Autism and Social Media: An exploration of the use of computer mediated communications by individuals on the autism spectrum.

University of Glasgow Chancellor’s Fund, Student Project Report

Jemma Byrne

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This literature review highlights some key research findings on the use of computer mediated communications (CMC’s) by people on the Autism Spectrum. The report looks at how social networking sites, second life programmes, and other social media can facilitate, or negatively affect, the communication needs of individuals with Autism Spectrum Disorder. The report is the result of an undergraduate project funded by the Chancellor’s Fund, University of Glasgow, and was undertaken in partnership with Scottish Autism.

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SECTION A

Summary of key research articles that enabled the writing of this report.


A qualitative investigation into the communication needs of the ASD population conducted via email interviews. The researchers’ focus includes: the need for control, clarity, the role of nonverbal communication and the social role of communication. The authors outline how CMC’s enable individuals with autism to aid their communication abilities while acknowledging their possible limitations and issues to be aware of.


Another qualitative research study looking at the social communication needs of individuals with ASD and how well CMC helps to fulfil them. Key themes include: the pros and cons of the mechanics of CMC; initiating social contact; and problems maintaining the connection with contacts. The latter theme included three relevant sub-themes: knowing who to trust, knowing how much to disclose, and understanding CMC specific norms.


A quantitative, longitudinal study, using a non-clinical sample of young married couples with the aim of assessing whether there is a link between compulsive internet use and autistic traits. Their findings are among the first to supply empirical evidence that autistic traits are linked to compulsive internet use in both males and females.


An investigation which claims to be the first quantitative piece of research to assess social media use within ASD populations. The researchers assessed the level of use, the reason for use, and the effects of social networking on friendships and loneliness within a clinical ASD sample.

The most frequent reason reported for using social media or social networking sites (SNS) was social connection. Adults with ASD who used SNS were more likely to have close friends and those that used SNS’s for social engagement reported closer friendship relationships.
Greater offline friendship quality and quantity, not social media use, were associated with decreased loneliness, implying that SNS weren't associated with decreased loneliness.


This study was conducted to assess the occurrence of traditional bullying and cyber-bullying in a young population of individuals with Asperger’s syndrome and or ADHD by assessing how often the children had ever been a victim or perpetrator of traditional or cyber-bullying. The authors also aimed to assess the social, psychological and health effects of such bullying. The researchers also wanted to compare their parent’s perceptions and understandings of their child’s online experiences with their child’s reality in order to examine how well adults communicated with their children about their activities online. The resulting disconnect between children and adults accounts lead the authors to suggest a greater need for more clear communication and correspondence between parents and children in regards to discussing online activities and behaviour.


This is an article that assesses the virtual online community of Second Life for autistic CMC users. The author considers the ease of operation, the implications of the creation of a virtual self, the virtual immersive and educational communities and the opportunities for support and advocacy. It also considers possible challenges and drawbacks that users may face including difficulties in operation and feeling isolated.


This is an explorative review discussing the use of virtual 3-D worlds in the application of e-Health for addressing various psychological issues. It looks at how the immersive, realistic but virtual environment provides a cohesive place for patients to virtually address real life issues in the presence of clinicians and other patients to rely on for support and also the issues that could arise such as being too dependent on 3-D virtual communities for support, and delaying progress.
SECTION B

Autism and Social Media: An exploration of the use of computer mediated communications by individuals on the autism spectrum.

Abstract

Social media has become a part of daily life. It allows users to make contact with others at any time across great distances making it a convenient and widely accepted form of communication. Individuals with Autism Spectrum Disorder (ASD) are often hindered in their ability to communicate face-to-face by struggling to make eye contact and sustain conversation, creating difficulty in making and maintaining friendships. This paper considers how CMC can help individuals with ASD to communicate with others and also to raise awareness of possible issues they may face. By alleviating the social and environmental pressures experienced in real life situations, ASD individuals can gain more control and confidence in what they share with others when conversing online and are more likely to find other people who share the same interests and experience. However the convenience and anonymity of the internet can also present issues to individuals with ASD such as compulsive internet use, cyber-bullying and deception by others. An outline of where future research should be aimed will also be discussed.

1. Introduction

Autism is a developmental disorder which can be characterised by a range of difficulties involving communication, sensory and information processing, and flexibility in thinking and imagination (Roth & Barson 2010, Frith 2003). The difficulties of individuals with Autism Spectrum Disorder can range from severe to mild impairments, meaning that individuals on the spectrum can have very different needs (Attwood 2007). Communicating is a typical problem encountered by individuals on the autism spectrum as they are often hindered by the struggle to make and maintain both eye contact and conversation. This makes it difficult to make and maintain new friendships (Burke, Kraut & Williams 2010). However the recent widespread use of computer mediated communications (CMC) and computer screen media has become widely popular in ASD and neuro-typical populations alike. (Finkenauer, Pollmann, Begeer & Kerkhof 2012)

In an increasingly fast paced, technological world computer mediated communications (CMC) have become the appropriate and simple means of contact between friends and professionals by allowing users to make primarily faceless and instant contact with others at any time of day, across great distances making it an easy, convenient and preferable mode of communication.

In fact CMC’s advancement has been so fast, its impact is becoming an increasingly widely researched area of psychology (Hidy, Porch, Reed, Parish, & Yellowlees 2013). Investigations have been conducted into it’s possible applications for the clinical treatment and improvement in psychological conditions (Gorini, Gaggioli, Vigna, & Riva 2008) and the
effects of group support that can be achieved through online communities for people with disabilities (Perkins & LaMartin 2012). These advancements ‘Telemental’ health research and widespread use of CMC and SNS has also encouraged researchers of autism to investigate how this medium can impact people with ASD’s lives and communication skills (Benford & Standen 2009; Burke et al. 2010; Mazurek 2013).

This paper seeks out the key research on autism and CMC in order to report on how this up and coming medium is providing new social possibilities to individuals within the autism community as well as acknowledging common issues that seem to arise repeatedly with its use. The aim of this paper is to investigate how the internet can both serve and disappoint ASD users by acknowledging that it can be a place of opportunity and possibility but can also be a place of disappointment and tribulations. By recognising both the pros and cons for individuals with autism the key areas for future research will also come to be acknowledged with the hope of advancing knowledge on this important area of researching autism and Telemental health, as well as providing an overview of common issues for Autism practitioners and families of people with ASD.

2. The Internet as a place of opportunities and possibilities.

For what purpose do individuals with ASD use social media?

A study involving a clinical sample of ASD individuals (Mazurek 2013) found that the most commonly cited reason for using social networking sites was for "social engagement and connection", with 64% of their sample citing this as a reason, followed by the disclosed purpose of entertainment (22.1%) e.g. gaming and researching special interests. Other individuals (5.2%) stated no explicit reason for their use and fewer individuals cited reasons including keeping contact with relatives (3.9%) and for business and work (3.9%). In line with these findings, Burke et al., (2010) found that over half of the participants in their sample were seeking new friends or potential romantic partners online as they struggled to initiate new connections or even maintain current ones in real life as they had difficulty appearing "normal".

Therefore how does CMC allow ASD users to achieve these social purposes and the process of making new friends?

Initiating friendships with others with similar interests or backgrounds

As previously noted most ASD individuals tend to use computer mediated communication to ease the process of meeting people and maintaining their new friendships. Burke and colleagues, (2010) noted that the strongest foundations for online friendships were those that were based on shared interests.

A relevant feature of the internet which seems to aid this process is the opportunity to disclose special interests and in turn search for likeminded people who share those interests by use of keyword searches on both member directory profile and online groups. This is a useful prospect - not available in the real world - (Benford & Standen 2009; Burke et al. 2010) meaning that users can then strike up conversations with others based on their shared interests. Fan pages and enthusiast websites that revolve around particular topics, e.g. film franchises also provide this shared foundation for users to initiate contact.
Once a common interest and connection has been established and maintained, there is a possibility for users to physically meet up and take their online friendship offline. In Burke and colleagues (2010) study one user described that many other users of an enthusiast website that she’d become familiar with lived in the local area meaning meet-ups became a regular feature to their friendships.

It’s also worth noting in this section however that some users noted they didn’t find likeminded users even when in specific online Autism communities. Although supportive initially, they were described as being “clique-ish” at times, and others mentioned the conversations shared weren’t fulfilling enough for users who could struggle find other users who lived nearby and shared a similar age and functionality (Burke et al., 2010).

**The possibility of more control during communication**

For individuals with ASD or Asperger’s syndrome initiating conversation can be a daunting task made worse still by the difficulty to maintain conversation. Therefore it is little surprise that the anonymity and faceless nature of CMC affords them great benefits in terms of control of conversation, time to reflect and consider what they want to say while not needing to worry about eye contact or facial expressions.

Benford and Standen's study (2009) yielded a lot of interesting findings in terms of control during communication for ASD individuals. They found that more control during communication was achieved via the restricted bandwidth of CMC, the permanence of the text format, and its asynchronous nature. These features allowed users more time to edit and consider their responses ensuring they are appropriate and relevant. This means that there is less pressure on users and therefore simplifies what can be a challenging and stressful process in face-to-face interaction. It also affords them to control the structure of the conversation and they can even log off if they do not approve of where the conversation is heading. As well as alleviating the social pressure and demands of individuals with ASD, the format of CMC diminishes the overbearing sensory variables that often occur in real life group communication situations. Individuals with ASD can have group discussions online without extraneous distractions: for example, group discussions in chat rooms can occur simultaneously without the overbearing noise that would be encountered in such real life situations.

**Identity freedom**

As well as control over the conversation process CMC users can moderate how they are perceived by others by controlling what they disclose to others in terms of actual information shared and exhibited body language. This also circumvents difficulty engaging in eye contact due to the facelessness of CMC. This relieved pressure can also help people with ASD to feel less socially awkward and more comfortable in their ability to communicate. One user noted that in online communications you can “convey what you want to convey. You can be seen as yourself” (Benford & Standen 2009). Second Life also affords this opportunity and even allows for identity play. In a study by Danilovic (2009), an autistic lecturer who was interviewed said he enjoyed the unique avatar creation involved in second life as you could create a virtual being based on how you see yourself—whether it be anthropomorphic or non-anthropomorphic it is your choice how you represent yourself. This sums up how most users interviewed felt about CMC in general and indicates how the increased anonymity and
control that its features provide, allow adults with ASD to choose how they portray themselves (and even if they want to disclose their autism or not) while working on their communication skills in a more comfortable environment (Gorini et al. 2008).

**Ease and clarity of communication**

For ASD users initiating and understanding conversations can be difficult. However “pre-packaged interactions” for example birthday reminders and greetings and features such as Facebook’s “like” button were noted by Burke and colleagues (2010) to be of use as they removed the need to think of something to say, were easily interpreted and good ice breakers to initiate conversation with someone new.

Despite all these positive features, Burke and colleagues (2010) also acknowledge some operational features of CMC that can make communication difficult. In chat room situations conversations are very fast paced and changeable and the factor of “window management” (i.e. the handling of multiple task windows) could lead to inadvertently offending others. This is particularly marked in instant messaging as they note that it is possible to gossip about one friend to another friend but accidentally message the person whom the gossip is about. This could lead to conflict and therefore users would need to take great care.

Sensory overload isn’t a problem that is removed completely either as there is still the possibility of being overwhelmed with information. Danilovic (2009) notes an example of this possible issue in Second Life as the learning of the operations and software could be overwhelming and require time, practice and patience for comfortable and competent use.

**Talking through problems with others and Gaining support and advice**

Computer mediated communications and SNS don’t just allow for interests to be shared. Individuals can compose their own ASD specific pages or visit readymade Autism online communities to share experiences and advice. Many autistic CMC users seem to visit forum discussion pages to share problems and seek others help and opinion, making friendships and connections based on similar past experiences (e.g. Wrong Planet, Society & NAS, n.d. 2013.). Indeed direct participation isn’t necessarily required for gaining support either as there is the possibility to virtually eavesdrop by visiting forums and looking at current and past conversations (something which would be socially unacceptable in face-to-face interaction allowing the user to decide if they want to involve themselves or not (Benford & Standen 2009).

Therefore online presence seems to be an efficient source of support and online friendships that don’t progress to offline friendships can serve great advantage. For example in Burke and colleagues study (2010), one participant noted one of the contacts he’d met on ‘Wrong Planet’ helped him during a difficult stage of his depression and would contact him to remind him to take his medication.

Virtual 3-D online communities also help in seeking support and have been researched for their use in clinical services. A study by Gorini and colleagues (2008) looked at the role of virtual social networks in e-Health applications for patients and therapists. They noted the example of ‘Brigadoon’, an area in Second Life dedicated to people with Asperger’s Syndrome who struggled greatly with communication, to give them a place to interact with similar people and practice their social skills. Interestingly, after initial encounters using this,
many participants felt comfortable enough to explore other areas of Second Life and to go on to communicate with non-autistic users. The researchers concluded that using virtual online 3D environments allows people to explore intimidating aspects of reality in a safe environment where the consequences don’t affect their real life—it provides a chance for users to face a 3-D manifestation of the situation they struggle to deal with—in this case for autistic people, communicating with others and therapists can observe and support this process.

**Increasing awareness and advocacy about ASD**

As well as supporting individuals with ASD, some SNS’s facilitate communities that campaign and encourage advocacy and awareness of ASD. Facebook is a place where autism charities, organisations and networks can create pages for people to connect to for updates, news, information and discussions e.g. Scottish Autism and Autism Speaks etc.

Second Life, is another example. This virtual social networking community provides more immersive community hubs. As (Danilovic 2009) mentions in her review paper, ALF (a Autism Liberation Front) is an example of a community that has adopted this feature to create an environment where user’s avatars can go and visit to gain advice, advocate for awareness and even learn about the history of autism and “sit in” for discussions that are scheduled on the virtual bulletin board.

3. The tribulations of the internet.

**The internet doesn’t combat feelings of loneliness nor substitute for offline friendships**

Logging on to communicate with other users in online communities can actually result in being an isolating experience. Danilovic (2009) notes that in second life there are certain times of the day or week where she has logged on to find there are no other visitors in certain spaces, noting that Second Life’s regions and ‘sims’ (virtual environments) are dependent on popularity with other users, frequency of visitors, and time of day. This is probably true of other websites as well and could create a problem if a user’s preferred contacts live in different time zones whereby the CMC user could stay up all night to chat with their recipient and therefore fall out of sync with everyday life.

In Gorini and colleagues' (2008) paper the authors acknowledge that there is a temptation for users to substitute real-life, meaningful relationships and face-to-face interactions for cyber-friends and virtual communications, meaning that already socially-awkward, autistic individuals with impaired communication skills could become further introverted.

Likewise, in Burke and colleagues (2010) study many of those who had few face to face friends or only temporary online friendships had few people to talk to online with their email inboxes and personal messages primarily being from immediate family.

In Mazurek’s (2013) study it was found that those who use social networking sites to improve social functioning were more likely to have a close friend and experience greater relationship closeness with that friend. However it wasn’t clear whether offline relationships lead to social
media use or resulted from them. They also interestingly found that only just over half of participants social network friends were also offline contacts. In terms of perceptions of loneliness, social media didn’t appear to contribute to decreasing loneliness, rather a lack of face-to-face friends and relationships appeared to have a more significant effect. They therefore conclude that social media shouldn’t be solely used for the aim of reducing loneliness but rather to encourage the development of new or existing offline relationships.

**Online friends may without warning or explanation cease contact**

In Burke and colleagues’ (2010) study a big problem for some ASD users was not the initiation of contact but maintaining it. Their participants often encountered online friends who would - without notice - desist speaking to them or block them from contacting them without offer of an explanation. Those that did receive explanation were often told they were too forward or “keen”. Even looking at forum discussion topics on ASD websites, there were many discussion threads on this topic with the same resounding pattern: people with ASD thought that their friendship was going well and without notice they would be blocked or ignored by their friend. Those that weren’t provided an explanation again assumed that it was because they were “too clingy”.

Indeed, in Burke and colleagues’ study some individuals noted why it happened, mainly because they had misjudged situations. For example one user recalled going on a date with a woman and then bombarding her with text messages because he had another friend who he frequently texted and so assumed she would do the same. However she asked that he would not contact her again showing that his incessant texting was overwhelming. Another individual noted he’d been looking to contact an old classmate and successfully found them after a lengthy extensive process however when he told his old classmate about his search procedure they became unsettled.

People with autism can have difficulty understanding others perspectives, engaging in flexible thinking (Attwood 2007; Frith 2003; Roth & Barson 2010), which can lead them to being misperceived in such social situations, their incredible attention to detail and obsession behaviour can appear odd and make others feel uncomfortable and cease contact.

In order to improve and maintain relations with online contacts then it’s important for them to know how often to contact others and the extent of detail they share and who to trust (Burke et al., 2010).

Adopting CMC specific rules and norms that work for the individual would surely be beneficial in their future online communications.

Most online forums have explicit rules and are moderated, thus presented guidelines allow users to learn and adopt structure and are present for referring to for constant guidance in group social interactions.

In Burke and colleagues’ (2010) study one subject noted that they’d created their own rule for using and posting on Facebook—a rule of mathematical average. He did this depending on how many Facebook friends he had and how often they posted, noting that some posted far more frequently than others who seldom posted but adopting a law of averages meant he remained at a medium level.
This same user also suggested that to prevent any mistakes that would be perceived as abnormal to others, he would try to be self-aware by imagining his actions in the third person and how he’d perceive it, allowing him to assess if it would look right.

It is important however to remember that every individual is different, what might work for one user might be inconceivable to another.

**Compulsive Internet use**

An important consideration with the medium of computer communications and internet use is regulating how often they are used. Compulsive internet use refers to “the inability to control online activity” (Finkenauer et al. 2012) i.e. difficulty moderating time spent online. In Finkenauer and colleagues’ longitudinal study (2012) of a non clinical sample, they found that persons with more autistic traits, compared to individuals with less autistic traits, were more vulnerable to compulsive internet use. The researchers suggest that people with more autistic traits express a preference for online communications rather than face-to-face interaction. They conclude therefore that although the internet as a form of communication can be helpful and beneficial to individuals with autistic traits, it could also be to the detriment of their offline, real world friendships.

In order to moderate time spent online a visual aid such as a clock timer could therefore be beneficial. It could remind users of the time – making them aware of how long they’ve been online - and a stopwatch feature could tell them how long they have left, when it’s time for bed, or when to stop. Of course support staff or family members would need to remember to set them but it would probably be worthwhile for practitioners to try this strategy out with users who are having difficulty remembering to switch off and see how they respond.

**Cyber-bullying**

Cyber-bullying is similar to typical, traditional bullying in the sense that it is “an act of aggression that’s often repeated over time occurring among individuals between whom there is a power imbalance,” (Kowalski & Fedina 2011). However the faceless forms that cyber-bullying can take e.g. via texting or online including emails, chatrooms, forums, or instant messaging makes, it much more difficult to detect and moderate as the perpetrators identity can remain hidden by these means (Kowalski & Fedina 2011). Ultimately it also means the victim is less likely to escape the abuse as it can occur at any time unlike traditional bullying where it would depend on the perpetrators physical presence. An example of cyber-bullying given in Burke and colleagues study (2010) by one user was when he’d sent a revealing photograph of himself to someone he’d met in a chat room under the impression that they were a girl. However the recipient turned out to be a male who then posted his picture across the website for others to ridicule and several other male respondents described similar experiences of girls pretending they had feelings for them. All resulted in emotional difficulty at having been deceived and ridiculed.

Kowalski and Fedina (2011) investigated the experiences of both traditional and cyber-bullying and its prevalence in populations of children with Asperger’s syndrome and or ADHD. Within their sample over half of their young respondents had declared being traditionally bullied, with a further 21% of them indicating they’d been cyber-bullied. Interestingly 38% had admitted perpetrating traditional bullying and nearly six percent disclosed they’d perpetrated cyber-bullying. Cyber bullying mainly took place via instant
messaging (66.7%), second to that was social networking sites (60.0%), and twenty percent was through text messaging. Those who encountered traditional bullying (both perpetrator and victim) had higher anxiety and depression rates than those not involved at all and surprisingly they found that cyber-bullying had no significant effect on anxiety or depression however this could perhaps be explained by their small sample size.

Their results also indicated that the children’s parents appeared to be ill-informed. Seventy three percent believed their child had never been cyber-bullied and 12% responded that they didn’t know. Eighty five percent outright believed their child had never cyber-bullied and a further 12% didn’t know if their child had perpetrated cyber-bullying with only a small 3% of parents admitting their child had committed cyber-bullying. Kowalski and Fedina emphasize the clear importance of more communication between parents and children when using the internet. However in order to do this, they argue that more research on cyber-bullying within special needs populations is needed to better inform parents.

Other psychological problems that can co-occur with autism could also complicate online experiences. In Burke and colleagues’ research (2010) one user mentioned he participated in creating drama in an autism online community by saying and doing things to intentionally hurt other people. However he cited his bipolar disorder being out of control at the time as a possible reason for doing something he wouldn’t normally do. This again reinforces Kowalski and Fedina’s suggestion for more research on cyber-bullying and CMC in special needs populations in order to improve and support online communications.

There is also the existence of web sites that function for the sole purpose of ridiculing people’s posts on social networking sites. “Lamebook” is such an example and includes screenshots of victim’s Facebook posts that are deemed worthy of humiliation. Indeed, it’s not just external sites that are a concern. For example, Facebook itself facilitates fast-word of mouth, and it’s easy for a Facebook “friend” to publicise any slight remarks that they deem worthy of humiliation on their newsfeed for their other Facebook friends to judge. At this point therefore it’s worth remembering to be aware of what is shared with others online as it could make users vulnerable for exploitation and humiliation and the permanence of text which ASD users typically appreciate can be a danger as once it’s shared online it really is in a world wide web.

Trolling

Claire Hardaker defines a “troll” as a “CMC user who constructs the identity of sincerely wishing to be part of the group in question, including professing, or conveying pseudo-sincere intentions, but whose real intention(s)is/are to cause disruption and/or to trigger or exacerbate conflict for the purposes of their own amusement.”(Hardaker 2010: 237) In other words a troll is someone who joins SNS’s to purposely offend others whilst concealing their real identity.

An extreme example of trolling on social networking that has recently gained media and press attention involves incidents on a website named “ask.fm” a question and answer web site where the key factor is the disclosure of the respondents identity and the anonymity of the surveyors. The genuine function of the website seems to be lost as it tends to descend into anonymous posters no longer using the anonymity feature to genuinely enquire about
the individual but rather viciously abuse and “troll” them, making them a victim rather than a respondent.

Obviously this is an issue that both autistic and non-autistic internet users need to be aware of as a troll could appear anywhere although it’s something that moderators of online community forums should be aware of especially since some trolls are dedicated to trolling specific interest based sites.

**Deception**

The internet is a place of infinite possibilities and the anonymity that it provides, although useful for ASD users to establish themselves and feel more comfortable during communications, can also serve a more sinister, deceptive purpose.

Benford and Standen (2009) report that “the social impairment of autism is such that individuals with the disorder may be more susceptible to the deceptive behaviour of others online.” However they also suggest that those individuals with ASD who are exclusively aware of the benefits of the anonymity that CMC provides may be extra cautious of the possibility of others abusing this element for means of deception and dishonesty.

Interestingly Burke and colleagues’ (2010) study documented that many users were sceptical of people they didn’t know online – either because they have made it a rule not to talk to strangers or because of past experiences of deception both online and offline, meaning they prefer not to enter chat rooms or SNS’s.

It’s important to consider some ways in which ASD users may be deceived online.

**Catfishing and Romantic Deception**

‘Catfish’ refers to persons who create a false identity online to entice romantic partners for online relationships. The term was coined in a documentary film bearing this term as its title and has even become a TV show following real life instances of online relationships. In addition to using other person’s photographs, a catfish might provide false information about where they live, their job and even their gender (BBC 2013). In extreme cases they may even create false friends to keep up their pretence and deception. This is similar to an issue noted above from Burke’s study (2010) where a user believed he was chatting to a girl who turned out to be male and ridiculed his efforts for a romantic relationship. For anyone to be deceived like this would be extremely distressing and disappointing. Similarly, you may be the person who the catfish pretends to be, i.e. they may use your complete identity including your name, pictures and friends.

There have also been other cases of online romantic deception, where the clear motive of the culprit is financial gain. There have been growing cases of romance fraud being facilitated online. Perpetrators target individuals on dating or social networking sites, basing their persona on the victims profile information, e.g. hobbies and interests, in order to appeal to them. Perpetrators often use a false identity and claim to live far away from victims with whom they strike up conversation. They will then feign romantic interest through kind words and flattery and regular communication. Once they’ve successfully gained the victims trust, perpetrators often invent personal crisis for which they need money to resolve and carefully persuade their victims to send the funds and will do this on numerous occasions. In
America, the average financial loss from these scams range between $15,000 and $20,000 (FBI 2013) and recent public cases in the UK have seen victims part with £20,000 (Plymouth Herald 2012) and even £60,000 (Action Fraud n.d.). Despite most victims being females in their late 40s to 50s, the FBI have stated that all demographics are at risk (FBI 2013).

**Münchausen by Internet**

This phenomenon is similar to ‘catfishing’ and trolling in that the main goal is to infiltrate and deceive other users with the motive of gaining attention, financial gain, or possibly both. Typically perpetrators enter chat rooms or forum discussion threads to ingratiate themselves amongst new people and then begin to tell their false story which typically portrays themselves or someone they love being afflicted with a serious illness e.g. terminal cancer. (Pulman & Taylor 2012; FBI 2013). It’s important therefore that individuals with ASD are made aware of this as it can lead to emotional distress and financial exploitation.

**E-hoaxing**

ASD users should also be aware of the presence of computer viruses and malicious spyware that can extract personal and financial information. Most of these viruses are obtained through internet advertising and e-mail links that are designed to look legitimate. However they could appeal to people with autism, who can have a tendency to interpret things very literally (Attwood 2007; Frith 2003).

4. **Conclusions**

This review has collectively reported findings from research that specifically investigates individuals on the autism spectrum and how CMC can help improve their lives, in particular by opening internet users up to more freedom and control in their ability to communicate. Although it is difficult to generalise, CMC so far seems to be a supportive and beneficial medium that shouldn’t be relied upon solely for contact but rather to supplement and support existing offline friendships and relations. There are, however, some issues that are to be considered in order to optimise time spent online and ensure it is safe and enjoyable as possible. Future research should be conducted to assess compulsive internet use in a clinical ASD sample, and more research on cyber-bullying within both young and older populations of ASD individuals would provide a better insight into the phenomenon. Hopefully with more time, there will be more qualitative and quantitative research on the social use of CMC and the applications and implications of websites such as Second Life by individuals with Autism in order to provide more information for users and practitioners. It would also be beneficial to see some of the suggested precautions, (e.g. stop watch timers) empirically tested to see how it could help budget time online. Future research should also continue investigating aspects like trolling and online deception with a perspective that considers the prevalence of existing forms of online deception within the online autistic population. This is especially important considering how fast technology is advancing and creating more issues for its users. Despite the challenges and the risks of upsetting experiences, it is clear to see that CMC and social networking can enhance the communication needs and skills of individuals with ASD.
References


SECTION C

This section includes a list of social networking sites that seem to be popular with the ASD population and other further helpful resources.

Popular Websites

Social/Virtual Networking

Facebook
www.facebook.com
A free social networking site that requires registration for log-in access.

Second Life
www.secondlife.com
A virtual online community that requires registration for log-in access. Membership is free but additional features e.g. buying an island, come at an additional cost.

http://www.whatsapp.com/
A mobile application for chatting and instant messaging with friends, which is free for download onto smartphones.

There are other social networking sites out there including twitter: www.twitter.com, and http://www.google.com/+ however the two mentioned above seem to be most popular within the autism population.

Blogging

Although blogging websites aren’t primarily used to socialise with others they are popular ways to share how you are feeling with cyberspace. You can make them private or you can have a public access blog for example:

http://www.dudeimanaspie.com

Free blogging websites users can use are:

www.blogger.com
www.wordpress.com
www.livejournal (a good one as it can also be used as a social networking site)
www.tumblr.com

The four outlined above appear to be the most popular for people with autism but additional suggestions are available: http://topsitesblog.com/blog-websites/
Forums
Wrong Planet;
www.wrongplanet.net
Talk about Autism;
www.talkaboutautism.org.uk
National Autistic society;
www.community.autism.org.uk
Aspergers and ASD UK online forum;
www.asd-forum.org.uk
Childline;
http://www.childline.org.uk/talk/boards/Pages/Messageboards.aspx
Most online autism organisations and charity websites have discussion forums.

Gaming
Minecraft (a game that revolves around building anything imaginable that requires registering for membership and a payment of €19.95 to download) www.minecraft.com
World of Warcraft (a free, online fantasy game, recommended for ages 12+)
https://eu.battle.net/account/creation/wow/signup/

Educational Gaming websites for children
http://www.autismgames.com.au
Other options are available at http://www.autismspeaks.org/family-services/resource-library/toys-games

Dating
There appears to be only two dating websites that are specifically intended for individuals with autism.
www.autisticdating.net (you can browse members without registering and is free to use)
www.autisticdating.co.uk (requires registration, is free to use)

**Websites to be aware of**

Ask.fm
www.Ask.fm
A question and answer social networking site, where the user members profile identity is known but the person asking the question can remain anonymous. The anonymity has led to recent and highly publicised incidents of “trolling” which has been linked to a young girl’s suicide. (For information on this story: [http://www.bbc.co.uk/news/uk-23612544](http://www.bbc.co.uk/news/uk-23612544))

Snapchat
http://www.snapchat.com/
A mobile app intended for the sharing of pictures between friends. Half the fun is said to be that the viewing of the picture is short lived—the recipient of the picture can only view it for a few moments before the picture disappears. Therefore there might be a temptation to share an unflattering or private picture with the recipient. However there is no guarantee that the recipient can’t take a “screenshot” of the picture, enabling them to keep it saved on their phone for them to share as they please.

**Helpful Resources**

For anyone wanting to gain further insight into social networking websites used by people with autism and their experiences using them, visiting open autism website forums such as [www.wrongplanet.net](http://www.wrongplanet.net) and [www.talkaboutautism.com](http://www.talkaboutautism.com) where discussions are open (i.e. membership isn’t required) is very insightful and informative. They are also useful for individuals with autism who are considering joining a social networking website or a discussion forum as it allows them to decipher if they are the kind of websites that appeal to them.

For using visual aids for moderating users time spent online, a stopwatch timer online can be initiated without the need for downloads or installations via websites such as [http://www.online-stopwatch.com/countdown-clock/full-screen/](http://www.online-stopwatch.com/countdown-clock/full-screen/) or for a more comprehensive system, where the timer can remain visible at all times e.g. a timer displayed on the task bar, there are options for downloads. An application such as the “pomodoro app” for desktop or even on mobile devices, could would also be well utilized for ASD users to monitor their time spent online and when to log off which can be downloaded at: [http://www.teamviz.com/downloads/](http://www.teamviz.com/downloads/). There are probably a lot more downloadable features of this kind but great care should be taken to ensure they are legitimate downloads.

Another option available if the computer user has Norton anti-virus by Symantec purchased and installed, is to set up a feature that allows you to set a time limit, view the time remaining
and either set it so the computer automatically logs the user out or allows the user to continue using the internet but sends an email to a parent/relative to remind notify them that they’ve reached their time limit. See https://onlinefamily.norton.com/familysafety/help.fs?action=viewingRemainingTime for more information.

For a young person deciding to join a social networking site, Autism Speaks have a comprehensive guide to online safety http://www.autismspeaks.org/family-services/tool-kits/transition-tool-kit/internet-technology-and-safety.

For anyone who has concerns over romantic fraud or indeed other forms of online fraud, they can find useful links on the Action Fraud website, http://www.actionfraud.police.uk

Although not covered in this report, for anyone concerned about online sexual exploitation of adolescents, there are good resources to be found on the Child Exploitation and Online Protection Centre (CEOP) website http://ceop.police.uk and on http://www.thinkuknow.co.uk/

Lastly it’s important to remember privacy and safety when online. Most social networking sites have their own privacy policies in place and facilities to block unwelcome users or to report abuse. Most recommend having your privacy settings set to the highest, most secure level. In discussion forums there are usually rules set in place and are normally moderated to ensure everyone abides by them. Therefore it’s useful to refer to websites privacy policy and security pages and their terms and conditions of use to ensure proper and safe use.