An Evaluation of the Theory of Planned Behaviour in Consumer Acceptance of Online Video and Television Services

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Abstract: This study aimed at evaluating the applicability of the Theory of Planned Behaviour (TPB) model in predicting user acceptance of online video services. Few studies have applied the TPB model within this context, even though the model has proven to be effective in predicting technology adoption. Validating the TPB model would improve the understanding of both academics and practitioners of the most influential antecedents of user acceptance. Past studies have demonstrated the importance of integrating user needs and behaviour as a requirement for building successful user-centric online services. Structural equation modelling was used as the main statistical procedure for data analysis. The results of the study confirmed that the TPB model was viable in predicting user acceptance of online video services. The findings also revealed that perceived behavioural control was the highest contributor to predicting intention to use online video services. Attitude toward use and subjective norm were found to have moderate predictive power, mostly because online video services present obvious benefits to users and are consumed privately.

Keywords: technology adoption, online video, online television, web TV, Theory of Planned Behaviour, user acceptance of online videos

1. Introduction

Even though online video and TV are currently considered to form a niche market, their use among Europeans is growing rapidly. According to a study by Jupiter Research, between 2006 and 2007, the percentage of people watching videos online jumped from 11% to 28%, which suggests that online video can potentially reach a mass audience within five years (Mulligan, Banerjee and Thomas 2008). Another study by Forrester Research has confirmed this trend by forecasting a 350% growth in worldwide online video delivery between 2008 and 2013 (McQuivey, de Lussanet and Wilkos 2008). The Jupiter Research study indicates that France, with a use rate of 37%, is more advanced than other European countries in online video use. The time spent consuming online videos in France grew by almost 87% from 2006 to 2007, starting from an average of 38 minutes of online video consumption in 2006 and increasing to 71 minutes in 2007.

Over recent years, online video and TV services have become one of the most promising activities in terms of advertising revenues and premium service revenues. eMarketer has estimated that online video advertising will soar at a pace of 56% to 70% in the next five years (Hallerman 2008), suggesting that this type of service will out-compete any other online services in terms of potential advertising-based revenues. So far, the nascent online video consumer behaviour field has produced little research that increases the understanding of user acceptance of online video and TV services. However, it is critical for both online video service providers and advertisers to understand the processes involved in user acceptance in order to design sound strategies to yield revenues from these services. Studying the drivers of user acceptance for new technologies can greatly help increase the pace of adoption (Amberg, Fischer and Schröder 2005). For example, the US-based Hulu has been relatively successful in aggregating premium syndicated video contents online free of charge to users because the services are funded by advertising. Hulu's managers have understood that users would be willing to accept advertising exposure as long as they have access to premium contents that are legal and safe for every family member (TheEconomist 2009). The website's success would most likely not have been possible without this fundamental understanding of user behaviour.

In light of the rapid increase in online video and TV use, this study aims to contribute to the existing literature regarding online video user acceptance by applying the Theory of Planned Behaviour (TPB) model to predict online video acceptance in France. The TPB is particularly suitable for this type of study since it has been suggested to be an effective model in predicting online technology adoption among consumers (e.g. Goby 2006, Hsu and Chiu 2004, Hsu, Yen, Chiu and Chang 2006, Bagozzi, Dholakia and Mookerjee 2006). More generally speaking, the TPB seems to be an effective predictive

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model in fields that lead to a certain degree of behavioural change from individuals. Even though research in technology adoption has used the TPB extensively, the literature contains little regarding its applicability to online video adoption. However, validating the TPB model in the context of online video consumption could help academics and practitioners better understand the social and behavioural antecedents of user acceptance. Structural equation modelling was used to test the validity of using the TPB in this context.

2. Literature review

Early attempts at understanding determinants of attitude and behaviour led to the Theory of Reasoned Action (TRA), proposed by Fishbein and Azjen (1975). The main tenet in the TRA (Figure 1) is that an individual's behavioural intention in a specific context depends on *attitude toward performing the target behaviour* and on *subjective norm*, which refers to "the person's perception that most people who are important to him or her think s/he should or should not perform the behaviour in question" (Fishbein and Ajzen 1975, p. 302). The TRA holds that the practical impact of subjective norm on behavioural intention is that an individual may choose to perform a specific behaviour, even though it may not be favourable to him or her to do so (Venkatesh and Davis 2000b).

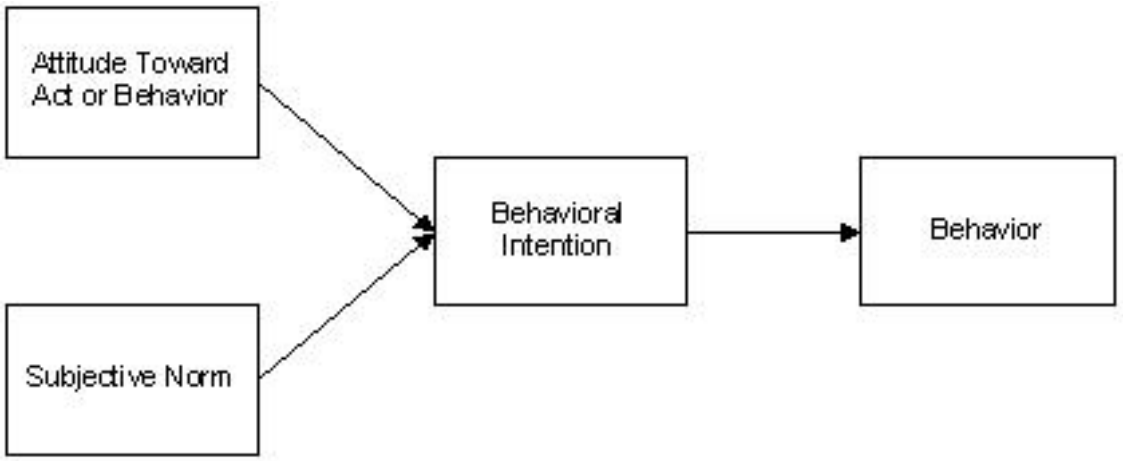

Figure 1: The Theory of Reasoned Action (TRA) (Source: Fishbein & Ajzen (1975))

The difference in capacity of attitude vs. subjective norm to predict behavioural intention is contingent on the context. For example, attitude will be the main predictor of behavioural intention when self-influence is stronger than perceived subjective norm. On the other hand, subjective norm would be the main predictor of a behavioural intention for behaviours in which normative implications are dominant. Subjective norm may be more salient during the early stages of technology diffusion if users have limited knowledge that forms the attitude toward the use of the technology (Taylor and Todd 1995).

A number of studies have successfully applied the TRA to predict behavioural intention in technology acceptance (e.g. Sheppard, Hartwick and Warshaw 1998, Bobbitt and Dabholkar 2001, Davis, Bagozzi and Warshaw 1989, Yoh, Damhorst, Sapp and Laczniak 2003, Venkatesh, Morris, Davis and Davis 2003). However, despite the strong predictability of TRA across contexts, it became apparent that the problem of contradictory results regarding the confounding relationship between subjective norm and attitude, as well as the assumption that intention directly led to action without limitations, necessitated further conceptual advances. To address the aforementioned weaknesses, Ajzen (1991) introduced the Theory of Planned Behaviour (TPB) (Figure 2). The overall aim of the TPB is to attempt to predict deliberative and planned behaviour. The theory includes the construct *perceived behavioural control* as an addition to the TRA to take into account the more common situation in which individuals do not have complete voluntary control over their behaviour, such as when they lack skills or resources to perform a particular task (Armitage and Christian 2003, Ajzen 1991, Ajzen 1985). Summarized, the TPB posits that behavioural intention is a function of an individual's beliefs in three areas: (1) behavioural beliefs (Attitude toward Behaviour)– meaning their beliefs about the probable outcome of the behaviour; (2) normative beliefs (Subjective Norm) – meaning their beliefs about the normative expectations of significant others; and (3) control beliefs (Perceived Behavioural Control) – meaning the beliefs regarding absence or presence of factors that might facilitate or impede the performance of the behaviour (Ajzen 1991).

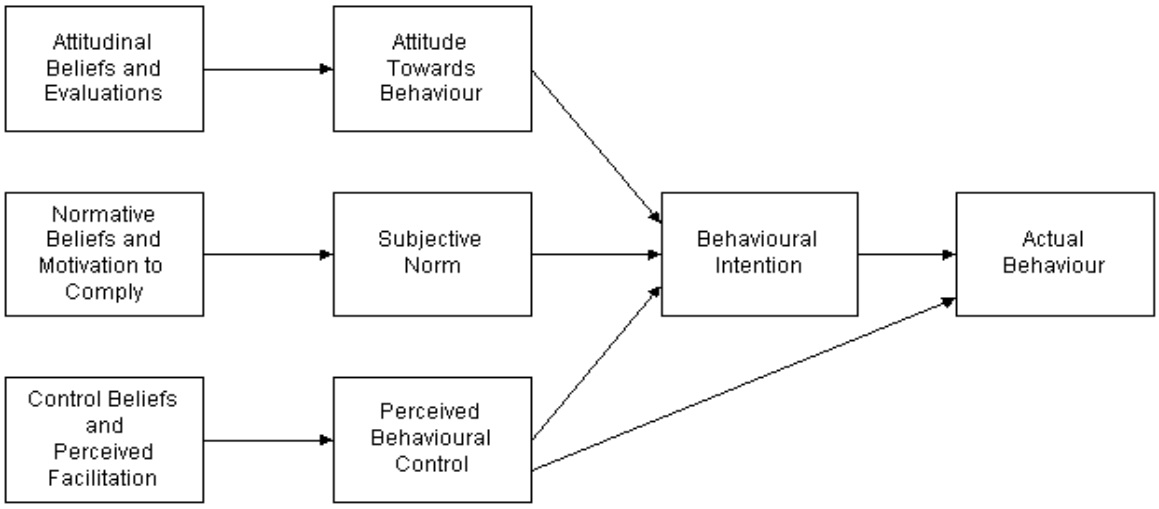

Figure 2: The Theory of Planned Behaviour (TPB) (Source: Ajzen (1991)).

The three antecedents in the TPB model are conceived to be influences, both direct and indirect, on a variety of behaviours through the mechanism of influencing behavioural intentions, and numerous reviews and meta-analyses conclude that the TPB is an effective theory (see Armitage and Connor 2001).

Since its introduction, the TPB has been used in numerous technology adoption contexts to predict and explain individual behavioural intentions as well as actual self-reported behaviour, both from the organizational and from the consumer perspective (e.g. Brown and Venkatesh 2005, Chau and Hu 2002, Chau and Hu 2001, Gentry and Calantone 2002, Venkatesh and Brown 2001, Pedersen 2005, Venkatesh et al. 2003). Recently, Liaw (2004) applied the TPB to the study of behavioural intentions to use search engines as a learning tool. Study of the consumer by use of the TPB is gaining momentum in behaviour toward digital technologies research: Goby (2006) studied online purchasing using the TPB, Hsu and Chiu (2004) used a decomposed version of the TPB to study electronic service continuance, and Hsu et al. (2006) used the TPB model to predict online shopping behaviour. Other studies have modified the TPB to specific contexts, such as consumers' adoption of broadband Internet (Oh, Ahn and Kim 2003) or bases of social influences in online environments (Bagozzi et al. 2006).

Since the current technology adoption literature shows little research on the applicability of the TPB model in the context of online video services acceptance, this study examines the TPB's ability to predict the behavioural intention to use online video and TV services in France. The hypotheses are therefore directly related to the classic TPB and are stated as follows:

Hypothesis 1 (H_1): There is a positive and direct relationship between Attitude toward Use (ATT) and Intention to Use (INT).

Hypothesis 2 (H_2): There is a positive and direct relationship between Subjective Norm (SUB) and Intention to Use (INT).

Hypothesis 3 (H_3): There is a positive and direct relationship between Perceived Behavioral Control (BEH) and Intention to Use (INT).

3. Model development

3.1 Methodology

Structural equation modelling was used as the main statistical technique and data were collected through survey questionnaires. The questionnaire items were taken from existing studies (see references in Table 1), but adapted to fit online video services consumption behaviour. The questionnaire used a seven-point Likert scale and included 13 items which were translated from English to French by two bilingual professors of consumer behaviour and then back-translated by two different professors in the same area. The pilot test of the questionnaire was performed face-to-face

on a convenience sample of 109 online video users in France. Since the exploratory factor analysis (EFA) showed that the preliminary results were satisfactory on both convergent and discriminant validity tests, the questionnaire was then made available online, hosted by the website www.thesistools.com. The link to the online questionnaire was published on 10 Internet discussion forums on online video and television services. The 10 selected forums were associated to large television channels in France (i.e., TF1, France2, France3, Canal+, France5, M6, TMC, W9, NRJ, MCM). All of these television channels offered both online discussion forums and online video and catch-up services. The survey introduction required all potential respondents to have had previous experience with online videos. In total, 336 questionnaires were completed, of which 26 were not usable because of missing data, resulting in 310 as the final sample.

The data analysis was conducted in a three-stage process. First, reliability tests were performed for each factor. Upon satisfactory results, confirmatory factor analysis (CFA) with SPSS 14 was used to analyse the convergent, concurrent, and discriminant validity of the model. Once the model was validated, Amos 7 was used to test the overall fit of the structural model and to estimate the relationships between the independent variables (predictors) and the dependent variable (predicted) so as to accept or reject the hypotheses.

3.2 Structural model

The tested model is composed of three independent latent variables and one dependent latent variable (Figure 3). As noted in the literature review section, all constructs of the TPB model have been already measured and validated in several previous studies related to the adoption of new technology and services. This study uses the TPB model for predicting acceptance of online video and television services.

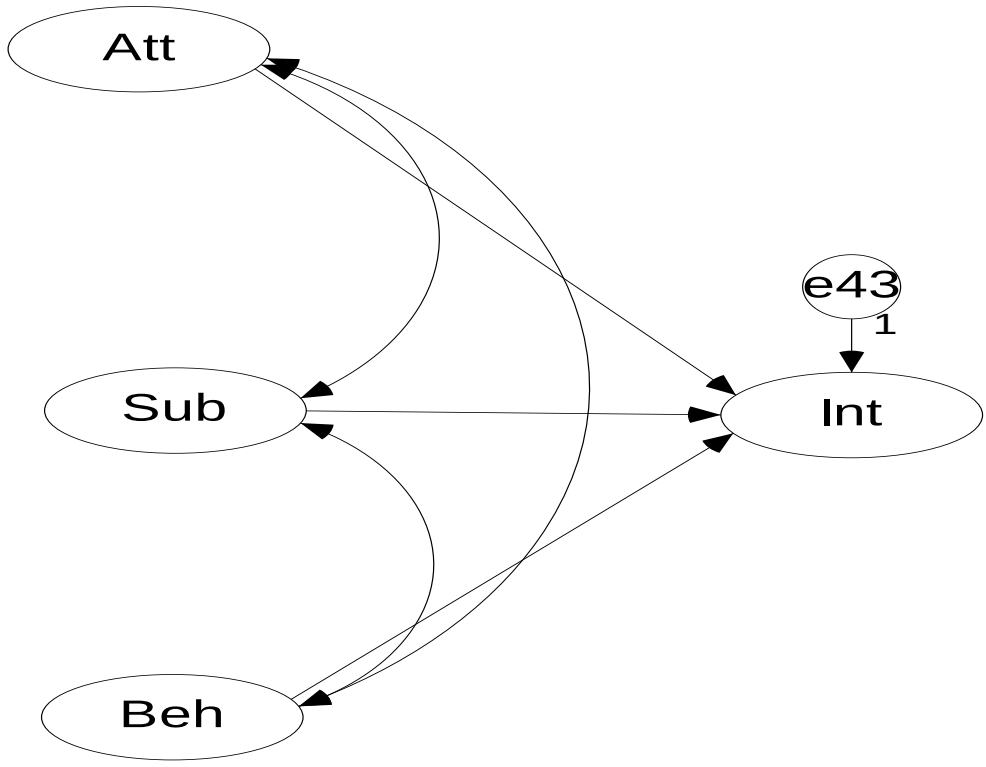

Figure 3: The structural model

Intention to use (INT) defines the objective to use a particular product or service in the future. Attitude toward use (ATT) refers to the degree of evaluative affect that an individual associates with using the target service. Subjective norm (SUB) is a person's perception that most people who are important to her or him think s/he should or should not perform the behaviour in question. Perceived behavioural control (BEH) reflects people's perception of their ability to perform a given behaviour. Table 1 shows the survey instrument, including the constructs and the items. The questionnaire asked participants to rate each statement using a seven-point Likert scale.

Table 1: TPB constructs and references

Constructs/items	References used
ATT: "In your opinion, using the use of online video and television services is..." Bad / Good Wise / Foolish Favourable / Unfavourable Harmful / Beneficial Negative / Positive	(Fishbein and Ajzen 1975, Taylor and Todd 1995, Battacherjee 2000, Pedersen 2005, Pedersen 2001, Pedersen 2002)
SUB: "Please indicate your opinion regarding the following statements from strongly disagree (1) to strongly agree (7)" People who influence my behaviour think I should use online video and TV services. People important to me think I should take advantage of online video and TV services. Others I know expect that people like me should use online video and TV services.	(Pedersen 2001, Pedersen 2002, Pedersen 2005, Taylor and Todd 1995, Ajzen 1991, Davis et al. 1989, Mathieson 1991)
BEH: "Please indicate your opinion regarding the following statements from strongly disagree (1) to strongly agree (7)" I am free to use the kind of online video and TV services I want to. Using online video and TV services is entirely my choice. I can choose the online video and TV services I want to use.	(Pedersen 2001, Pedersen 2002, Pedersen 2005, Taylor and Todd 1995, Ajzen 1991)
INT: "Please indicate your opinion regarding the following statements from strongly disagree (1) to strongly agree (7)" I have the intention to use online video and TV services in the next 6 months. I have the intention to use online video and TV services often in the next 6 months.	(Wang, Lin and Luarn 2006, Pedersen 2001, Venkatesh and Davis 2000a, Pedersen 2005, Venkatesh and Morris 2000)

4. Results of the study

4.1 Sample statistics

The sample distribution indicated a large proportion of respondents with a high level of education (30% have at least a master's degree) and a younger age (77% are 40 years old or less), which is consistent with the common assumption that early adopters of new technology or new technological services are often well educated younger people (Rogers 2003). All respondents have used at least one of the three main online video and TV services: 98% have already watched short online videos, 79% full-length online videos, and 55% web-TV. The sample also showed no sign of over-representation of a particular gender. Therefore, this relatively savvy sample was particularly suitable to this research.

4.2 Reliability tests

The reliability of the measurement instruments was evaluated using Cronbach's Alpha. A Cronbach's Alpha value of at least 0.7 is commonly seen as acceptable (Churchill and Brown 2006). The individual construct reliability tests reported scores above 0.74, which suggests that all constructs could be considered as reliable.

4.3 Confirmatory factor analysis

Passing KMO and Bartlett's test is a pre-requisite to factor analysis (Schumacker and Lomax 2004). The study's tests showed very good results, with a KMO score above 0.80 and a significant Bartlett's Test, signifying that the collected data are suitable for factor analysis (Table 2).

Table 2: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.819
Bartlett's Test of Sphericity	Approx. Chi-Square	2018.580
	Df	78
	Sig.	.000

The CFA extracted four components corresponding to the four constructs in the TPB structural model. Convergent, concurrent, and discriminant validity tests are the most common tests for validating measurement instruments (Schumacker and Lomax 2004). Convergent validity verifies that the expected relationships between the items and factors are confirmed by the actual test results. Convergent validity was tested by observing factor loadings and the squared multiple correlations (SMC) of the items. The rotated component matrix showed four distinct factors with their respective items and SMC of 41%-81%, which confirmed convergent validity. All items loaded on their corresponding factor with loadings higher than 0.69, as shown in Table 3. The total variance explained after rotation of the four components accounted for 73% of the total variance.

Concurrent and discriminant validity tests ensure that acceptable patterns of correlations exist among the constructs of a model, which means that (1) the correlations among the three independent variables are significantly less than 1 to show that each is a distinct factor and (2) the correlations between the independent variables and the dependent variable must be positive and significantly high to show concurrent validity. As Table 4 shows, discriminant validity was confirmed as the inter-construct correlations among the independent variables are significantly below 1. Concurrent validity was also confirmed by the higher correlations between the independent variables and the dependent variable. In conclusion, the TPB model can be validated in this study.

Table 3: Rotated component matrix

	Component			
	1	2	3	4
INT1				.889
INT2				.864
BEH1			.775	
BEH2			.690	
BEH3			.829	
SUB1		.876		
SUB2		.824		
SUB3		.740		
ATT1	.701			
ATT2	.756			
ATT3	.851			
ATT4	.835			
ATT5	.850			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 5 iterations.

Table 4: Inter-construct correlations

			Estimate
Att	<-->	Sub	.339*
Att	<-->	Beh	.365*
Sub	<-->	Beh	.326*
Att	<-->	Int	.424*
Sub	<-->	Int	.443*
Beh	<-->	Int	.583*

*All significant, p=0.001

4.4 Model fit and hypothesis testing

The structural equation modelling analysis reported satisfactory results in terms of model fit and significance of the relationships. The model fit analysis reported acceptable scores with 0.90 for NFI, 0.91 for TLI and 0.93 for CFI. A score of above 0.90 on these indices indicates a good fit (Garson 2006). These fit indices have been suggested to be more robust regarding sample biases than the commonly used GFI and AGFI (Schumacker and Lomax 2004, Garson 2006). Moreover, the RMSEA was also satisfactory with a score of 0.80 (Garson 2006). All relationships within the model reported significant p-values (p=0.000). The final model with the regression weights is shown in Figure 4.

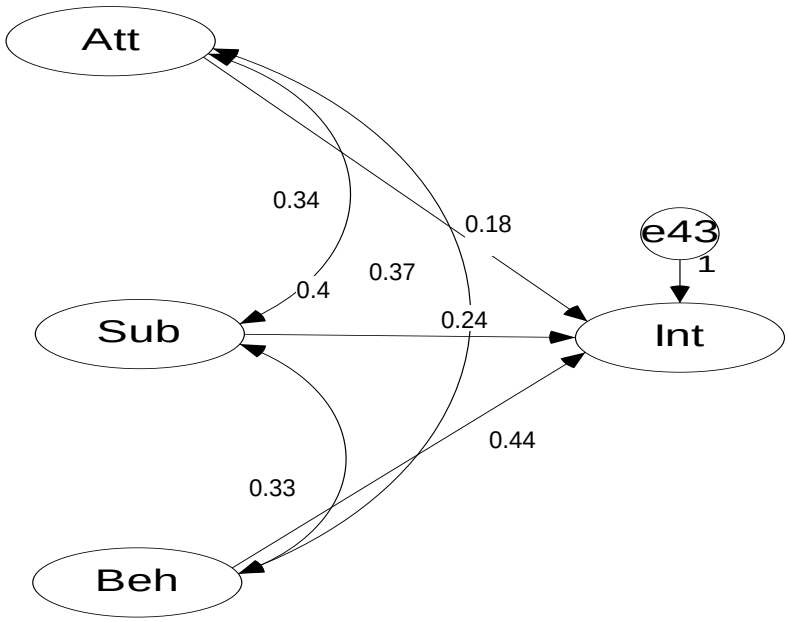

Figure 4: Final model with regression weights

H_1 stated that attitude toward use has a positive and direct relationship with intention to use. The regression weight between attitude toward use and intention to use was 0.18, with a significance level of 0.000. This result suggests that attitude toward the use of online video and TV services has a positive yet moderate effect on intention to use these services. Although H_1 was accepted, among the three independent variables, attitude was the lowest contributor to intention.

H_2 stated that there is a positive and direct relationship between subjective norm and intention to use. The regression weight between subjective norm and intention to use was 0.24, with a significance level of 0.000. H_2 was therefore also accepted. The last hypothesis (H_3) stated that perceived behavioural control has a positive and direct relationship with intention to use. The regression weight between perceived behavioural control and intention to use was the strongest, with a score of 0.44 at the significance level of 0.000. This finding confirms the importance of the potential effect of perception of non-motivational factors on behavioural constraints to use online video and TV services. H_3 was accepted. The implications of these results are discussed in the next section.

5. Discussion and implications

This study used the TPB model to predict user acceptance of online video and TV services. Despite a three-digit growth in online video and TV services over the span of a few years, little research has investigated the factors influencing the use of these services, and the findings of this study contribute to a better understanding of the antecedents of online video use. In particular, the findings can help practitioners understand and focus on the factors that contribute most strongly toward the use of online video and TV services. The results showed a greater influence of perceived behavioural control on intention to use this type of services. The effects of attitude toward use and subjective norm were positive, but more moderate. The lesser effect of attitude toward use may be explained by the evident benefits of watching videos online. Several recent consumer studies have confirmed that watching online videos and TV has become one of the favourite online activities for Internet users (Hallerman

2008, Mulligan et al. 2008). Since users actually perceive the benefits of using this service, their attitude is often highly positive and therefore has little predictive power for their intention to use the service.

The effect of subjective norm was also moderate. This result may relate to the personal nature of this type of service. Subjective norm depends on others' perception of one's behaviour. However, users are often alone when watching online videos (Mulligan et al. 2008). A common phenomenon is the use of this type of service at the workplace and at home when the main television is already used by another family member (Hallerman 2008). This usage context can partly explain the lower predictive power of subjective norm. In the absence of other parties in the usage context, the pressure of others on intention to use a particular service is weaker. A user watching online videos engages in little physical interaction with others. Therefore, the user is less concerned with how s/he would be perceived by others when using this type of service. Further, watching online videos may well be a common activity among her/his peer-group. The strong influence of perceived behavioural control suggests the importance of non-motivational factors in one's intention to use online video and TV services. These factors may relate to a perceived lack of skill in using the service, or to a lack of resources such as a suitable Internet connection, or even to the perceived complexity of a website. One general recommendation would be to reassure users regarding the ease of use and safe environment of a website that proposes these types of service. Another growing issue is the intrusiveness of misleading advertisements and unclear conditions of use of the website with respect to user privacy, which could seriously increase one's reluctance to use the service more frequently (Li and Lee 2002, Edwards, Li and Lee 2002). One example of the need for a user-friendly and safe environment was the recent shift made by the largest video websites from a software-based to a streaming-based service (TheEconomist 2009). Many websites, including Youtube and Hulu, found that many users did not trust the player or were simply reluctant to download it as the process would require them to follow a procedure perceived to be more complex or tedious. As a result, they now offer instant in-browser streaming videos rather than requiring users to download a player to view the videos. Video service providers and advertisers can overcome the perceived behavioural control obstacle by addressing these issues.

For academics, the implications lie in the lesser importance of attitude toward the use of a new service when the positive attitude toward this service is already established. The importance of subjective norm is also less influential when the service is of a more personal nature. This study suggests that, when investigating online video services, more emphasis should be put on the influence of perceived behavioural control. Even though this study has identified this variable as the strongest contributing factor in the TPB model, little is known regarding what non-motivational factors affect the intention to use online video and TV services, constituting the main limitation of this study. Other limitations lie in the relatively younger age (mostly under 40) and single nationality (French) of the sample. Recommendations for future research should address the influence, on various samples, of the non-motivational factors on intention to use with respect to these services.

6. Conclusion

In the literature, the Theory of Planned Behaviour (TPB) has proven to be effective in predicting technology adoption. However, this model has never been applied to online video and television services. Given the exponential growth of this type of service, applying the TPB is appropriate, and this study uses the TPB to predict intention to use online video and television services. A structural equation modelling analysis of data gathered from a sample of more than 300 participants revealed that perceived behavioural control is the most influential factor. The results of this study suggest that practitioners and academics should focus their efforts on this particular factor.

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