

How virtual community participation influences consumer loyalty intentions in online shopping contexts: an investigation of mediating factors

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Extant studies generally recognise that virtual community building is an effective marketing programme for forging deep and enduring affective bonds with consumers. This study extends previous research by proposing and testing a model that investigates key mediating processes (via trust, satisfaction and identification) that underlie the relationship between virtual community participation and consumer loyalty intentions. The authors test the hypotheses using data obtained from three large online retailing stores. Virtual community participation significantly enhances loyalty intentions, through both social mechanisms (via community identification) and psychological mechanisms (via trust and satisfaction). Moreover, the findings provide insights into the complex relationship between the two mechanisms in online shopping settings. Community identification is a pivotal factor for enhancing customer loyalty intentions. The results advance understanding of the process by which virtual community building facilitates the development of business-to-consumer relationships in the computer-mediated environment. The authors discuss the managerial implications of the findings, as well as avenues for further research.

Keywords: virtual community participation; consumer loyalty intentions; community identification; trust; satisfaction

1. Introduction

In the past decade, marketers have become increasingly interested in understanding how to organise and facilitate the development of virtual communities (Nambisan and Nambisan 2008). Many reasons underlie this interest, including the ability of virtual communities to offer valuable insights into product innovation, facilitate deep and enduring affective bonds with consumers and reduce customer service costs by enabling peer-to-peer problem-solving (Hagel and Armstrong 1997, Dou and Krishnamurthy 2007). Considering the importance of virtual communities, scholars have dedicated considerable efforts to understand the process of community cultivation (e.g. Wellman and Gulia 1999, Bagozzi and Dholakia 2002, 2006a, Lin and Lee 2006).

In this study, we set out to address a key research question: how does virtual community participation facilitate the development of firm–customer relationships? Prior studies generally have emphasised that virtual community participation enhances customer loyalty (e.g. Bagozzi and Dholakia 2006b), but there is a lack of research into the role of and intricacies involved in the process of virtual community building as a means to manage customer relationships

(Algesheimer *et al.* 2005). Furthermore, we have yet to precisely model the process by which virtual community participation leads to relational outcomes in online shopping settings (Srinivasan *et al.* 2002).

Consumer behaviour theorists (i.e. Bagozzi and Dholakia 2006b) have investigated cognitive (attitudes, perceived behavioural control and identification with the open-source movement), affective (positive and negative anticipated emotions) and social (social identity) determinants of participation and its consequences for members' behaviours in an open-source software user communities (i.e. Linux user groups). However, in a context similar in nature but qualitatively different, we propose that social (i.e. community identification) and psychological (i.e. trust and satisfaction) mechanisms together influence members' loyalty intentions to an e-tailer. In the case of social mechanisms, community members feel a 'consciousness of kin' – an intrinsic connection with other members and a collective sense of separation from non-members (Wellman and Gulia 1999). Such group affiliation not only influences consumer opinions (e.g. product attitudes) but also should exert a direct, positive and long-term influence on store loyalty (Bhattacharya *et al.* 1995, Jang *et al.* 2008). In terms

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of psychological mechanisms, virtual community participation helps reduce risks for consumers and increases confidence in e-tailers. Moreover, in a context of deepening participation, e-tailers can engage in dialogue with consumers and respond better to their desires and needs.

The contribution of this study therefore is twofold. First, we fill a research gap in customer relationship management pertaining to virtual communities. These online groups represent a relatively new tool, which firms can use to manage their customer relationships; this study advances understanding of the process by which virtual community building facilitates the development of business-to-consumer (B2C) relationships in computer-mediated environments. Prior research on virtual communities has suggested that various factors influence the development of B2C relationships and membership behaviours (e.g. Constant *et al.* 1996, Bock *et al.* 2005, Wasko and Faraj 2005, Chiu *et al.* 2006, Koh *et al.* 2007, Wiertz and de Ruyter 2007). Despite these efforts to identify important factors that facilitate virtual community participation, there is a relative lack of research that considers the process of forming favourable perceptions of the outcomes of virtual community participation. This study therefore proposes a model that outlines the outcomes of virtual community participation and its mediating mechanisms, in association with customer loyalty intentions.

Second, we suggest that virtual community participation significantly enhances customer loyalty through both social mechanisms (i.e. community identification) and psychological mechanisms (i.e. trust and satisfaction). Unlike prior empirical studies that analyse individual and social mechanisms separately as antecedents of customer loyalty intentions, we examine their combined impact in a single model. Furthermore, we explore the inter-relationships between social and psychological mechanisms in virtual community contexts. Thus, our results not only clarify the theoretical relationship between virtual community participation and loyalty intentions but also improve understanding of how different factors jointly explain consumers' loyalty intentions (Todd and Benbasat 1999, Olivera *et al.* 2008). In particular, community identification may be pivotal in the relationship between virtual community participation and consumer loyalty intentions. We suggest that community identification, along with satisfaction and trust, mediates the effect of virtual community participation on consumer loyalty intentions. It thus presents a more complete picture than that currently available in online relationship management literature. Addressing this issue provides new theoretical insights into the nature of community participation – a topic that, to the best of our knowledge, has not been examined in prior research.

The remainder of this article is structured as follows: in the next section, we present our conceptual framework and research hypotheses. We then describe our research methodology, present the empirical results and discuss the findings and their managerial implications. We conclude with some limitations and suggestions for further research.

2. Conceptual background and research hypotheses

In shopping malls, where buyers and sellers interact face to face, consumers can easily obtain product/service information and request assistance as needed. Face-to-face communication offers a rich medium for transmitting information concurrently through multiple channels, including verbal, non-verbal, social, personal and paralinguistic (Thatcher and Zhu 2006). In online shopping contexts though, consumers experience uncertainty in nearly every transaction, not only because this channel can communicate substantially less information (Daft and Lengel 1986) but also because the spatial and temporal separation of the online environment creates additional information asymmetries that benefit the seller, which causes consumers to be wary of seller opportunism (Pavlou *et al.* 2007). These concerns can inhibit the development of buyer–seller relationships (Ba and Pavlou 2002). Therefore, encouraging virtual community participation represents a fresh approach to building and sustaining long-term, high-quality relationships (Srinivasan *et al.* 2002).

2.1. Virtual community participation

Because the topic of virtual community participation is multidisciplinary and has received attention from scholars and practitioners in many fields, we integrate theory developed in several disciplines to determine the two mediating mechanisms for our theoretical framework to identify antecedents of members' loyalty intentions. Specifically, we undertake a careful review of consumer behaviour (e.g. Bagozzi 2006), relationship marketing (Morgan and Hunt 1994, Sheth and Parvatiyar 1995, Palmatier *et al.* 2006) and brand community (e.g. Muñiz and O'Guinn 2001, McAlexander *et al.* 2002, Algesheimer *et al.* 2005) research.

Members' participation in the activities of virtual communities is a critical factor for not only their positive development (Casaló *et al.* 2007) but also their long-term sustainability (Koh and Kim 2003). For this study, the research context pertains to firm-hosted virtual communities, which refer to online aggregations of customers who collectively co-produce and consume content that is central to their interest

in purchasing activities from the firm, through exchanging product information, knowledge and socio-emotional support (Wiertz and de Ruyter 2007). Thus, we define virtual community participation as the extent to which a member actively engages in community activities and interacts with other community members. Those activities may include posting or viewing information, personal opinions, questions, pictures and knowledge on the firm-hosted community's message boards. Posting and viewing are fundamental forms of participation in the ongoing life of most online communities (Koh *et al.* 2007).

Previous studies have discussed the antecedents and consequences of virtual community participation. To understand users' motivation to voluntarily contribute, various investigations have focused on motivations to share knowledge and engage in helping behaviours in, for example, communities of practice (e.g. Wasko and Faraj 2000, 2005). The factors that increase user participation intentions include altruism, rewards, recognition, status enhancement and personal enjoyment (Hars and Ou 2002, Fang and Neufeld 2009). In this study, we are more concerned with how virtual community participation shapes consumers' behaviours in online contexts. For example, Algesheimer *et al.* (2005) find that encouraging community participation triggers consumers' citizenship behaviours, such as word of mouth, recruitment of other customers and proactive communication of anticipated problems. At the interpersonal level, virtual communities provide not only utilitarian support for online buying but also social support through learning and fellowship experiences (Fisher *et al.* 1997, Srinivasan *et al.* 2002).

In summary, face-to-face communication typically involves two parties; virtual community participation involves many-to-many communication in real time, in which users can participate and modify both form and content (Hoffman and Novak 1996). This type of interaction encourages customers to engage in dialogues and share their experiences and expectations (Lamb and Kling 2003). By engaging in such interactions, e-tailers can learn about consumers' past purchases and better respond to their desires and needs (Muñiz and O'Guinn 2001, Nambisan and Nambisan 2008). Building a consumer community strengthens both consumers' confidence in doing business with the e-tailer and their perceptions of friendliness (Winer 2001). We therefore seek to shed light on how virtual community participation facilitates the development of firm–customer relationships in computer-mediated environments (see the conceptual framework in Figure 1).

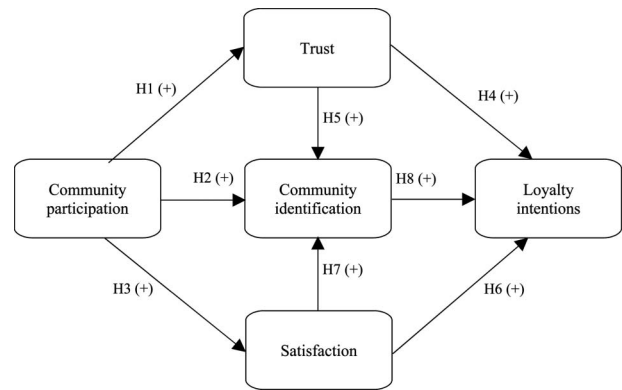


Figure 1. Conceptual framework.

2.2. Virtual community participation and trust

For this study, we define trust as perceptions of the credibility and benevolence of e-tailers (cf. Doney and Cannon 1997). Trust helps consumers to overcome perceptions of uncertainty and insecurity, which enables them to share personal information with and make purchases from the e-tailers (McKnight *et al.* 2002). By cultivating virtual communities, e-tailers can provide a supportive environment for consumers to facilitate the exchange of opinions and information about their offerings. Relationship marketing literature indicates that community-based interaction is a strategic communication tool that helps e-tailers respond promptly to queries regarding products/services or transaction security, going beyond routine information sharing (Oliver 1999). During the sharing process, the more information consumers' gain, the less uncertainty they face in online shopping contexts. In other words, the community context offers the opportunity for repeated and successful interactions, so that the parties in a relationship can generate trust (Morgan and Hunt 1994). Harris and Goode (2004) also emphasise this point when they posit that the interactions in an exchange relationship encourage trustworthy behaviour, even if controls against opportunistic behaviour are not in place. Therefore, we propose:

H1: Virtual community participation positively influences consumers' trust in e-tailers.

2.3. Virtual community participation and community identification

Identification is the degree to which community members perceive that they and their community share the same defining attributes (Ahearne *et al.* 2005). Bhattacharya and Sen (2003) suggest that identification is more likely to occur when consumers frequently participate in group activities and interact with other

members. In their study of community behaviour, Algesheimer *et al.* (2005) find participation in community events increases consumers' attachment to the community significantly. In addition, consumers with high levels of interaction have direct access to other community members and can mediate the flow of resources in the community. Frequent participation in community activities thus makes consumers feel more like 'insiders' and increases the likelihood that the community will become a viable social category, capable of shaping their social identity (Bergami and Bagozzi 2000). Therefore, we propose:

H2: Virtual community participation positively influences community identification.

2.4. *Virtual community participation and satisfaction*

Because virtual community participation encourages consumers to engage in dialogue and share their experiences and expectations, e-tailers can gain insight and create effective responses by attending to that dialogue (Muñiz and O'Guinn 2001, Nambisan and Nambisan 2008). From the customers' perspective, queries or information requests no longer require a long wait for a (possibly slow) response from the e-tailer; rather, they can communicate directly with one another (Dholakia *et al.* 2004). These arguments also reflect the findings of Tsai and Huang's (2007) study of e-loyalty, which shows that community participation significantly enhances consumers' post-purchase evaluative judgments. Therefore, we propose:

H3: Virtual community participation positively influences satisfaction.

2.5. *Trust and loyalty intentions*

As e-commerce managers place increasingly greater emphasis on building long-term relationships, the conventional wisdom has recognised that trust is an essential ingredient of successful outcomes (Ba and Pavlou 2002, Bhattacharjee 2002). Morgan and Hunt (1994, p. 23) posit that relational trust exists 'when one party has confidence in an exchange partner's reliability and integrity'. In an online shopping context, the primary rationale for enhanced loyalty intentions is that high levels of trust reduce reliance on formal controls or monitoring mechanisms, which in turn lower transaction costs (Gefen *et al.* 2003, Pavlou *et al.* 2007). Harris and Goode (2004) develop a framework to describe how online buyer-seller relationships form and develop. Central to the development and maintenance of long-term relationships is the establishment of trust, because it facilitates future exchanges and

increased risk-taking in the relationship. On this basis, we propose:

H4: Trust positively influences loyalty intentions.

2.6. *Trust and community identification*

Consumers who trust e-tailers can develop strong, lasting bonds with their associated communities. The underlying rationale for this relationship is derived from the generalised norm of reciprocity. Gouldner (1960, p. 168) notes that the norm of reciprocity 'evokes obligation toward others on the basis of their past behavior'. In a study of consumer-retailer relationships, de Wulf *et al.* (2001) suggest likewise that a consumer's positive assessment of a retailer's goodwill and reliability may lead him or her to reciprocate with a trusting response or action in the form of cooperative and citizenship behaviours (Ahearne *et al.* 2005). In other words, an atmosphere of trust is an important mechanism to encourage community identification to develop. On this basis, we propose:

H5: Trust positively influences community identification.

2.7. *Satisfaction and loyalty intentions*

Overall satisfaction can be defined as a positive affective state resulting from the global evaluation of an e-tailer's performance, based on all previous purchasing and consumption experiences (Anderson *et al.* 1994, Lam *et al.* 2004). Following Lazarus's (1991) well-investigated framework, which proposes an appraisal-response-coping sequence to explain how attitudes form, we suggest that overall satisfaction positively influences loyalty intentions. Previous research on Internet-enabled contexts has hypothesised and empirically validated a link between overall satisfaction and loyalty intentions (e.g. Harris and Goode 2004, Hsu and Chiu 2004). Other studies indicate that the intention to repurchase can be increased by raising overall online customer satisfaction, such that the perceived benefits of switching are minimal (e.g. Szymanski and Hise 2000, Devaraj *et al.* 2002, Chiou 2004). Thus, we hypothesise:

H6: Satisfaction positively influences loyalty intentions.

2.8. *Satisfaction and community identification*

Consumers likely feel a strong psychological bond with the virtual community when they are satisfied with

their relationships with the e-tailer. The logic for this viewpoint is that consumers view online stores as viable partners and may even assign animate characteristics to them. Such satisfactory relationships encourage consumers to interact with like-minded consumers who share their enthusiasm (Algesheimer *et al.* 2005). Brand community research likewise notes that a consumer's relationship with a brand precedes and contributes to his or her relationship with the brand community (McAlexander *et al.* 2002). On this basis, we propose:

H7: Satisfaction positively influences community identification.

2.9. Community identification and loyalty intentions

Once consumers identify with and become emotionally attached to the community associated with a particular consumption context (e.g. shopping for a brand or a particular online store), they are likely to support these entities in a variety of ways. Positive actions include customer-initiated marketing or a high level of tolerance for quality lapses (Oliver 1999, Bhattacharya and Sen 2003), consistent with Bagozzi and Lee's (2002) arguments that a group-based identity motivates a member's behaviour to support identity maintenance. In their community research, McAlexander *et al.* (2002) find that individual identification with a community results in relative immunity to negative publicity and even increased rivalry with and derogation of competitors. From a social psychology perspective, Bergami and Bagozzi (2000) also suggest that the outcomes of community identification comprise extra- and in-role behaviours. Extra-role behaviours include acting as a consumer advocate and enthusiastic promotions of the online store to others. In-role behaviour encompasses a sustained, long-term preference for a particular online store and repurchase. Therefore, we propose:

H8: Community identification positively influences loyalty intentions.

3. Research method

3.1. Sampling and data collection procedures

We collected data from a survey of customers of three well-known Taiwanese online stores, each of which offered products in similar categories: general commodities (e.g. clothes, books and furniture), electronic equipment (e.g. PCs, laptops, printers and cameras) and fashion products (e.g. cosmetics, perfumes and jewellery). All stores cultivated virtual communities to facilitate customers' information exchanges and

routinely asked customers to register as members of the stores' virtual communities before making purchases. From the individual retailers' records, we determined that these exchanges typically involved customers answering others' inquiries, offering suggestions on product usage and presenting opinions on purchase decision-making.

Customers who made purchases from the online stores were identified as potential respondents and invited to participate in our survey by an e-mail message that contained a link to the online survey instrument. In the e-mail, we explained the academic purposes of the survey and emphasised that the results would only be used for research and not for commercial ends. As an incentive to participate, a US\$20 shopping voucher was offered based on a random drawing of 30 valid respondents. A total of 2500 e-mails were sent to customers randomly selected from a membership list provided by each of the online stores.

We are aware of the potential for self-selection bias in the sample and therefore took extensive precautions to minimise it. One such precaution was that we randomly selected customers from the membership list provided by each of the online stores as our sample. A sample of randomly selected participants is unlikely to be affected by the self-selection bias (Wooldridge 1999). Moreover, the entire membership list was composed of members who had any buying experience with the three online stores, irrespective of whether they were loyal. Most online stores require customers to provide their names for transaction safety and data recording, that is, the names in the member list did not represent their loyalty status. Another deliberate step to prevent self-selection bias was to draw a large sample ($n = 2500$).

After the invalid returns were removed, 537 usable responses remained (i.e. response rate of 21.5%). The respondent pool was 57% female and 43% male. Furthermore, 53% of them were aged 20–29 years, and 31% were 30–39 years of age. The participants were well educated, in that 87% held at least a university diploma. Approximately 26% were students, 45% employees and the remainder worked in their homes or were unemployed. In terms of their consumer characteristics, 37% spent 2–3 h per day surfing the Internet, and 25% spent 4–5 h daily (excluding study/work hours); moreover, 56% visited the online store they chose as the focus of their answers at least once a week. Approximately equal percentages purchased frequently or less frequently, that is, 44% purchased 2–6 times annually, but 40% did so less than twice. Finally, the sample is comparable to US consumers, in that their most popular purchases include books, CDs, computers, clothing and travel (Szymanski and Hise 2000).

3.2. Measures

The multiple measurement items used for each construct were adapted from validated scales obtained from prior literature. Minor adjustments were made to fit the context of this study, as discussed in the following sections. Respondents evaluated all items on 7-point scales that ranged from 'strongly agree' to 'strongly disagree'.

3.2.1. Loyalty intentions

Loyalty intentions were measured using three items adapted from Burnham *et al.* (2003). The questions specifically asked respondents to evaluate their willingness to increase their future use of the online store, their perception of their current loyalty and the extent to which the online store was their preferred choice.

3.2.2. Community identification

To measure community identification, we adapted the 4-item scale used by Algesheimer *et al.* (2005). Respondents indicated the extent to which they identified with the community in terms of attachment, belongingness, shared goals and membership.

3.2.3. Trust

Trust in the e-tailer was measured by six items, similar to those used by Bart *et al.* (2005) and Gefen *et al.* (2003). The items related to trustworthiness, reliability, responsibility and non-opportunistic behaviours.

3.2.4. Satisfaction

Based on measures developed by various researchers (e.g. Szymanski and Hise 2000, Harris and Goode 2004), we evaluated overall customer satisfaction using a 4-item scale. The items chosen assessed respondents' general satisfaction, confirmation of expectations and divergence of the actual purchase from the desired product or service. We also used the words 'in general' and 'overall' in the descriptions to indicate overall satisfaction rather than attribute satisfaction.

3.2.5. Virtual community participation

To assess virtual community participation, we selected four items from the participation scales of Algesheimer *et al.* (2005) and Dholakia *et al.* (2004). The items focused on frequency of interaction, willingness to help other participants, level of mutual interaction and extent of participation in community activities.

3.2.6. Perceived service quality

In addition to these constructs, perceived service quality may affect satisfaction (Harris and Goode 2004). This variable was included as a control variable for hypotheses dealing with satisfaction. Perceived service quality was measured by seven items [adapted from the scales of Harris and Goode (2004) and Bart *et al.* (2005)] that related to customer perceptions of efficiency and effectiveness of the purchasing and delivery process.

3.3. Pre-test and questionnaire design

Thirty senior members of the firm-hosted virtual communities from our targeted online stores participated in a quantitative pre-test, in response to a request to help modify items and provide feedback, mainly about ambiguities or difficulties responding to certain items. The request also asked for suggestions of changes that might enhance the clarity and appropriateness of the items. We then made several minor changes in the wording before finalising the items to be used in the main study.

We provide a summary of the final scales in the following session (as Table 1). The original questionnaire was written in English and translated into Chinese by a Taiwanese marketing professor with in-depth knowledge of marketing issues in Taiwan. Two doctoral students then independently translated the questionnaire back into English to verify its accuracy. The original and back-translated versions were compared for conceptual equivalence and refined where necessary by two marketing professors fluent in both English and Chinese.

4. Results

Following Anderson and Gerbing (1988), we adopted a two-step approach to test the models. First, we conducted confirmatory factor analyses to assess the measurement properties of the reflective latent constructs. Second, we performed structural equation analyses to test the research hypotheses. We ran all the models using the LISREL 8.54 programme (Jöreskog and Sörbom 1999). We assessed the goodness of model fit using chi-square tests, the root mean square error of approximation (RMSEA), non-normed fit index (NNFI) and comparative fit index (CFI) (Marsh *et al.* 1996, Hu and Bentler 1999). Satisfactory model fit requires insignificant chi-square tests, RMSEA values less than or equal to 0.08 and NNFI and CFI values greater than or equal to 0.90.

4.1. Measurement model validation

We assessed the adequacy of the measurement model by evaluating the reliability of individual items, the internal

Table 1. Measurement items and reliabilities.

Construct/items	Standardised item loading	CR ^a	AVE ^b
Loyalty intentions			
I will do more business with this online store in the near future	0.90*	0.93	0.81
I consider myself a loyal patron of this online store	0.92*		
I consider this online store as my first choice for online shopping	0.89*		
Community identification			
I am very attached to the community	0.84*	0.90	0.69
I see myself as a part of the community	0.88*		
Other community members and I share the same objectives	0.85*		
The friendships I have with other community members mean a lot to me	0.75*		
Trust			
This online store is trustworthy	0.76*	0.92	0.66
This online store keeps promises that it makes to me	0.87*		
I trust this online store to act in my best interests	0.81*		
If this online store makes a claim or promise about its product, it's probably true	0.84*		
There are no limits to how far this online store will go to solve a service problem I may have	0.82*		
In my experience this online store is very reliable	0.78*		
Satisfaction			
In general, I am satisfied with the services or products that this online store provides.	0.87*	0.93	0.77
I am happy with my decision to purchase from this online store	0.90*		
Overall, this is a good online store to do business with	0.87*		
My choice to purchase from this online store was a wise one	0.87*		
Virtual community participation			
I frequently interact with other community members	0.76*	0.79	0.50
I help other community members accomplish tasks	0.77*		
I have bi-directional communication with other community members	0.74*		
I actively participate in the community's activities	0.51*		
Perceived service quality			
Service and product guarantees in this online store are clearly explained	0.64*	0.89	0.53
The organisation and structure of online catalogues were logical and easy to follow	0.72*		
This online store accepts a variety of payment methods	0.72*		
The products/services I ordered were delivered within the time promised by this online store	0.74*		
This online store provides me with convenient options for returning items	0.73*		
This online store responds to my inquiries promptly	0.76*		
The website of this online store is user friendly	0.75*		

Note: * $p < 0.05$. ^aCR = composite reliability. ^bAVE = average variance extracted.

consistency between items designed to measure the same construct and the discriminant validity between constructs. To determine the reliability of each item, we examined the significance and magnitude of the item's loadings. All the items loaded significantly on their respective latent factors and had standardised loadings of at least 0.50 (Bagozzi and Yi 1988). We used two measures to evaluate the internal consistency of the constructs, composite reliability (CR) and average variance extracted (AVE). As we show in Table 1, the CRs range from 0.79 to 0.93 and the AVEs range from 0.50 to 0.81, above the recommended cut-off levels of 0.60 and 0.50, respectively (Bagozzi and Yi 1988); therefore, all the constructs exhibited good internal consistency.

We assessed discriminant validity in two ways. First, the square root of the AVE for each construct should exceed the correlations between that construct and other constructs (Fornell and Larcker 1981). As we show in Table 2, the diagonal elements

representing the square roots of the AVE for each construct are greater than the off-diagonal elements, satisfying the criterion of discriminant validity. Second, we checked whether the correlations among the latent variables were significantly less than 1 (Bagozzi and Yi 1988). We constructed 95% confidence intervals for each correlation coefficient. None of the confidence intervals included the value of 1, also providing evidence of discriminant validity.

We tested for common method variance bias, following Podsakoff *et al.*'s (2003) suggestions. We used Harmon's one-factor test to assess whether a single latent factor could account for all the manifest variables and thus determine whether common method variance posed a serious threat to our interpretation of the study findings (Podsakoff *et al.* 2003). A chi-square difference test of the hypothesised nine-factor model enabled us to assess its impact. The significant difference between the chi-square values of the two models indicated that the fit

of the one-dimensional model was significantly worse ($\Delta\chi^2 = 8147.79$, $\Delta df = 21$, $p < 0.01$) than that of the measurement model. Therefore, we obtained preliminary evidence that our hypothesised model was robust to common method variance.

Table 2. Correlation matrix and descriptive statistics of measures.

Variables	Correlations					
	1	2	3	4	5	6
1. Loyalty intentions	0.90 ^a					
2. Community identification	0.43	0.83				
3. Trust	0.47	0.31	0.81			
4. Satisfaction	0.63	0.41	0.56	0.88		
5. Virtual community participation	0.30	0.60	0.26	0.30	0.71	
6. Perceived service quality	0.43	0.18	0.58	0.47	0.10	0.73
Mean	5.10	4.15	4.81	4.80	4.32	4.74
Standard deviation	0.89	0.93	0.85	0.82	1.14	0.98

Note: ^aSquare roots of the AVE score for each construct are the bolded diagonal values.

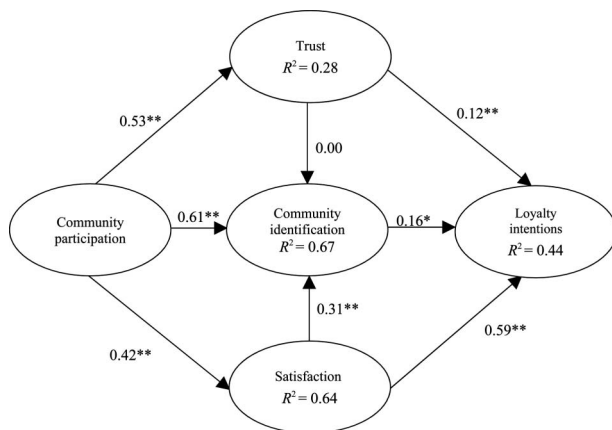


Figure 2. Structural model results. For visual clarity, the measurement items associated with each latent construct are omitted in this figure. Their factor loadings are listed in Table 1. * $p < 0.05$, ** $p < 0.01$.

4.2. Structural model evaluation

Figure 2 represents the findings related to the structural model (also see Table 3), including the sign and significance of the path coefficients and the R^2 for each endogenous construct. The R^2 values (ranging from 0.28 to 0.67) demonstrate that the model explains a substantial amount of the variance in the outcome variables. Besides, the overall fit statistics indicated that the hypothesised model was a good representation of the structures underlying the observed data ($\chi^2(330) = 1419.28$, $p \approx 0.00$, RMSEA = 0.078, NNFI 0.96 and CFI = 0.97).

As predicted in H1, virtual community participation positively and significantly influences trust, with a standardised γ coefficient of 0.53 ($p < 0.001$). Similarly, virtual community participation positively influences community identification ($\gamma = 0.61$, $p < 0.001$) and overall satisfaction ($\gamma = 0.42$, $p < 0.001$), in support of H2 and H3. Trust positively influences loyalty intentions ($\beta = 0.12$, $p < 0.001$), providing some support for H4. However, the coefficient of the impact of trust on community identification is not significant, which suggests a lack of support for H5. The link between overall satisfaction and loyalty intentions is positive ($\beta = 0.59$, $p < 0.001$), which supports H6. Furthermore, in H7, we propose a positive and direct relationship between overall satisfaction and community identification. The results strongly support this claim ($\beta = 0.31$, $p < 0.001$). Finally, a positive and significant relationship exists between community identification and loyalty intentions ($\beta = 0.16$, $p < 0.01$), in support of H8. Regarding the control variable, perceived service quality is positively related to satisfaction ($\gamma = 0.55$, $p < 0.001$).

4.3. Tests of mediation

To confirm the model's validity, we performed a formal test of mediation for the path from community participation to loyalty intentions. We compared our proposed model (Figure 1) with a model that

Table 3. Results of hypotheses testing (main effects).

Structural path		Standardised coefficient	Hypothesis
Community participation	→ Trust	0.53**	H1 (supported)
Community participation	→ Identification	0.61**	H2 (supported)
Community participation	→ Satisfaction	0.42**	H3 (supported)
Trust	→ Loyalty intention	0.12**	H4 (supported)
Trust	→ Identification	0.00	H5 (not supported)
Satisfaction	→ Loyalty intention	0.59**	H6 (supported)
Satisfaction	→ Identification	0.31**	H7 (supported)
Community identification	→ Loyalty intention	0.16*	H8 (supported)

Note: * $p < 0.05$, ** $p < 0.001$.

contained an additional path from community participation to intentions and determined the difference in the chi-square values of the two models ($\Delta\chi^2 = 2.16$), with one degree of freedom. Because the difference was not significant ($p > 0.14$), we conclude that the direct path was insignificant, in support of the robustness of the proposed model.

5. Discussion and conclusion

This study extends previous research by filling a research gap noted by Algesheimer *et al.* (2005), pertaining to the role of and intricacies associated with the process of community building in managing customer relationships in a computer-mediated environment. We propose and test a model that identifies the impacts of virtual community participation on customer loyalty intentions, through both social and psychological mechanisms. Investigating the mediating mechanisms helps clarify the theoretical relationship among trust, satisfaction, identification and customer loyalty intentions, as well as account for how the relational constructs jointly explain customer loyalty intentions (Todd and Benbasat 1999, Olivera *et al.* 2008).

5.1. Theoretical implications

Our study contributes to literature in three main ways. First, it advances our understanding of the process by which community-building facilitates the development of B2C relationships in a computer-mediated environment. Our results show that virtual community participation significantly enhances customer loyalty intentions, through both social mechanisms (i.e. community identification) and psychological mechanisms (i.e. trust and satisfaction). In the case of social mechanisms, as consumers identify increasingly with the community, they perceive that they and the focal community share the same core or defining attributes and see themselves as typical representatives of the group (Ahearne *et al.* 2005). Furthermore, this membership has profound effects on their decision-making, consistent with arguments in social psychology literature (e.g. Bagozzi and Lee 2002) that group-based identity motivates a member's behaviour in a way consistent with identity maintenance.

Second, we find that psychological variables (i.e. trust and satisfaction) significantly mediate the effect of community participation on consumer loyalty. By encouraging virtual community participation, e-tailers can gain greater levels of knowledge about consumers' past purchases and offer an appropriate response to customers' desires and needs. Virtual communities enable e-tailers to respond promptly to

queries and go beyond routine information sharing, which contributes to the development of trust (Fisher *et al.* 1997, Duncan and Moriarty 1998). The results not only clarify the theoretical relationship between virtual community participation and loyalty intentions but also improve our understanding of how different factors together explain consumers' loyalty intentions. Our findings thus demonstrate some enhanced insights that can accrue from combining social identification with satisfaction and trust to establish an explanatory platform for this form of consumer behaviour.

Third, our findings provide insights into the complex interrelationships among psychological and social mechanisms in virtual community contexts. In contrast with previous empirical research that assesses the mechanisms separately as antecedents of customer loyalty, we have examined their combined impact on customer loyalty intentions in a single model. Our results demonstrate that when consumers are satisfied with their relationship with an e-tailer, they are likely to develop feelings of attachment and belongingness to the associated community. These findings also support marketing theory propositions that higher levels of brand relationship quality lead to stronger community identification (Muñiz and O'Guinn 2001, McAlexander *et al.* 2002). It is noteworthy that identification, as the immediate determinant of loyalty intentions, is the pivotal concept in the community participation–consumer loyalty relationship. Moreover, social identification and trust and satisfaction together completely mediate the effect of community participation on consumer loyalty. This result is interesting, particularly in light of the emphasis placed on the direct effect of community building on repurchase intentions in prior e-commerce literature (e.g. Srinivasan *et al.* 2002). Overall, these findings present a more complete picture than that currently offered by online relationship management literature.

5.2. Managerial implications

Our study provides three main managerial implications. The first pertains to strategies for managing a firm-hosted online community. For e-tailers cultivating a virtual community, it is important to understand the mechanisms with the best potential for encouraging long-term customer relationships (Hagel and Armstrong 1997, Dou and Krishnamurthy 2007). Although social identification significantly mediates the effect of community participation on consumer loyalty intentions, satisfaction is dominant. Therefore, companies should invoke consumers' satisfaction during interactions with virtual communities. One strategy for doing so might be to ensure the presence of active and core

responders, whether they represent the e-tailer or not, who provide timely responses to customers' questions. Toral *et al.* (2009) consider this tactic the key determinant of successful online communities. Well-organised information shared by community members also can improve customer experiences. Customer satisfaction then increases, because consumers no longer need to wait for a response only from the e-retailer but can communicate directly with other participants. Thus, e-tailers should endeavour to maintain a high level of interaction in virtual communities, which ensures new threads get answered and doubts and problems solved in a reasonable time (Lin and Lee 2006).

The second implication relates to the need to institute measurement systems. For online businesses, the measurement system captures any gains in customer knowledge, which precede increases in customer satisfaction and loyalty. From a consumer perspective, building a virtual community not only reinforces feelings about the e-tailer's friendliness but also provides credible evidence of its commitment to a long-term relationship. From the e-tailers' point of view, an online conversation with customers may offer an opportunity to develop co-production benefits (e.g. customisation and cost reductions), which lead to more favourable assessments of the company and increase customers' intentions to spend, as well as actual spending with the company over time (Auh *et al.* 2007).

Therefore, we suggest that e-tailers regard virtual community cultivation programmes as strategic investments. They create intangible assets that strengthen consumers' confidence in relationship exchanges. As Pavlou and Dimoka (2006) argue, the inherent temporal and physical separation of buyers and sellers in impersonal online environments could inhibit consumers' purchasing behaviour and loyalty development. Our findings further indicate that cultivating online communities increases a consumer's resistance to leaving while also improving the firm's knowledge about consumers' preferences. Initiating a virtual community does not invariably result in enhanced consumer loyalty though. In the long term, the success of a virtual community depends on its members' sustainable engagement (Koh and Kim 2003). Thus, marketers should design reward systems to encourage participation, especially in the form of citizenship behaviours in the virtual community (cf. behaviour rooted in personal gain).

Finally, we address the potential double-edged sword of virtual community participation. Although we find evidence of the significant effect of community building on loyalty intentions, caution is necessary, considering the potential dangers associated with

consumer power formation. Community interaction motivates consumers to integrate with the community, which strengthens their ability to leverage their presence as a large customer base with bargaining power and thus influence the e-tailer's decision-making. To avoid problems associated with this influence, we encourage e-tailers to adopt consumer orientations and be sensitive to the community's feedback cues, which should help e-tailors avoid the potential negative effects of consumer power.

5.3. Limitations and further research

Our study has some limitations that we should acknowledge. First, this research focuses on user participation in e-tailers' virtual communities, but our theoretical model may not generalise to all types of participation in virtual communities. We call for more research to clarify the boundaries of our proposed model, in terms of industry or personality differences. For example, Harris and Goode (2004, p. 143) study online service dynamics by examining the inter-relationships among service quality, perceived value, trust, satisfaction and loyalty in two online stores and suggest 'the relative importance of particular constructs (such as satisfaction) may vary from one context to another depending on the nature of markets and exchange'. Empirical studies should examine our hypothesised model in different research contexts. An interesting potential approach might add contextual moderators (e.g. customers' affective involvement) or individual moderators (e.g. susceptibility to social influence) in the relationships between virtual community participation and relational outcomes (i.e. trust, identification, satisfaction and loyalty intentions).

In addition, this study uses cross-sectional data to derive causation; however, we also recognise the need for longitudinal studies. Our results accord with the theoretically specified causal sequence outlined in the hypotheses; however, cross-sectional data do not permit the exclusion of some alternative models, such as those depicting relationships between virtual community participation and consumer attitudes or behaviour. Further research using both self-reported data and archival data (e.g. participation behaviours in virtual communities and buying records) could investigate the specific sequence of states and actions. Longitudinal studies are important for another reason. Although we have found that virtual community participation influences community identification positively, it is possible that higher community identification precedes community participation. Similar reciprocal relationships may occur between virtual community participation and satisfaction or even

loyalty intentions. Our study thus would benefit from a time lag between the measures of the independent and dependent variables, as well as multiple measurement sources, such as self-reported and content analysis data. With such varied data, we could determine the causal relationships better.

Finally, to enhance the generalisability of the findings, we suggest research into the impact of virtual community participation on customer loyalty intentions in other countries. Cultural characteristics may moderate the favourite outcomes of virtual community participation and the formation loyalty intentions (Kale and Barnes 1992). For example, Eastern countries (e.g. Taiwan) tend to be relatively collective societies, so the effects of virtual community participation through social mechanisms (i.e. identification) may be stronger than it would be in most Western countries. These challenging issues all merit further investigation.

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