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Research report

The measurement of maladaptive cognitions underlying problematic video-game playing among adults

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ABSTRACT

Research has shown that some individuals can develop excessive patterns of video-gaming, leading to significant psychological and interpersonal problems. Recent reviews of problematic gaming suggest that treatment is best approached from a cognitive-behavioural perspective. However, relatively little research has examined the underlying cognitive factors that might be usefully targeted in an intervention. To address this gap, we present the findings of a study involving $N = 485$ adult regular video-game players (84% male, $M_{age} = 26$ years) who completed a questionnaire about gaming activity, problematic gaming, and problematic cognitions. Gaming cognitions fell on four dimensions: (1) perfectionism, (2) cognitive salience, (3) regret, and (4) behavioural salience. All cognition subscales correlated moderately to highly with two different measures of problematic gaming ($r = .49–.76$), as well as a measure of emotional distress (DASS-21; $r = .25–.35$). Large effect sizes ($d = .87–1.96$) were found when comparing problematic and non-problematic gamers on all four cognition types. This study is among the first to provide empirical evidence for cognitive differences between problematic and non-problematic video-game players, and to identify specific cognitions which could be practically addressed in clinical settings. The implications for the further development and refinement of clinical approaches to problematic gaming, including formulation, assessment, and intervention, are discussed.

1. Introduction

Maladaptive cognitions have long been thought to play a central role in addiction (Walker, 1992). Previous research has identified the influence of erroneous thoughts in excessive behaviours, particularly pathological gambling (Baboushkin, Hardoon, Derevensky, & Gupta, 2001; Goodie & Fortune, 2013) and pathological Internet use (PIU; Davis, 2001). Despite international debate on its conceptualisation (Griffiths et al. 2015; Petry et al. 2014), Internet Gaming Disorder (IGD) has been listed in Section 3 of the DSM-5 as a condition warranting further investigation (APA, 2013), and appears to bear numerous similarities to other behavioural addictions. Amid concerns that interventions for IGD that focus solely on attaining behavioural changes may be ineffective if underlying cognitions are not addressed (Peng & Liu, 2010), an emerging body of work has attempted to identify specific cognitions related to IGD (King & Delfabbro, 2014a; 2014b; Komnenić, Filipović, & Vukosavljević-Gvozden, 2015).

According to Davis' (2001) model, cognitive distortions represent a proximal cause of PIU and are enacted whenever a stimulus associated with the Internet is present. Maladaptive cognitions related to Internet use pertain to thoughts about the self, others, and the world. Thoughts about the self involve rumination reflecting themes of having limited self-efficacy in the real world, such as "I am only good on the Internet" and "I am worthless offline, but online I am someone." Such thoughts underlie positive expectancies about using the Internet and may develop habitual patterns of using the Internet to deal with stress or emotional discomfort. Thoughts about others and the world include distortions such as "the Internet is the only place I will be respected" and "people treat me badly offline." Another key feature of PIU cognition is the persistent and intrusive nature of thoughts about the Internet, which includes planning the next time that one will use the Internet. Although the individual may have insight into the problematic nature of their Internet use, the individual rationalises that continued playing will help to alleviate associated feelings of guilt or regret about problematic behaviour.

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Davis' model also distinguishes between 'generalised' and 'specific' forms of PIU. While generalised PIU involves using a range of Internet activities to avoid responsibilities, specific PIU involves a specific use of a particular function of the Internet. Examples of specific PIU include the pathological use of online gambling, sexual material, auction houses, and stock trading services (Davis, 2001). Within this model, IGD may be considered a specific PIU. Indeed, in many studies of Internet activities, video-game playing often emerges as having the strongest associations with compulsive Internet use (Meerkerk, van den Eijnden, & Garretsen, 2006). Based on this model, it is evident that maladaptive cognitions play a significant role in IGD (Liu et al. 2014; Zhou, Yuan, & Yao, 2012). Peng and Liu (2010) reported that a five-item scale measuring cognitions, including those proposed by Davis, significantly predicted online gaming dependency in Chinese adults. Furthermore, these cognitions had greater predictive validity of problematic gaming than male gender and frequency of play, i.e., factors which had previously been found to be among the strongest predictors of problematic habits. Additional studies have examined cognitive aspects of IGD, however these studies have tended to be limited by a focus on preoccupation, rather than a broader view of the content of gaming-related beliefs and assumptions (see King & Delfabbro, 2014a).

Cognitive-behavioural therapy (CBT) aims to help clients to identify and deal with cognitions that underlie problematic behaviour. The process of 'cognitive restructuring' is often employed to help a patient recognise and challenge erroneous or distorted thought patterns related to an appetitive activity (Baboushkin et al. 2001; Davis, 2001). On limited evidence (see King, Delfabbro, Griffiths, & Gradisar, 2011; King & Delfabbro, 2015), CBT may be a promising treatment for video-game related disorders, with some studies reporting that CBT may be an effective short-term treatment for Internet and video-game addiction (Griffiths & Meredith, 2009; Lemos, De Abreu, & Sougey, 2014). Li and Wang (2013) found that rumination, short-term thinking, and all-or-nothing thinking associated with online game addiction could be reduced through CBT. However, a limitation of empirical and treatment studies on gaming cognition is the tendency to rely on the problematic criteria (i.e., preoccupation) to assess cognition, given the lack of a specialised measure of gaming cognition. By analogy, this may be considered akin to measuring dysfunctional anxious beliefs within an anxiety disorder by relying on a single item that assesses the tendency to experience fearful thoughts. A tool for measuring maladaptive cognitions associated with problematic video-game playing is therefore desirable from a clinical perspective, as it may aid clinicians in identifying the specific thoughts responsible for maintaining problematic behaviour. It would also enable clinicians to assess progress and changes in these cognitions during and post-treatment.

1.1. Specific cognitions associated with problematic gaming

Cognitive dissonance theory (Festinger, 1957) provides one explanation for how video-gaming cognitions relate to problematic behaviour. Individuals may become highly invested in video-games if they spend large amounts of time and/or money playing them. If habits begin to interfere with daily life, the individual experiences dissonance in the form of regret due to feelings of personal responsibility for the negative consequences of play. Most players are able to successfully adjust their behaviour to reduce this dissonance. However, some players instead reaffirm the value of video-game playing to themselves in order to justify the negative consequences (Chiou & Wan, 2007). This allows them to reduce their dissonance while also maintaining problematic habits. Chiou and Wan demonstrated this process through two experiments. The first study showed that players who feel responsible for their behaviour would be more likely to shift their attitudes towards video-games from positive to negative. The second study showed that players with a higher invested cost in video-game playing would be less likely to engage in attitude-discrepant behaviour. These findings suggest that the extent to which an individual feels personally responsible for the negative consequences associated with his or her behaviour, as well as willingness to adjust habits accordingly, may help to distinguish problematic from non-problematic players.

King and Delfabbro (2014a) proposed a framework for understanding video-game related cognitions which specifies four categories. *Beliefs about game rewards and tangibility* includes cognitions related to preoccupation with play, increased cognitive salience of video-games, the over-valuation of in-game rewards, and an attachment to an avatar or online identity. *Maladaptive and inflexible rules about video-gaming behaviour* include cognitions that create rigidity and consistency in the players' patterns of gaming, and serve to justify continued use despite mounting evidence that the game is causing harm to the player. Such cognitive processes include the 'sunk cost' effect, which highlights that problematic players might continue to play in order to justify their previous actions and commitment. This can be especially pronounced in games with objectives which can take several hours to complete, or which are only available for a set period of time, as is often the case in massively multiplayer online games (MMOs). Failing to reach a goal before the end of a playing session may therefore result in a loss of progress of up to several hours. *Gaming as a source of self-esteem or ego-protection* entails playing in order to compensate for other perceived deficits of the self. Problematic users may have low self-esteem and come to redefine their self-worth in terms of their video-game playing abilities, and their performance and gaming investment becomes the measure of their self-esteem. If the individual has perfectionistic tendencies, then they may hold unrealistic expectations of their playing ability and achievements, reflecting an inability to cease play until 'victory' has been achieved. This may be an explicit goal set by the game, or it may be self-developed, such as obtaining a 'perfect' character build. Finally, *gaming as a means of gaining social acceptance* includes playing games to avoid 'real life' stressors, as well as playing within communities of video-game players in order to feel a sense of relatedness or belonging that is believed to be unattainable in the real world.

Historically, comparisons between gambling and video-game playing have led to conceptual confusion regarding pathological involvement with these activities. Numerous structural similarities have been noted between slot or 'fruit' machines and arcade video-games in particular, such as predictable stimuli governed by a software loop, requirements for concentration and hand-eye co-ordination, and the use of visual, aural and incremental rewards (Fisher & Griffiths, 1995; Griffiths, 1991; Griffiths & Wood, 2000). However, the primary difference between these activities is that rewards in gambling are generally received as a function of chance, whereas video-games generally reward a player's skill. Accordingly, modern video-game players typically value experiences that cannot be provided by gambling, such as those involving strategy and planning (Forrest, King, & Delfabbro, 2015). While gambling typically involves monetary gain, video-games provide intangible rewards such as points or items as a marker of progress and winning. Some games, especially MMOs, provide many of these in-game rewards that work concurrently and interact with each other. Some players may therefore be motivated by a sense of 'completion' which drives them to explore and complete every aspect of the game (Delfabbro & King, 2013; King, Delfabbro, & Griffiths, 2010). Furthermore, due to variable ratio reward schedules inherent within video-games, players might be motivated by