



Individual differences in implicit learning abilities and impulsive behavior in the context of Internet addiction and Internet Gaming Disorder under the consideration of gender



Rayna Sariyska^{a,*}, Bernd Lachmann^a, Sebastian Markt^{b,c}, Martin Reuter^{b,c}, Christian Montag^{a,d}

^a Institute of Psychology and Education, Ulm University, Helmholtzstraße 8/1, 89081 Ulm, Germany

^b Department of Psychology, University of Bonn, Kaiser-Karl-Ring 9, 53111 Bonn, Germany

^c Center for Economics and Neuroscience, University of Bonn, Nachtigallenweg 86, 53121 Bonn, Germany

^d Key Laboratory for NeuroInformation/School of Life Science and Technology, University of Electronic Science and Technology of China, Chengdu, China

ARTICLE INFO

Article history:

Received 17 January 2017

Received in revised form 5 February 2017

Accepted 5 February 2017

Available online 7 February 2017

Keywords:

Internet addiction
Internet Gaming Disorder
Implicit learning
Risk-taking

ABSTRACT

Introduction: In three consecutive studies, we aimed to investigate the relationship between problematic Internet use (PIU), Internet Gaming Disorder (IGD) and implicit learning abilities, and impulsivity/risk-taking among on-line video gamers and control participants.

Methods: In study 1, male visitors, recruited at the “Gamescom” in Cologne (2013), filled in a short version of the Internet Addiction Test (s-IAT), the Online Gaming Addiction Scale (OGAS), and completed an experimental task to assess implicit learning abilities. In study 2, a group of WoW gamers and control participants completed the same set up, in order to replicate the results of study 1. Study 3 used a modified version of the experiment to measure impulsivity/risk-taking in a group of healthy participants.

Results: In study 1, results revealed a significant negative correlation between the s-IAT score and the measure of implicit learning among male Gamescom participants. In study 2, the s-IAT and WoW addiction scores were negatively correlated with implicit learning only in male WoW players, which mirrors the results from study 1. In study 3, the OGAS score was positively correlated with the experimental measure of impulsivity/risk-taking.

Conclusion: In the current research project, deficient implicit learning was linked to PIU only in male participants with (a tendency towards) IGD. These findings might help to disentangle some opposing results on this relationship, when considering the gender of participants. Furthermore, higher risk-taking tendencies were associated with IGD among healthy participants, thus, suggesting the potential of risk taking as a predictor of IGD in a non-gamer population.

© 2017 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

The Internet has found its way into the daily life of many people worldwide, offering an easy way to gather information and to consume entertainment. With the growing number of Internet users, accounting for almost 50% of the world population at the moment (accessed on 07.09.16. <http://www.internetlivestats.com/internet-users/>), the number of reports on problematic Internet usage (PIU) is rising. In a representative study from Germany ($N = 15,024$ participants) Rumpf, Meyer, Kreuzer, John, and Merkekerk (2011) showed prevalences of 1.5% in Internet addiction, with younger users showing higher proportions (4% in the group of 14–16 year olds). First attempts to define

and diagnose PIU¹ have been made by Kimberly Young in the year 1998 (see also first case report from Young, 1996). Since then numerous tests and screening instruments have been developed (e.g. Young, 1998b; Young, 1998a; Tao et al., 2010), in order to be able to calculate prevalences in different populations and provide patients with effective treatment. However, there is still no existing nosological classification of PIU. The research on online gaming addiction seems to be one step ahead, as recently Internet Gaming Disorder (IGD) was included in Section III of DSM-5, by this means encouraging further examinations before its consideration as a formal disorder (American Psychiatric Association). IGD

¹ Throughout the present paper we will be using the term Problematic Internet Use (PIU) as a substitute for Internet addiction, as there is currently no existing official diagnosis in DSM-5 and ICD 10. As Internet Gaming Disorder (IGD) was included in the Appendix of DSM-5, this term will be used as a synonym of Online Gaming addiction. Please note that not every study, that we cite in the present article, investigated IGD, using the criteria suggested in DSM-5.

* Corresponding author. Tel.: +49 731 5026 558.

E-mail address: Rayna.sariyska@uni-ulm.de (R. Sariyska).

is considered to be a specific form of PIU, which only overlaps in small parts with the generalized form of PIU described above (e.g. Davis, 2001; Montag et al., 2015).

1.1. PIU and implicit learning/decision making

Deficits in decision making have been shown in numerous studies, investigating patients with substance and behavioral addictions (e.g. Bechara et al., 2001; Schoenbaum, Roesch, & Stalnaker, 2006). Because of similarities in the conceptualization of PIU and behavioral/substance addiction (Young, 1998a), the topic of decision-making is also of high relevance to better understand the nature of excessive Internet usage. When assessing decision making a differentiation between decision making under ambiguity and decision making under risk have been made (Brand, Labudda, & Markowitsch, 2006; Schiebener & Brand, 2015). While in decision making under ambiguity the rules for gains and losses and the probabilities of different outcomes are not explicitly explained (measured e.g. with the (first trials of the) IOWA Gambling Task or IGT), in decision making under risk explicit information about the potential consequences, and the probabilities for gains and losses is available or is calculable (measured e.g. with the Game of Dice Task or GDT) (Brand et al., 2006; Schiebener & Brand, 2015). Based on this differentiation and on the dual-process models of decision making (e.g. Epstein, 2003), Schiebener and Brand (2015) proposed a theoretical model to explain decision making under risk. In this model the role of executive functions is highlighted as a key of relevance for decision making under risk, but not decision making under ambiguity. Emotional reward and punishment are supposed to accompany both forms of decision making. Thus, both reflective processes (controlled by cognition), along with impulsive processes (induced by the anticipation of emotional reward and punishment) may be involved in decision-making processes under objective risk conditions (Schiebener & Brand, 2015). Moreover, factors such as information about the decision situation, individual attributes and situational induced states and external influences have been proposed to have modulatory effects on decision making (Schiebener & Brand, 2015).

With respect to Internet addiction a new theoretical framework was proposed by Brand, Young, Laier, Wöfling, and Potenza (2016), called an Interaction of Person-Affect-Cognition-Execution (I-PACE), where an impairment of executive functions and inhibitory control also has been highlighted to be of relevance for the development of PIU. According to this model the development and maintenance of specific Internet-use disorders underlie interactions between predisposing factors (e.g. personality and psychopathology), moderators (e.g. dysfunctional coping style and Internet expectancies), and mediators (e.g. affective and cognitive responses to situational cues). These complex interactions, combined with experiencing gratification and positive reinforcement, as a consequence of the use of a certain feature of the Internet, and with reduced executive functions and inhibitory control, could result in a specific Internet use disorder.

So far, a few empirical studies have been conducted in the context of PIU, inhibitory control and decision making. Most of them are in accordance with the aforementioned theoretical framework by Brand et al. (2016). Sun et al. (2009) for example reported worse performance in a gambling task in excessive Internet users and slower choice of a successful strategy compared to control participants. In a more recent study, Pawlikowski and Brand (2011) reported reduced decision-making ability under risk in the GDT in a group of excessive World of Warcraft (WoW) players compared to control participants. Yao et al. (2015) used a modified version of the Go/NoGo task (where gaming-related stimuli were used next to neutral stimuli) and reported reductions in inhibitory control in participants with IGD, compared to control participants. Laier, Pawlikowski, and Brand (2014) found similar results with a modified version of the IGT, when using pornographic and neutral pictures on the advantageous and/or disadvantageous card decks. Here, male participants showed deficient decision making in trials where the pornographic

pictures were associated with disadvantageous card decks. However, also mixed results concerning decision making in the context of PIU or IGD were reported. In a study by Ko et al. (2010) for example Internet addicted participants showed better decision making, measured with the IGT, compared to control participants. In the study by Yao et al. (2015) already cited above, no difference in decision making using the IGT could be found between healthy participants and those with IGD. To disentangle these conflicting results further studies, examining possible interfering variables, are necessary. One particular variable is described later in the current study.

1.2. PIU, risk taking and impulsivity

Due to the initial characterization of PIU as an impulse control disorder, a number of studies were conducted to explore PIU in the context of impulsivity and risk-taking. Cao, Su, Liu, and Gao (2007) and Lee et al. (2012) showed that PIU was positively associated with trait impulsivity, measured with the Barratt Impulsiveness Scale (BIS-11). With respect to the theoretical framework by Brand et al. (2016), already introduced above, impulsivity is mentioned among the personality factors, showing most stable associations with PIU and is, thus, proposed to be one of the factors, influencing its development and maintenance. Broadly, impulsivity is characterized as “a predisposition toward rapid, unplanned reactions to internal or external stimuli, without regard to the negative consequences of these reactions to the impulsive individuals or to others” (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001; p. 1784). The related term of risk-taking is defined as “behaviors performed under uncertainty, with or without inherent negative consequences, and without robust contingency planning” (Kreek, Nielsen, Butelman, & LaForge, 2005; p. 1453). Ko et al. (2010) applied the Balloon Analog Risk Task (Lejuez et al., 2002) to measure risk-taking, but found no significant association with PIU. In the present study, we are once more looking into these associations, by applying both, self-report along with experimental measures of impulsivity/risk-taking.

1.3. The role of gender for PIU/IGD

Another important issue in the context of Internet addiction is the preference of specific features of the Internet (e.g. online shopping, online gaming), depending on gender. A representative study from Germany showed that 77.1% of Internet addicted females at the age of 14–24 years use social networking sites compared to 64.8% males at the same age (Rumpf et al., 2011). In the same study 7.2% of Internet addicted females at the age between 14 and 24 years reported using the Internet to play online video games, compared to 33.6% of males at the same age (Rumpf et al., 2011). Thus, it seems that with respect to IGD, male participants show higher preference for online-gaming, compared to female participants and were reported to be more at risk to develop IGD. Moreover, Ko, Yen, Chen, Chen, and Yen (2005) observed that older age, lower self-esteem and lower daily life-satisfaction were associated with more severe IGD among males, but not females. Despite these results, there are still just a few studies, which systematically consider the gender of participants as a moderator/mediator variable in the context of PIU. However, it is possible that these differences account for some opposing results in the field and, thus, in the following studies they will be taken into consideration.

The aim of our research project was to investigate the link between PIU, as well as IGD and implicit learning in a group of male participants with proneness to IGD (study 1). In study 2 we aimed at replicating these results, by comparing healthy participants and excessive WoW players under the consideration of gender. The purpose of study 3 was to explore the relationship between PIU, IGD and impulsivity/risk-taking (self-report and experimental data) in healthy participants.

Based on the aforementioned literature, we formulated the following hypotheses:

Download English Version:

<https://daneshyari.com/en/article/5037952>

Download Persian Version:

<https://daneshyari.com/article/5037952>

[Daneshyari.com](https://daneshyari.com)