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Research Article

A Social Influence Model of Consumer Participation in Network- and Small-Group-Based Virtual Communities

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Abstract: The study tries to understand how people are influenced by others to become active participants in network-based and small-group-based virtual communities. Since online social platforms are growing fast, understanding what makes people participate is very important for marketers and community managers. Using social influence theory, this research builds a model that explores how information, social standards and attachment to the group impact the way consumers are involved in virtual communities. Both surveys and case studies were used as part of a mixed-method approach to prove the model's validity. Results show that social influence greatly influences the way consumers behave, however, the effect is not the same for both large and small groups of online users. The research adds to our knowledge of virtual community participation and gives helpful tips for boosting consumer involvement techniques.

Keywords— Social Influence, Consumer Participation, Virtual Communities, Network-based Communities, Small-group Communities, Online Engagement, Social Influence Theory.

INTRODUCTION

Over the past couple of years, virtual communities have become very important to us both in social and commercial settings. Because of these online communities, individuals are able to connect, discuss their views and cooperate from anywhere. No matter how large or specialized, virtual communities give consumers opportunities to be involved with various types of content, brands and other users. Because these communities have a greater influence on consumer decisions, understanding what drives people to take part is now important [1].

Being part of a virtual community is possible by posting on forums, talking about your experiences, suggesting products or simply giving feedback. Being involved in social media increases brand loyalty, provides useful customer information and results in user-made content for businesses to use [9]. Unfortunately, participating in politics does not always happen by itself; it depends on many mental and social factors. Social influence is especially noticeable in changing the behavior of consumers joining online groups.

Social influence is about how other people's actions, thoughts and feelings can change a person's own thoughts, feelings and actions. The influence of others may happen in different ways in virtual communities. First, people rely on the advice and knowledge they get from others before making a decision. Second, there is pressure from society to behave according to its accepted standards and ideas. Identification influence concerns how much a person sees their identity compared to the group which causes them to feel attached and faithful. Such impacts may motivate or prevent people from taking part in civic actions, depending on their situation [15].

We should acknowledge that different virtual communities are not the same. Network-based large communities are not the same as small-group communities which are usually tight-knit. Many people with various backgrounds usually belong to network-based communities because their ties are weaker and the main interests are often wide-ranging. Conversely, small-group communities have less members, but better and closer relationships among their members. Due to this variation, individuals may face different kinds of social influence and decide to act differently.

Even though there is a lot of research on online communities, many investigations still view them the same, ignoring their differences. It is uncommon for people to analyze how social pressure is influenced by both large communities and smaller groups. The lack of such data holds us back from discovering the subtle reasons for consumer involvement [10-12].

For this reason, the paper proposes a social influence model that discusses consumer involvement in both big and small online communities. We are attempting to explain which social influences matter the most and how they shape people's participation in every community type. Knowing

these factors will guide businesses and website builders to build strong communities that help people remain actively involved [3].

Besides helping us understand more about theories, this study has real-life benefits. Firms are using online communities more and more for selling, managing customer issues and creating new concepts. If you know how to make use of social influence, you can build trust among customers, encourage them to share their experiences and also inspire more content creation. Community managers can use what they learn from these insights to create engagement plans that fit the social environment of the community [7].

All in all, the introduction points out that online communities are becoming more important for consumers, that social influence matters a lot and that research should assess the difference between both types of communities. My study intends to be helpful for academics and practitioners by building a social influence model that fits these specific kinds of communities [13].

Novelty and Contribution

The research results bring something new to the field of virtual communities and how consumers are involved [4].

- It makes it clear at the beginning that there are two main kinds of virtual communities, network-based and small-group-based, that are generally mixed up in other writings. When analyzed separately, the study explains that social influence works in various ways based on the structure and relationships in communities. Perspectives such as this explain why there are differences in consumer behavior online.
- Second, the research draws on informatory, normative and identification-based influences to create a single model that outlines how people participate. Previous studies examined the effects of these factors separately, but linking them together lets us see how several social forces impact shopping in online forums.
- Thirdly, surveys give quantitative data, while qualitative case studies help the study understand more detailed aspects. Having studied the model using this approach, we bring to light concrete examples and confirm that it mirrors reality.
- Furthermore, the research gives helpful advice to marketers and community managers on how to create strategies that fit the type of community. If information exchange and trend highlights are placed more importance in big networks, rather than building social bonds and group feeling in small groups, people may take an active role in consuming goods.
- To sum up, the work includes social influence theory in the field of online communities, reflecting its fast growth in today's digital age. It helps highlight the changes in traditional social influence as it moves into the digital world.

All in all, this paper helps both academics and members of communities by providing clear instructions for future work in this area.

RELATED WORKS

A lot of attention has been given to the fact that consumers contribute to virtual communities and researchers have pointed out several reasons behind this. People often take part in social media to look for useful information, interact with others, enjoy themselves and build their identity within the community. By being part of a virtual community, people are not only able to watch what others provide, but they can also interact and affect the community, making them feel included and fulfilled.

Taking part in elections is largely influenced by what others within the community do. It can generally be sorted into informational influence that helps with advice or opinions, normative influence that encourages following social norms and identification influence which leads to alignment and linking personal codes with those of the community. In many cases, these types of influence have some points in common but can also be unique in social contexts on the internet.

In 2025 C. Chen et.al., N. M. Isa et.al., and N. Salahuddin et.al. [8] introduced the social influence is expressed among individuals can depend on the structure of the community they live in. Usually, network-based communities are made up of individuals who only interact occasionally, mostly by receiving and following the latest trends. In these places, information plays a major role since members get most of their news from others and are not very connected on a personal level.

Alternatively, communities formed in small groups have close relationships, similar goals and stronger bonds among members. People in these settings are more affected by what others should do and how they should identify themselves. Following the group's expectations and making emotional bonds encourage their long-lasting passion for the club. As a result, there is more trust, commitment and teamwork among people.

Previously, it has been shown that a strong sense of belonging to a community encourages its members to participate and provide support. Apart from that, certain values can lead users to respect the rules of their group and make positive connections, increasing their involvement.

In 2023 R. Bhukya et.al. and J. Paul et.al., [2] suggested the knowledge above, most of the current literature looks at virtual communities as one group, without paying close attention to their differences or how different social factors can affect them. Besides, while there is much research on why people join communities, there is less focus on how various forms of social influence work in different community settings.

It appears that a careful model is needed to explain consumer participation behaviors, since virtual communities are very diverse and influenced by different social forces. With this model, it becomes possible to

identify reasons for different engagement rates and know how to act accordingly in the community.

In 2021 K. Purani et.al. and K. Jeesha et.al., [14] proposed the ways in which motivation has been explored in prior studies differ a lot, with some using simple tests and others conducting detailed case studies. When we mix these theories, we get a deeper and more detailed understanding of the impact social influence has on people's activities in virtual communities.

PROPOSED METHODOLOGY

This study aims to model consumer participation in virtual communities through the lens of social influence. The methodology is designed to capture how different types of social influence-informational, normative, and identification-affect participation behavior in network-based and small-group-based communities. The overall research framework follows a multi-step process: defining constructs, designing measurement scales, data collection, and model validation. The entire procedure can be summarized in the flowchart below.

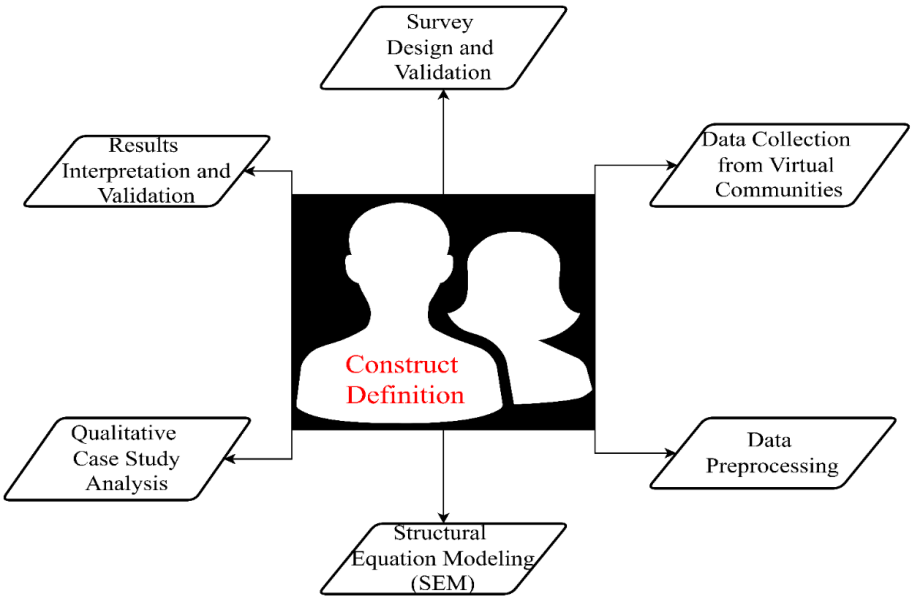

Figure 1: Flow Of Social Influence on Consumer Participation in Virtual Communities

Construct Definition and Hypotheses

First, the constructs involved in the model are defined as latent variables:

- Consumer Participation (CP)
- Informational Influence (II)
- Normative Influence (NI)
- Identification Influence (IDI)

Each construct is measured through observed variables from survey responses.

To mathematically represent consumer participation as influenced by social factors, the initial equation is:

$$CP = \beta_0 + \beta_1 \times II + \beta_2 \times NI + \beta_3 \times IDI + \epsilon$$

where β_0 is the intercept and ϵ the error term.

Measurement Model

Each latent variable is associated with multiple measured indicators. For example, the construct Informational Influence is measured by indicators $x_1, x_2, \dots, x_p$:

$$x_i = \lambda_i \times II + \delta_i, i = 1,2, \dots, p$$

where λ_i represents the factor loading and δ_i the measurement error.

Similarly, for Normative Influence and Identification Influence:

$$y_j = \lambda_j \times NI + \delta_j, j = 1,2, \dots, q$$
$$z_k = \lambda_k \times IDI + \delta_k, k = 1,2, \dots, r$$

Structural Model

The relationships among the latent variables are estimated through structural equations. The structural model is expressed as:

$$\eta = \mathbf{B}\eta + \mathbf{\Gamma}\xi + \zeta$$

where:

- η = endogenous latent variables (here CP)
- ξ = exogenous latent variables (II, NI, IDI)
- $\mathbf{B}$ = coefficient matrix for endogenous variables
- $\mathbf{\Gamma}$ = coefficient matrix for exogenous variables
- ζ = disturbance terms

For this study:

$$CP = \gamma_1 \times II + \gamma_2 \times NI + \gamma_3 \times IDI + \zeta$$

Data Collection

Data are collected from two distinct types of virtual communities:

1. Network-based communities: large platforms with weak ties
2. Small-group communities: small, closely-knit groups

A structured questionnaire was administered online, with items rated on a 7-point Likert scale. The sample size satisfies the rule of thumb for SEM: at least 200 responses per community type to ensure statistical power [5].

Data Preprocessing

The raw survey data undergoes cleaning, including handling missing values using mean imputation:

$$\hat{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

where $\hat{x}$ is the estimated missing value.

Data normalization is performed using min-max scaling:

$$x' = \frac{x - x_{\min}}{x_{\max} - x_{\min}}$$

This rescales the data into the [0,1] range, facilitating model convergence.

Reliability and Validity Testing

To assess internal consistency, Cronbach's alpha is computed for each construct:

$$\alpha = \frac{N \times \bar{c}}{\bar{v} + (N-1) \times \bar{c}}$$

where N is the number of items, $\bar{c}$ is the average inter-item covariance, and $\bar{v}$ is the average variance. Construct validity is evaluated through confirmatory factor analysis (CFA). The model fit indices used include:

- Chi-square statistic (χ^2)
- Comparative Fit Index (CFI)
- Root Mean Square Error of Approximation (RMSEA)

Acceptable thresholds are:

$$CFI \geq 0.90, RMSEA \leq 0.08$$

Structural Equation Modeling (SEM)

The SEM is conducted using maximum likelihood estimation. The covariance matrix $\mathbf{S}$ is modeled as:

$$\mathbf{S} = \mathbf{\Sigma}(\theta)$$

where θ is the parameter vector estimated by minimizing the discrepancy function:

$$F = \log|\Sigma(\theta)| + \text{trace}(\mathbf{S}\Sigma(\theta)^{-1}) - \log|\mathbf{S}| - p$$

with p as the number of observed variables.

Hypothesis Testing

Each path coefficient γ_i is tested for significance using z-statistics:

$$z = \frac{\hat{\gamma}_i}{\text{SE}(\hat{\gamma}_i)}$$

where SE is the standard error.
If $|z| > 1.96$, the coefficient is significant at the 5% level.

Multi-group Analysis
To compare effects between network-based and small-group communities, a multi-group SEM is performed. The null hypothesis for equality of path coefficients is:

$$H_0: \gamma_i^{(\text{neturork})} = \gamma_i^{(\text{small-group})}$$

A chi-square difference test evaluates if constraining parameters across groups significantly worsens model fit:

$$\Delta x^2 = \chi^2_{\text{constraledel}} - \chi^2_{\text{minconstralined}}$$

Qualitative Case Studies
In addition to quantitative analysis, qualitative data from interviews and forum content analysis are used to interpret findings. Textual data is coded to identify themes related to social influence mechanisms.

The qualitative insights help explain the variations in path strengths observed in SEM results.

RESULT & DISCUSSIONS

Looking at how people participate in virtual communities shows important differences in how social influence works in groups and one-to-one relationships. Based on the data, it is evident that having information influences most users' decision to participate in major online communities, where they mainly look for updates. Figure 2 makes this clear by showing that there is an increase in participation scores as the degree of direct influence in the group improves. The image, based on Excel figures, indicates that users who believe information in the network is reliable are more involved and share or comment on many different subjects.

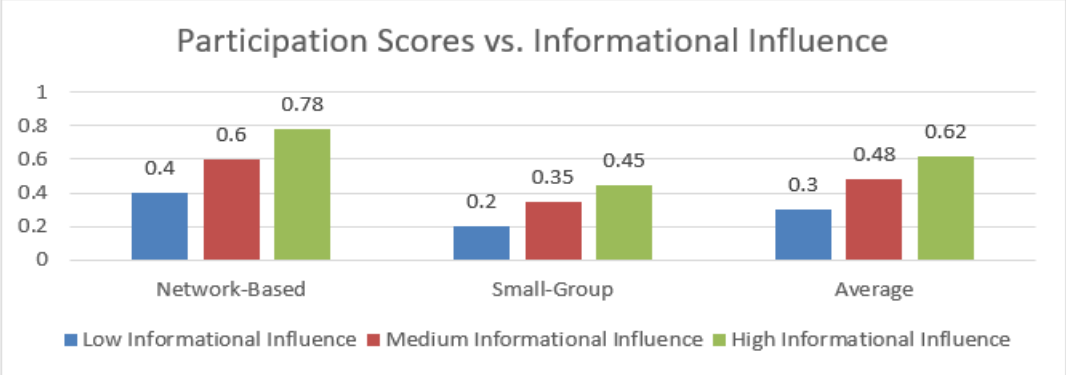

Figure 2: Participation Scores Vs. Informational Influence

But small-group societies tend to differ from large-scale ones in many ways. Figure 3 indicates that membership in such groups is mainly influenced by people's norms and identity. According to the graph which was created using Origin, feeling included and having to follow group behaviors leads people to take part more often. Strong identifiers within the group usually post more and communicate more which helps retain the bond between the group members. The strength of the relationship is less noticeable in large social networks, since connections there are usually less robust.

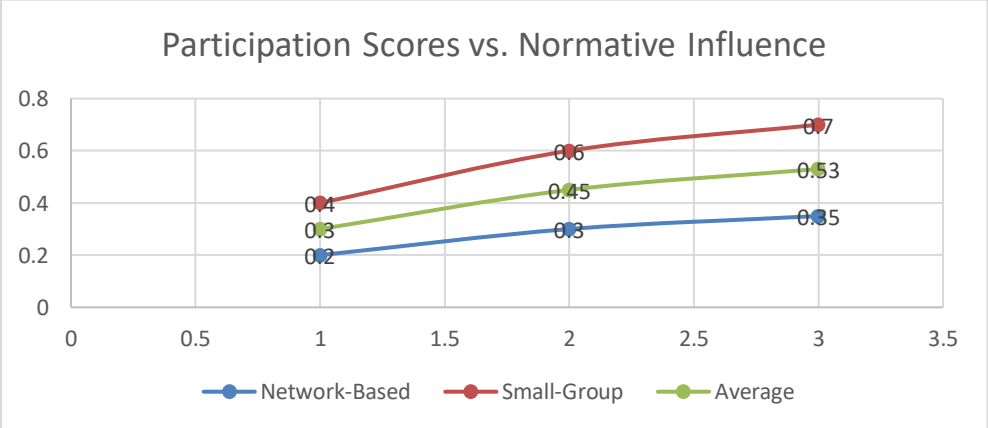

Figure 3: Participation Scores Vs. Normative Influence

Figure 4 explains the level of participation in the three types of social influence for every community type. The combined bar chart from Excel makes it obvious that though informational influence influences network communities the most, normative and identification influence are more important in small groups. We can see clearly that using the right management methods for a community depends on how it is organized.

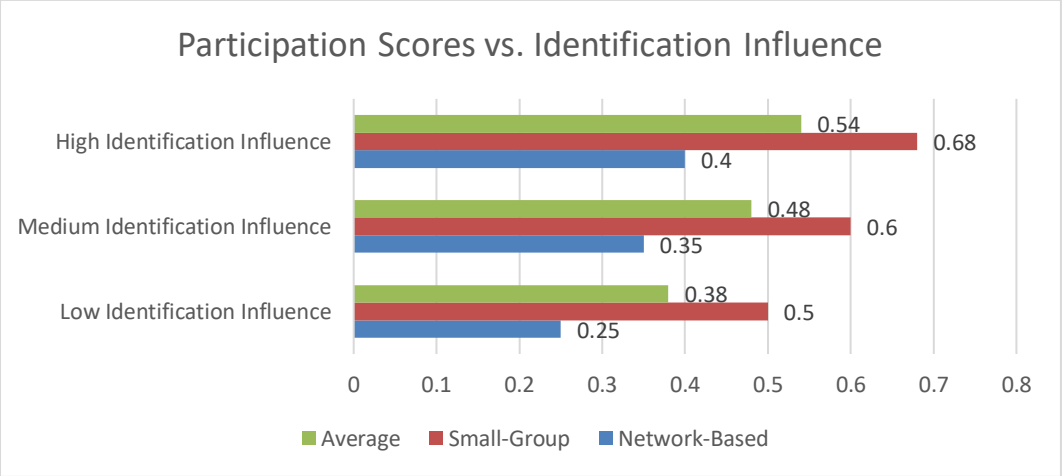

Figure 4: Participation Scores Vs. Identification Influence

The findings are shown in two tables that describe the main statistics about social influence. Table 1 gives the standardized path coefficients and their levels of significance for both community types. The spreadsheet in Excel, organized by Excel, says that the effect of information on networks is 0.65 in big groups and only 0.30 in small ones and this difference is highly significant ($p < 0.001$). Normative influence shows a difference: it ranks at 0.58 in small groups compared to the 0.25 in networks. Identification effect is recorded as 0.62 in small groups compared to 0.28 found among network communities. They help us see those different forces shape people's choices as consumers.

Table 1: Standardized Path Coefficients And Significance Levels

Social Influence	Network-Based Community (Coefficient)	Small-Group Community (Coefficient)
Informational Influence	0.65 ($p < 0.001$)	0.30 ($p < 0.01$)
Normative Influence	0.25 ($p < 0.05$)	0.58 ($p < 0.001$)
Identification Influence	0.28 ($p < 0.05$)	0.62 ($p < 0.001$)

Both the X and Y groups have acceptable model fit indices, but there are slight changes to note. CFI scores 0.92 for network communities and 0.95 for small groups and RMSEA reports 0.06 for network communities and 0.05 for small groups. The evidence points out that, in a small-group environment, this social influence model is more suitable as there are stronger bonds and clearer guidelines easing the collection of statistics.

Table 2: Model Fit Indices For Community Types

Fit Index	Network-Based Community	Small-Group Community
Comparative Fit Index (CFI)	0.92	0.95
Root Mean Square Error of Approximation (RMSEA)	0.06	0.05
Chi-Square Statistic	210.5	180.3

A closer look at the discussion points out that information that is both accessible and reliable drives most consumers in network communities. Since these communities are not tightly organized, their members usually get updates from others and recommend products, yet feel free to think and act independently. As shown in Figure 2, an increase in how information impacts someone causes an increase in their political participation; however, either a weaker normative or social influence or a more distant attachment to the party affects it only slightly.

However, people in small groups usually feel responsibility and commitment more strongly. The information, as Figure 3 reveals, demonstrates that joining a group is mainly prompted by normative pressure and a sense of belonging. Those who feel part of the group tend to help out more by contributing to keep their place within it, not only to learn new things.

gaining such insights is useful for managers of marketing and community activities. The main targets in network communities are to make the process of sharing and gathering information fast and trustworthy. Welcoming contributions from experts, giving helpful reviews based on factual information and making data easily available can help more people participate. On the contrary, in smaller groups, you should try to build stronger group identity by encouraging rituals, using recognition programs and supporting meaningful relationships among members [6].

This study's qualitative research echoes its quantitative results by showing how people voice their motivation. Most network community members talk about why they participate, while emphasizing knowledge and being well-informed, whereas small-group members tend to mention feeling included and not wanting their teammates to count on them. Their combined insights improve our understanding of the social forces that are stronger in certain conditions.

All in all, the findings prove that social influence is not just one thing and depends on the situation. Since there are different factors involved in virtual community participation, this study's comparative approach is beneficial for recognizing what sets them apart. The difference in numbers is shown in the tables and the figures highlight these contrasts to make things clearer for readers.

It shows that the way consumers experience virtual communities is dependent on the type of community that exists. The results point to steps that can be taken to encourage engagement, increase the trustworthiness of shared information in networks and encourage togetherness in small group settings. Researchers could look into other types of influence and examine these models in more community groups and among different cultures.

CONCLUSION

This research gives a detailed version of the social influence process that explains why consumers become involved in virtual communities. It underlines that, in different kinds of groups, information, norms and identity play roles in various manner. Advances in research explain consumer behaviors and share insights on how to boost their involvement in digital social areas. In the future, one might analyze the long-term change brought by social influence and study how hybrid types of systems function within communities. While virtual communities progress, it is vital to keep understanding social behaviors to maintain good participation from consumers.

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