Modeling the Antecedents of Co-Production Behavior in Virtual Communities

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Abstract

This study pursues a better understanding of member co-production behavior in virtual communities. To extend prior research, it proposes and tests a model with three levels of behavioral antecedents. The authors test this model using both self-reported and objective behavioral data. With the exception of perceived member support, each proposed antecedent significantly influences co-production behavior through different processes. Informativeness and recognition of contribution significantly influence co-production behavior through satisfaction, community prestige affects it through identification, and enjoyment exerts the greatest effect through both satisfaction and identification. The authors conclude by considering some managerial and research implications of the study's findings.

1. Introduction

The emergence of new information and communication technologies has initiated a radical transformation of social interactions, with important implications for the formation of virtual communities (Wellman and Gulia 1999). For many marketers, virtual communities seem like ideal means to build brands (Muñiz and O'Guinn 2001), support product use (Armstrong and Hagel 1996), and collect feedback and ideas for innovation (Williams and Cothrel 2000). Those managers who have cultivated virtual communities thus have undertaken varied approaches to encourage member participation (Koh and Kim 2003/2004).

Scholars who examine participation behaviors in virtual communities instead tend to focus on intentions to continue using the virtual community (Cheung and Lee 2009), visits to the community site (Bagozzi and Dholakia 2006b), helping behavior (Yu and Chu 2007), or viewing activity (Koh et al. 2007). Yet these concepts have been criticized for their emphasis on relatively passive forms of participation behavior (Morrison and Phelps 1999). Moreover, Nambisan and Baron (2009) note that research has been limited by an overly narrow conceptualization of participation behavior, especially from a value creation perspective. In response to these shortcomings, several researchers have suggested the co-production construct, defined as voluntary and constructive efforts by individual members to influence a community's long-term viability (Gruen, Summers and Acito, 2000; Nambisan and Baron 2009). Despite the importance of co-production behavior, the factors and processes that underlie members' co-production behaviors are not well understood (Gruen et al. 2000). Therefore, this study contributes to existing literature by developing a model that outlines the antecedents and mediators of members' co-production behaviors in virtual communities.

2. Theoretical Background and Hypotheses

Figure 1 shows our model of the antecedents of co-production behavior.

Figure 1 about here

2.1. Behavioral Intentions

Bagozzi (2006) suggests that intentions direct the motivation to act in appropriate ways, as well as the initiation of planning and related mental and physical activities to implement goal-directed behaviors. Therefore, we hypothesize that intention is a significant predictor of virtual community members' co-production behavior.

H1: Co-production intentions have a positive influence on co-production behavior.

2.2. Satisfaction

Several service evaluation models (e.g., Anderson et al. 1994; Anderson and Sullivan 1993; Gotlieb, Grewal and Brown, 1994) adopt the appraisal-response-coping sequence (Lazarus 1991) or the cognitive-emotive causal order (Oliver 1997), both of which position behavioral intentions as superordinate to satisfaction. On the basis of these arguments, we advance the following hypothesis:

H2: Satisfaction has a positive influence on co-production intentions.

2.3. Identification

Bergami and Bagozzi (2000) suggest that members who strongly identify with a community want to ensure that their affiliation with it is communicated to relevant audiences in the most positive light possible. Thus, identified members have a vested interest in the community's success, and their decision to co-produce represents a key manifestation of their voluntary effort to achieve success (Gruen et al. 2000; Tajfel and Turner 1986).

> **H3**: *Members' identification with the virtual community has a positive influence on co-production intentions.*

2.4. Antecedents of Satisfaction and Identification in Co-Production Processes

2.4.1. Recognition of Contributions

Recognition is "a public expression of appreciation given by a group to individuals who undertake desired behaviors" (Fisher and Ackerman 1998, p. 264). It is a fundamental extrinsic reward that the community can manipulate easily (Gruen et al. 2000). From a member's perspective, recognition elevates the visibility of his or her contribution and thus generates favorable social consequences, such as status or prestige (Fisher and Ackerman 1998). With greater social benefits, contributors should experience higher levels of satisfaction with the virtual community.

> **H4**: *Recognition of contributions has a positive influence on overall satisfaction.*

2.4.2. Informativeness

Informativeness can be considered a cognition-based construct, whereas overall satisfaction is primarily an affective and evaluative response. Social science literature indicates that cognitive thought processes trigger affective responses (Weiner 1986), such that informativeness judgments may affect overall satisfaction. When members consider the information they gain from the virtual community useful, they should feel more satisfied with the online community.

> **H5**: *Informativeness has a positive influence on overall satisfaction.*

2.4.3. Enjoyment

Enjoyment is a hedonic benefit of engaging in the virtual community, as well as one of the most important factors that influences virtual community members' participation decisions (Cheung and Lee 2009; Dholakia and Bagozzi 2004). Research into affective-processing mechanisms suggests that the emotions elicited during consumption experiences leave strong affective traces or markers in episodic memory (Westbrook and Oliver 1991). These memory elements are highly accessible during current cognitive operations. Enjoyment as an emotional response to previous participation in the community may influence a member's overall satisfaction (Cheung and Lee 2009). Ahearne, Bhattacharya, and Gruen (2005) also argue that identification is likely only if the individual member finds the community attractive, so the degree to which it occurs in practice varies with perceptions of the level of enjoyment.

H6: *Enjoyment has a positive influence on overall satisfaction.*

H7: *Enjoyment has a positive influence on members' identification with the virtual community.*

2.4.4. Perceived Member Support

According to the reciprocity norm, perceived member support should produce a sense of obligation to care about the community's welfare; because every member acts as the community agent, the member's receipt of favorable treatment from other members should enhance overall community support. This expectation is similar to Bagozzi's (1995) argument that members demonstrate identification with the social group to reciprocate other group members' investments in the relationship.

H8: *Perceived member support has a positive influence on members' identification with the virtual community.*

2.4.5. Community Prestige

Community prestige reflects the extent to which members perceive that people whose opinions they value hold the community in high esteem (Ahearne et al. 2005; Bergami and Bagozzi 2000). Social identity theory suggests that people's need for self-continuity goes hand in hand with their need for self-enhancement, or the maintenance and affirmation of positive self-views that result in their greater self-esteem (Bhattacharya and Sen 2003; Mael and Ashforth 1992).

H9: *Community prestige has a positive influence on members' identification with the virtual community.*

3. Research Methods

3.1. Data Collection

The data for this study were collected from members of virtual communities located in a large virtual community platform in Asia. We administered the main survey through a Web-based questionnaire system available through the community platform provider. The platform provider randomly selected the sample from the membership lists and forwarded our e-mails to encourage the members to participate in the survey. Briefly, 351 of the community members were male (43.17%). The mean age was 37.8 years. Regarding duration of membership, 213 (or 21.7%) had belonged to their respective community for less than a year, 420 (or 42.8%) had belonged between one and three years, and 349 (or 35.5%) had belonged for more than three years.

3.2. Archival Data

We coded behavioral data through direct observation of members' participation behavior which were available online. This community platform provider also has a database that accumulated the data related to the number of articles which a member created, the number of photos which a member uploaded, the number of virtual gifts sending to other members, and members' demographics. We retrieved data about members' participation

behavior with their consent and coded them immediately after the survey data collection.

3.3. Measures

The origins of other measures are listed in Table 1.

Table 1 about here

4. Results

4.1. Measurement Model Evaluation

4.1.1. Internal Consistency

We used two measures to evaluate the internal consistency of constructs: composite reliability (CR) and average variance extracted (AVE). Estimates of CR greater than .60 and AVE greater than .50 support internal consistency (Bagozzi and Yi 1988). As we show in Table 1, the CRs range from .73 to .96, and the AVEs range from .57 to .92. Therefore, all constructs exhibit good internal consistency.

4.1.2. Discriminant Validity

We assessed the discriminant validity of the measures using two different approaches. First, we checked whether the correlations among the latent variables were significantly less than one (Bagozzi and Yi 1988). We constructed 95% confidence intervals for each correlation coefficient. Because none of the confidence intervals include the value of 1, this test offers evidence of discriminant validity. Second, as we show in Table 2, the diagonal elements (representing the square roots of the AVE for each construct) were greater than the off-diagonal elements, indicating that each construct shares more variance with its measures than it shares with other constructs (Fornell and Larcker 1981).

Table 2 about here

4.2. Structural Model Evaluation

The R^2 values (ranging from .34 to .46) demonstrate that the model explains a substantial amount of the variance in the outcome variables. The hypothesized paths reveal that the effect of intentions on co-production behavior is significant ($\beta = .30$, $p < .01$), in support of H1. Furthermore, satisfaction has a positive and significant effect on co-production intentions ($\beta = .21$, $p < .01$), in support of H2. The results likewise support the positive, direct relationship between identification and intentions, as we propose in H3 ($\beta = .19$, $p < .01$). With regard to the antecedents of satisfaction and identification, we find a positive and significant relationship between informativeness and satisfaction ($\gamma = .13$, $p < .01$), in support of H4. The results also indicate a positive and significant main effect of recognition of contribution on satisfaction ($\gamma = .39$, $p < .01$), in support of H5. The results that indicate a positive and significant main effect of enjoyment on satisfaction ($\gamma = .28$, $p < .01$) and identification ($\gamma = .43$, $p < .01$) support H6 and H7, respectively. The path from prestige to identification also is positive and significant ($\gamma = .19$, $p < .01$), which supports H9. However, the effect of member support on identification is not significant, so we cannot confirm H8.

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5. General Discussion

The current research extends previous studies of virtual communities by proposing and testing a model of member co-production behavior. Overall, our contributions to virtual community research thus are threefold. First, this study advances our understanding of member co-production behavior in virtual community settings. Although the notion of co-production has been discussed previously, researchers have not defined the scope of such behavior. Therefore, an important contribution of our study is to clarify the content of co-production behavior by providing an empirical description of the construct according to three key dimensions: (1) contributing information to the community, (2) actively facilitating community interactions, and (3) promoting the community through word of mouth. Second, our study models co-production processes in a virtual community context. In addition to conventional, satisfaction-based mechanisms, our identification-based construct accounts for some important social mechanisms that underlie members' decisions to co-produce for the virtual community.

Third, we contribute to virtual community research by investigating the distal antecedents of co-production behavior. When members perceive information as useful, they feel more satisfied with the virtual community, and that satisfaction influences their co-production intentions. From a member's perspective, informativeness could demonstrate the community's interest in the adoption of a member-centric orientation and lead to more favorable assessments of the community, which then enables the progression of their relationships with the community. In addition, we find that recognition of members' contributions has a positive, direct effect on co-production intentions through satisfaction. Another key finding of our study reveals that enjoyment plays a relatively more important role in triggering co-production, compared with the other four antecedents. This result supports the notion that when deciding to co-produce in a virtual community, the member takes into account the pleasure associated with the experience of the participation process (Cheung and Lee 2009).

Finally, a surprising finding from this study indicates that perceived member support does not significantly influence identification, despite relatively consistent evidence from previous community research that members' supportive actions offer a powerful source of identification (e.g., Kang et al. 2007). The Internet and other modern information-processing technologies enable people gain help from diverse others, through such tools as social networking sites (SNS), quickly and without much effort. Therefore, perhaps other members' supportive actions seem indifferent or substitutable, because friends can also provide assistance through SNS that may even be more helpful. This result is interesting, particularly in light of the previous emphasis on the direct effect of member support on the development of community identification (e.g., Kim 2000).

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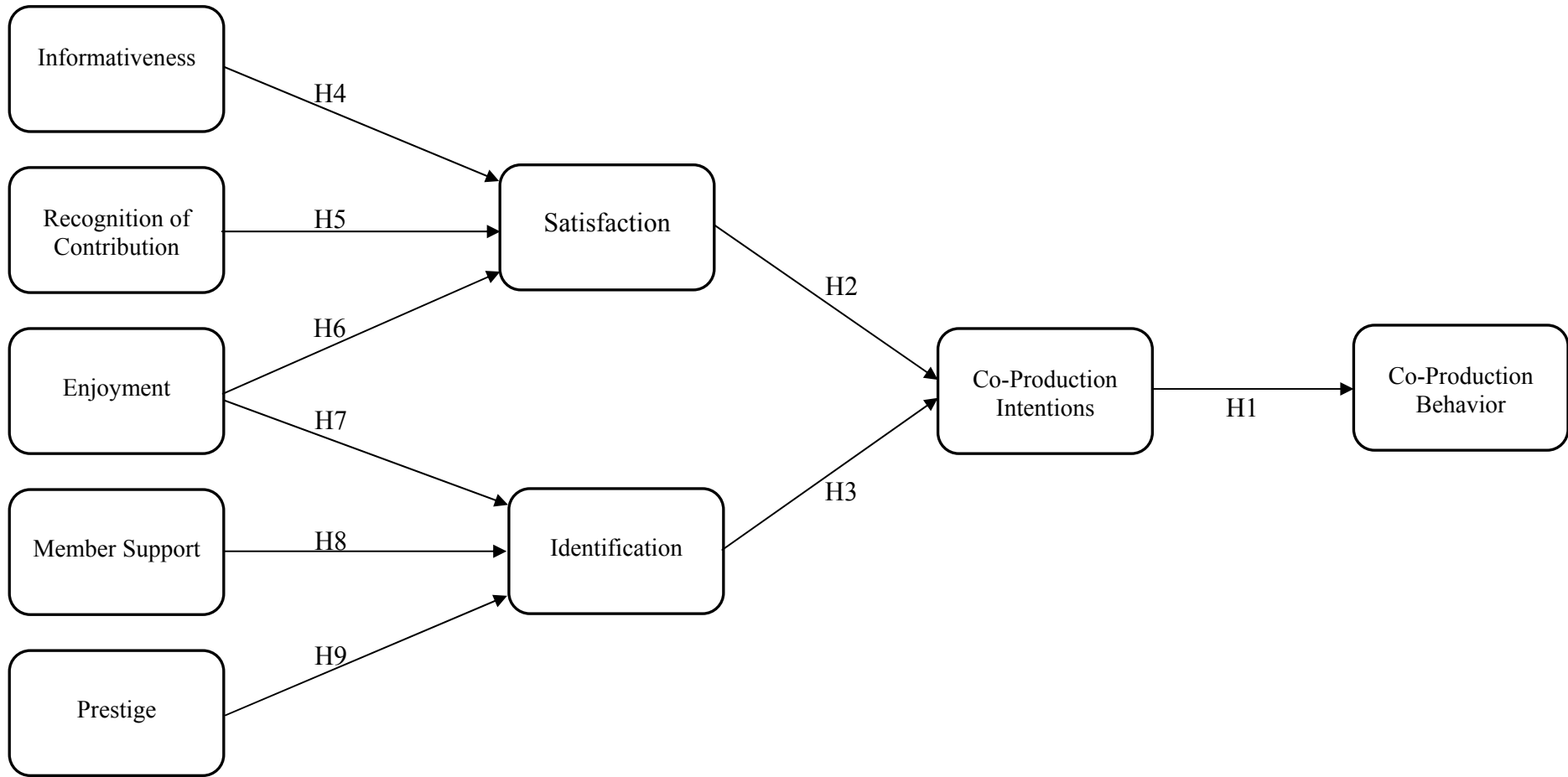
FIGURE 1

Conceptual Framework

TABLE 1

Summary of Measures

Construct	Measures	Standardized Factor Loading[a]
Informativeness	(1) The information provided by this community is useful.	.92
Chen and Wells (1999)	(2) The information provided by this community is valuable.	.95
CR[b] = .95		.93
AVE[c] = .88	(3) This community is a very good source of information.	
Recognition of Contribution	(1) The community provides proper rewards to active members for their efforts.	.82
Gruen et al. (2000)	(2) The community shows its appreciation to those who contribute information.	.92
CR= .91		.89
AVE = .76	(3) The community shows proper gratitude to actively participating members.	
Perceived Enjoyment	(1) I found participating in this community interesting.	.90
Flanagin and Metzger (2001)	(2) I found participating in this community enjoyable.	.80
CR = .90		.91
AVE = .76	(3) I found participating in this community fun.	
Prestige	People generally regard this community as …	
Bergami and Bagozzi (2000)	(1) Well-known.	.92
CR = .96	(2) Respected.	.95
AVE = .88	(3) Prestigious.	.94
Perceived Member Support	(1) Help is available from the community members when I have a problem.	.92
Eisenberger et al. (1986)	(2) The community members show very little concern for me. (R)[d]	.93
CR = .95		.92
AVE = .86	(3) The community members are friendly and approachable.	

<p align="center">**Summary of Measures (continued)**</p>

Construct	Measures	Standardized Factor Loading [a]
Satisfaction CR = .91 AVE = .77	(1) Based on all my participation experience, I am satisfied with this virtual community.	.89
	(2) I am satisfied with my decision to participate in this virtual community.	.88
	(3) In general, this is a good virtual community to participate in.	.86
Community Identification CR = .89 AVE = .67	(1) I am very attached to the community.	.82
	(2) Other community members and I share the same objectives.	.80
	(3) If community members planned something, I'd think of it as something "we" would do rather than something "they" would do.	.85
	(4) I see myself as a part of the community.	.79
Co-Production Intentions CR = .92 AVE = .79	(1) I will contribute actively to this community in the near future.	.86
	(2) I intend to give time to help other community members.	.88
	(3) I would consider donating my time or effort to make the community better.	.92

[a]All factor loadings are significant at $p < .001$.

[b]Composite reliability.

[c]Average variance extracted.

[d] Reverse-coded item.

TABLE 2

TABLE 2

Correlation Matrix and Summary Statistics

Variable	Correlation[a]								
	1	2	3	4	5	6	7	8	9
1. Co-Production Behavior	-								
2. Co-Production Intentions	.60 (.04)[b]	**.89**[c]							
3. Satisfaction	.59 (.03)	.50 (.03)	**.88**						
4. Identification	.53 (.03)	.49 (.03)	.56 (.04)	**.82**					
5. Informativeness	.35 (.03)	.30 (.03)	.43 (.03)	.52 (.03)	**.94**				
6. Recognition of Contribution	.43 (.03)	.38 (.03)	.55 (.03)	.39 (.03)	.39 (.03)	**.87**			
7. Enjoyment	.45 (.03)	.36 (.03)	.51 (.04)	.55 (.04)	.54 (.04)	.41 (.03)	**.84**		
8. Community Prestige	.29 (.03)	.24 (.03)	.38 (.03)	.41 (.03)	.43 (.03)	.30 (.03)	.44 (.04)	**.94**	
9. Perceived Member Support	.30 (.03)	.23 (.03)	.43 (.04)	.36 (.03)	.42 (.03)	.38 (.03)	.49 (.04)	.41 (.04)	**.93**

[a]All correlations are significantly less than 1.00.
[b]Standard deviations.
[c]Figures on the diagonal are the square roots of the AVE score for each construct.