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Does Early Exposure to Digital Media Harm Children's Development? A
Cross-Disciplinary Review

Dina H Bassiouny and Chris Hackley

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Does Early Exposure to Digital Media Harm Children’s Development?

A Cross-Disciplinary Review.

Dina H Bassiouni, The American University in Cairo

Chris Hackley, Royal Holloway University of London

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Author contact details

**Dina H. Bassiouni PhD, Assistant Professor, The American University in Cairo,
Department of Management, School of Business, AUC Avenue, PO Box 74, New Cairo
11835, Egypt**

dbassiouni@aucegypt.edu

**Chris Hackley, Professor of Marketing, School of Management, Royal Holloway
University of London, Egham, Surrey TW200EX UK**

chris.hackley@rhul.ac.uk

Abstract

It is often taken as axiomatic that ‘Generation Z’ children, broadly defined as those born since 1995, are marked by different formative experiences to previous generations because of the rapid penetration of digital communications media into this age group. It is important to understand the effects of early exposure to digital technology on children’s development to inform consumer, education, media, and family and social policy. This review paper synthesises a wide range of cross-disciplinary literature to explore the possible influence of digital media on children’s cognitive and physical development, and their socialisation as family members and consumers, using the role of video games in children’s lives as a point of entry. The aim is to bring together a cross-disciplinary range of work to assist in establishing a trajectory for future research into children’s development and socialisation within digital consumer culture.

Extended Abstract

‘Generation Z’ children, born about 1995, are heavily targeted by marketers and treated as active consumers with a high degree of autonomy. This review paper synthesises a cross-disciplinary review in order to explore just what is known about Generation Z children within contemporary consumer culture.

Also described as Post Millennials (Oblinger & Oblinger, 2005), The New Silent Generation (Saldik, 2007), Digital natives (Prensky, 2001), Generation M (Roberts et al., 2005), and the Net Generation (Tapscott, 2009), Generation Z children are assumed to be different in certain respects to children of previous generations (Strauss & Howe, 2006; Lancaster & Stillman, 2003; Martin & Tullgan, 2001; Zemke et al 1999). The key difference is assumed to arise from their early exposure to, and assimilation of, digital communications: especially, video and computer games.

Ownership and use of video games is no longer reserved for affluent elites but has reached a high degree of penetration into this age group. According to Childwise, a leading UK research specialist on children and their families, in 2009, half of the UK children aged between 5 and 10 were reported to have mobile phones compared to 95% of those aged between 11 and 16, while all children in the UK aged between 5 and 16 have access to a PC at home, with half of them owning their own (Childwise, 2009). One in five children aged between 0 and 4 access the internet and 40% of these use games consoles. Also, 83% of children between 5 and 16 years of age in the UK have a game console at home (Childwise, 2009).

While the marketing industry actively pursues this age group as consumers, there is also much disquiet over the way of life of Generation Z kids, with concerns over lack of exercise, lack of outdoor play and inadequate focus on traditional education. Concern often coalesces around the role of video games, played on a variety of consol units, in the lives of these children. Video games, originally designed for young adults, have become an integral part of the lifestyle of many children (Snyder, 2000) to the extent that many prefer them to TV (Griffiths, 1996). Playing games takes a high proportion of children’s time in digital engagement. There have been many research studies into various aspects of children and

video games, including studies of cognitive development, studies of family socialisation, of learning, gender identity formation, and peer socialisation, among others. It is important to build a more coherent and connected base of research findings for evidence-based consumer education, media policy, family development, regulation and social policy. Increasingly, the assumption that video and computer games are 'bad' for children is being challenged, but the bases for these assumptions are often anecdotal. Video games (not only played on laptops and pcs but also on mobile devices, iPads, specialist consols such as Gameboys and so on), have received a bad press because of anecdotes of 'addicted' children or stories that violent crimes were motivated by an unhealthy obsession with graphically violent games. On the other hand, video games have been shown to positively influence some aspects of children's learning, attention and memory. Another widespread assumption is that video games are anti-social, yet the increase in online playing has created a virtual community. Some parents fear that such online access makes children vulnerable to the influence of strangers (Gunter et al, 2005), but there is emerging evidence that children connect online with other children that they already know (Bassiouni, 2013). There is also an assumption that the game consol itself becomes an 'electronic friend' (Selnow, 1984) and inhibits the development of social skills in children (Bacigalupa, 2005). However, many current games allow communication with other players and teamwork on strategic tasks, opening possibilities for co-operation, competition and conflict (Buckingham & Green, 2003; Olson et al., 2008) much like face-to-face forms of socialisation. There remains the possibility that online socialisation is different in nature to face-to-face socialisation, perhaps with regard to the physical manifestations of body language. However, emerging evidence suggest that online interaction is often a supplement to, and not a substitute for, face-to-face interaction for some children (Bassiouni, 2013).

There is a need for a multi-disciplinary research base on the experience of children in digital consumer culture, and a focus on video games provides an entry point into this consumer cultural area. This paper draws together findings from a wide cross-disciplinary literature review in order to begin to establish parameters for a trajectory of research around children and their role in digital consumer culture.

Does Early Exposure to Digital Media Harm Children's Development?

A Cross-Disciplinary Review

Introduction: the Penetration of Digital Communications for ages 5-16

Many children aged between 5 and 16 around the world now have access to digital communications technology in the form of personal computers, mobile phones and computer and video games consoles. The penetration of this technology into younger age groups has occurred at a rapid pace, leaving major research gaps in the field. It is often taken as axiomatic that children today have different formative experiences to previous generations as a result of their exposure to digital communications and the internet (Berk, 2009), but research in different fields has not previously been brought together to examine the implications of this assumption. This review looks across disciplines to focus on children as consumers, and it examines the group that marketing agencies often know as Generation Z, roughly, those born since 1995. The marketing industry has other descriptive terms for this group, including The Post Millennials (Oblinger & Oblinger, 2005), The New Silent Generation (Saldik, 2007), Digital natives (Prensky, 2001), Generation M (Roberts et al., 2005), and the Net Generation (Tapscott, 2009) among many others. Researchers from various disciplines have tried to identify this age group and the characteristics that set it apart from previous generations (Strauss & Howe, 2006; Lancaster & Stillman, 2003; Martin & Tullgan, 2001; Zemke et al 1999).

On one question there can be little doubt- that is, Generation Z is the first generation of children to have access on a wide scale to online communication, mobile phones and interactive computer games in their own homes; they are said to be "born with a chip" (Berk, 2009; Abram and Luther, 2004). For example, according to Childwise, a leading UK research specialist on children and their families, in 2009, half of the UK children aged between 5 and 10 were reported to have mobile phones compared to 95% of those aged between 11 and 16, while all children in the UK aged between 5 and 16 have access to a PC at home, with half of them owning their own (Childwise, 2009). One in five children aged between 0 and 4 access the internet and 40% of these use games consoles (Childwise, 2001). Also, 83% of children between 5 and 16 years of age in the UK have a game console at home (Childwise, 2009). Research has suggested that children spend up to six and a half hours per day in front of an

electronic screen (Woodward and Grindina, 2000) although this is clearly exceeded in many cases. The average estimated time children spend per day in playing on games consoles seems to be steadily increasing (Childwise, 2009). The marketing industry has estimated that 86% of children in the UK access the internet to play online games (NMA Marketing Week, 2007). This access to digital technology has the effect of exposing children to brand communications and internet marketing on an unprecedented scale. There is among children a high order of personal ownership of and engagement with mobile devices, including access to the internet and exposure to a wide range of information from online and offline adult media (Gunter et al, 2005).

Video games, originally designed for young adults, have become an integral part of the lifestyle of many children (Snyder, 2000) to the extent that many prefer them to TV (Griffiths, 1996). Playing games takes a high proportion of children's time in digital engagement. Games have historically appeared as a cultural response to stress and socio-cultural uncertainty (Pearce et al, 2007). Playing them may have developmental advantages in assisting problem solving, socialisation and intellectual development. Yet many of the computer games children play today were originally designed for adults, and they are played via advanced technology which enhances visual realism. It seems problematic to dismiss computer games as 'just' games, especially since they involve online rather than physical social contact. What is more, increasingly, many computer games have an online dimension which extends their scope into social networking, since players can interact, communicate and form teams in online game-playing scenarios.

It is important to note that digital communications technology, especially computer and video games are highly gendered. Boys are more likely to become heavily involved in games, especially if they are shoot-em-up and strategy based genres, while females tend to focus more on social networking and other lifestyle based games (Griffiths, 1996). It is acknowledged that many video and computer games are made by males for males (Gutman, 1982) and they demand visual, depth perception, spatial skills and aggression which are more commonly culturally associated with males (Griffiths, 1996; Maccoby and Jacklin, 1974). Much research, though, has failed to distinguish gendered practices, focusing instead on the commonalities around access to the internet, games and social media in general. Female and male children share a general experience of access to digital and mobile communications although how this plays out in specific practices and pursuits is differentiated by gender. In

this paper we focus on the general shared experience while also drawing attention to gender differentiated issues where appropriate.

There is, then, a sense that profound cultural shifts are being seen around the conduct and experience of this age group. For example, unlike earlier generations, they are considered by the marketing industry to have a high degree of autonomy as consumers (Ekström, 2007), and they are regarded as having considerable influence in family consumer decision making (Thomson et al, 2007; Tinson & Nancarrow, 2005). However, their autonomy as consumers who have access to extensive marketing and consumer information online may not be matched by their physical autonomy to play and move beyond the home in the absence of parental supervision (Weir et al, 2006) and therefore many may spend more time in their home playing on video and computer games, watching TV or communicating with friends via mobile devices (Burdette & Whitaker, 2005). There is, consequently, a fear that their physiological and intellectual development, psychology and socialisation may be different to that of previous generations. Some researchers have suggested that today's children are seen as 'less' social and more impatient than previous generations since they may be more likely to spend their free time alone in their room rather than playing outside unsupervised or interacting with their parents (Weir et al, 2006; McNeal, 1999).

There is a danger that the headline findings of studies such as those noted above may fuel a sense of moral panic about the dangers of digital communications technology for children. In the UK, the popular media often carry stories of crises in children's health because of lack of outdoor exercise, blamed on excessive time spent playing computer games. There are frequent media stories of the dangers children face online from predatory adults or bullying peers, along with stories of 'addiction' to computer gaming causing problems with socialisation or education. These risks must be taken seriously, but there is also a need for a balanced perspective which takes into account the tendency for new technology to be seen as threatening to each generation. In the past, motor cars were once thought potentially dangerous to health because the human body was 'not designed' to travel at speeds of up to 15 miles per hour, while it was once feared that the wide availability of radio might cause widespread insanity. Following the same line of thought, there is also a risk that the technological convergence of 'play' and 'work' tools such as mobile phones and computers might create confusion. It is generally felt that, in the UK at least, traditional school playground games are on the decline, having been replaced by technologically advanced

games and modes of communication. This begs the question of when children's engagement with advanced technology should be conceived as 'just' a new form of play, or as quasi-adult behaviour. Conversely, many adults now play computer games and use social networking websites, creating further difficulties for demarcating between 'child' and 'adult' behaviour.

Most importantly, the research basis of what is known about issues such as these varies considerably. Many studies not grounded in robust social research, but are regarded as received wisdom in marketing trade press and popular psychology publications were used as references (e.g. "Kidfluence" Sutherland & Thomson, 2003; "Brandchild" Lindstorm & Seybold, 2003; "Born to Buy" Juliet Schor, 2004; etc). They have wide 'common sense' credence even though it is difficult to support their findings conclusively. What cannot be doubted is that knowledge about Generation Z is still relatively under-developed.

This paper synthesises research concerning digital communications technology in the following overlapping categories: children's play, socialisation, their role in the family, their emotional, moral and physical development, their intellectual development, their understanding of brands and commerce, and their identity projects. The review engages with popular assumptions, arguments and attempts to inform a balanced and rounded view based on recent research.

The Implications of Children's Digital Engagement

Digital Consumption as Child's Play

Some research has suggested that advanced toys originally developed for young adults are now being introduced to very young children (Cross, 1997; Postman, 1994). Anecdotally, age ratings on computer games appear to be widely ignored by many parents, and by many children. Children have access via the internet to services and websites which are not age categorised and may have adult themes. It has been suggested that, in some respects, this might be contributing to the erosion of childhood itself. Childhood is a historically modern idea, so such claims need to be carefully qualified. Until the Mines Act in 1842, children as young as 4 years of age worked 12 hour shifts underground in coal mines in Britain, so idealized myths of childhood need to be treated with caution. Exactly what children are supposed to do to define themselves as children is historically relative. Some researchers have suggested that differences in knowledge, behaviour or attitudes that set children apart

from adults are diminishing as a result of children's engagement with digital communications technology (Goldberg et al, 2003). This may be a difficult claim to sustain given that definitions of childhood are relative. However, many computer games are now often played, especially by males, into their 40s, while being taken up by children before their teenage years. Consequently it can be said that, in the post-digital era, some consumption practices emerging as a result of digital communication blur the cultural distinction between child and adult behaviour.

Digital communication and children's socialisation

It is important to note that computer and video games have evolved from non-interactive forms to inter-active forms because of the wide use of wireless internet connections which transform games played on PCs or games consoles into social networking vehicles. Not all games have this network capability, but most new produced do so. As a result, the question of whether excessive time playing on games inhibits normal socialisation needs to be examined in the wider context of other socialisation factors in the family and environment. The idea that the computer itself becomes an 'electronic friend' (Selnow, 1984) and inhibits the development of social skills in children (Bacigalupa, 2005) does not appear to fit with the current generation of games. Many current games allow communication with other players and teamwork on strategic tasks, opening possibilities for co-operation, competition and conflict (Buckingham & Green, 2003; Olson et al., 2008) much like face-to-face forms of socialisation. There remains the possibility that online socialisation is different in nature to face-to-face socialisation, perhaps with regard to the physical manifestations of body language.

Gaming also provides children with discursive material which can enhance face-to-face interaction. They share interests at school and talk about favourite games and strategies (Howe & Strauss, 2000). The online interests can be shared via networking but these also leak into the offline world in face-to-face encounters. There is an argument then that Generation Z children need not necessarily be 'less' sociable, but that their socialisation is qualitatively different to that of previous generations. Online games and networking can be seen as a 'play space' for children (Jenkins, 1998) which they are able to use for exploration and experimentation. It is a space they feel they can control in an era in which many do not play outdoors in as unrestricted way as previous generations because of security concerns.

Children and the family: power and socialisation

Children's use of digital communication may be part of a change in family dynamics, giving children more power because of their technical skills and access to information and to peer opinion. In many households, the children are more comfortable with digital technology than the parents, giving them a source of expert power (Tinson & Nancarrow, 2005; McDermott et al, 2006; Ekström, 2007; Sutherland & Thomson, 2003). This power has had the effect of further lowering the age at which children seek and exercise autonomy in decisions which affect them (Sutherland & Thomson, 2003). Following in the footsteps of the teenage rebels of the 1950's and the subsequent generations X and Y, children of generation Z now demand to have an equal right to adults to have their opinion heard (Thomson et al, 2007). Like adults, they exercise this right freely on social networking and mobile media, building confidence in certain forms of self expression within peer environments.

In a study conducted on Generation Y children, it was found that two thirds provided expert advice to parents which influenced the family purchase decision (Ekström, 2007; Sorce et al., 1989). Thus, what is experienced is a process of 'reverse socialisation' (Ward, 1974) in which parents are socializing the children and conditioning them by encouraging them to make sound arguments to get what they want (Moschis & Moore, 1979; Caruana & Vassallo, 2003; Thomson et al. 2007), while the children are socializing their parents into new trends by passing on to them their knowledge and skills when it comes to innovation and technology (Thomson et al, 2007). In her research, Ekström found that children are continuously socializing their parents, not only prior to a purchase but also during and post the purchase incident (Ekström, 2007). Looking back at the literature, it is noted that the process of children being socialized by peers and media and then influencing their parents has been defined as "retroactive socialization" by Riesman and Roseborough (1955: in Ekström, 2007).

Research done on previous generations has referred to children's influence on family purchases by "pester power" (McDermott et al, 2006). Pester power is defined as the effect of children nagging on their parents to cede to their requests. Having this in mind and looking at children of generation Z, it is argued that there is a move from "pester power" to "expert power", with the result that children are regarded as "equal" to adults (Ekström, 2007; Quortrup, 1994; Lee, 2001). Children's autonomy in household purchases extended from

minor basic purchases to major household purchases including electronic gadgets, automobiles, and holiday destinations to name a few. Evidence for such a shift in the power of children within the family must be considered alongside evidence for a broader shift towards a Western model in which female family members have economic power through independent working and family matters are debated and discussed rather than simply being dictated by the older males based on traditional authority (Stueve and Pleck, 2001; Tinson & Nancarrow, 2005; Moschis & Moore, 1979; McDermott et al., 2006).

One economic factor empowering children is the increase in their financial resources resulting from increased general affluence and from changing family models in which grandparents are younger and more able to give children money (Foot and Stoffman, 1998; Sutherland and Thomson, 2003). A further factor is the trend toward both parents working longer hours and spending less time with children, or divorced families in which single parents work long hours, leaving children with both the time and the emotional need to further exercise their autonomy through engagement with digital communications (Lee and Beatty, 2002; Tinson and Nancarrow, 2005; Sutherland and Thomson, 2003). Marketing agencies have noted these trends and increasingly treat children as a defined market segment to be targeted, magnifying the effects of children's economic empowerment and giving them a constitutive power which may undermine the structural power of parents (McDermott et al., 2006; Ekström, 2007). The rising incidence of dual income families, single parent families and 'blended' families has encouraged many parents to treat children more as adults, partly to compensate for a sense of parental guilt at a degree of perceived emotional neglect (Acuff, 1997). Children are, of course, astute at using this parental guilt to negotiate additional freedoms and resources (McDermott et al, 2006), thus further increasing children's autonomy as consumers.

Children's emotional and moral development

The evidence that children's emotional and moral development is influenced by digital communication is conflicting. Most of this research has focused on male children. A link between playing violent computer and video games and committing acts of physical violence is not proven (Anderson and Dill, 2000). But, nonetheless, there have been suggestions that playing such games can result in increased tendencies toward aggression, hostility, early drug and/or alcohol abuse, prejudice toward minorities, reduced school performance, school

truancy, and early sexual activity (Erwin and Morton, 2008; Mahood et. al, 2006; Griffith, 1999; Griffiths and Hunt, 1995; Anderson and Bushman, 2001; Dill et al., 2005; Burgess et al. 2007). On the other hand, some research has suggested that rates of juvenile crime have reduced in Generation Z children (Ferguson, 2008; Kutner & Olson, 2008). Yet at the extreme, there have been incidents of children committing crimes to obtain the money to buy games which tends to support the view of associating violent and malicious acts to playing violent computer and video games (Griffiths and Hunt, 1995; Mclaure and Mears, 1984).

On another level, there are therapeutic elements to games as stress relievers (Olson et al., 2008; Griffiths, 1996). Video and computer games, like traditional games, can engage children's fantasies and act as opportunities for venting and expressing emotions. They can also improve children's reaction times, concentration, cognitive problem-solving skills, and hand-eye co-ordination, and they are often used in professional therapeutic contexts (Griffiths, 1996; citing Spence, 1988 and Gardner, 1991; Anderson and Ford, 1986).

Children's physical development

The increase in children's autonomy and negotiating power within the family setting that has accompanied the rise in engagement with digital communication for Generation Z seems to have had some negative effects on their physical development. Cases of childhood obesity are rising rapidly all over the developed world, although there are of course many other factors involved. Nonetheless, it seems plausible that to some extent at least, children's lives may be more sedentary than previously as a result of the time spent engaging with digital communication. High numbers of children have computers and game consoles in their bedrooms, and it has been reported that many 9 to 11 year-olds in the UK are sleep deprived (Harrison, 2010) because 31% aged between 5 and 16 play with their game console in bed at night (Childwise, 2009). Furthermore, children spending too much time indoors do not get enough vitamin D from sunlight exposure (Harrison, 2010). It has been reported in the UK that rickets, a disease thought to have been eradicated a century ago resulting from vitamin D deficiency, has returned.

Children's intellectual development

Besides diminished school performance because of lack of sleep, there have been suggestions that increased cases of ADHD, associated behavioural issues and shortened

attention spans in school may be connected to computer games (Hill, 2006; Chan and Rabinowitz, 2006), although evidence is unclear and lines of causation are difficult to separate from other factors in the child's environment. It seems unlikely that computer, online games and social networking would improve children's school performance since it constitutes time spent away from learning the official syllabus, although as it has been noted above there is evidence that they may play a part in children's informal development. Some researchers have suggested that high exposure to digital communications such as games actively harms academic performance in children (Roberts et al., 2005; Bacigalupa, 2005). Others have argued that the development of online elements of games, making them socially inter-active, may have beneficial effects in intellectual development (Larson, 2001; Dill and Dill, 1998). Video games are highly motivating tasks to which children devote a great deal of energy trying to solve problems and execute tasks (Dill and Dill, 1998). Video games often have clear objectives, time constraints, rules, progressive levels of achievement and reward for success, and elements of experiential and collaborative learning, making them exemplary learning vehicles, though perhaps not in subjects of the official school curriculum (Gee, 2003; Arnseth, 2006; Veen and Vrakking, 2006).

Children's understanding of brands and commerce

Not all the assumptions about Generation Z are entirely negative. As Beastall (2008) states, this generation has an advanced relationship with technology which they hone from a very early age. Websites like Mickey Mouse Clubhouse, Club Penguin, and other Disney games are developed to appeal to the under 4s. Children have always encountered stories, verbally and then in print. There are two differences in a digital context. The first is that early access to stories for children was previously mediated, that is, regulated and interpreted, by an adult. Children today can access stories in animated form autonomously if they have access to a PC. Secondly, digital access to children's stories is commercially inflected. Access to the website may be free of charge, but there is usually a retail interface giving the opportunity to purchase additional games, action figures or other branded products as accessories to the stories. According to some reports, at least 37% of children aged between 5 and 16 have researched or bought products online (Greenfield, 2004).

The commercialisation (or Disney-fication) of children's stories might be seen as commercial exploitation of children, but it may also be leading some children to become

more commercially aware than previous generations. Some children believe that they are smarter consumers than their elder counterparts (Haynes et al, 2002; Tinson & Nancarrow, 2005). Anecdotally, many parents would agree that children know how to search and access detailed product information about the products and services which interest them. Generation Z children have even been reported to have developed a cynical attitude towards advertising and they view it as something which they can control, for their own benefit (Childwise, 2003). It is widely assumed that children develop an understanding of the commercial intent of advertising at about age ten. This may be changing. What is more likely is that children view traditional advertisements as entertainment not as information and rely more on other sources such as peer information and online reviews for their consumer information.

Historically, knowledge of brands and products has been attained by direct experience of products and services which accrues over time (Achenreiner & John, 2003). Previous research has suggested that children go through a number of stages in their commercial awareness. They have been said to recognize brands as young as 3 or 4 years old (Chaplin & John, 2005; Derscheid et al., 1996), and to develop an evoked set of preferred brands within familiar product categories by age 7-8 (John, 1999). At a later stage of development, children's views on brands develop from being perceptual and concrete to being conceptual in that they start forming symbolic brand associations and linking the brand with their sense of self identity (Chaplin & John, 2005; Achenreiner & John, 2003). However as is the case with elder consumers, the children of generation Z are now purchasing products for the image associated with them rather than their functional features (Achenreiner & John, 2003), which gives credence to the 'kids are getting older younger' phenomenon that is widely associated with this generation. Generation Z's access to the internet and their subsequent accelerated development as consumers has meant that now children as young as 8 years old realize that having the right brands are the quickest way to acceptance by reference groups (Kantrowitz & Wingert, 1999; Chaplin & John, 2005; Lindstorm and Seybold, 2003). In their awareness of brand symbolism and its implications for self identity and group membership, Generation Z may be exhibiting commercial awareness that is more like that of adults.

Regardless of whether children really are acquiring advanced analytical skills in the online commercial context, there is a self-confirming logic to the new marketing strategies. Children may be responding to expectations that they act more like young adults, without the accompanying emotional and psychological development. Access to the internet seems to

have accelerated the process of commercial awareness and detached it from direct product experience because of the presence of opinion-forming blogs and internet comment, especially by childhood peers. This implies that children may form brand preferences at a very early stage, before critical intellectual skills have fully evolved and before life experience has been accumulated.

The assumption that Generation Z are acquiring extensive brand knowledge and forming strong brand preferences at a younger age than ever before (Achenreiner & John, 2003), and, in particular, that “new” media, which refers mainly to the internet, has shaped generation Z’s experience and understanding of brands and influenced the way they think and learn (Greenfield, 2004; Narin et al., 2008), now has wide currency among brand marketing organizations. They are now responding to this assumption by targeting young children as a primary market and not merely an influence market (McNeal, 1999) because, as we note above, they have access to financial resources through increasing levels of expectation as regards spending money provided by adults (McDermott et al, 2006). In 2005, Childwise reported that, in the UK, purchases made from children’s own money were estimated at £3 billion, with another £30 billion’s worth of purchases accounted for by influencing adults in the purchase of children’s products or general household purchases. Children’s direct and indirect influence in family consumption decision-making has been said to have increased substantially, partly as a result of their empowerment as consumers via their online engagement (Thomson et al, 2007; Ekström, 2007).

Liminal tweens and children’s identity projects

Adolescence can be conceived as a ‘liminal’ stage of ‘fruitful darkness’ (Turner, 1995: 94) in which possibilities for identity abound and experimentation can take place at the threshold of adulthood. Many young adolescents report that they use the internet and online gaming specifically for identity experimentation (Gross, 2004; Maczewski, 2002; Valkenburg et. al, 2005). The advantage of the virtual world is that identity experimentation may not carry the risk of repercussions entailed in the physical world (Turkle, 1995). On the internet, children can play with identities that can be quickly shed and changed. Baudrillard (1994) argued that humans “wish to be seen and not seen, they wish to appear but not lose their privacy” (in Hegarty, 2004:114). This is resonant with the modern digital media and contingencies for simulation it offers.

Individual identity integrates with group identity; often one is achieved through the other. Children playing online-video games tend to develop a strong and meaningful collective identity with other players; consequently creating an informal social group which is based on shared interest and voluntary membership (Friedman & McAdam, 1992). Children may often engage in online communication with friends whom they have never met face-to-face (Griffiths et al. 2003). Within these informal social groups, players tend to formulate the culture of the group and its identity through the interaction and the common social norms in the electronically mediated communication thus develop a sense of we-ness among its members. This is achieved sometimes by devising their own set of language and codes that are meaningful to them and that accordingly help in incorporating themselves into their new found reality featured in the game world (Fayard and DeSanctis, 2010).

A further element of identity connected with digital communication is that it has become a new form of cultural capital, much as advertising was for the previous generation (Willis, 1990; O'Donohoe, 1994). Knowing and using the digital landscape has become a tool for successful socialisation among children, they can be seen as 'cool' by being advanced in their knowledge and use of digital technology. Engagement with digital media does not necessarily replace face-to-face interaction for children, but can actively enrich it by creating spaces for expressing mutual interests and forming identification strategies.

Concluding comments

Children are not passive dupes in the thrall of digital communications technology. Manufacturers are highly responsive to consumer behaviour and in this sense children are active in shaping the way that digital media are developing. The developmental consequences of Generation Z's deep involvement with digital communications technology, can be as individual as children themselves, and in most cases cannot easily be separated from wider cultural and social issues. For example, there are clear risks around physical development as outdoor activity and exercise become subordinate to internet time, but this is bound up with other issues including the place of sport, exercise and diet in the school curricula, the availability of outdoor play facilities, the perception of risk in outdoor play, the tendency for more adults to take less exercise, and the rising rates of obesity across the population in general. There is no doubt that excessive time spent engaged in digital media can have negative effects on children's physical development. Equally, there can be little doubt that

wider cultural trends are facilitating increased time on digital media for Generation Z children. Rising rates of family breakdown, increased disposable income, increasing constitutive power for children within many families, longer working hours for adults, and the vast marketing resources devoted to targeting Generation Z children as a major consumer segment all make life difficult for the parent or carer who wants to control the time their children spend on digital media. There is no conclusive evidence that the engagement with digital media, and especially computer, video and online games is harmful in itself. There is some evidence of negative effects on socialisation and development, but there is also opposing evidence which suggests that there can be positive consequences for children's socialisation and development. It appears that the more negative consequences require other contributory factors which result in digital media featuring as too great a presence in a child's life, for example by substituting virtual for face-to-face relationships and by disrupting school or other offline activities. However, in general, it appears that children have proved adept at integrating the technology into their lives in ways which are often creative and positive. The technology in and of itself seems to carry little risk of short or medium term harm, it is the context in which it is used which creates the possibility for harm. Clearly, the broader intellectual, social and physical skills which come from other pursuits, reading books, playing physical games and sports and engaging in face-to-face conversation remain of great importance. Equally clearly, access to digital media has become intrinsic to childrens' socialisation.

The phenomenon of the digital generation is still very new and continuing research is needed to monitor longer term implications. One simplistic message for parents might be not to worry about digital media but ensure that children's lives are balanced with adequate physical activity, school work and sleep. However, this is indeed simplistic because the technology is part of the changing dynamic of family relationships: the technology is neither a cause nor an effect in childrens' development but both, in partnership with wider socio-cultural trends and policy issues. The powerful presence of digital communications technology in children's lives cannot be reversed; it has become a precondition for Generation Z's socialisation more than an alternative to socialisation. The technology itself will not determine childrens' development, but it occupies a central place in childrens' lives. Digital media are not merely adult technologies which children happen to use. A well-

informed understanding of the engagement of children with digital media should be central to the development of policy in all areas which affect children.

Importantly, it appears that the answers to the question of whether digital media act positively or negatively on children's development are highly contingent on cultural and family issues. Children have proved extremely adaptive to a digital and online world, and they live part of their lives in a liminal zone in which online and offline experiences merge in a fluid way, allowing for much experimentation with identities, social relationships, attitudes and modes of communication. Children are treated by marketing agents as autonomous consumers on the internet, and they respond in adult-like ways. Digital media do not necessarily act negatively upon children, since children are active in shaping the development of these media. However, their developmental experiences of life are qualitatively different to those of previous generations, and these differences need to be better understood.

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