

# Investigating the Drivers of the Continuous Use of Social Virtual Worlds

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## Abstract

*Social virtual worlds (SVWs) have become increasingly important environments for social interaction, especially for the younger generations. For SVWs to be economically sustainable attracting users and retaining existing users is a paramount issue. This requires understanding the underlying reasons why users continuously engage in social virtual worlds and therefore we empirically investigate the world's largest SVW for teens, Habbo. We apply Technology Acceptance Model as well as IS continuance models complemented with perceived critical mass to investigate the continuous use of Habbo. The research model is empirically tested with data from 2215 Finnish Habbo users by applying structural equation modeling. Perceived enjoyment was found to be the main determinant of the continuous use intention followed by perceived critical mass. Somewhat surprisingly, satisfaction had very little influence on the continuous use intention. Moreover, perceived usefulness and ease of use had only a marginal impact on satisfaction.*

business importance. SVWs offer new business opportunities not only to individuals but also to organizations. For example, automotive manufacturers utilize Second Life to present their products.[38] Moreover, by attracting a fairly large number of individuals the value of monthly user-to-user transactions conducted in Second Life has, according to Linden Labs, been soaring rapidly, yielding a value of nearly 50 million USD in the second quarter of 2009.<sup>2</sup> Hence, understanding the characteristics and dynamics of this new virtual business environment and use context is important for information systems (IS) research and practice.

SVWs can be categorized as a subset of virtual worlds used in relation to game worlds. Many SVWs provide a platform that can be described more as an extension of reality than just a fantasyland. Moreover, SVWs are persistent computer-mediated communities that simulate an environment and use elements of gaming [4; 8]. Yet, contrary to games, there are no specific goals or tasks to be accomplished. Apart from the element of game immersion, SVWs could be compared to virtual communities; "social aggregations that emerge from the net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace"[44]. In contrast to mere 'traditional' online communities, SVWs contain graphic elements e.g. avatars and a 3D virtual space in which the users can move their avatars.

In this paper, we empirically investigate Habbo, which has almost 12 million monthly unique visitors in 31 local portals, making it the world's largest SVW designed for teens.<sup>3</sup> Habbo collects no access fee but offers virtual furniture for decorating user-

## 1. Introduction

Social virtual worlds (SVWs) have become increasingly popular places for spending free time. Most virtual worlds are targeted at people under 30 years old.<sup>1</sup> In addition, they are increasing in terms of

<sup>1</sup> [http://www.kzero.co.uk/blog/?page\\_id=2092](http://www.kzero.co.uk/blog/?page_id=2092)

<sup>2</sup> The Second Life Economy - Second Quarter 2009 in Detail, <https://blogs.secondlife.com/community/features/blog/2009/08/12/the-second-life-economy--second-quarter-2009-in-detail> (Retrieved Sep 1 2009)

<sup>3</sup> Sulake Corporation, "Habbo - Where else", April 2009 (retrieved June 9, 2009) <http://www.sulake.com/habbo/?navi=2>.

generated virtual rooms, and voluntary memberships that allow members additional benefits not available to non-subscribers. All these can be bought with Habbo credits, virtual currency purchased with real-life money. In a business that relies on access fees, commercials and premium services, the social outcomes, extended play and loyalty that result from members engaged with an SVW is translated directly into monetary value. [21; 26]

Thus, as with several other online services [6; 7; 19; 43], attracting and retaining existing users i.e. customer loyalty is a paramount issue to the survival of SVWs. Therefore, in this paper, we particularly focus on investigating continuous use intention at the post-adoption phase. Within the context of SVWs, ensuring sustained user involvement is a result of social interaction, which is a core stimulus for users. A sufficient base of active users, a critical mass, is thus required to make an SVW worth logging in to. On the other hand, achieving both a critical mass and social action between users in any network would be virtually impossible, if users visited them only once and then discontinued use.

The purpose of the paper is to better understand why people engage in social virtual worlds. So far, social virtual worlds have not been investigated in technology acceptance and post-adoption research, yet prior research has investigated related areas such as online communities and games. [33; 35] Hence, we attempt to contribute on two areas, information technology acceptance and the research on use of social virtual worlds. The present paper contributes to technology acceptance research by developing a research model for investigating the determinants of the continuous use of SVWs and by empirically testing the model with active Habbo users. Secondly, the paper focuses on examining adolescents. While employees [51; 54], heads of household [53] students [15; 36], consumers [49] elderly people [37], and the socially advantaged and disadvantaged [23] have received attention in prior IT adoption and post-implementation literature, young users, namely teenagers, seem to be passed unnoticed in empirical investigation. Moreover, the paper contributes to multi-disciplinary research on virtual worlds by utilizing the tools from the IS research tradition to systematically investigate the motives for continuous engagement in SVWs.

As regards to the practical contribution, the paper provides the maintainers and developers of SVWs with insights into the factors behind the continuous use of SVWs, which can be beneficial in developing new features and services to promote customer loyalty.

In the present paper, we apply TAM [14; 15], IS continuance models by Bhattacharjee [6; 7] and Thong et al. [47], complemented with perceived

critical mass [31; 34; 50] to develop and integrative research model. By doing this, we attempt to provide a somewhat comprehensive illustration of the determinants for continuous SVW engagement. In addition, we investigate the mutual relationships between these constructs. Taken together, we believe that our research model provides a starting point for further research to better understand the user behavior in the SVW context.

The research model with the hypotheses will be presented in the following chapter, followed by the results. Finally, the findings are discussed from both a theoretical and managerial perspective and areas for further research are suggested.

## 2. Background and hypotheses

Investigating technology acceptance and adoption has evolved into one of the most prominent research streams within the IS discipline [27; 52; 54], providing researchers with a wide array of theoretical tools. Recent IS literature has shown increasing interest in post-adoption behavior [27; 28; 41] and IS continuance [6; 7; 32; 42], which underscores the importance of understanding subsequent behavior, after initial user acceptance, to materialize business benefits. Several theoretical frameworks, such as the theory of planned behavior, TAM and expectation-(dis)confirmation theory have been utilized in investigating post-adoption user behavior. [6; 7; 24; 42; 47]

As argued by Benbasat & Zmud [5], the usage context of the IT artifact is an important factor in explaining user behavior. Self-evidently, the use context of SVWs differs from organizational computing in many ways. First of all, the use of SVWs is related to free time and leisure rather than work and productivity, which underscores the importance of hedonic use motives [49]. Secondly, the use of SVWs is based on voluntariness. Finally, social motives are particularly significant within the virtual world context since the presence of other users makes them meaningful [3]. To grasp the characteristics of the use context of Habbo, we have applied TAM as well as the IS continuance models. The research model is presented in Figure 1.

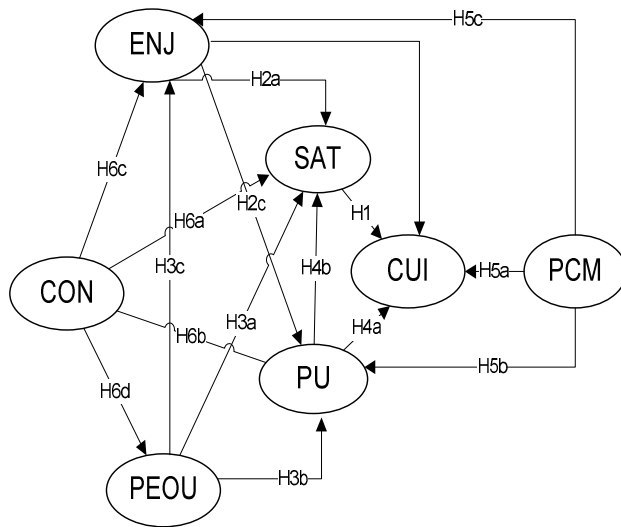


Figure 1. The research model

Drawing on TRA, TAM views attitude as the main determinant of behavioral intent [15]. Thereafter, the attitude construct has been excluded from subsequent models investigating technology acceptance such as TAM2 and UTAUT. [14; 49; 52; 54]. However, Venkatesh et al. (2003) regarded attitude as an interesting construct [52].

IS continuance models by e.g. Bhattacharjee (2001) and Thong et al. (2006) are built on TAM and expectation-(dis)confirmation theory and the attitude construct has been replaced with satisfaction.[7; 47]

Attitude can be formed based on information about past behavior, affective information and cognitive information [57]. In a pre-adoption context the user relies on secondary sources of information whereas in the post-adoption context he or she has gained first hand experience. First hand experience is found to reinforce the link between attitude and behavioral intention [28]. We use the term satisfaction, yet it could potentially be replaced with attitude since attitude and satisfaction can, despite their conceptual distinction, be used as isomorphic constructs when they, over time, reach a steady phase [7; 10]. The fact that we focus on post-adoption user behavior and apply IS continuance models support using the word satisfaction [10; 32]. However, to be consistent with prior studies on IS continuance; we employ satisfaction in place of attitude.

Since our unit of analysis is the individual user in contrast to an organization, and the use of Habbo is voluntary, the inclusion of attitudinal construct, i.e. satisfaction in the research model, can be considered appropriate [16]. Finally, we investigate active users of Habbo and have operationalized satisfaction for a user’s overall evaluation of Habbo because it

particularly refers to the user’s disposition to Habbo rather than SVWs in general. Based on these arguments we believe positioning satisfaction in the research model is theoretically well-grounded.

*H1: Satisfaction with the SVW has a positive effect on the continuous use intention.*

Human behavior is influenced by extrinsic and intrinsic motives [46]. Hence, as argued by Childers et al. [11] and Dabholkar & Bagozzi [12], including hedonic aspects may be beneficial for technology acceptance models.

Thus, similarly than in Thong et al.[47] and Hsieh et al. [23] the enjoyment derived from using the technology is viewed as an intrinsic motivation, which in turn is an antecedent of attitude. In this study, satisfaction is employed in place of attitude and hence enjoyment is positioned as a determinant of satisfaction.

In his empirical investigation of acceptance of hedonic web sites van der Heijden [49] found perceived enjoyment to be a more powerful determinant of acceptance intention than perceived usefulness or ease-of-use. Due to the leisure-driven use context of SVWs and since the target group of Habbo is teenagers, the hedonic motives, i.e. enjoyment, are particularly important. Therefore we argue that to be considered useful in social interaction, using the SVW must be perceived enjoyable[56]. As a result, drawing on [16; 47; 49; 56], the role of enjoyment is hypothesized as follows:  
*H2a: Perceived enjoyment has a positive effect on the satisfaction with the SVW.*

*H2b: Perceived enjoyment has a positive effect on the continuous use intention*

*H2c: Perceived enjoyment has a positive effect on perceived usefulness.*

In the original TAM, perceived usefulness and perceived ease of use (PEOU) were positioned as the antecedents of attitude [14; 15]. Perceived ease of use has found to have a somewhat inconsistent effect, particularly in the later stages of usage [52]. Since the role of ease of use has not been extensively investigated in the SVW context, we draw on [14; 15] and place ease of use as a precursor of satisfaction. In addition to its direct effect, numerous studies have verified perceived ease of use as having a direct influence through perceived usefulness.

The relationship between perceived ease of use and enjoyment has been somewhat debatable; enjoyment has been found to be a determinant of PEOU and vice versa. [13; 55]

As Habbo is used particularly for entertainment, i.e. hedonic purposes and the use is entirely voluntary, we argue that to be enjoyable, the user experience in Habbo needs to be free from mental effort. Thus, drawing on [49], we hypothesize:

*H3a: Perceived ease of use has a positive effect on satisfaction.*

*H3b: Perceived ease of use has a positive effect on perceived usefulness.*

*H3c: Perceived ease of use has a positive effect on perceived enjoyment*

Several studies have found perceived usefulness (PU) to be a consistent determinant of technology use. [47; 52] *Based on the models on IS continuance [7; 32] PU is placed as a determinant of continuous use intention and satisfaction.*

However, when investigating information systems of a hedonic nature, perceived usefulness needs to be operationalized somewhat differently than in a workplace context. In his seminal work, Davis (1989, 320) assumed that “people tend to use or not use an application to the extent they believe it will help them perform their job better,” and therefore, defined perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance.” Although Habbo is not designed to facilitate occupational performance, it still provides a means to attain a goal extrinsic to the object, namely communicating or becoming friends with other users. Similarly, a user may feather his or her nest by selling virtual items collected in Habbo for real money. Therefore, perceived usefulness, in general, refers to any utility gained by using technology, not only to enhancing his or her job performance. To provide managerial relevance, perceived usefulness, in our study, reflects the social utility (i.e. social interaction with friends) gained by using Habbo.

*H4a: Perceived usefulness has a positive effect on the continuous use intention with the SVW.*

*H4b: Perceived usefulness has a positive effect on the satisfaction with the SVW.*

As SVWs are designed for social interaction with other people, one can assume the presence of other users is of particular importance in the SVW context. Drawing on Metcalfe’s law, the number of relevant other users in general terms increases the value the SVW is able to provide its users. Due to its popularity among the target group, Habbo has reached a critical mass. Thus, in this paper, we investigate critical mass from an individual user’s perspective and utilize the concept of perceived critical mass introduced by Lou et al. (2000) [34]. Similarly to Hsieh et al. [23], Lou et al. and Li et al. [31; 34], perceived critical mass has been operationalized as the degree to which a person believes that most of his or her peers are using a particular innovation. In comparison to the subjective norm, perceived critical mass captures the aggregate personal network exposure [23]. Prior studies have shown perceived critical mass influencing behavioral

intention both directly and indirectly (cf. Van Slyke et al., 2007) [50].

*H5a: Perceived critical mass has a positive effect on the continuous use intention.*

*H5b: Perceived critical mass has a positive effect on perceived usefulness*

*H5c: Perceived critical mass has a positive effect on perceived enjoyment.*

According to expectation-(dis)confirmation theory, the confirmation of expectations is an antecedent of satisfaction, which in turn is a positive affect [40]. Moreover, the actual experience from being involved in the SVW leads the user to confirm or disconfirm his/her expectations of perceived usefulness, enjoyment and ease of use. [7; 47]

*H6a: Confirmation has a positive effect on satisfaction with the SVW.*

*H6b: Confirmation has a positive effect on perceived usefulness.*

*H6c: Confirmation has a positive effect on perceived enjoyment.*

*H6d: Confirmation has a positive effect on perceived ease of use.*

### 3. Empirical research

#### 3.1. Data collection

The data was collected with an online survey which was posted on eight local Habbo portals, namely Brazil, Canada, Finland, France, Germany, Spain, UK and the U.S. The users logged in at their local portal and each portal had its own specific content. Hence, the user experience is also, at least to some extent, portal-specific. Thus, we decided to examine the portals separately. In the present paper we focus on the data from the Finnish responses. The survey was originally written in English and thereafter translated by professional translators into the target languages. Finally, back-translation was conducted to ensure the translations corresponded with the original English version. The Finnish survey was opened 8814 times and 3266 respondents completed the survey. Hence, the response rate was approximately 37%. To ensure the best possible quality of the responses, only fully completed responses were included in the analysis. After excluding cases with missing or incomplete responses, 2215 fully completed and usable cases were retained for analysis. In total, 59.6% of the respondents were female and, 13, 12 and 14 year old teenagers were the largest age categories with respectively, 19.3, 19.0 and 14.5% shares from all respondents.

### 3.2. Measurement model

To assess model fit and construct validity, the data analysis was begun with a confirmatory factor analysis (CFA) on the measurement model using AMOS 7.0 software. Each scale item was modeled as a reflective indicator. Apart from satisfaction and perceived critical mass, the items were measured with a seven-point Likert scale, anchored from strongly disagree to strongly agree. Satisfaction was measured using a semantic scale based on Ajzen (1991). Continuous use intention was measured with two items, other constructs with three or four items. The items were mostly adapted from prior IS literature with some minor modifications. The items for perceived usefulness were designed to measure to what extent Habbo is perceived helpful in social interaction. The operationalizations of the constructs can be found in Appendix 1.

Convergent validity indicates the degree to which the items of a scale that are theoretically related are actually related in reality, whereas discriminant validity reflects whether the items measure the construct in question or other constructs. The convergent validity was evaluated based on three criteria: Firstly, all indicator factor loadings should be significant and exceed 0.7. Secondly, composite reliabilities should exceed 0.80. Third, average variance extracted (AVE) by each construct should be greater than the variance due to measurement error (AVE > 0.50). [18] Composite reliabilities ranged from 0.852 to 0.937. AVE ranged from 0.614 to 0.753. Finally, all item loadings in the CFA model exceeded 0.7 and were significant at the 0.001 level. Thus, the conditions for convergent validity were met.

As regards the discriminant validity, the square root of the AVE for each construct should exceed the correlation between that and any other construct. Table 3 indicates that the highest correlation between any pair of constructs was 0.747 (confirmation and continuous use intention). Hence, the test of discriminant validity was also met. [18]

After the convergent and discriminant validity was found to be acceptable, the goodness-of-fit of the CFA model was investigated. As the large sample size substantially inflates the chi-square, the chi-square statistics or the normed chi-square (CMIN/df = 5.209) were not used [22]. As can be seen from table 3, all the fit indices for the measurement model indicate a good model fit.

	MEAN	SD	Loading	C.R	AVE
SAT1	5.235	1.647	0.826	0.9274	0.753
SAT2	5.200	1.736	0.907		
SAT3	5.052	1.693	0.863		
SAT4	5.290	1.749	0.893		
CUI1	5.611	1.864	0.884	0.8862	0.614
CUI2	5.102	2.045	0.900		
PEOU1	5.864	1.603	0.854	0.9053	0.695
PEOU2	5.807	1.687	0.89		
PEOU3	5.873	1.628	0.873		
PU1	5.002	2.071	0.919	0.9349	0.712
PU2	4.864	2.106	0.942		
PU3	4.900	2.085	0.866		
CON1	4.963	1.870	0.879	0.8525	0.705
CON2	4.966	1.876	0.898		
CON3	4.972	1.850	0.900		
ENJ1	5.756	1.599	0.881	0.9373	0.714
ENJ2	5.632	1.614	0.929		
ENJ3	5.002	2.071	0.927		
PCM1	4.201	1.951	0.713	0.926	0.708
PCM2	3.682	2.045	0.982		
PCM3	3.692	2.059	0.978		

Table 1. Construct validity

	SAT	CUI	PEOU	PU	CON	ENJ	PCM
SAT	<b>0.868</b>						
CUI	0.534	<b>0.784</b>					
PEOU	0.466	0.570	<b>0.834</b>				
PU	0.521	0.559	0.468	<b>0.844</b>			
CON	0.561	0.747	0.624	0.605	<b>0.840</b>		
ENJ	0.670	0.704	0.591	0.705	0.705	<b>0.845</b>	
PCM	0.338	0.380	0.273	0.507	0.456	0.369	<b>0.842</b>

Table 2. Correlations between the constructs (the elements descending diagonally show the square root of the AVEs)

Fit index	Measurement model	Recommended thresholds
GFI	0.962	> 0.90 [20]
AGFI	0.947	> 0.80 [20]
TLI	0.980	> 0.90 [48]
SRMR	0.039	< 0.05 [20] < 0.08 [25]
NFI	0.980	> 0.90 [20]
CFI	0.984	> 0.90 [9]
RMSEA	0.044	< 0.06 [25]

Table 3. Model fit statistics

### 3.3. Structural model results

After having tested the fit of the measurement model we proceeded to test the structural model. Maximum likelihood estimation was used since the data was only moderately non-normal and ML has proven robust with large sample sizes and under

conditions of moderate non-normality. The model fit for the structural model was found to be acceptable (GFI = 0.950, AGFI = 0.933, TLI = 0.972, NFI = 0.973, CFI = 0.977, RMSEA = 0.052, SRMR = 0.050).

Of the 16 hypothesized paths, 14 were significant at 0.01 level, potentially also because of the influence of the large sample size. H3b and H4a were rejected. Moreover, the empirical support for H1, H3a, H4b, H5c and H6b was weak. Enjoyment was found to be clearly the strongest predictor of satisfaction, followed by confirmation. The very weak causal relationships between PU, PEOU and satisfaction are in contrast with prior studies, calling for further analysis. In terms of variance explained, the variables used in the research model accounted for 46.9 percent in satisfaction.

In addition to the hypothesized paths, we controlled the influence of age, gender and experience by positioning these factors as antecedents of all the latent variables in the research model. As regards the dependent variable, enjoyment was found to be a strong predictor of the continuous use intention, followed by perceived critical mass. Interestingly, the impact of satisfaction was very weak. In terms of squared multiple correlations, satisfaction, enjoyment and perceived critical mass accounted for 53.8 percent of the continuous use intention. Tables 3 and 4 summarize the results from the path analysis.

Hypothesis	Std. path coefficient	*** = p < 0.001 ** = p < 0.01
H1: SAT•CUI	0.075	**
H2a: ENJ• SAT	0.492	***
H2b: ENJ• CUI	0.590	***
H2c: ENJ• PU	0.530	***
H3a: PEOU• SAT	0.067	**
H3b PEOU• PU	0.025	n.s.
H3c PEOU• ENJ	0.251	***
H4a PU• CUI	0.051	n.s.
H4b PU•SAT	0.068	**
H5a: PCM• CUI	0.116	***
H5b: PCM• PU	0.266	***
H5c PCM• ENJ	0.055	**
H6a: CON• SAT	0.126	***
H6b CON• PU	0.082	**
H6c: CON• ENJ	0.544	***
H6d: CON• PEOU	0.626	***

**Table 3. Results from the structural model**

Construct	r-squared
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PEOU	0.392
PU	0.569
ENJ	0.568
SAT	0.469
CUI	0.538

**Table 4. R-squared for the constructs**

After having tested the structural model, we conducted a post hoc analysis to investigate the potential influence of age, gender and the length of prior Habbo experience by controlling their impact on the latent variables. Age was found to have a statistically significant negative impact on the latent constructs, except on the continuous use intention and perceived usefulness. Similarly, prior experience had a significant negative effect on all latent constructs, except perceived ease of use. Interestingly, gender and prior experience did not have a significant impact on any of the latent constructs. All model fit indices exceeded the recommended thresholds also when the control variables were examined. The fact that age, and therefore prior experience, had a negative impact was expected, since when growing up, the users shift away from Habbo’s target group, potentially towards other SVWs.

We also examined the risk for common method bias using Harmon’s single-factor test via CFA by specifying a hypothesized method factor as an underlying driver for all the indicator variables. The fit of the single-factor model was completely unacceptable (GFI=0.512; AGFI=0.410; TLI=0.525; CFI=0.570; RMSEA=0.213), which indicates that CMV is not a major source of the variations in the observed variables. However, since Harman’s test is known to be conservative in detecting biases, the findings do not provide full certainty that the results are completely free from CMV.

#### 4. Discussion

Explanatory power was found to be above 50 percent for the continuous use intention, which is similar to prior studies [29; 32; 47]. A post hoc analysis revealed that when the variable measuring enjoyment was excluded from the research model, the explanatory power of the continuous use intention decreased to 35 percent. Our results are in line with prior studies underscoring the role of enjoyment in technology acceptance [16; 31; 49]. As we focused on active users of SVWs, the present paper extends the scope of research on the role of enjoyment in technology acceptance.

Enjoyment, confirmation, perceived ease of use and usefulness were able to explain almost 50 percent of the variance in satisfaction, although the weak

effect of PU and PEOU was somewhat surprising. However, this finding is in line with Moon & Kim (2001) [39], which indicated PU to be less influential in a hedonic than in a work-oriented context. In this paper, PEOU possibly fails to explain PU, since it primarily reflects the ease of interaction between people and computers [54], rather than computer mediated social interaction. Although using Habbo is perceived relatively straightforward and helpful in communicating with existing friends, the causal relationship between PEOU and PU was not supported. Interestingly, while studying the motivational pull of video games, Ryan, Rigby, and Przybylski (2006) noted that the intuitive controls variable (i.e. similar to PEOU) was positively associated with outcomes only if the game is considered motivating enough. Consequently, it appears that Habbo should be first considered as a communication tool before PEOU in this sense is regarded as important. Another explanation could be related to the fact that users already have experience of using the technology in question and thus, PEOU plays a less important role. In prior studies, however, PEOU is claimed to be a result of general beliefs even if individuals were experienced with the system [54]. Further research to investigate if this is the case would be appropriate with reference to SVWs.

Somewhat surprisingly, despite the relatively high number of variables, the research model yielded only to 50 percent level in explaining continuous use intention. Moreover, the model was not very successful in uncovering the determinants of satisfaction. As a result, further research is needed to identify the most influential predictors of continuous SVW use.

Perceived critical mass was found to have a statistically significant, yet relatively small impact on the continuous use intention. This is in line with the prior studies [31; 34; 50]. Interestingly, the path form perceived critical mass to enjoyment was weak.

Furthermore, it should be remembered that because satisfaction is operationally close to attitude [1], there is a danger of falling short of adopting the appropriate set of outcomes in each setting [1; 17; 46]. In general, Ajzen [2] refers to these outcomes as readily accessible beliefs that should specifically reflect the knowledge about the behavior. Similarly, the satisfaction construct should mediate readily accessible constructs and behavioral goals in the context of social virtual worlds. Therefore, satisfaction may prove insufficient to explain continuous use of Habbo ( $SAT \rightarrow CUI$ ; std. path coefficient 0.075) as only enjoyment has a considerable effect on satisfaction.

From a managerial perspective, the present study provides new information about user behavior in the SVW context. The findings emphasize the

importance of enjoyment in keeping customers loyal. In addition, achieving a critical mass of relevant users was found to be important. As enjoyment was found particularly influential, developing new features and value-added services to further increase the enjoyment aspect in the user experience can be a valid approach to further improve Habbo's, as well as other SVW's attractiveness to existing users.

## 5. Limitations

Self-evidently, our research suffers from several limitations, but these are also areas for further investigation. First of all, the empirical data was collected from the users of only one SVW from one country. The field of SVWs is heterogeneous both in terms of the array of services as well as the demographic, sociographic and cultural background of the users. As Habbo is primarily targeted at teenagers, the respondents were mostly teens. Additionally, due to the self-selection of the respondents, the data is potentially biased towards active users. However, since the aim of the paper was to investigate active users of Habbo, the data collection method can be considered appropriate.

Moreover, as Taylor (2006) has argued, people play games in various ways [45]. SVWs do have narratives and thus, the users have even more freedom to choose what to do. As a result, the idea of a generic user is not particularly applicable in the SVW context. For these reasons, the results from a study conducted among users of one SVW cannot be directly and entirely generalized to other ones. As a result, further studies investigating the users of more than just one SVW could elaborate on other, potentially numerous, reasons for using SVWs as well as the differences between different user groups and SVWs.

## 6. Future research

First of all, comparing the results in different countries would provide interesting insights into the cultural aspects related to SVW use. Moreover, testing the model country by country could potentially better grasp the possible culture-bound nature of the used constructs. Secondly, as continuous use is an ongoing process, a longitudinal study would be a good way to better grasp the evolving and dynamic nature of the phenomenon. Thirdly, in this paper the social influence was investigated solely with critical mass. However, other variables, such as subjective or social norm, could be used to examine the role of social influence to either

complement or replace the perceived critical mass construct. As argued by e.g. Limayem et al. (2007) [32], habit can be an important contributor in continuous behavior. Thus, the fourth suggestion is that further research should examine the role of habit in SVW use.

As stated earlier, many of the causal paths were relatively weak, so the present research model requires refinement. Nevertheless, it yielded a satisfactory explanatory power for the continuous use intention. Hence, further research is needed to identify a better research model based on a more suitable theoretical framework. Moreover, due to the low regression weights for e.g. PU, PEOU and satisfaction, a fifth potential path for additional research is to take a closer look at these constructs, especially satisfaction, in our context to investigate whether the scales from prior IS research would be appropriate for reflecting the perceptions of young SVW users.

In the present paper we investigated only one aspect of loyalty, continuous use. However, as argued by Kim and Son (2009), there are also other important post-adoption behaviors to be examined [30]. For example, Habbo generates revenue through selling virtual items and premium memberships. Therefore, investigating the purchasing aspect of loyalty would also be highly relevant in understanding post-adoption behavior in the SVW context.

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<b>CUI1</b>	I intend to continue using Habbo during the next three months.	[7; 23]
<b>CUI2</b>	I intend to continue using Habbo frequently during the next three months.	
<b>PEOU1</b>	Using Habbo to communicate with others is clear and understandable.	[15; 49]
<b>PEOU2</b>	Navigation through the menus and toolbars in Habbo is easy to do.	
<b>PEOU3</b>	I feel that Habbo's interface is easy to learn.	
<b>PU1</b>	Helps me stay in close touch with my friends.	[49]
<b>PU2</b>	Helps me stay in close touch with people I know.	
<b>PU3</b>	Helps me to communicate easier with people I know.	
<b>CON1</b>	My use of Habbo meets my expectations.	[see 47]
<b>CON2</b>	My overall experience of Habbo has been better than I expected.	
<b>CON3</b>	Most of my expectations from using Habbo were confirmed.	
<b>ENJ1</b>	It is enjoyable to use Habbo.	[49; 53]
<b>ENJ2</b>	It is fun to use Habbo.	
<b>ENJ3</b>	It is entertaining to use Habbo.	
<b>PCM1</b>	How many of yours peers use Habbo? (none...all)	[34; 50]
<b>PCM2</b>	How people in your environment use Habbo? (none...all)	
<b>PCM3</b>	How many people most meaningful to use use Habbo? (none...all)	

### Appendix 1. The Questionnaire

	Measurement item	Source
	All things considered, using Habbo is...	[2; 7; 10; 28]
<b>SAT1</b>	Extremely negative...positive	
<b>SAT2</b>	Extremely bad...good	
<b>SAT3</b>	Extremely dissatisfying...satisfying	
<b>SAT4</b>	Extremely displeasing...pleasing	