MEDIATING ROLE OF TECHNOLOGY AWARENESS ON SOCIAL INFLUENCE – BEHAVIOURAL INTENTION RELATIONSHIP

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ABSTRACT
Behavioural intention has received a tremendous attention in the technology adoption literature. Thus empirical studies have found a number of factors as influencers of behavioural intention, which included Social Influence, Technology Awareness among others. However, there is sparse of literature that examine the mechanism through which Social Influence predicts Behavioural Intention, especially given the fact that previous studies have resulted in conflicting findings. This study proposed and examined the mediating role of Technology Awareness on the aforementioned relationship. Available data from owners and managers of Nigerian retail industry, on the use of Point of Sale terminal, were analysed using Partial Least Squares – Structural Equation Modeling technique, with SmartPLS 2.0 software. Measurement model was assessed based factor loading, average variance extracted and composite reliability using standard PLS algorism, while the structural model was assesses based on coefficient of determination, effect sizes and predictive relevance using bootstrapping procedure and blindfolding. The direct effect was significant, but absorbed when the mediating variable was introduced, therefore we assessed the mediating effect based on variance accounted for. Technology Awareness was found to have significant mediating effect on the relationship between the two constructs; hence we offer recommendations to stakeholders, highlight limitations of the current study and chart way for future research.

Keywords:
Retail, Mediating Role, Technology Awareness, Behavioural Intention, PLS – SEM

INTRODUCTION

The volume and value of cash-based transactions are increasing in Nigeria (Ayo & Ukpere, 2012; Chima, 2011). The CBN introduced the cash-less policy to curtail the excess cash (Agboola, 2012; Ilesanmi, 2012; Yaqub, Bello, Adenuga, & Ogundeji, 2013), however, there is resistance to change to the alternative electronic payment channels, such as the POS, as the usage was put as 6% (Adepetun, 2012). Ironically, change is an inevitable phenomenon for all businesses, to survive it, business enterprise must embrace change (Ahmad, 2012; Drucker, 1969; Hamel, 2000; Mintzberg, 1988; Toffler, 1970). Interestingly, one of Kotter's eight (8) steps to change is Sense of Urgency (SU). It is argued that personal attributes such as behaviour should lead the execution of what the change brings (Belasco, 1990; Harari, 1996; Kotter, 1995, 1996). Furthermore, Plouffe, Hulland, and Vandenbosch (2001) defined behavioral intention as "respondent's sense of urgency for formally adopting an innovation after it becomes broadly available" (p. 212). As SU is linked to Behavioural Intention (BI), thus calls for research to examined user BI.

THEORETICAL BACKGROUND

Biola and Dan (2012) argued that behaviors of Nigerians are usually controlled by the actions of others, whom they have a high regard for, such as friends, parents, religious leaders, sports personalities, teachers, and politicians and celebrities. Their behaviors are also reactive to the influence of television, radio, internet, social media and print media. It is therefore appropriate to conclude that the resistant to change to e-payment systems by merchandise in Nigeria can be associated with lack of adequate infrastructure to support the use of the system, fear of uncertainty of the performance of the system and the required effort and influence of people who are important to others. Therefore there are substantial justifications to theorise that UTAUT construct, Social Influence is related to the Nigerian context, thus this study conceptualised that it influences the adoption of technology in the said context. Furthermore, information and communication technology experts in Nigeria believed that prospective users of POS are not aware of the system. If there is awareness, the penetration of the system will be high (Ilesanmi, 2012). It can be deducted here, that the awareness might be the mechanism through which the social influence-behavioural intention works better. Interestingly, it is suggested that UTAUT should be further extended to enhance our understanding of behavioural intention phenomenon.

"This might take the form of additional theoretically motivated moderating influences, different technologies (e.g., collaborative systems, e-commerce applications), different user groups (e.g., individuals in different functional areas), and other organisational contexts (e.g., public or government institutions)"(Venkatesh, Morris, Davis, & Davis, 2003, p. 470).

BEHAVIOURAL INTENTION

Behavioural Intention is an important determinant of actual behaviour (Zhou, 2008), thus researchers have used several variables and models to examine similar phenomenon, for example; Abadi and Nematizadeh (2012), Mangin, Bourgault, León, and Guerrero (2012), Chen, Kuan, Lee, and Huang (2011), Ho and See-To (2010), Huh, Kim, and Law (2009), Li and Huang (2009), Kim, Ferrin, and Rao (2008), Troshani and Rao (2007), Rigopoulos and Askounis (2007), Nysveen, Pedersen, and Thorbjørnsen (2005), Van Slyke, Belanger, and Comunale (2004), Chang and Cheung (2001), W.W. Chin and Gopal (1995) etc. However, a number of them yielded a conflicting findings, (Alrawashdeh, Muhairat, & Alqatawnah, 2012; Birch & Irvine, 2009; Foon & Fah, 2011; Gao & Deng, 2012; Huang & Qin, 2011; Lai, Lai, & Jordan, 2009; Sumak, Polancic, & Hericko, 2010; Yamin & Lee, 2010). Despite previous researchers' attempts to explain the phenomena, however, there is need to further our understanding beyond what is known and understood (Venkatesh et al., 2003). "future research should focus on identifying constructs that can add to the prediction of intention and behaviour over and above what is already known and understood" (Venkatesh et al., 2003, p. 471).

SOCIAL INFLUENCE

The construct is originated from Fishbein and Ajzen (1975)'s TRA. Identified assubjective norm, the construct was later adopted in Davies, et al., (1989)'s TAM2, Ajzen, (1991)'s TPB/DTPB and Taylor and Todd, (1995)'s C-TAM-TPB. The three theories maintained the construct's name as subjective norm. However, it was subsequently modified in Thompson, et

al., (1991)' MPCU and More and Benbasat, (1991)'s IDT as social factors and social norm respectively. Upon review of these theories and identification of their similarities, Venkatesh, et al., (2003) named the construct social influence and defined it as 'the degree to which an individual perceived that others believe he or she should use the new system" (p. 451). Thus the current study defines it as the degree to which the behaviour of owners and managers of retail business is subjected to their perception that other people who are important to them think that they should use POS and that its usage will enhance their business image.

Social influence was proposed as a direct determinant of behavioural intention to use technology, although there is difference of significance influence between users in mandatory and those in voluntary settings Venkatesh, et al., (2003). Warshaw, (1980) stressed that the explanation for such differences is, in mandatory settings, rewards and punishment could trigger the user to behave according to the beliefs of their superior executives. A further variation was detected among different gender and experience levels of users (Venkatesh & Davis, 2000; Venkatesh & Morris, 2000).As declared by Biola and Dan, (2012), social influence plays an important role in shaping the behaviors of Nigerians, it is therefore expected that social influence can affect behavioral intention of retail managers in Nigeria. Thus it is important to empirically test Biola and Dan, (2012)'s assertion in order to confirm or reject their claim.

H1: There is significant positive relationship between social influence and behavioural Intention to use POS.

H2: There is significant positive relationship between social influence and technology awareness.

TECHNOLOGY AWARENESS

Mofleh, Wanous and Strachan (2008) defines awareness as citizen's knowledge about the existence and advantages of using the e-government. Similarly, a variable related to awareness is 'technology cognizance' (Nambisan, Agarwal & Tanniru, 1999). Rogers (1995) defined it as "user's knowledge about the capabilities of a technology, its features, potential use, and cost and benefits, i.e., it relates to awareness-knowledge" (p. 372). Based on the definition of awareness and technology cognizance, the current study coined and operationalized the construct as 'technology awareness' and define it as the merchant's knowledge of the existence, features, costs, benefit and simplicity or otherwise of using POS in their businesses.

Although there are no much study that examines the relation between awareness and behavioural intention, the few ones are reviewed and found awareness as important predictor of behavioural intention. For example, Charbaji and Mikdashi (2003) empirically investigated the influencing e-government adoption factors among Lebanese postgraduate MBA students. Factors included in the study are knowledge, awareness, and feelings. Multiple regression analysis was used to analyse the data collected from 220 subjects. Although the variance explained by the model was rather small (12.9%). Findings of the study indicated that awareness significantly influenced behavioural intention to use e-government.

Similarly, Rehman, Esichaikul, and Kamal (2012) empirically examined the adoption of e-government among internet users in Pakistan. The study was carried out in two folds. The first was to determine behavioural intention to get information and secondly, to determine the behavioural intention to transact. Results from regression analysis found that awareness significantly influence behavioural intention in both cases. In the field of environmental management, Wan, Cheung, and Shen (2012) coined the variable as 'awareness of

consequences' and investigated its influence on behavioural intention to recycle among Hong Kong university staff and students. A PLS SEM analysis technique was employed to analyse 205 valid data sets obtained. Wan et al. (2012) found that awareness of consequence significantly influenced behavioural intention. Therefore the following hypotheses are stated;

H3: There is significant positive relationship between technology awareness and behavioural intention to use POS

H4: Technology awareness mediates the relationship between social influence and behavioural intention to use POS

METHODOLOGY

Measurement instrument for the three constructs in this study were adapted from extant literature. Five (5) items for the dependent variable behavioural intention to use POS are adapted from Du, Zhu, Zhao, and Lv (2012), over and above the three (3) items in Venkatesh et al. (2003). Futhermore, five (5) items for social influence and technology awareness are adapted from Cheng, Liu, Qian, and Song (2008) and Nambisan et al. (1999) respectively. All of them were measured reflectively. 600 questionnaires were prepared and personally administered to retail owners/managers in Nigeria's six geo political zones. 165 valid data were obtained. This is adequate, based on power analysis (Jacob Cohen, 1992), using G*power (Erdfelder, Faul, & Buchner, 1996) and Barclay, Higgins, and Thompson (1995)'s "rule of 10". PLS-SEM was used to analyse the data as it is a predictive technique (Sanchez-Franco, 2006). PLS-SEM is an analyses technique that allows simultaneous test of multiple variables for predictive models (Wold, 1974, 1982). Chin, (1998a) maintained that PLS-SEM can be used for both confirmation and development of theory. Recently, there has been widespread use of PLS-SEM technique as a main analysis technique for multivariate research in various business and management fields (Wold, 1982). Ringle, Wende, and Will (2005) argued that the robustness of PLS-SEM enable a test of several relationships simultaneously, thus produces an enhanced, valid and reliable conclusion better than covariance based analysis technique. PLS-SEM can be run with fewer sample size and non-normal data (W.W. Chin & Gopal, 1995; Wynne W Chin, 1998a; Compeau & Higgins, 1995; Lohmöller, 1989). Therefore, we used SmartPLS 2.0 software (Ringle et al., 2005) and analysed the data.

ANALYSIS AND FINDINGS

First of all we checked for missing values and found that it is missing completely at random, at less than 5%. Therefore it was remedied using mean replacement (J Cohen & Cohen, 1983; Kumar, Talib, & Ramayah, 2013). Then the demographic characteristic of the data was assessed. About three-quarter of the respondents are male, while female constitutes 26.9%. This signifies that the retail business in Nigeria male-dominated. 15.7% of the respondents aged between 1-23 years, 23.9% are 26-30, 15.7% are 31-35, 16.8% are 36-40, 10.2% are 41-45, 6.9% are 46-50, 5.1% are 51-55, 5.3% are 56-60, while only 0.5% of respondents are above 60 years of age. 61% of them are married; half are educated to secondary school level, while only about 10% each have bachelors and master's degree. 45 and 40% of them are owners and managers respectively. As discussed earlier in the methodology section, the data was drawn from six (6) geo-political zones in Nigeria; these are North Central, North East, North West,

South East, South South and South West. The distribution of responses from these zones is 28, 42, 39, 16, 18 and 22, representing 17, 25.5, 23.6, 9.7, 10.9 and 13.3 per cent respectively. Furthermore, the data was checked for outlier and multicollinearity. No outlier was detected and there is no indication of presence of multicollinearity, based on the values of variance inflated factor and tolerance value. See Appendix.

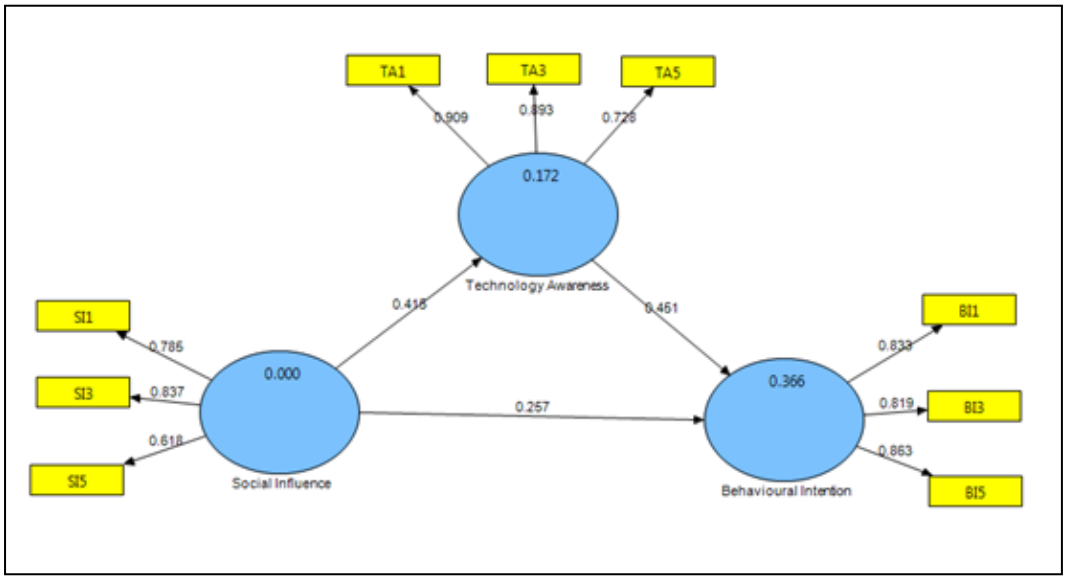

Figure 1: Mesurement Model

MEASUREMENT MODEL ASSESSMENT

The reflective measurement model was assessed based on the indicator and internal consistency reliabilities and convergent and discriminant validity. Individual item loading should be >0.7 (J. J. F. Hair, Black, Babin, & Anderson, 2010), however, >0.4 is also acceptable (Hulland, 1999). Three out of five indicators for each construct have met and exceeded the minimum threshold, while two each were dropped from the analysis because their loading does not achieve the minimum threshold (see table 1). Composite reliability was used to assess internal consistency and it should be >0.70 for each latent construct (Joe F Hair, Ringle, & Sarstedt, 2011). Interestingly, CR values for all the constructs are above 0.7 (see Table 2).

Table 1: Loading and Cross Loadings

Constructs	Items	BI	PE	SI
Behavioral Intention	BI1	**0.833**	0.461	0.356
	BI3	**0.819**	0.427	0.309
	BI5	**0.863**	0.508	0.438
Technology Awareness	TA	0.591	**0.909**	0.428
	TA	0.466	**0.893**	0.393

	TA	0.237	**0.728**	0.092
Social Influence	SI1	0.263	0.309	**0.785**
	SI3	0.430	0.378	**0.837**
	SI5	0.277	0.226	**0.618**

Average variance extracted (AVE) was used to determined convergent validity. The value should be greater than 0.5 for each latent construct (Fornell & Larcker, 1981; J. J. F. Hair et al., 2010). Table 2 depicted the AVE values for all the latent variables, having exceeded the benchmark. Furthermore, the discriminant validity was assessed using Fornell and Larcker (1981) criteria, by comparing the square-root of the AVE with inter-construct correlation. The later correlation must be less than the square-root of the AVE (Wynne W Chin, 1998b). Table 2 shows that this condition has been met.

Table 2: Discriminant Validity and Internal Consistency Reliability

	BI	**PE**	**SI**	**AVE**	**Composite Reliability**
Behavioral Intention	**0.838**			0.703	0.876
Technology Awareness	0.558	**0.847**		0.718	0.883
Social Influence	0.444	0.415	**0.753**	0.567	0.794

STRUCTURAL MODEL ASSESSMENT

Having met the all the assessment conditions for measurement model, we assessed the structural model by performing the bootstrapping procedure in SmartPLS (Joe F Hair et al., 2011; Joseph F Hair, Hult, Ringle, & Sarstedt, 2014). Hypotheses were tested to examine the relationship among the variables in the model and all the paths are significant. First of all, without the mediator variable in the model, we tested the direct relationship between social influence and behavioural intention. The relationship was significant (beta 0.451). This relationship was strong. However, the model was then run with the mediator variable. Accordingly, the beta value is for the direct effect becomes small (0.257). This indicates that the mediating variable has absorbed the direct effect as it was included in the model (refer to figure 2 and 3). Furthermore, the social influence-technology awareness and technology awareness-behavioural intention paths were all found significantly positive, with path coefficient 0.415 and 0.451 respectively. The indirect effect is also significant at ($p<0.001$), as depicted in Table 3.

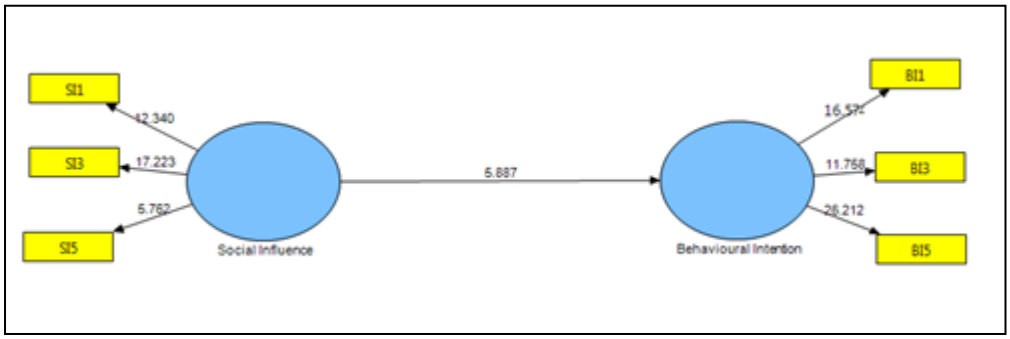

Figure 2: Direct Effect Model

Prior to that, the coefficient of determination of the endogenous variable in the model was assessed. Jacob Cohen (1988) recommended three levels of structural model quality as; substantial (0.26), moderate (0.13) and weak (0.02) respectively. During the assessment of measurement model for this study, the standard PLS algorism was calculated for the main effect model. The R^2 values for technology awareness and behavioural intention are 0.172 and 0.366 respectively (refer to figure 1). Therefore they are satisfactorily based on Falk and Miller (1992). They are precisely moderate and substantial (Jacob Cohen, 1988) respectively. We further adopted Helm, Eggert, and Garnefeld (2010)'s method of assessing indirect effect. Variance accounted for (VAF) is a useful tool to assess the indirect effect. As demonstrated in Joseph F Hair et al. (2014), VAF value of greater than 80% is full mediation, while greater than 20% but less than 80% is partial mediation. We substituted the VAF formula (indirect effect/total effect), thus the size of the indirect effect in respect of the total effect in 0.421. Therefore the indirect effect of social influence on behavioural intention is partial mediation. Additionally, we assess the effect sizes (f^2) of the exogenous variables (Jacob Cohen, 1988; Henseler & Fassott, 2010). Effect sizes are evaluated as small (0.02), medium (0.15) or large (0.35) respectively (Jacob Cohen, 1988). Technology awareness and social influence have medium and small effect sizes respectively, as shown in Table 4.

Table 3: Summary of Hypotheses Testing

Direct (without mediator)	**Path Coefficients**	**Std Error**	**T Value**	**P Value**
Social Influence -> Behavioural Intention	0.451	0.077	5.887	0.000
Indirect and Total Effect (with mediator)				
Social Influence -> Behavioural Intention	0.257	0.085	3.037	0.001
Social Influence -> Technology Awareness	0.415	0.066	6.304	0.000
Technology Awareness -> Behavioural Intention	0.451	0.077	5.852	0.000
Social Influence ->Technology Awareness -> Behavioural Intention	0.189	0.039	4.871	0.000

Table 4: Effect Sizes

Endogenous Variable	Exogenous Variables	R2 Incl	R2 Excl	R2Inc-R2 Excl	1-R2 Incl	Effect Size
Behavioural Intention	Technology Awareness	0.366	0.203	0.163	0.634	25.71%
	Social Influence	0.366	0.305	0.061	0.634	9.62%

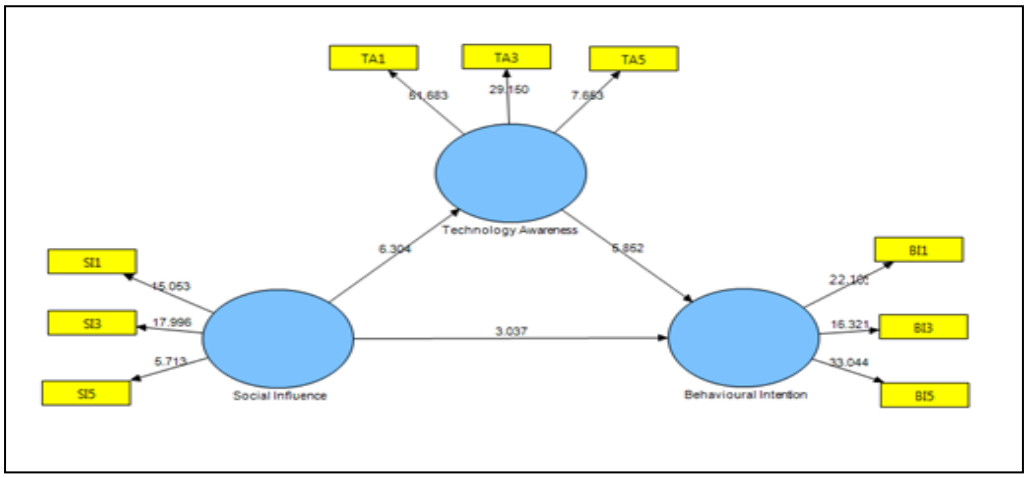

Figure 3: Bootstrapped Structural Model

Furthermore, a blindfolding procedure (Henseler, Ringle, & Sinkovics, 2009) was run with 7 omission distance, to obtained Q^2 value for the endogenous latent constructs. Q^2 is the measure of model predictive capability (Geisser, 1974; Stone, 1974). As demonstrated in Joseph F Hair et al. (2014), a PLS path model with Q^2 greater than 0 has predictive relevance. As shown in table 5, the Q^2 values for behavioural intention and technology awareness are 0.246 and 0.101 respectively. This implies that the model has predictive relevance.

Table 5: Predictive Relevance

Endogenous Latent Variable	R Square	CV Red	CV Com
Social Influence	_	_	0.5676
Behavioral Intention	0.366	0.2463	0.7035
Technology Awareness	0.172	0.1011	0.7181

DISCUSSION AND CONCLUSION

Social influence is operationally defined as the extent to which of owners and managers of retail business is subjects their behaviour to perception of other people who are important. Thus they think that they should use POS, because it will enhance their business image. Therefore it was established as direct determinant of behavioural intention. However, little was known about the mechanism through which social influence predicts behavioural intention. Interestingly, technology awareness was proposed as intervening variable in this relationship, after careful consideration of the context of the current study. Hypotheses for the direct and indirect relationship was put forward and tested. All the four hypotheses are supported, thus the finding can be interpreted as; social influence-behavioural intention relationship is better understood by the intervening of technology awareness.

The findings are in line with a number of past literatures. For example, Huang and Qin (2011) found significant positive relationship between social influence and behavioural intention in the context of adoption of virtual fitting room among Chinese shoppers. Furthermore, Wu, Yu, and Weng (2012) found significant positive relationship between social influence and behavioural intention in the study of I-Pass adoption among Taiwanese passengers. Similarly, the current study findings concurred with the result of the examination of the relationship between social influence and behavioural intention (Lin & Anol, 2008), in an online social support adoption study. On the other hand, finding is consistent with Charbaji and Mikdashi (2003) findings. They found that awareness significantly influenced behavioural intention to use e-government.

It is interesting to note that the direct relationship between social influence and behavioural intention was absorbed when the mediating variable of technology awareness was introduced. Therefore technology awareness becomes the most important variable of interest. This might be true, because of the managers' exposure to media campaign about the benefits and cost of deploying POS in one's business, thus they became aware of the importance of adopting technology such as POS, then subsequently intent to use it. For example, the CBN is engaged in massive media campaign to reach out to the merchant to embrace electronic payment gateways, particularly the POS. Therefore regulators, promoters and other stakeholders in the payment, retail and POS industries should focus more on giving awareness to the prospective users of POS.

Finally, this study charted an avenue for expanding the body of knowledge with respect to finding the mechanism through which social influence predicts behavioural intention. However, we do acknowledge the parsimonious nature of the study, thus researchers might expand the horizon of technology adoption literature to integrate more of such mechanisms. Similarly, as the current study focused only on the intention, researchers should therefore focus beyond, particularly the mechanism through which the consequences of behavioural intention works.

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