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DOES SOCIAL MEDIA BRAND COMMUNITY MEMBERSHIP TRANSLATE TO REAL SALES? A CRITICAL EVALUATION OF PURCHASE BEHAVIOR BY FANS AND NON-FANS OF A FACEBOOK FAN PAGE

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Abstract

The emerging social media brand communities provide a good platform for marketers to promote brands to their members. Marketers are devoting time and efforts to building their social media fan pages; however, the elusive question of whether their social media fans exhibit any behavioural loyalty in terms of actual purchase behaviour remains unanswered. Based on the characteristics of social media, we treat social media fan membership as the objective indicator of attitudinal loyalty. This study validates the positive relationship between social media attitudinal loyalty and behavioural loyalty by proposing three models on purchase expenditure, quantity and frequency. We used treatment effects model to account for selection bias problem. Our data for model estimation consist of an apparel retailer brand's customer transaction data and their Facebook fan page membership data. This study shows that fans of the brand have higher behavioural loyalty than non-fans in terms of all the three purchase behaviour aspects.

Keywords: Social Media Brand Community Membership, Brand Loyalty, Attitudinal Loyalty, Behavioural Loyalty, Purchase Behaviour, Treatment Effects Model, Selection Bias.

1 Introduction

On social media, marketers can create a brand community to promote their brands, and customers who like the brand can join as fans of the brand. Members of the brand community can get useful information of the brand while marketers engage members to form a personal connection with the brand. Brand communities on social media are well-accepted by customers. The Coca-Cola fan page on Facebook has over 25 million fans (All Facebook Report 2011). With the belief that brand community members on social media are potential loyal customers, marketers are increasingly devoting time and efforts to building their social media brand communities. For example, more than 2,900 fan pages of apparel brands have been created on Facebook (All Facebook Report 2011). However, the question as to whether these brand community members on social media eventually make any actual purchases remains unanswered. Therefore, it is of great interest to explore the relationship between customers' social media brand community membership (SMBCM) and their actual purchase behaviour.

In order to retain loyal customers, marketers have long been offering membership to engage customers. Past literature has shown that membership of a loyalty program has a positive influence on the customers' purchase behaviour (Bolton et al. 2000; Dowling et al. 1997). Nevertheless, SMBCM is different from traditional loyalty program membership in three aspects. First, the barrier for joining SMBCM is lower. Customers can easily declare themselves as members of the brand community by indicating their preference to the brand. Second, the brand preference becomes known to the public. Once customers become members of the brand community, customers' brand preferences are known to all their friends and customers with the same membership. Third, there is no sunk cost for quitting SMBCM. Customers can simply quit the brand community without any penalty. Considering these differences of SMBCM from loyalty program membership, the relationship between loyalty program membership and purchase behaviour can be different in social media context. Therefore, we propose the following research questions: (1) *Does customers' SMBCM influence their purchase behaviour?* (2) *To what extent does customers' SMBCM influence their purchase behaviour?*

According to Dick and Basu's (1994) framework, loyalty can be represented by the causal relationship between attitudinal loyalty and behavioural loyalty. Attitudinal loyalty was shown to have a positive impact on behavioural loyalty (Dick et al. 1994). In past research, customers' purchase behaviour was usually considered as the indicator of their behavioural loyalty (Dowling et al. 1997). Customers' membership is regarded as a good reflection of their attitudinal loyalty (Bolton et al. 2000). In this study, we treat SMBCM as social media attitudinal loyalty and purchase behaviour as behavioural loyalty. Based on the theoretical guidance of Dick and Basu's (1994) framework, we propose a positive relationship between social media attitudinal loyalty and behavioural loyalty.

By using the customers' fan membership data on Facebook and the transaction data from an apparel retailer named FFS (due to confidentiality agreements, we are not able to reveal the identity of the retailer), three models are proposed to investigate the relationship between customers' SMBCM and their purchase behaviour in terms of purchase frequency, quantity and expenditure. The novelty of our data set allows us to operationalize social media attitudinal loyalty as SMBCM and conduct detailed analysis on behavioural loyalty in terms of purchase behaviour. It is possible that customers became fans as they had made purchases. To account for this self-selection bias, we specified a treatment effects model to address the potential endogeneity problem.

Our findings show that customers who are fans of the brand on social media exhibited exceptionally better behavioural loyalty than non-fans in all the three aspects of purchase behaviour. In summary, this study contributes to the extant academic marketing research in three aspects, (i) validating the positive relationship between social media attitudinal loyalty and behavioural loyalty (ii) examining the business value of SMBCM, (iii) demonstrating a methodological approach to account for the self-selection bias in a social media marketing context.

2 Literature Review and Hypotheses

Customers' brand loyalty is essentially important for marketers (Griffin 1995; Reichheld et al. 1996). Marketers have been long offering loyalty program membership to customers with the aim of building customers' brand loyalty (Dowling et al. 1997). The ultimate goal of marketers is to make more profits by influencing customers' purchase behaviour (Leenheer et al. 2007).

2.1 Brand Loyalty

The importance of brand loyalty has been recognized in the marketing literature for decades (Howard et al. 1969). Various definitions for brand loyalty have been given in the past literature. The definition first crafted by Newman and Werbel (1973), who defined loyal customers as those who re-buy a brand, consider only that brand, and do not attempt to seek information about other brands. Later, there is a general agreement that "Brand loyalty is the biased behavioural response (i.e., purchase) expressed over time by some decision-making unit with respect to one or more alternating brands out of a set of such brands and is a function of psychological (decision-making evaluative) processes." (Jacoby et al. 1978, p. 80). These definitions mostly focus on the behavioural response and were criticized for insufficient in capturing the meaning of brand loyalty. In response to this criticism, researchers proposed measuring loyalty by means of an attitudinal dimension in addition to a behavioural dimension. A theoretical framework was established and customer loyalty was viewed as the strength of the relationship between an individual's relative attitude and repeat patronage (Dick et al. 1994). Thus, brand loyalty is expressed in the causal relationship between attitudinal loyalty and behavioural loyalty (Chaudhuri et al. 2001; Dick et al. 1994; Oliver 1996).

2.2 Behavioural Loyalty

Behavioural loyalty refers to customers' repeated purchase behaviour (Fader et al. 1993; Oliver 1996). It is thought to be the consequence of attitudinal loyalty (Oliver et al. 1997). As long as the attitudinal loyalty is established, customers' purchase behaviour can largely reflect their brand loyalty (Gommans et al. 2001). For marketers, they are more interested in behavioural loyalty than attitudinal loyalty as customer purchases can eventually generate profits for the business.

The objective measures of behavioural loyalty in terms of actual purchase behaviour are more interesting in the eye of marketers. Based on customers' purchase behaviour, marketers can plan their marketing strategies accordingly. Referring to the objective measures of behavioural loyalty in past literature, in this study, we measure customers' behavioural loyalty in three aspects, which are purchase frequency (Brody et al. 1968; Tellis 1988), purchase quantity (Chintagunta 1993; Krishnamurthi et al. 1991; Pauwels et al. 2002), and purchase expenditure (Lewis 2004; Sharp et al. 1997).

2.3 Attitudinal Loyalty

In response to the criticism that using behavioural loyalty only is insufficient in expressing the concept of brand loyalty, attitudinal loyalty was introduced (Day 1969; Jacoby et al. 1978). Attitudinal loyalty is defined as the level of commitment of consumers toward the brand (Chaudhuri et al. 2001; Jacoby et al. 1978). Attitudinally loyal customers are found to have the special attachment or commitment to the brand (Fournier 1998). Consequently, attitudinal loyal customers perceive some unique value in the brand that they are not easily attracted by a slightly better alternative (Jacoby et al. 1978; Pessemer 1959; Reichheld et al. 1996). Further, such a resistance to counter-persuasion allows attitudinal loyal customers to have the willingness to pay a price premium and recommend the service provider to others (Shankar et al. 2003).

Nevertheless, to capture customers' attitudinal loyalty, past researchers mostly used subjective measures of attitudinal loyalty (Assael 1992; Jacoby et al. 1978). The subjective measures claim to reveal the 'soft side' of the loyalty phenomenon; however, when in reality, customers may behave

differently from their survey responses. Thus, an objective measure for attitudinal loyalty will be a great help in identifying attitudinally loyal customers. On social media, such an objective measure of attitudinal loyalty has been made possible.

2.4 Social Media Brand Community Membership

We term the membership of brand community on social media as social media brand community membership (SMBCM). With the unique characteristics of social media, we argue SMBCM can be treated as an objective measure for attitudinal loyalty on social media. First, customers self-declare as members of a brand community to show their favour to the brand (Keller et al. 2001). Second, different from traditional membership which are only known to marketers, customers' SMBCMs are known to all of their friends on social media. In such case, customers' brand preferences on social media are transparent and become the social images among their friend (Dobni et al. 1990). If customers change their brand preferences by quitting the membership, their deviation from the current brand preference is also known to their friends. Thus, customers' commitments to the brand are established as their brand preferences are known to their friends on social media (Bergami et al. 2000; Lassar et al. 1995). From the two points discussed above, we can see that the presence of customers' SMBCM captures their feelings of attachment and commitment to the brand. Here, SMBCM is a clear status presented on social media which can objectively reflect customers' attitudinal loyalty on social media. Therefore, we treat SMBCM as an objective indicator of social media attitudinal loyalty.

The key to the Dick and Basu's (1994) framework is the conceptualization of loyalty as the causal relationship between the attitudinal loyalty (relative attitude) and behavioural loyalty (patronage behaviour). Higher attitudinal loyalty is found to lead to higher behavioural loyalty (Chaudhuri et al. 2001; Shankar et al. 2003). On social media, we operationalize social media attitudinal loyalty as SMBCM. Behavioural loyalty is measured by the purchase behaviour in terms of purchase frequency, quantity and expenditure. Based on this theoretical relationship between the two constructs, we propose our research model with an illustration of the relationship between social media attitudinal loyalty and behavioural loyalty (Figure 1).

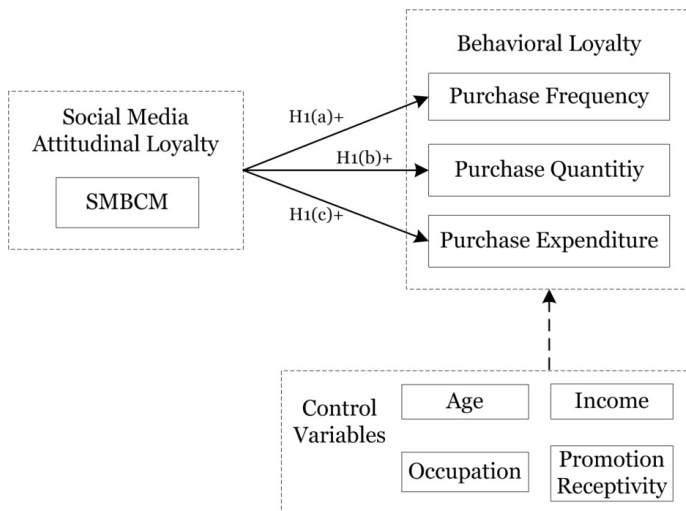


Figure 1. Research Model

Compared to non-members, customers who are members of brand community on social media have showed their attachment and commitment to the brand by presenting their brand preference to their friends on social media. The presence of SMBCM for an individual is believed to be a representation of attitudinal loyalty toward a brand. Thus, members of social media brand community are considered to possess social media attitudinal loyalty compared to non-members. According to Dick and Basu's (1994) framework, higher attitudinal loyalty is believed to lead to higher behavioural loyalty in terms of the purchase behaviour. Thus, we hypothesize that,

H1(a): Social media attitudinal loyalty for a brand leads to higher behavioural loyalty in terms of purchase frequency.

H1(b): Social media attitudinal loyalty for a brand leads to higher behavioural loyalty in terms of purchase quantity.

H1(c): Social media attitudinal loyalty for a brand leads to higher behavioural loyalty in terms of purchase expenditure.

3 Research Methodology

3.1 Data Description

The data set consists of two parts, the transaction data from the FFS retailer and the fan membership data from Facebook fan page. The transaction data together with the customer demographics are retrieved from the customer data base of FFS retailer. On Facebook, the fan page for FFS has over 8,000 fans country-wide. All these fans have indicated that they “like” FFS and thus have become fans of FFS. Based on the names of customers in the transaction data, we referred to the FFS fan page to identify whether each customer in the transaction data is also a fan of FFS on Facebook. Using the Facebook API (application programming interface), a JAVA program was employed to retrieve the fan membership of the customers. Therefore, we identified the fan membership of these customers and treated their fan membership as the indicator of their social media attitudinal loyalty.

The transaction data of the FFS members covers 20 months from 09 July 2009 to 28 February 2011. There are a total of 12,944 unique customers and 474 of them (3.66%) were identified as fans on FFS fan page. We aggregated the transaction records into monthly level data as customers usually make a purchase of clothing monthly (Sexauer 1977; Wagner et al. 1983). Some of the descriptive statistics of the three dependent variables are listed here to show the characteristics of the data set. The monthly visit for each customer was 0.23 on average and with a variance of 0.36. Each customer purchased roughly 0.68 items monthly with a variance of 5.32. The average monthly expenditure of each customer was \$11.60 with a variance of 1,453.56.

3.2 Variables and Measures

Construct	Variable	Measure
Social Media Attitudinal Loyalty	<i>FAN</i>	The presence of fan membership of customers on Facebook fan page: Fan: 1, Non-fan: 0
Behavioural Loyalty	<i>FREQ</i>	The number of monthly visits to FFS stores by each customer
	<i>QUNT</i>	The number of items bought by each customer monthly
	<i>EXPD</i>	The amount of dollars spent by each customer monthly
	<i>TOTEXPD</i>	The total purchase expenditure by each customer across 20 months
	<i>TOTQUNT</i>	The total number of items bought by each customer across 20 months
Age	<i>AGE</i>	The age of the customer in years until 1 January 2011.
Income	<i>INCOME</i>	Dummy variables for monthly income categories.
Occupation	<i>OCCUPATION</i>	Dummy variables for occupation categories.
Receptivity	<i>PHONE</i>	Binary indicators of promotion receptivity, whether FFS can send promotion message to certain customer via these means: phone, mail and e-mail.
	<i>MAIL</i>	
	<i>EMAIL</i>	

Table 1. Summary of Measures

We operationalize social media attitudinal loyalty as SMBCM. The variable *FAN* is the binary indicator of fan membership on the Facebook fan page. As we identified customers’ fan membership after collecting the transaction data, we can only get the static information of fan membership (i.e., we do not know when the fans acquired their fan membership.). Therefore, in this study, we assume the fan membership (*FAN*) as a time-invariant variable which does not change over our observation period.

To examine customers' monthly behavioural loyalty, the variables *EXPD*, *QUNT* and *FREQ* are used as measures of purchase expenditure, purchase quantity and purchase frequency respectively.

Across the 20 months, there are some customers who did not purchase anything during certain months. For these customers, the transaction records on certain months were missing. The missing records will lead to an unbalanced panel data sample in the model estimation. Thus, we transformed our data into a balanced panel data set. We added additional records for these months without transaction records and padded the three dependent variables with zeros. Control variables such as age, income, occupation, promotion receptivity were used to control for potential wealth, education and information accessibility effects. A summary of the measures of all variables used in this study is shown in Table 1.

3.3 Model Specification

3.3.1 Model for Purchase Frequency

For purchase frequency, we count the number of monthly visits to FFS stores for each customer. A Poisson count model accounts for the non-negative, discrete integer distribution of customers' purchase frequency (Cameron et al. 1998; Cameron et al. 2005). We specify the random-effects Poisson model for purchase frequency as follow,

$$f(FREQ_{it} | \lambda) = \exp(-\lambda) \lambda^{FREQ_{it}} / FREQ_{it}! \quad (1)$$

$$\lambda = \exp(X' B) \quad (2)$$

$$X' B = \beta_{0i} + \beta_1 * FAN_i + \beta_2 * AGE_i + \beta_3 * Income_i + \beta_4 * Occupation_i + \beta_5 * Receptivity_i + \beta_6 * Month_t + \varepsilon_{it} \quad (3)$$

where $i = 1 \dots 12,944$ denotes each individual customer, $t = 1 \dots 16$ denotes each month. *Income*, *Occupation* and *Receptivity* are the categorical dummy variables as shown in Table 1. *Month* is the time dummy for each month in the transaction period.

3.3.2 Model for Purchase Quantity

For the purchase quantity, the values are all integers and greater or equal to zero. We used a nonlinear estimation approach to avoid heteroskedastic, nonnormal residuals (Hausman et al. 1984). As the variance of purchase quantity is much greater than the mean ($5.318 \gg 0.068$), the count data for purchase quantity is over-dispersed. Therefore, we specify a random-effects Negative-Binomial model with a quadratic variance function that is consistent with overdispersion generated by the Poisson-gamma mixture.

The parameter λ equals the mean and variance of purchase quantity. In our model, $\exp(\alpha)$ has a gamma distribution with a mean of 1 and a variance of α^2 , in which α is the reciprocal of the standard deviation of the heterogeneity distribution.

$$f(QUNT_{it} | \lambda) = \exp(-\lambda) \lambda^{QUNT_{it}} / QUNT_{it}! \quad (4)$$

$$\lambda = \mu \nu \quad (5)$$

$$\mu = \exp(X' B) \quad (6)$$

$$X' B = \beta_{0i} + \beta_1 * FAN_i + \beta_2 * AGE_i + \beta_3 * Income_i + \beta_4 * Occupation_i + \beta_5 * Receptivity_i + \beta_6 * Month_t + \varepsilon_{it} \quad (7)$$

3.3.3 Model for Purchase Expenditure

To estimate the influence of SMBCM on purchase expenditure, we propose a customer panel-level random-effects model. As the fan membership of each customer is assumed as time-invariant, a random-effects model is more applicable to our situation rather than a fixed-effects model. Therefore, random-effects model approach is applied.

$$EXPD_{it} = \beta_{0i} + \beta_1 * FAN_i + \beta_2 * AGE_i + \beta_3 Income_i + \beta_4 Occupation_i + \beta_5 Receptivity_i + \beta_6 Month_t + \varepsilon_{it} \quad (8)$$

To account for the potential heteroskedasticity problem and issue of correlated errors within groups of observations (Wooldridge 2002), we obtain the cluster-robust standard errors under the weak assumptions that errors are independent across individuals.

3.3.4 Model for Treatment Effects

When estimating the purchase expenditure, there could be potential endogeneity problem for the independent variable *FAN* in our random-effects model. In this research study, fan membership is used as an explanatory (i.e., independent) variable for the random-effects model. However, this fan membership is voluntarily declared by customers themselves, which means it is determined endogenously by customers. Thus, there may be a self-selection bias in our findings of the random-effects model. The intuition behind the self-selection bias is that the customers who are fans of FFS on Facebook fan page may select themselves as fans because they spent a lot on FFS products.

We employ the treatment effects model (Wooldridge 2002) to account for the potential selection bias. In our random-effects model, we estimated the treatment effects of SMBCM on purchase behaviour. Both Heckman (1978) and Maddala (1983) show that such a model can be consistently estimated by using a two equation system (first stage Probit model, followed by second stage OLS model) and by employing an inverse Mills ratio as a proxy variable (accounting for omitted variables) in the main equation of interest.

With the data available, we believe total purchase quantity (*TOTQUNT*) and demographics variables could potentially determine customers' fan membership. The data were re-organized into cross-sectional level and the dependent variable will be the total expenditure across 20 months (*TOTEXPD*). The model specifications are as follows,

$$\Pr(FAN_i = 1 | X_i) = \Phi(\beta_{0i} + \beta_1 * TOTQUNT_i + \beta_2 * AGE_i + \beta_3 Income_i + \beta_4 Occupation_i + \varepsilon_i) \quad (9)$$

$$TOTEXPD_i = \gamma_{0i} + \gamma_1 * FAN_i + \gamma_2 * AGE_i + \gamma_2 Income_i + \gamma_3 Occupation_i + \gamma_4 Receptivity_i + \varepsilon_i \quad (10)$$

The model (9) is the Probit model specification for fan status (*FAN*), where Φ is the Probit cumulative distribution function. The regression for total expenditure is shown in model (10). For reference, we also report results obtained from estimating the outcome equation using OLS, i.e., ignoring the endogeneity problem of fan membership choice.

3.4 Estimation Results

3.4.1 Model for Frequency

The results of the random-effects Poisson model are shown in Table 2. The full model of column (4) includes our explanatory variable, the control variables and the month dummies. The full model of column (4) shows a positive coefficient of *FAN* with 0.541 ($p < 0.01$). This positive coefficient implies that a fan visited the FFS stores on a more frequent basis than a non-fan. On average, a fan of FFS had 1.718 store visits ($e^{0.541} = 1.718$) more than that of a non-fan. Compared to the average monthly visits (0.228), fans visited the stores 7.5 times more frequently than non-fans. The great margin between fans and non-fans for the store visit frequency proves the higher behavioural loyalty of fans. Hence, our *H1(a)* is supported.

Due to page limit, only part of the results for dummy variables are reported, i.e, the 15-30k income category, executive category for occupation, and the email category for receptivity. The full results are available upon request.

	(1)		(2)		(3)		(4)	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<i>FAN</i>	0.356**	9.38	0.348**	9.24	0.355**	9.42	0.541**	9.38
<i>Constant</i>	-1.494**	194.19	-1.492**	46.55	-0.847	1.12	0.489	0.41
<i>AGE</i>			0.004**	4.67	0.004**	4.65	0.006**	4.87
<i>INCOME15_30</i>			-0.086**	3.44	-0.084**	3.39	-0.131**	3.52
<i>EXECUTIVE</i>			0.009	0.36	0.008	0.31	0.014	0.38
<i>EMAIL</i>					-0.696	0.92	-1.029	0.86
<i>Month Dummies</i>							Included	
<i>Ln(α) Constant</i>	-0.777**	41.93	-0.804**	42.93	-0.808**	43.08	0.259**	18.94
<i>Number of obs</i>	207,040		207,040		207,040		207,040	

* $p < 0.05$; ** $p < 0.01$ *

Table 2. Random-Effects Poisson Model for Purchase Frequency

3.4.2 Model for Quantity

The results of the random-effects Negative-Binomial model are shown in Table 3. The full model of column (4) includes our explanatory variable, the control variables and the month dummies. The full model of column (4) shows a positive coefficient of *FAN* with 0.382 ($p < 0.01$). This positive coefficient implies that a fan of FFS bought 1.465 items ($e^{0.382} = 1.465$) more than a non-fan. By comparing the average number of items bought monthly by fans and non-fans, we see that the number of items bought by fans doubles the number of items bought by non-fans. This indicates that fans exhibited higher behavioural loyalty in terms of purchase quantity compared to non-fans. Therefore, our *H1(b)* is supported.

	(1)		(2)		(3)		(4)	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<i>FAN</i>	0.387**	14.13	0.381**	13.94	0.385**	14.10	0.382**	13.87
<i>Constant</i>	-2.337**	280.49	-2.350**	92.77	-1.211**	2.64	-1.236**	2.70
<i>Ln(r) Constant</i>	1.351**	41.31	1.381**	41.30	1.385**	41.30	1.395**	33.35
<i>AGE</i>			0.003**	5.26	0.003**	5.23	0.003**	5.14
<i>INCOME15_30</i>			-0.072**	3.75	-0.071**	3.69	-0.068**	3.54
<i>EXECUTIVE</i>			0.026	1.38	0.025	1.35	0.025	1.34
<i>EMAIL</i>					-1.171*	2.56	-1.142*	2.50
<i>Month Dummies</i>							Included	
<i>Ln(s) Constant</i>	2.982**	70.44	3.023**	70.20	3.028**	70.17	3.043**	54.96
<i>Number of obs</i>	207,040		207,040		207,040		207,040	

Table 3. Random-Effects Negative-Binomial Model for Purchase Quantity

3.4.3 Model for Expenditure

The results of purchase expenditure model are shown in Table 4. Model in each column include different explanatory variables in the estimation. The full model of column (4) includes our explanatory variable, the control variables and the month dummies.

	(1)		(2)		(3)		(4)	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<i>FAN</i>	4.230**	5.06	4.187**	5.05	4.271**	5.16	3.986**	5.00
<i>AGE</i>			0.046**	3.95	0.047**	3.97	0.044**	3.88
<i>INCOME15_30</i>			-1.390**	2.83	-1.353**	2.75	-1.257**	2.67
<i>EXECUTIVE</i>			-0.118	0.29	-0.134	0.33	-0.157	0.40
<i>EMAIL</i>					-5.758**	15.34	-4.166**	5.83
<i>Month Dummies</i>							Included	
<i>Constant</i>	11.446**	89.37	11.337**	20.26	16.414**	21.19	14.451**	15.34
<i>Number of obs</i>	207,040		207,040		207,040		207,040	

Table 4. Random-Effects Model Results for Purchase Expenditure

The result of the full model shows a positive coefficient of *FAN* with 3.986 ($p < 0.01$). The coefficient of *FAN* drops from 4.271 to 3.986 after including the monthly dummies, but it still remains positive and significant. This indicates that a customer who is a fan of FFS spent \$3.986 more than a non-fan, ceteris paribus. Compared to the mean of the purchase expenditure (\$11.600), this margin of \$3.986 is 34.36% more in terms of monthly expenditure. Thus, higher behavioural loyalty of fans in terms of purchase expenditure is evidenced by the promising result on purchase expenditure. Therefore, our *H1(c)* is supported.

3.4.4 Model for Treatment Effects

The results of regression analysis after controlling for the potential self-selection bias are presented in Table 5. The Fan model column details the coefficients and standard errors of the first stage Probit regression results that are used to estimate the inverse Mills ratio. The results of TOTEXPD model are listed in the next column. The last column shows the results of the OLS regression for comparison with our treatment effects model. The coefficient on the *FAN* variable is 324.685 and statistically significant ($p < 0.01$) after controlling for selection-bias. This indicates that, on average and all else being equal; fans spent \$324.685 more compared to non-fans across the 20 months. Meanwhile, as we expected, the total purchase quantity has a positive effect on the possibility of being a fan. Overall, the results of the treatment model provide more evidence in support our *H1(c)*.

As discussed above, an important feature of our model is that it controls for the endogenous nature of fan membership choices. Interestingly, as we show in Table 6, the results obtained by ignoring this endogeneity through using a simple OLS regression (i.e., assuming that the correlation between the error terms in the choice and outcome equations is zero) would suggest that fans only generated \$68.343 more compared to non-fans. Compared with the treatment effects model, we can see that the coefficient of *FAN* in the simple OLS model is largely under-estimated. This evidence confirms the important role of accounting for the selection bias in order to estimate the effect of fan membership on total purchase expenditure in our application, illustrating that the model cannot be estimated by OLS due to the self-selection in the fan membership choice decision.

	<i>FAN</i>		<i>TOTEXPD</i>		OLS	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<i>FAN</i>			324.685**	52.29	68.343**	6.34
<i>TOTQUNT</i>	0.055**	77.48				
<i>AGE</i>	-0.002	0.90	0.763**	3.76	0.744**	3.74
<i>INCOME15_30</i>	0.092	1.75	-22.468**	3.23	-21.648**	3.18
<i>EXECUTIVE</i>	-0.029	0.53	-3.830	0.57	-2.139	0.32
<i>EMAIL</i>			-57.671	0.40	-92.134	0.40
<i>Constant</i>	-1.429**	18.64	218.949	1.52	262.627	1.14
<i>Number of obs</i>	12,940		12,940		12,940	

Table 5. Treatment Effects Model for Total Purchase Expenditure

4 Discussion

The aim of our study is to investigate the causal relationship between social media attitudinal loyalty and behavioural loyalty. We examined the impacts of customers' social media brand community membership (SMBCM) on their purchase behaviour in terms of purchase frequency, quantity and expenditure. In summary, all our research hypotheses are supported by the findings of our model estimations.

From our Poisson model results, fans were found to visit FFS stores 7.5 times more frequently than non-fans. Compared to non-fans, fan contributed much more in store traffic. The significant difference in purchase frequency largely supports our last hypothesis. This finding also corroborates with past research findings that attitudinal loyalty leads to repeated purchase of customers (Chaudhuri et al. 2001; Oliver 1996).

The positive relationship between social media attitudinal loyalty and behavioural loyalty was further validated by examining the quantity purchased between fans and non-fans. We found that, for every month, fans individually purchased double the number of items than non-fans did. Meanwhile, it is also shown in the treatment model that purchase quantity has a positive effect on the possibility in becoming a fan. Therefore, our findings are consistent with the past research that loyal customers purchase in large volume (Tellis 1988).

Interestingly, it is shown that fans of FFS spent much more than non-fans on the monthly basis. This 34.36% margin supports our hypothesis that the higher social media loyalty leads to higher behavioural loyalty in terms of purchase expenditure. To address the potential selection bias issues, we further employed treatment effects model and found a great expenditure margin between fans and non-fans. OLS results is used for comparison to show that the importance to take into account the potential endogeneity. Indeed, this robustness test using treatment effects model provided more evidence of the positive impacts of social media attitudinal loyalty on behavioural loyalty. Therefore, our results confirm the past findings that loyal customers spend more for the brand they like (Shankar et al. 2003).

In summary, our results answered our research question that customers' SMBCM does influence their purchase behaviour in terms of purchase frequency, quantity and expenditure. The statistic figures further show that social media brand community members exhibit significantly better purchase behaviour in the three aspects we proposed.

5 Implications

5.1 Theoretical Implications

As all our hypotheses are supported by the findings, this study validates the theoretical relationship between social media attitudinal loyalty and behavioural loyalty. Follow Dick and Basu's (1994) framework, we managed to extend the existing literature that the positive influence of attitudinal loyalty on behavioural loyalty also applies to the social media context. Besides extending the current literature, the findings of this study provide more confidence that social media can generate business values. The social media can foster customers' brand loyalty and consequently influence their purchase behaviour.

With the unique characteristics of social media, we contribute by operationalizing attitudinal loyalty as SMBCM. SMBCM is believed to be a good reflection of customers' attitudinal loyalty on social media. Different from subjective measures which can only be known to certain group of people, customers' SMBCM is a transparent brand preference indicator on social media which are known to any of their friends. Although it is easy to self-declare as members of a brand community or to quit as non-members, the social media attitudinal loyalty exhibited by members was proved to be effective in correlating with higher behavioural loyalty. Supported by our findings, the SMBCM can be considered as an objective measure for attitudinal loyalty in the social media settings. Further, with the presence of customers' objective attitudinal loyalty, it allows us to compare the objective measure with subjective measures and investigate their influences on purchase behaviour respectively.

5.2 Practical Implications

Practically, we provide empirical evidence that social media brand community members have higher behavioural loyalty than non-members in terms of purchase behaviour. The results show a clear finding that SMBCM generates incremental sales value for marketers. First, as social media brand community members spent more than non-members, up-sale strategy may be applied to those fans to gain more profit from them. Second, the larger purchase quantity of fans than non-fans shows that bundle sale strategy may as well be utilized to stimulate inventory liquidating when necessary. Third, as fans are those frequent store visitors, it is a good opportunity for marketers to ask their brand fans to disseminate the latest promotion message to their friends. Lastly, as SMBCM is a transparent status online, it is a good opportunity for marketers to identify this group of attitudinally loyal customers and

collect more information like interests and hobbies. With detailed customer information available, marketers can offer more customized promotions to their loyal customers. For social media developers, they may create brand preference recommending feature which can identify customers with the same interest and attracting them to brand community. Besides, features like group buying can be developed on social media so as to further influence the purchase behaviour of brand community members. Overall, marketers should continue to devote themselves to building their brand community on social media. With the help of social media developers, marketers can use social media brand community to attract more potential loyal customers, retain these loyal customers and further increase their loyalty.

6 Conclusion

This study validates the theoretical relationship between social media attitudinal loyalty and behavioural loyalty by investigating the influence of SMBCM on purchase behaviour. However, there are limitations which future researchers may pay attention to. First, due to the limited accessibility of information on Facebook, we only have the cross-sectional level data on customers' fan status. If panel level data on fan status is available, we are able to compare the purchase behaviour before and after becoming a fan. In such a case, the findings will be more accurate in showing the differences in purchase behaviours between fans and non-fans. Second, our data did not capture members' activity within the fan page. The involvement of fans in the fan page could be additional objective measures for attitudinal loyalty. Customers' positive comments or suggestion on building the fan page can reflect their involvement in the brand fan page. Thus, the involvement of fans could also have an impact on their purchase behaviour. Third, we did not account for customers' preference for other brands. The inter-brand preference may provide more information for our model estimation. Future research can investigate the influence of fans' inter-brand preferences on their purchase behaviour attributes such as inter-purchase time. We would encourage information systems and marketing researchers to pursue further research in this area.

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