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POSSIBLE EFFECTS OF THE ELECTRONIC SOCIAL MEDIA ON GIFTED AND TALENTED CHILDREN'S INTELLIGENCE AND EMOTIONAL DEVELOPMENT

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ABSTRACT

In just a few decades, electronic networks have expanded beyond all expectations. Instant messaging via smart phones and computers of all sorts whizz round the world. Researchers and policy makers are strongly divided in their findings and conclusions as to the effects of possible persuasive changes on the minds and lives of children, particularly the gifted. Although electronic social media might have positive effects on learning, professional development, gifted advocacy, research and policy-making, they might also encourage superficial rather than deep thought to negatively affect children's intellect and personal relationships. This paper takes a look at some approaches to the interactions of positive and negative impacts with special implications for gifted and talented children.

Key words: social media, evidence, culture, intellect, relationships, morality

Enthusiasts for the electronic social media argue passionately for the new ease and speed it brings to communication. So often, though, the widespread assumption seems to be that these powerful new tools are good for civilisation. Some educators are keen to set up and spread electronic networks, as the way forward for the development of gifts and talents. I am questioning whether this eagerness is entirely justified. It is possible, for example, that the speed of electronic communication can detract from the depth of children's understanding and creative thinking. I am advising caution.

Scientific evidence on the effects of the electronic social media, whether on individuals or society, is still fragile and inadequate. What is more, the research conducted so far often seems to produce diametrically opposed findings and draws conflicting conclusions. It is not possible to describe with certainty what sort of effects the electronic social media might be having, in particular, which effects may be positive and which may be negative.

Involuntary involvement with the media can start even before birth when parents publish foetal ultra-sound images on the internet. In North America and the EU, even before they can walk, 81% of children now have some kind of online presence through their parents. A quarter of Western children between the ages of eight and 12 have social networking profiles (AVG, 2010).

Perhaps unexpectedly, there seems to be almost no gender divide. Whether playing computer games or using phone apps, boys are only more active than girls by 1%. By middle childhood, only 52% can ride a bike while 70% can play computer games. Coincidentally, morbid obesity is rapidly rising. This could be partly due to the recognised drop in children's exercise which is related to the dominance of the electronic social media in their lives.

I am concerned here about the effects of the electronic social media on the development of gifts and talents. In a complicated scene, I am focussing on the evidence in just two important arenas. The first is intellectual development and the second is developing relationships, which include morality.

HIGH LEVEL INTELLECTUAL DEVELOPMENT

Evidence is emerging that that e-mails, social networking and texting might not only be changing children's cognitive functioning, but also the physical make up of their brains. Electronic social media probably affect both children's style of learning and the way they use their minds. But if so, we are not sure how. Any changes may be of a similar kind across the whole range of intelligence, or they may affect different levels of intelligence in different ways.

We do know, though, that cognition and even brain structure can be changed by the way the brain is used. An example comes from studies of London taxi drivers. To earn their licenses, drivers in training spend three to four years cycling around the city, memorizing a labyrinth of 25,000 streets within a 10-kilometre radius of centrally placed Charing Cross train station, plus thousands of tourist attractions and hot spots. Additionally, drivers must show they are able to instantaneously calculate the swiftest route between any two points. 'The Knowledge', as these skills are called, is unique to London taxi licensing and culminates in a series of very difficult exams that only about 50% of candidates pass.

MRI scans over five years found that a licensed taxi-driver's right posterior hippocampus - a seahorse-shaped section in the brain that is crucial for long-term memory and spatial navigation was 7% larger than normal by a significant difference (Zeidman, Mullally, Schwarzkopf, & Maguire, 2012). Their intensive training was apparently responsible for their larger-than-average memory centres. In fact, the longer someone had been driving a taxi the larger his or her hippocampus, as though the brain had expanded to accommodate the cognitive demands of navigating London's streets. Excelling at one form of memory, however, may have inhibited another as the licensed taxi drivers did worse than non taxi drivers on tests of visual memory.

If this can happen to adult brains, it is more than likely that the effects of specialist training and means of learning will have a similar effect on the make-up and functioning on the developing brains of children - for the rest of their lives.

Some researchers believe that too much attention to screens and fleeting superficial interactions diminishes children's brain power and that the internet provides a poor schooling for considered thought. For example, the Pulitzer Prize non-fiction winner in 2011, Nicholas Carr (2010), after considerable research into the scientific findings on the subject, concluded that although we enjoy the Net's bounties, we may be sacrificing our ability to read and think deeply. And yet, one could also say that tweeting focuses your mind on the crucial point of whatever research or story you are tweeting about. It also

provides another platform to get your ideas out there and noticed.

Human thought, Carr said, is shaped through “tools of the mind” so that changes in our brains come not only from responses to our experiences but also the means by which these are delivered. His prize-winning research suggests that the technologies we use to find, store, and share information can physically reroute our neural pathways (as with the cab drivers). We have known for centuries that creativity is influenced by tools of hand and mind, and all in a socio-cultural setting (Wertsch, 1998). If, for example, simply using a thicker brush changes the painting on the easel, how much more might a radical change of perception change the development of creative thinking?

Marshall McLuhan’s famous phrase of the 1960s – “The medium is the message” – meant that the means of communication is itself part of the message. Understanding is changed because of the way information is delivered and perceived. Carr’s thesis has a ring of truth, and if true, the deterioration of deep intellectual thought will soon be measurable. There is, though, a counter argument that certain kinds of intelligence as measured by IQ tests are going up.

A strange phenomenon has been described by Prof James Flynn of the University of Otago, New Zealand (Flynn, 2012). Beginning in the 1950s, he demonstrated a year-on-year rise in measured intelligence of about three IQ points a decade, called the ‘Flynn Effect’. The increase has been highest at 20 points per generation (of 30 years), in Belgium, Holland and Israel, and lowest, at 10 points per generation, in Denmark and Sweden. Although the data are limited, it seems that the increase in IQ is accelerating. In Holland, for example, scores went up most (over 8 points) for the most recently measured period, 1972 to 1982.

Yet while advanced countries may even be reaching a plateau by now, developing countries have yet to see this rise at all. Flynn believes this is due to modern changes - such as more intellectually demanding work, greater use of information technology and smaller families where each child gets more attention. For nearly a century, he says, first world youngsters have become very much better at manipulating abstract concepts such as hypotheses and categories. Something major is happening in their heads. It is not so much that natural intelligence is simply going up; the big changes are in the way in which information is being received and used.

In theory, then, we should be seeing proportionately more gifted individuals as the years go by, and longitudinal studies should pick up the changes. This change could even alter the bell-shaped curve which social scientists use to see what is normal and what is unusual. The gifted come in at the right-hand tip of the curve, indicating relatively fewer of them. Possibly that slope will change form. But it may also be that the familiar IQ measure has to be adjusted to new styles of knowledge acquisition and reasoning.

Certain intelligence tests which use abstract, non-verbal patterns, like the Raven's Progressive Matrices, are possibly the best designed to measure this new way of thinking. Yet the old-style tests which ask for more memorised information are still the most popular, tying in with the school-style learning required for examinations. Flynn says it is not that our ancestors were more stupid, but that they thought differently. He provides an illuminating example – ‘What do a dog and a rabbit have in common?’ Whereas a bright

modern child would say they are both mammals - an abstract answer – fifty years ago they might have said that you catch rabbits with dogs - a concrete answer.

This emerging style of cognition offers a greatly superior facility to be able to think through both theoretical and practical problems. Computers for education and even games can boost the curious child's knowledge and intellectual agility. Just using everyday appliances, such as ipads, tablets and mobile communications equipment, demands a more abstract type of perception and reasoning, which older generations can find extremely difficult.

Subjectively, in my private psychology practice I am seeing increasing numbers of unquestionably gifted children between two and five years-old measured within the top 1% of the population. These very young children appear to thoroughly enjoy the intellectual tasks, and it seems to me that the higher their intelligence, the greater their pleasure in the challenges. At barely two years old, little ones can draw simply, explain similarities and differences deal with geometric shapes and spot a missing bit of a picture – and read fluently. Almost all of them know how to use a tablet to play games.

As I am the only psychologist in the UK who specialises in assessing very young potentially gifted children, I have no means of comparing what I experience. It is difficult to know whether the increase in parents seeking help is due to the Flynn Effect or to increased concern with gifts and talents. (Nor can I say why increasing numbers of young children are diagnosed by their teachers as showing Asperger's syndrome.) Typically, the gifted children I see have the essential problem of education. Parents are often desperate to know how to support those who are reading fluently and doing simple arithmetic by the age of three, long before they reach formal school in the UK at the age of five.

The media spread of indiscriminate information is not only a matter for the children; parents use it too. Any twitterer, blogger or Wikipedia addition may distort the truth. The effects of the electronic social media go well beyond individual development. Slick concerted presentations can indeed change beliefs and behaviour whether true or false.

We scientists are very fond of 'on-the-one-hand-but-on-the-other-hand' type of argument, which is not usually the way of the social media. Carl Gustav Jung (1964) coined the expression, "The shock of the new". So often in the past, new inventions have been ill received in society, the underlying objection usually seen as a threat to morality. Notably, translating the bible into the spoken local language meant that people could read it for themselves and not be directed by a priest. But evidence and fears about the new electronic social media is far more shocking than its novelty. There is scientific evidence that children's developing brains are being changed in both their functioning and form, and there is a serious need to step back and look closely at what may be happening.

RELATIONSHIPS AND DANGERS

Networks are not new. Individuals have always been connected to a broader interactive set of social groups. Relationships are essential for emotional support and quality of life - for most animals. When these connections are limited to any degree, such as with individuals afflicted by autistic spectrum problems, it is extremely hard to function in society.

There are risks and benefits to belonging to any social group, whether of competition or cooperation. The size of the group too makes a big difference to how it works. Membership of very close groups, such as family and friends, are more costly in time and emotional involvement. A widely spread group, such as an electronic social network, lowers intimacy and in theory costs much less in time and energy, unless it becomes addictive. Blogging, like any other activity, takes time away from something else. Yet, talent and content still count, as does style of presentation. Boring is boring in any medium.

Deep personal changes we cannot yet anticipate in the coming generation could involve the multiplication of selves that is now possible online. There are children for whom electronic avatars can become almost real, whether of their own electronic images and virtual lives, or those of others. Heavy involvement with the electronic social media might be involved in increasing mental illness such as schizophrenia (Dokoupil, 2012). Certainly, many more children are being diagnosed as on the autistic spectrum and put on drugs. It is difficult to say, though, whether this is due to a current trend to this diagnosis, its long awaited recognition, or the effects of the electronic social media.

In all social groups, there needs to be minimum level of mutual trust. The stronger the trust the stronger the group. That precious trust depends very much on the Theory of Mind capacity to interpret the social intentions of others (Wellman, 1990). Abuse of that trust comes for example, in vicious anonymous emails and tweets. Innocent children may take trust for granted which leaves them open to abuse at many levels: older sophisticated and experienced youngsters may lack trust and set up barriers which prevent intimacy. In spite of all the good words said about the electronic media, cyber bullying – trolling – whether from individuals or groups is rampant. It has never been easier or more widespread to spread lies and threaten others. It can and does drive youngsters to suicide.

The Theory of the Social Brain proposes that supportive social groups increase intelligence (Sutcliffe, Dunbar, Binder & Arrow, 2011). The idea is that individual brain size – that is the actual volume of the neocortex - evolves to match the demands of membership of the social group. That idea, though, is based on non-electronic social interaction, which in the old days would amount to about 150 personal contacts at any time. It might no longer be applicable when great numbers of people in social groups never actually meet or interact personally. Social networking sites can carry so very many more members, some of whom have only weak ties in the lists of friends. This might only be a keyed-in name - and even that may be a false one with no interaction at all.

And addiction ... we know all too well reports of sad youths in their bedrooms who spend all their waking hours on the Net. Some may be intellectually gifted, but I doubt whether anyone would call them healthy. The myth that gifted and talented children are more vulnerable to negative social influences is still widespread, but the evidence shows that they are in fact emotionally stronger than other children (Neihart, Reis, Robinson & Moon, 2002). Without that emotional strength, they could not be creative and high achievers (Freeman, 2009). In theory, they should be less afflicted by the electronic social media, but there is no evidence to support any conclusions on this.

Some unexpected secondary effects are also beginning to emerge from the many hours of staring at screens. For example, it is not a good idea to read eBooks in bed. Why? Because research reveals that back-lit screens suppress melatonin levels in your brain by

as much as 22% (*The Times*, September 2012). This brings insomnia; and insomnia has other effects on daily life such as fatigue, bad temper and so on. Fatigue affects the individual's precious supply of willpower, for example (Baumeister & Tierney, 2011). Each morning provides people with a fresh and renewed supply of willpower – but only after a good night's sleep and a healthy breakfast.

Morality does not change

The vast and instant reach of the media has certainly affected social change. We have plenty of evidence about events such as the Arab Spring to judge by – though the Czech Spring managed perfectly well without it. Not all tweets or blogs results in joyful gatherings; they also promote riots, murder and introduce children to pornography. Moral conduct has not changed, only the means and speed of reach by which it is communicated.

From all the evidence, it does not appear that the gifted and talented are likely to be any more moral in working the social media than anyone else (Freeman, 2008). The gifted may be better at mastering the technology and the more literate may be better at expressing themselves, but this does not imply a finer sense of respect for the views of others. Oxford University neuroscientist Susan Greenfield believes social networking sites are damaging moral values. Possibly too, young people who use sites like Facebook and games for hours every day might lose the ability to feel empathy for others (Greenfield, 2012). There is no accountability in the electronic social media.

In September 2012 in London, Sir Tim Berners Lee, inventor of the World Wide Web, while objecting to censorship also warned – “We have to keep ahead of organised criminals and terrorists” (*The Times*, 2012). It looks as though the new media provide the same moral dilemmas as the older media. The difference is in the speed of communication and possibly a greater and more naive belief in the truth of what is being proposed on the web than what is presented in other static media.

The glories of the electronic social media are exciting to use and hold immense potential for a world of good things. Yet although it's immediate effects are still difficult to be sure about, its long-term effects are entirely unknown and its advance is swift and unstoppable. The outcomes are far too important to be accepted uncritically.

The electronic media present a great challenge to produce evidence on which to base possible educational interventions for the most able. These could be, for example, discussions in school on possible effects of virtual relationships, or investigations into the accuracy of information on Wikipedia. Ziegler and Stoeger in Germany are running an exciting electronic venture, an e-mentoring program of CyberMentors offering students (notably girls) personal mentoring in Science Technology Engineering and Mathematics (STEM) using a virtual community (Ziegler, 2012). Across Germany, more than 2,500 mentoring pairs have been involved. The scheme is well advanced and is expanding further.

Those of us working in psychology and education are in the forefront of professional care for the intellectual and emotional development of children. This paper presents an urgent call for research to increase evidence and awareness of the effects of the electronic social media on the hearts and minds of our children. This would also provide a basis to devise and improve specialist interactive electronic programmes for the gifted and talented.

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