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The Internet addiction components model and personality: Establishing construct validity via a nomological network

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ABSTRACT

There is growing concern over excessive and sometimes problematic Internet use. Drawing upon the framework of the components model of addiction (Griffiths, 2005), Internet addiction appears as behavioural addiction characterised by the following symptoms: salience, withdrawal, tolerance, mood modification, relapse and conflict. A number of factors have been associated with an increased risk for Internet addiction, including personality traits. The overall aim of this study was to establish the association between personality traits and the Internet addiction components model in order to develop a theoretical framework via a nomological network. Internet addiction and personality traits were assessed in two independent samples of 3105 adolescents in the Netherlands and 2257 university students in England. The results indicate that low agreeableness and high neuroticism/low emotional stability are associated with the Internet addiction components factor in both samples. However, low conscientiousness and low resourcefulness predicted it in the adolescent sample only. The implications include the usage of the Internet addiction components model as parsimonious tool for the initial screening of potential clients in mental health institutes, and identifying populations at risk through their personality traits which may prove advantageous for the initiation of targeted prevention efforts.

1. Introduction

The increased ubiquity and mobile nature of new digital media has arguably come at a price. Excessive and sometimes problematic Internet use is highlighted by a steadily growing research base (Byun et al., 2009; Kuss, Griffiths, Karila, & Billieux, 2014). Treatment approaches such as specialised cognitive-behavioural therapy (CBT) (King, Delfabbro, Griffiths, & Gradisar, 2012) and more controversial methods such as boot camps (Koo, Wati, Lee, & Oh, 2011) are being developed in order to provide professional support for those in need of help from problematic Internet use. Similar to substance-related addictions, Internet addiction is characterised by clinical symptoms leading to significant impairment and distress, which have led the American Psychiatric Association (APA) to include it in Section 3 of the current (fifth) version of the *Diagnostic and Statistical Manual for Mental Disorders* (DSM-5) as *Internet Gaming Disorder* (American Psychiatric Association, 2013), a diagnosis that requires further research to be included as formal disorder (Herold, Connors, & Moore, 2012).

A number of factors have been associated with an increased risk of Internet addiction. These include the presence of comorbid psychiatric symptoms, such as obsessive–compulsive and depressive symptoms (Jang, Hwang, & Choi, 2008), the use of specific Internet applications, such as shopping, social networking, online chatting, blogging, gambling, and playing online games (van Rooij, Schoenmakers, van de Eijnden, & van de Mheen, 2010), and demographic determinants, such as being an adolescent (Leung, 2007), and/or being a university student (Widyanto & Griffiths, 2006).

In addition to this, certain personality traits have been reported as risk factors for Internet addiction. Personality traits appear particularly important given the theory that addiction shapes personality, leading to an addictive personality (Nakken, 2013). Individuals who exhibit certain personality traits and/or do not show other personality traits may be more likely to develop an addiction to different forms of technology, such as mobile phones

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(Takao, Takahashi, & Kitamura, 2009). Additional research supports the theoretical link between Internet addiction and personality traits. A study of Dutch adolescents found that emotional stability, agreeableness, and conscientiousness as measured via the Quick Big Five Scale (QBF; Vermulst & Gerris, 2009) decreased the risk of Internet addiction operationalized with the Compulsive Internet Use Scale (CIUS; Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009), whereas resourcefulness increased it (Kuss, van Rooij, Shorter, Griffiths, & van de Mheen, 2013). It has also been found that neuroticism as measured via the NEO-Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1992) increased the risk of Internet addiction as measured with the Assessment for Internet and Computer Game Addiction Scale (AICA-S; Wölfling, Müller, & Beutel, 2010), whereas agreeableness decreased it in an English university student sample (Kuss, Griffiths, & Binder, 2013). Furthermore, in a sample of 204 individuals diagnosed with Internet addiction disorder and 100 control subjects from universities and high schools in Beijing, it was found that Internet addicts had lower extraversion and higher psychoticism scores (Xiuqin et al., 2010) as measured via Eysenck's Personality Questionnaire Revised (EPQ-R) (Eysenck & Eysenck, 1975). Of 7888 adolescents sampled in the Netherlands it was found that the likelihood of developing Internet addiction as assessed via the CIUS (Meerkerk et al., 2009) was associated increased with low agreeableness and emotional stability, and high introversion (van der Aa et al., 2009). Additionally, in a sample of 868 university students in China, Internet addicts as classified via Young's Internet Addiction Test (Young, 1998) scored more highly on the EPQ's neuroticism and psychoticism subscales than non-addicts (Dong, Wang, Yang, & Zhou, 2012). Finally, in a sample of 1360 university freshmen in China tested via the Chinese Internet Addiction Scale-Revision (CIAS-R; Chen, Weng, Su, Wu, & Yang, 2003) and the EPQ (Eysenck & Eysenck, 1975), Internet addiction was associated with neuroticism (Tsai et al., 2009).

From the framework of the components model of addiction (Griffiths, 2005), Internet addiction develops as a consequence of biopsychosocial processes along with situational and structural factors. Similar to any other substance-related addiction, Internet addiction is characterised by the following symptoms: salience, withdrawal, tolerance, mood modification, relapse and conflict. A recent study (Kuss, Shorter, van Rooij, Griffiths, & Schoenmakers, 2013) indicated the addiction components model conceptualises Internet addiction in a parsimonious and comprehensive way as indicated by good fit with data obtained from two independent samples (3105 adolescents in the Netherlands and 2257 university students in the UK) using two separate Internet addiction measures.

As Internet addiction is a relatively recent phenomenon, research on this mental health problem is still in its infancy (Young, 2010). It is of crucial theoretical and practical importance to develop a conceptual basis for this type of addiction, and a valid and reliable psychometric assessment tool to measure it. From a theoretical perspective, Cronbach and Meehl (1955) argue that it is necessary to understand the nature of a construct by comprehending the statistical or deterministic laws that underlie its appearance, namely its *nomological network*. The laws underlying this network can either link (i) observations to each other, (ii) constructs to observations, or (iii) constructs to each other (Cronbach & Meehl, 1955). In line with the principles of the nomological network that are a manifestation of a construct's validity, in this study the Internet addiction components model and an addictive personality are operationalised as theoretical constructs that have been observed in two distinct populations via psychometric self-reports. As the Internet addiction components model has recently been established (Kuss, Shorter, et al., 2013), its theoretical understanding requires the development of a statistical model that is able to explain its associations with related constructs, such as an addictive personality (Nakken, 2013). Antisocial and depressive behaviours have been linked to an addictive personality (Nathan, 1988), suggesting that neuroticism and lack of agreeableness are predictors of Internet addiction. Other research suggests that although there are commonalities regarding an addictive personality across different addictions, there are also differences (Kagan, 1987), furthermore strengthening the need to assess the predictive power of personality characteristics on Internet addiction specifically. The potential importance of this research is to establish a nomological network of theoretical knowledge about the concepts of the Internet addiction components model and an addictive personality, their observed manifestations, as well as their associations.

Based on previous findings (Kuss, Griffiths, et al., 2013; Kuss, van Rooij, et al., 2013), in the present study it was hypothesised that (i) in a Dutch adolescent sample low emotional stability, low agreeableness, low conscientiousness, and resourcefulness predict the Internet addiction components factor, and (ii) in an English university student sample, it was predicted that (ii) neuroticism and low agreeableness predict the Internet addiction components factor. The overall aim of this study was to establish a nomological network for the Internet addiction components model by testing the predictive accuracy of personality traits on the Internet addiction components factor.

2. Method

2.1. Participants

Two separate samples were used. Sample 1 (S1) contained a total of 3105 adolescents aged 11–19 years ($M = 14.2$, $SD = 1.1$ years) sampled from high schools in the Netherlands. Sample 2 (S2) contained a total of 2257 university students aged between 18 and 64 years ($M = 22.7$, $SD = 6.34$ years) from a university in the East Midlands of England. Detailed sample information has been published elsewhere (Kuss, Griffiths, et al., 2013; Kuss, van Rooij, et al., 2013).

2.2. Measures

2.2.1. S1 Personality traits

Personality traits in S1 were measured using the 30-item Quick Big Five Scale (QBF) (Vermulst & Gerris, 2009), based on Goldberg's personality markers (Goldberg, 1992). It assesses the Big Five personality traits extraversion, agreeableness, conscientiousness, emotional stability and resourcefulness. Extraversion is the extent to which the following characteristics are present or absent: talkative, introverted, quiet, reserved, withdrawn, and bashful. Agreeableness is the extent to which the participant indicates the following characteristics: kind, cooperative, sympathetic, pleasant, agreeable, and helpful. Conscientiousness consists of being organised, systematic, thorough, neat, careful, and not sloppy. Emotional stability is indicated by the degree of being anxious, irritable, touchy, nervous, fearful, and high-strung, all negatively scored. Finally, resourcefulness consists of being creative, complex, imaginative, artistic, deep and innovative. The QBF uses a 7-point Likert scale ranging from 1 (“is not completely correct”) to 7 (“is exactly correct”), and total scores for the respective scales were derived by summing up the scores for the applicable items. The factor structure, validity and reliability of the scale have been evidenced in large adolescent samples in the Netherlands (e.g., Gerris et al., 1998; Harakeh, Scholte, DeVries, & Engels, 2006; Otten, Engels, & Van den Eijnden, 2008). The internal consistency of the personality trait scales in the present sample was good, with a *Cronbach's alpha*