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Building it better: Applying human–computer interaction and persuasive system design principles to a monetary limit tool improves responsible gambling

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ABSTRACT

In two studies, we aimed to improve the responsible gambling (RG) utility of monetary limit tools for non-disordered Electronic Gambling Machine (EGM) players – the target population for such prevention-oriented RG tools. To this end, based on feedback from focus groups with non-disordered EGM players, we created a new monetary limit tool that incorporated EGM players' desired functionality coupled with design fundamentals of Human Computer Interaction (HCI) and Persuasive Systems Design (PSD; Study 1). We then tested the newly created HCI and PSD inspired tool and compared its RG utility (limit adherence) against a standard monetary limit tool (Study 2). Non-disordered EGM players were randomly assigned to experience the HCI and PSD inspired or the standard monetary tool prior to gambling in a virtual realty casino. As predicted, participants adhered to their pre-set monetary limits more (92%), when exposed to the HCI and PSD inspired pop-up tool than the standard monetary limit tool (62.2%). Improving RG tools through the use of HCI and PSD principles is discussed.

1. Introduction

Against the backdrop of economic downturns and budget shortfalls, governments around the world have legalized gambling as a means to generate public funds (see Campbell & Smith, 1998). Unfortunately, the expansion of legalized gambling results in the increased availability and access to gambling activities, not to mention the normalization of gambling behaviors (Seelig & Seelig, 1998; Volberg & Wray, 2007) – factors that heighten rates of disordered gambling (Room, Turner, & Ialomiteanu, 1999; Temcheff, St-Pierre, & Derevensky, 2013; for a review see Vasiliadis, Jackson, Christensen, & Francis, 2013). To counteract the harms of legalized gambling, gambling jurisdictions have increasingly turned their attention to the development of responsible gambling (RG) tools that help non-disordered gamblers keep their spending within affordable means and thus hinder or halt possible progression toward disorder (Ladouceur, Blaszczynski, & Lalande, 2012; Wohl, Sztainart, & Young, 2013).

To-date, most RG tools have been developed as a primary prevention tool for use on Electronic Gambling Machines (EGMs). The focus on EGMs is due, in large part, to the strong association between EGM play and disordered gambling (see Griffiths, 1993; Productivity Commission, 2010; Williams & Wood, 2004). However, EGMs have also served as a conduit for RG tools because of their electronic displays. Specifically, EGMs have been modified to incorporate a variety of RG tools with the intent of reducing problematic EGM play among non-disordered gamblers (typically it is assumed that intervention by means of professional treatment is needed for disordered gamblers; see Blaszczynski, Ladouceur, & Shaffer, 2004; Christie, Wohl, Matheson, & Anisman, 2010; Wohl, Kim, & Sztainert, 2014). One such RG tool that has been incorporated into EGMs and garnered much attention from stakeholders in the gambling arena (e.g., policymakers, regulators, and operators) is pop-up messages (see Monaghan, 2008; Schellink & Schrans, 2002).

While empirical research has shown a meaningful effect of pop-up messages in terms of RG knowledge (Cloutier, Ladouceur, & Sevigny, 2006; Floyd, Whelan, & Meyers, 2006; Monaghan & Blaszczynski, 2007) and RG behavior (Stewart & Wohl, 2013; Kim, Wohl, Stewart, Sztainert, & Gainsbury, in press; Wohl, Gainsbury, Stewart, & Sztainert, 2013), there is room for increasing their efficacy. Indeed, gambling jurisdictions that make RG tools available for use tend to see low uptake from the end-user usage

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(Productivity Commission, 2010; Schellinck & Schrans, 2007). The gap between current and desired impact of RG-oriented pop-up messages could be due to the way pop-up messages are currently designed. Presently, standard limit-oriented pop-up message tools are designed and implemented based on experts' and researchers' notions of what RG entails. Such an approach does not fully consider the needs and preferences of gamblers (i.e., the end-users) in terms of functionality, usability, and experience. Indeed, we surveyed extant RG pop-up message tools and found that they do not follow fundamental design principles of Human Computer Interaction (HCI) – a discipline concerned with the design, evaluation and implementation of technologies for humans, thus limiting their RG utility. Moreover, the pop-up messages currently used in many gambling jurisdictions do not follow Principles of Persuasive System Design (PSD; Fogg, 2003) – principles that would significantly increase the likelihood of having an influence on the end-users' behaviors (e.g., a gambler adhering to their pre-set limits). In the current research, we outline the design and creation of a new HCI and PSD inspired monetary limit pop-up message tool and then test its RG utility against a standard monetary limit pop-up message tool currently in use in most gambling jurisdictions.

1.1. Electronic gambling machines and disordered gambling

While it is true that most EGM gamblers do not develop disordered patterns of gambling behavior, a small but significant portion will (Williams & Wood, 2004). The development of problematic EGM play is due, in part, to the fact that EGMs are the most accessible and addictive form of gambling (Azmier, 2005; Collier, 2008). In fact, relative to other types of gamblers, those who play EGMs exhibit more rapid onset of gambling problems (Breen, 2004; Breen & Zimmerman, 2002) and experience more gambling related harms (Cox, Kwong, Michaud, & Enns, 2000; Doiron & Nicki, 2001; Wiebe & Cox, 2001; Wiebe, Mun, & Kauffman, 2006). Moreover, EGMs are disproportionately represented as the preferred form of gambling reported by problem gamblers seeking treatment (Productivity Commission, 2010). Putting a dark line under these findings, Williams and Wood (2004) reported that approximately 15% of EGM players experience moderate or severe gambling problems and account for an astonishing 60% of total EGM revenue.

Importantly, EGM expenditures decrease when a monetary limit is set (Omnifacts Bristol Research, 2007), without decreasing the intensity or enjoyment of gambling (see Nelson et al., 2008). As a result, pre-committing to a spending limit is an effective way to limit the harms associated with EGM play, especially among non-disordered gamblers. Unfortunately, many non-disordered gamblers who set a limit prior to play exceed their limit once it is reached (Wohl, Christie, Matheson, & Anisman, 2010). Although the ultimate decision to exceed a pre-set monetary limit (and gamble excessively) remains with the gambler, the structural characteristics of EGMs (e.g., rapid playing speed, flickering lights, continuous rate of play and "winning" sounds) can undermine the gambler's ability to stop (Dowling, Smith, & Thomas, 2005; Productivity Commission, 1999). In response to the harms associated with EGM play, governments and the gambling industry have begun initiating primary prevention programs designed to help the non-disordered gambler set and stay within an affordable monetary limit on their play to hinder or halt their possible progression toward disordered gambling – programs that have demonstrated varying amounts of RG utility (see Responsible Gambling Council, 2006; Wohl et al., 2013).

1.2. Facilitating monetary limit setting via pop-up message tools

One means by which the RG utility of monetary limit setting has been communicated to gamblers is via pop-up messages on EGMs (see Ladouceur et al., 2012; Monaghan, 2008; Stewart & Wohl, 2013). A pop-up message is the periodic display of information on a computer screen that is used to shift the user's attention towards the intended information (Moe, 2006). Traditionally, pop-up messages have been used to advertise products and services on the Internet. However, they have increasingly been successfully applied to promote healthy behaviors including, among other things, the cessation of smoking, the promotion of physical activity, as well as responsible gambling (see Monaghan & Blaszczynski, 2007; Sohn & Lee, 2007; Stewart & Wohl, 2013).

Within the context of gambling, a pop-up message can be designed to inform the gambler of the benefits of a pre-determined monetary limit. For example, Monaghan and Blaszczynski (2007) presented EGM gamblers with RG information via pop-up message or a static sign beside the EGM being played. They found that gamblers recalled the presented information more accurately when it was presented via a pop-up message. Based on this finding, Monaghan (2008) argued that pop-up messages facilitate RG because the messages they provide are dynamic and thus capture the EGM gambler's attention. Capturing their attention is critical due to the gambler's susceptibility of entering a trancelike state (i.e., dissociation) while gambling on an EGM (see Diskin & Hodgins, 2001; Grant & Kim, 2003). Specifically, dissociation while gambling on an EGM makes the gambler oblivious to their surroundings and expenditures (Wynne, 1994), which helps to explain why gamblers are particularly apt to exceed their pre-set monetary limits when engaging in EGM play.

Recently, Wohl and colleagues (Stewart & Wohl, 2013; Wohl et al., 2013) found empirical support for the contention that pop-up messages functioned to reduce the EGM gambler's dissociative state. Specifically, they found that a pop-up message that (a) asked EGM gamblers to set a monetary limit and then (b) reminded them when their pre-set monetary limit had been reached, reduced the extent to which they dissociated. Moreover, this reduction in dissociation helped the EGM gambler adhere to their pre-set limit. By grabbing the gambler's attention and focusing it on their pre-set monetary limit, the pop-up message was able to facilitate adherence and help gamblers play responsibly. Thus, it would appear that pop-up messages oriented to limit setting and adherence has significant RG utility.

1.3. Improving the efficacy of RG pop-up message with HCI and PSD

Despite the fact that pop-up messages on EGMs have shown considerable promise in helping gamblers avoid losing more money than they can afford, there is considerable room to improve a pop-up message's RG utility. Indeed, while pop-up messages may help capture the attention of gamblers (Monaghan, 2008; Monaghan & Blaszczynski, 2007) and facilitate the setting of a pre-set monetary limit (Stewart & Wohl, 2013), a significant number of gamblers exceed their limit despite the presence of such tools (see Wohl et al., 2010). This reflects a limited efficacy of pop-up messages as they are presently designed. Herein, we argue that the efficacy of pop-up messages can be improved by applying knowledge and experience from HCI – a discipline that examines people's engagement with interactive technology to increase technology's usability and uptake.

The basic philosophy of HCI is that designing the look and feel of interactive technology must incorporate feedback from the end-user. Indeed, according to O'Brien and Toms (2008), the incorporation of end-user feedback engages the technology, which leads to a satisfying human–computer interactive experience whilst achieving the goals of the user. Aside from the simple and yet powerful notion of having the user inform designers of their needs, a user-oriented approach is also characterized by continuous involvement of the end-user throughout the design, evaluation, and testing