their senior years now, never saw a computer. And we couldn't even take calculators into high school exams so I'm not sure that that was a good thing but it was the way of the day and age . . . (Man, aged 54)

Members of the ATARI Generation also spoke about workplace inductions into computing. This IT owner recalls, ' . . . these sixty pound laptops with the tiny little six inch screens . . . and I got to use it and learn Word Perfect and DOS at the time' (Man, aged 43). In terms of high school encounters with computers, this technician from the ATARI generation notes that, 'we really didn't have access to them there' (Woman, aged 43). In the view of this technician from the Console generation, lack of exposure to computers in high school is a disadvantage to older workers. As she puts it,

I'd say I come right on the edge of the generation that really started getting into the IT, maybe just missed it a little bit (laughs) . . . a lot of people who are around my age have had a lot of computer experience, as long as they did the training . . . it's not like someone who's older than me and never touched computers when they were in high school. I think they're at a disadvantage in IT unless they really go for the courses. (Woman, aged 34)

The ability to be innovative is highly valued in the IT sector and was occasionally discussed relative to generations. Several workers conceptualized technological innovation as generational and expected the future crop of workers to bring more technological change. As this programmer from the Windows Generation notes,

... I have a feeling that IT's going to be a generational, will be a generational thing. Like we probably won't see a lot of new advances in IT until we kind of reach a generational break ... the students about to start university they'll come out and there'll be some sort of breakthrough and it will be a completely new generation in IT. (Man, aged 29)

There was also a general sense among the Windows Generation that they were the current innovators in IT. An IT Manager says:

... this is what I pictured in school was this environment, it kind of is a generational industry, in that my generation being twenty-nine, thirty are the people sort of taking this thing off. (man, aged 29)

Another Windows Generation IT manager expresses a similar view, noting that technology workers of his age are really leading the way:

It's really weird, see ten years ago there were no thirty year old programmers. Now all my friends who are really good at this are all my age. So now there are thirty and thirty-five year old programmers ... I'm actually in an age group where I'm at the cusp, like I'm on the leading edge of who the oldest programmers are and that just keeps getting older. So we just keep getting BETTER. (Man, aged 31)

Some felt that older generations of IT workers resisted new technology and had developed a loyalty to older technologies. Resistance to change and generational allegiance to a form of technology was sometimes interpreted as a refusal to adapt. According to an owner from the Console Generation,

... the older generation of IT people were not interested in the new technology at all, showed no interest ... a lot of push back from the older IT generation 'get that toy off my desk' kind of thing. (Man, aged 37)

For others, lack of creativity or resistance to change was transmitted to other cultural attributes, such as musical preference. One respondent from the Windows Generation makes this link and argues that a person in their late forties would not be able to create a 'cool' web page:

Rarely is a person who is in the age-bracket (late forties) interested in and up-to-date with what's current in music ... what's current in media ... because they're not really interested in that anymore. Yeah, they want to see a nice movie, yeah they want to hear a nice song, but usually their song is sort of set in a sound that is similar to when they were younger. (Man, aged 27)

Similarly, a woman from the ATARI Generation notes the following about some older workers:

... they've been around since punch cards, they're still programmers and they're curmudgeons (laughs). And they're sometimes fun to work with and,

you know, they usually have the beard and the longish hair and haven't progressed probably past the 1970s, but they're the people that just haven't seen any need to change or progress. (Woman, aged 45)

Although nearly all of our respondents talked about a generational advantage for younger IT workers, there were significant discrepancies about how 'young' this younger generation was. For the Console, Windows, and Internet generations, and even for some of the ATARI Generation, the disadvantaged generation of IT workers was perceived as one just slightly older than theirs. In other words, they thought that the generation just ahead of their own was the one disadvantaged due to lack of exposure to technology in childhood. It was only the Pre-ATARI Generation who expressed a disadvantage for themselves.

Conclusions

In this paper, we examined whether and how people from different computing generations invoke generational discourse in their discussions of IT employment, whether developments in computing technology provide a basis for generational formation and identity, and whether and how the generation concept is used to create cultures of difference in the workplace. Our data suggest that coming of age with a particular technology is viewed as forging an affinity with it. Indeed, the importance of youth and the timing of events has been a recurring theme in studies of generations (Pilcher 1994).

Edmunds and Turner (2005: 573–4) suggest that a 'generational perspective' may illuminate the 'consequences of technological change'. Our research examines generational formation objectively in the context of computing innovation and suggests that technology is highly salient in the formation of generational consciousness. Technological innovation crosses the realms of production and culture and may provide increasingly fine distinctions in generational consciousness and boundaries. As a harbinger of social change, computing technologies may shape and give meaning to generational boundaries in a more accelerated fashion than in the past. Technology, on account of the fast pace of change, provides an apt illustration of Vincent's (2005: 595) idea that '... quite narrow age ranges and very specific experiences differentiate and subdivide broader historical generations'. As our data indicate, computing technology innovations can serve as benchmarks for the development of a collective memory. For these workers, technology acted as a touchstone for generational bonds; there was an evident 'generation connection' in their exposure to technology from their growing years (Cavalli 2004: 157).

Conceptualizations of a generational consciousness based on technology were evident among members of the Console, Windows, and Internet

Generations, whereby symbolic consciousness formed around memories of computer games and internet discovery. These generations felt an affinity with the advent of personal computing on a larger scale. Hence, our findings suggest that generational identification does not require trauma and duress per se. Instead, immersion in technological innovation offers a type of generational affinity. In the case of IT workers, cohesion of generations is bolstered by the further homogeneity of those exposed to gaming and computing technology during key coming of age years.

The fact that respondents discussed growing up with technology in generational terms would only be a matter of intellectual interest if such discourse had not spilled into the realm of skills assessment. Yet, our data show that IT workers invoke generational discourse when discussing perceptions of difference in skill, innovation and adaptability. The common view held among study participants is that technological skill and capacity for innovation are linked to youthful exposure to computing technology. Hence, those who came to IT later in life and generations who missed 'growing up' with certain technologies, are at a disadvantage.

Members of all of the generations used generational discourse to frame discussions of technological expertise and ability. Technological skills were thought to harden in given generational milieus, not easily transplanted, integrated or transformed. Besides skill differences, older generations of workers were also faulted for their perceived refusal to adapt to new technologies and the dictates of business. These findings speak to the salience of generational bonds and timing as a mechanism of social inequality.

According to Eyerman and Turner (1998), generational cohorts sometimes engage in forms of 'strategic closure' of material resources and cultural capital. Generational theorizing on age-based inequities has often focused on labour market disadvantage faced by younger generations. Yet, our data show that mechanisms of closure may be used to exclude older generational groups. Among our respondents, the matter-of-factness with which youth and technological expertise are linked suggests that technological closure on the part of the younger generations is not strategic. None the less, shared views about generational advantage and disadvantage in relation to computing have a bearing on work relations and conceptualizations of 'older' and 'younger' IT workers that disadvantage older workers. The pervasiveness of this view points to biases in terms of age and ability to learn. As McDaniel says,

... the internalization of beliefs about age and technologies, about generations who are trainable or not, has the effect of rendering human generations obsolescent in ways similar to generations of technologies... technology, socially interpreted, deflects responsibility to the individual, and yet individual agency is usurped because one cannot deage, or readily switch into a more technically literate generation. (McDaniel 2002: 584)

For older IT workers, age bias and discrimination may be difficult to transcend, given the apparent rigidity of links between age, exposure to computing innovations and presumed levels of computing expertise. Again, it is the perception of these linkages more than their actual fixity that fuels existing stereotypes about age and technological aptitude. The pace of change in computing technology has been accelerating, which means that progressively younger workers may be linked to 'old' and ageing technologies. The denial among our respondents of generational disadvantage for themselves and the displacement of technological marginalization to the generation 'just before' one's own suggest that generational advantage in computing technology is a moving target.

Reliance on generational discourse to articulate degrees of computing expertise demonstrates that employment relations in IT are shaped by more than objective computing capabilities. In the case of computing technology, Corsten's (1999) concept of the 'cultural circle' may offer additional insight. Recall that the 'cultural circle' involves the realization of a shared interpretive map or schema of a given topic. In computing, this schema may take the form of a stance toward computing technology (e.g. loyalty to certain programming languages or software versions). Although this schema is said to be fluid in nature, in the case of computing, the pace of change may render loyalty to specific technologies a drawback, unless it is an allegiance to change and innovation itself. The actualization of generational consciousness requires an investment of identity, and in this process, notable signifiers from the experience of coming of age are incorporated into the psyche.

Generational experiences are likely shaped by class, gender, nation, and race and ethnicity. None the less, our respondents prioritized generation over other bases of difference. Hence, the articulation of affinities and inequalities through generation is significant. Moreover, there are implications for generational unity, in that similar exposures to technologies may forge generational bonds across other bases of social inequities.

Given the dissemination of computing technologies in many workplaces, our findings likely have implications beyond the boundaries of IT work. Whether and how generational affinities to computing technology shape work environments and concepts of skill in other industries remains to be seen. Sociological studies of generation need to further consider how generational bonds influence social capital and proffer links between productive and cultural realms in relation to social inequalities.

(Date accepted: February 2007)

Notes

1. This research was funded by the Social Sciences and Humanities Research Council of Canada through the Workforce Ageing in

the New Economy (WANE) Project (P.I. Professor Julie McMullin). We thank all WANE team members for their support.

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