



Does a contextualized theory of planned behavior explain why teenagers stay in virtual worlds?



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ABSTRACT

Academics and business practitioners are intrigued by the factors that foster continued user engagement in virtual worlds (VWs). It is unclear how, and to what extent, existing theories can explain their continued use. As young people constitute the majority of VW users, understanding the reasons for their continued use intentions is important. Taking the distinctive features of VW services into account, such as the visibility of users' actions to other users, we contextualize the Theory of Planned Behavior and investigate the role of teenagers' attitudes, social influences and perceived behavioral control as the determinants of their continued intention to use VW. We then apply a set of constructs from prior Information Systems (IS) literature to decompose these constructs. By analyzing primary data collected from 923 users of Habbo Hotel, a leading virtual world for teenagers, this study confirms the role of users' intrinsic motivation, interpersonal influence and self-efficacy as key constituents of sustained user engagement in VWs. In addition, we demonstrate that decomposing these three established constructs can capture many of the key contextual characteristics of VWs. The study contributes to the literature by showing that IS theories and constructs are appropriate for the VW setting and teenage users.

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1. Introduction

Virtual worlds (VWs) are a rapidly emerging socio-technical reality for an increasing number of users, particularly young people. By May 2012, VWs had received 1.9 billion registered users, 60% of whom are between 5 and 15 years of age (kZero, 2012). As an example, Habbo Hotel—the largest VW for teenagers—has attracted 275 million registered users since its inception in 2000 (Sulake Corporation, 2013). The issue of continued use in VWs and other online services is of utmost interest to academics and business practitioners, as only a proportion of the registered accounts remain active, users are hard to retain, and lost users are even more difficult to win back (cf. Schwarz, Schwarz, Jung, Pérez-Mira, & Wiley-Patton, 2012; Sulake Corporation, 2013).

In the literature, VWs are defined as persistent computer-simulated environments in which multiple users interact

simultaneously through avatars (Bainbridge, 2007). VWs embody a variety of functions and activities that tap into the extrinsic and intrinsic motivation contributing to the attitude toward using these systems (Verhagen, Feldberg, van den Hooff, Meents, & Merikivi, 2012). Further, when employing VWs for one of their purposes, users do so through interaction with a changeable group of other people (Chaturvedi, Dolk, & Drnevich, 2011, p. 675). Therefore, we suggest that social influence affects user behavior in VWs (Hau & Kim, 2011). With respect to system controllability, VWs feature simultaneous events that are to be navigated through an avatar. Bearing this in mind, it is reasonable to suggest that VW users need specific skills to control their activity in the system (Goel, Junglas, Ives, & Johnson, 2012).

Although recent studies have provided new and valuable insights into the diverse mechanisms that are unique to the use of VWs (Behm-Morawitz, 2013; Faiola, Newlon, Pfaff, & Smyslova, 2013; Goel, Johnson, Junglas, & Ives, 2011; Mäntymäki & Islam, 2014; Saunders, Rutkowski, van Genuchten, Vogel, & Orrego, 2011), little effort has been made to integrate these perspectives into a single theoretical structure that would explain *why young people engage in VWs on a sustained basis*. To address this gap we adopt the

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Table 1
An overview of studies on post-adoption behavior in virtual worlds.

Focus	Theoretical background	Key constructs	Target group	Author(s)
VW assimilation as a predictor of continued use	Theory of reasoned action	Attitude, ease of use, playfulness, social presence, self-distraction	University students	Schwarz et al. (2012)
Continuous VW use and purchasing behavior	Technology acceptance model	Perceived enjoyment, usefulness, network pressure	Adolescents	Mäntymäki and Salo (2011)
Environmental characteristics of VWs and deep user involvement	Interactionist theory of place attachment	Cognitive absorption	University students	Goel et al. (2011)
Flow and learning in VWs	Flow theory	Flow, telepresence	Adult users	Faiola et al. (2013)
Continuous VW use in the work setting	User-technology-task	Cognitive absorption, work usage, recreational usage	Adult users	Nevo et al. (2012)
Sense of presence and perceived autonomy in VWs	Expectation-confirmation theory	Telepresence, social presence, perceived autonomy	Adult users	Jung (2011)
Satisfaction and commitment as drivers of continued VW use	Dedication-constraint framework of commitment	Satisfaction, affective commitment, calculative commitment	Adult users	Zhou et al. (2012)
The effect of habit on continuous VW use	Theory of habit	Habit, perceived usefulness, enjoyment	Adult users	Barnes (2011)
Social drivers of user retention in VWs	Spatial model of interaction; awareness attention theory	Focused immersion, temporal dissociation, social perception, social awareness	Adult users	Goel et al. (2013)
Hedonic, utilitarian and social gratifications and social influences as drivers of continuous use intention in VWs.	Theory of reasoned action; Uses & Gratifications theory	Perceived enjoyment, perceived usefulness, social presence, status gains outside the VW, secondary sources of information, perceived network size	Adolescents	Mäntymäki and Riemer (2014)

decomposed theory of planned behavior (DTPB) (Hsieh, Rai, & Keil, 2008; Pavlou & Fygenon, 2006; Taylor & Todd, 1995a, 1995b) as it allows us to pursue a theory-based decomposition of attitudes, social influences and system controllability and investigate their effects on the continued use intention of VWs.¹ The data is gathered from the largest VW for teenagers, Habbo Hotel.

This study makes three contributions. First, we shed light on young people's intentions to continue using a VW service. Bearing in mind that young people are the majority of users in VWs, investigating social practices with this group is particularly relevant for further academic pursuits. Second, we provide insights into the roles and relative influences of attitudinal beliefs, social influences, and system controllability as the antecedents of continued VW use. Third, we add to the body of theoretical knowledge of how and to what extent DTPB predicts VW users' continued use intentions.

2. Research background

To choose the relevant theoretical perspectives to explain continued VW use, and to support the selection of viable constructs to measure it empirically, we conducted a context-centric review of the body of research literature on users' post-adoption behavior in VWs. Based on review, a pool of nine empirical studies is summarized in Table 1.

As Table 1 demonstrates, there is no single theoretical framework that dominates the research on the continued use of VWs (Schwarz et al., 2012). Indeed, the review demonstrates that only a few studies have investigated post-adoption behavior in VWs, and that a systematic integrative investigation of the role of attitudinal beliefs, social influences, and system controllability has been lacking. Although the available studies reflect diverging theoretical orientations, the DTPB has not yet been subjected to an empirical investigation in this context. We believe that the nomological structure of the DTPB is well suited to accommodating and expanding upon the constructs that emerged from the review as it offers applicable constructs to address users' motives and goals related to use (Barnes, 2011; Billieux et al., 2013; Mäntymäki & Islam, 2014;

¹ Based on Fishbein and Ajzen's (1975) conceptualization, we adopt behavioral intention as a proxy for measuring actual behavior, and define it as users' intent to continue using a virtual world, which exemplifies instance of use.

Mäntymäki & Salo, 2011; Nevo, Nevo, & Kim, 2012; Zhou, Jin, Vogel, Fang, & Chen, 2011). The DTPB (Taylor & Todd, 1995a, 1995b) draws upon theory of planned behavior (TPB) (Ajzen, 1991) by proposing a decomposition of attitude, subjective norm, and perceived behavioral control into attitudinal, normative, and control beliefs. The attitude is viewed as a function of cognitive beliefs and refers to an "individual's positive or negative feeling (evaluative affect) about performing the target behavior" (Fishbein & Ajzen, 1975, p. 216). Congruently, subjective norm in turn represents the social influences on behavior and refers to the perception about whether others important to an individual believe that he or she should perform a particular behavior (Fishbein & Ajzen, 1975). Finally, perceived behavioral control captures the constraints on behavior and refers to the "perceived ease or difficulty of performing a behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles" (Ajzen, 1991, p. 188).

In our effort to contextualize the theoretical approach to explaining continued VW usage, the attitudes, subjective norms and perceived behavioral control are disaggregated in beliefs that are assumed to be of interest in this research setting. The logic behind the decomposition places specificity before generalization. Hence a deeper reconstruction of the constructs considered to be influential to users' behavioral intentions is achieved (Midgley, 1984). In doing so, we meet important model-building criteria, such as accuracy, depth, predictive power, and originality (Bunge, 1961), thereby contributing to the theoretical and managerial value of our findings.

3. Research model and hypotheses

The research model is presented in Fig. 1. The individual relationships in the model are justified on the basis of the IS literature and especially the literature on VWs.

Drawing on the core assumptions of the DTPB, we suggest that behavioral intention to use VWs is driven by three constructs: attitude toward a behavior, subjective norms, and perceived behavioral control. Previous research on VWs has provided accumulative support for this nomological structure. For example, Shin (2009) and Schwarz et al. (2012) demonstrated the positive relationship between attitude and behavioral intention within a VW. Regarding the influence of subjective norms in the VW context, Wu, Li, and Rao (2008) found that normative pressure favoring the use of a VW

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