Institution: University of Bolton

Unit of Assessment: 04 Psychology, Psychiatry and Neuroscience

Title of case study: Refining criteria for computer-related addictions

1. Summary of the impact (indicative maximum 100 words)

Our factor analytic and psychometric work distinguishing addiction from (non-pathological) high engagement has helped stimulate public and professional psychiatric debate about, and improved public understanding of, Internet-related and computer game addictions. Evidence of this impact exists on various web sites; computer game players, parents of young game players and games designers using our work to debate the issues of whether it is reasonable to conceive of some people being addicted, what the indicators of addiction might be, the personality factors that might put people at risk, and to develop strategies for preventing and dealing with addictions.

2. Underpinning research (indicative maximum 500 words)

The research programme started in 1993, with a project in which John Charlton (then a PhD student and part-time lecturer) and Paul Birkett (his research supervisor) investigated factors leading to success on higher education computing courses At this time the major area of interest in pathological computing behaviour was computer anxiety. Given the project's focus, it was therefore necessary to develop a scale measuring highly positive attitudes towards computers; the Computer Apathy and Anxiety Scale (CAAS) (Charlton & Birkett, 1995). This included measures of computer apathy - engagement (a continuum running from apathy towards computers at one end to non-pathological but highly positive attitudes towards computers at the other end) and computer anxiety. Using this scale, among other things, computer engagement was shown to predict computing students' performance on higher education courses (Charlton & Birkett, 1999).
Towards the end of the 1990s debates concerning Internet and computer game addiction were emerging. Therefore Charlton (by then a research fellow) decided to include a computer over-use subscale in the CAAS and to investigate whether, because of the tendency of researchers to import criteria for pathological gambling into the domain of pathological Internet over-use, some studies might be confusing symptoms of high engagement with those of addiction. During this project, data on biological sex and psychological gender was also collected, this showing a positive correlation between masculinity and computer engagement, that more feminine people tended to have fewer problems with over-use of computers, that males and females did not differ with respect to engagement, but that males were more prone to over-use computers (Charlton, 1999). Perhaps, more importantly, though exploratory factor analysis confirmed the idea that, with respect to computing in general, researchers were likely to be confusing symptoms of addiction with those of high engagement. Specifically, it was argued that the criteria of conflict, withdrawal, behavioural salience and relapse and reinstatement can be considered core characteristics of computing-related addictions, but that tolerance, euphoria and cognitive salience are more characteristic of high engagement than of addiction (Charlton, 2002). A further factor analytic study with Ian Danforth (a final year undergraduate student at Whitman College, USA), verified Charlton's (2002) findings with respect to a Massively Multiplayer On-line Role Playing Game (MMORPG) called Asheron's Call (Charlton & Danforth, 2007). A sequel to this latter paper focusing on the personalities of Asheron's Call players showed that scores on a psychometric index of Asheron's Call addiction were negatively related to extraversion, agreeableness, conscientiousness, emotional stability, intellect and attractiveness, and positively related to negative valence, but that, in general, minimal relationships existed between personality variables and scores on an index of Asheron's Call engagement. This further validated the distinction between the addiction and engagement constructs, and also suggested that people who might be at risk of addiction to activities such as the playing of MMORPGs may be characterized by Asperger's syndrome-like personality traits. (Charlton & Danforth, 2010), this latter interpretation being consistent with the earlier sex and gender findings of Charlton (1999).

3. References to the research (indicative maximum of six references)

The journal impact factor and citation statistics mentioned below as evidence of the quality of research

were collected on 3 June 2013.

Charlton, J.P., & Danforth, I.D.W. (2010). Validating the distinction between computer addiction and engagement: Online game playing and personality. *Behaviour & Information Technology*. *29*(6), 601-613. DOI: 10.1080/01449290903401978. 2011 journal impact factor: 1.011. Number of article citations: 13.

Charlton, J.P., & Danforth, I.D.W. (2007). Distinguishing addiction and high engagement in the context of online game playing. *Computers in Human Behavior, 23(3)*, 1531-1548. DOI: 10.1016/j.chb.2005.07.002. 2011 journal impact factor: 2.293. Number of article citations: 109.

Charlton, J.P. (2002). A factor analytic investigation of computer addiction and engagement. *British Journal of Psychology, 93*(3), 329-344. DOI: 10.1348/000712602760146242. 2011 journal impact factor: 2.368. Number of article citations: 72.

Charlton, J.P. (1999). Biological sex, sex-role identity and the spectrum of computing orientations: a re-appraisal at the end of the 90s. *Journal of Educational Computing Research, 21(4)*, 393-412. DOI: 10.2190/6MRU-DY8D-TMDQ-NV6P. 2011 journal impact factor: 0.815. Number of article citations: 6.

Charlton, J.P., & Birkett, P.E. (1999). An integrative model of factors related to computing course performance. *Journal of Educational Computing Research, 20(3), 237-257*. DOI: 10.2190/BTG0-7VQK-6XD3-G4C4. 2011 journal impact factor: 0.815. Number of article citations: 10.

Charlton, J.P., & Birkett, P.E. (1995). The development and validation of the Computer Apathy and Anxiety Scale. *Journal of Educational Computing Research, 13(1),* 41-59. DOI: 10.2190/5UPE-80NP-W9WN-BE6W. 2011 journal impact factor: 0.815. Number of article citations (this article was published before 1996 and is not on Scopus; the following number is from Google Scholar): 15.

4. Details of the impact (indicative maximum 750 words)

This work helped inform professional psychiatric debate, public debate and debate within the computer game playing and design communities as to criteria for classifying people as pathologically over-engaged with respect to computer-related activities in general and internet-related activities and computer game playing in particular, and whether children on the autism spectrum are particularly at risk of such addictions.

The work came into the public arena via dissemination activities such as press releases by the University of Bolton and the British Psychological Society (leading to articles in the Daily Telegraph, Daily Mirror, Daily Mail, Daily Record, Irish Times, Metro and The Scotsman - all articles published 3 April 2008; The Manchester Evening News - article published 27 April, 2010; Metro - article published 25 August, 2010), interviews for newspapers (e.g. The Guardian - article published 11 March, 2011, and syndicated in The Sydney Morning Herald, Melbourne Age and Brisbane Times 16 - 17 March 20011), magazines; Play magazine (a magazine for Sony Playstation users), issue 179, May 2009; 360 Magazine (article published autumn 2007), interviews on a number of radio stations (e.g. BBC Radio Lancashire, April 2007; BBC Radio Manchester, April 2008; BBC Radio 4 iPM November 2008), and a public presentation at the Museum of Science & Industry, Manchester on 25 October, 2011.

The above activities have led to the use of our findings in debates via a number of Internet sites. These include an article entitled "Is Video Game Addiction Really an Addiction? by Elizabeth Hartney on About.com (a US cite claiming to have 69 million visitors which "...offers expert, quality content that helps users find solutions to a wide range of daily needs – from parenting, health care and technology to cooking, travel and many others"). Here, Hartney asks whether parents should worry about whether children spending large amounts of time playing video games are addicted in the same way that some are addicted to alcohol and hard drugs, and uses the Charlton (2002) findings to argue that computer addictions are a unique type of addiction that are dissimilar from phenomena such as pathological gambling, and that children's excessive game playing can be unhealthy. A further example of our contribution to this debate is an essay entitled "Is internet addiction a valid psychiatric disorder?" in the open access journal Psychiatry Online, which is aimed at the psychiatric profession. Here, the consultant psychiatrists Sanju George and Fionnbar Lenihan assess the evidence for and against considering the concept of internet addiction as a valid psychiatric disorder, and cite data from Charlton (2002) as evidence that the number of people suffering from Internet-related addictions is over-estimated in studies which apply DSM-IV criteria for other pathologies to computing-related activities.

The findings in Charlton and Danforth (2007) have also informed worldwide debates in the computer gaming community as to the circumstances under which game playing behaviours might be considered problematic. For example, one player with the pseudonym Dr Strangelove quotes widely from our paper

in a video on tacticalgamer.com, noting our distinction between core criteria indicating addiction and peripheral criteria which are indicative of (non-pathological) high engagement. The 2007 paper has also impacted on computer games development discussions, with, for example, an article posted by Michael L. Grimes on gamecareerguide.com in July 2011 using our findings on addiction vs. high engagement to show how developers can use psychological research outcomes to understand addiction mechanisms, adjust the reward systems in their games to make addiction less likely, and thereby, in extremis, avoid law suits.

In addition to informing non-academic debates about the concept of Internet addiction and its nature, there is also Internet material showing that members of the public use our findings to address their children's problematic behaviours. One example is an article written by a child's mother on the US Autism Support Network web site citing our 2008 presentation at the BPS's Annual Conference (later published as Charlton & Danforth, 2010). Here the mother describes how our findings on personality and addictions implying that some people with Asperger's Syndrome (AS) might be susceptible to game playing addictions struck a chord with her own experience and how she developed a strategy to work with her son to moderate his video game playing. Similarly, a 2011 post on Netmums (a prominent UK online parenting organisation with over 1.2 million members and 5 million visits annually) used our personality study findings to warn parents of AS children that although they might consider excessive game playing as a child self-medicating, the behaviour should be discouraged because it hinders social development.

5. Sources to corroborate the impact (indicative maximum of 10 references)

Evidence of the studies' impact upon public debate can be found on the following web pages:

http://www.guardian.co.uk/technology/2011/mar/11/i-was-games-addict
http://www.brisbanetimes.com.au/digital-life/games/confessions-of-a-computer-games-addict-20110316-1bx90.html
http://www.telegraph.co.uk/earth/earthnews/3338422/Video-game-addiction-like-being-on-drugs.html
http://www.bbc.co.uk/blogs/ipm/2008/11/your_experiences_of_online_gam.shtml
http://www.priory.com/psychiatry/Internet_Addiction.htm
http://addictions.about.com/od/videogameaddiction/i/is_gaming_addiction_real_2.htm
http://www.autismsupportnetwork.com/news/video-game-addication-autism-892833202
http://www.netmums.com/coffeehouse/advice-support-40/special-needs-disabilities-support-502/596005-aspergers-children-video-game-addiction.html
http://www.gamecareerguide.com/features/975/operant_conditioning_in_.php?print=1
http://www.tacticalgamer.com/content/75-online-gaming-addiction.html