We investigated an antecedent and consequences of network centrality in a virtual brand community from the perspective of the motivation of social enhancement. The research model was proposed and tested using structural equation modeling. The results showed that the motivation of social enhancement can promote both degree and betweenness centrality. As the members’ degree and betweenness centrality increase, the psychological ownership they feel toward the community becomes stronger, thereby increasing the likelihood that the members will engage in virtual brand community citizenship behavior. The theoretical and practical implications of the findings are discussed.

Keywords: citizenship behavior, network centrality, psychological ownership, social enhancement motivation, virtual brand community.
Furthermore, brand communities often play an important role in promoting consumer-brand relationships, and this applies especially to the virtual brand community, which is defined as “a specialized, non-geographically bound, online community, based on social communications and relationships among a brand’s consumers” (de Valck, van Bruggen, & Wierenga, 2009). In virtual brand communities, each member plays a different role that contributes to the development of the community. For example, in Spain Coca-Cola has developed a very successful virtual brand community in which functional, social, and experiential values are provided for its consumers. This community has attracted 50,000 accesses and 2,000 new members daily. The company’s sales have grown by roughly 15% since the year 2000, owing to the contribution of moderators, opinion leaders, and common members (Sicilia & Palazón, 2008).

Although the process by which brand community is transformed to brand loyalty has previously been explored, in these studies the researchers have failed to examine the effect of brand community on the members’ behavior in a social context. According to the theory of embeddedness, the network structure and the location of members affect members’ behavior and attitude (Brass & Burckhardt, 1993; Granovetter, 1985). Thus, the relationship between brand-related behavior and the brand community can be explained from the social network perspective. Network centrality has often been used to describe this characteristic in the virtual brand community and researchers have reported finding that it has a great impact on individual behaviors (Estrada, 2007). Several scholars have devoted more attention to the consequences of network centrality than to the antecedents (Klein, Lim, Saltz, & Mayer, 2004) and few researchers have sought to address both the factors influencing, and the results of, network centrality in virtual brand communities. It is, thus, unclear what factors affect the members’ perception of position or how the position of members within a community network influences their behavior in relation to the community. In order to better understand this, we explored social enhancement motivation, psychological ownership, and virtual brand community citizenship behavior, in relation to an antecedent and consequences of network centrality.

Research Hypotheses

Antecedents of Network Centrality

Freeman (1979) classified centrality into three types, depending on the method of measurement; namely, degree centrality, betweenness centrality, and closeness centrality. Degree centrality is the identification of which member is closest to the network center. Betweenness centrality refers to whether a member is in the middle of two other members and whether the connection of these two members
can only be conducted via that individual. Finally, \textit{closeness centrality} is calculated according to the distance of a member from the other members of the network. A shorter distance corresponds to higher closeness centrality. The main objective in our study was to examine virtual social networks that are related to communicating the features of products and brands. We viewed this from the perspective of the information flow. Therefore, we made the decision to focus on only the first two types of centrality (i.e., degree and betweenness centrality). We did not examine closeness centrality because, for this to be applicable, all members of a community must associate with one another, and this does not occur in an online brand community.

Only a few researchers have explored the antecedents of network centrality (see e.g., Klein et al., 2004). In the existing studies social enhancement motivation has, to date, received very little attention, although the attention is increasing. \textit{Social enhancement motivation} refers to the explanation of how members join a particular community to gain the respect of other members, or to establish their status by gaining recognition from other members, thus achieving social enhancement. This kind of motivation prompts members to share information and help others, which, in turn, could influence the attitude and behavior of other members toward them.

Members who are motivated by the desire for social enhancement are more willing to share their experiences and information, as well as being more willing to solve others’ problems (Yen, Hsu, & Huang, 2011). In a virtual brand community, those members with social enhancement motivation aspire to prove their capability, as well as to gain recognition and respect from others by posting messages and providing help for others. This results in other members within the community paying attention to such behavior and becoming more willing to seek help from these people, who are most likely to be the most sought-after “consultants” in that group. In addition, researchers (e.g., Hars & Ou, 2001) have reported that social enhancement motivation serves as a fundamental motivation that strengthens others’ perception and opinion as well as facilitates the transformation of an individual’s own status through social interaction with others. Members with this motive tend to actively answer others’ questions and contribute information to the community (Hars & Ou, 2001). These factors are the conditions necessary to become an opinion leader. By communicating with others, a member can be recognized by others in the community and earn their acceptance (Füller, Bartl, Ernst, & Mühlbacher, 2006). In a virtual brand community, this status is directly matched to a member’s contribution to the community, and his/her behavior; thus, it affects his/her degree centrality or betweenness centrality. Therefore, we proposed the following two hypotheses.

\textbf{Hypothesis 1}: Social enhancement motivation will have a positive influence on the member’s degree centrality in an online brand community.
Hypothesis 2: Social enhancement motivation will have a positive influence on the member’s betweenness centrality in an online brand community.

Consequences of Network Centrality

Psychological ownership refers to a state of mind in which an individual perceives that he or she has entire or partial ownership of an object (Pierce, Kostova, & Dirks, 2003). Psychological ownership is affected not only by property or other legal ownership, but also by right of control of, and knowledge about, the objective. Even individuals who do not have legal ownership as their target may acquire a certain right of control through their degree of familiarity with an object. Individuals can gradually gain a perception of psychological ownership through controlling the ownership target, coming to know the target intimately, and investing the self into the target (Pierce et al., 2003).

In a brand community network, degree centrality and betweenness centrality comprise a network of relationships with others. To a certain extent, the degree of each type of centrality reflects the depth of the relationship among the members in a community. A member’s centrality corresponds to the degree of his/her importance within the network. Similarly, the closer a relationship is with other members the higher the degree of trust and attachment a member has toward the other members and the community. This also leads to a greater probability that a member with a high degree of trust and attachment and a close relationship with other members will regard him/herself as part of the community (Lee, Lee, Taylor, & Lee, 2011). Compared with marginal members, central members have a greater sense of belonging, self-efficacy, and self-identification because of the sense of honor and achievement they gain from their status. These affirmations often affect their consciousness of psychological ownership within the virtual brand community. Accordingly, we developed two hypotheses.

Hypothesis 3: Degree centrality will have a positive influence on the member’s perception of psychological ownership in an online brand community.

Hypothesis 4: Betweenness centrality will have a positive influence on the member’s perception of psychological ownership in an online brand community.

In previous studies of psychological ownership researchers have reported finding that the possession mentality of individuals has three basic consequences, namely, positive attitude toward the target, strengthened self-concept, and responsibility. When individuals realize that their needs (e.g., self-efficacy, self-identity, and sense of space) are met through psychological ownership, their sense of responsibility increases, along with their willingness to take risks, spend more time and energy to protect the organization, and make sacrifices for it (Pierce et al., 2003). Psychological ownership can also lead to employee extrarole behaviors, such as helping colleagues, voluntarily performing specific tasks, and guiding new employees in their work (Van Dyne & Pierce, 2004).
Although the focus of research on psychological ownership related to citizenship behavior has been on organizational behavior, the findings can equally well be applied to consumer behavior. As a virtual organization, an online brand community also has the objective of promoting a sense of ownership among its members (Baer & Brown, 2012). Similar to the organizational context, a perception of psychological ownership of the community also motivates the members’ citizenship behavior. From the perspective of the beneficiary, virtual brand community betweenness centrality involves two aspects, namely, citizenship behavior benefiting brand community, and citizenship behavior benefiting brand community members. This is because the aim of these behaviors is to protect the brand community and help community members. According to social exchange theory, when community members believe that their needs are met through community psychological ownership, they are more likely to construct the community efficiently (i.e., to perform citizenship behavior benefiting brand community) and help other community members (citizenship behavior benefiting brand community members). Pierce et al. (2003) pointed out that psychological ownership is positively associated with citizenship behavior, that is, behaviors that contribute to the community’s well-being. Taking this reasoning into consideration, we proposed two hypotheses.

**Hypothesis 5:** Psychological ownership will have a positive influence on citizenship behavior that will benefit the online brand community.

**Hypothesis 6:** Psychological ownership will have a positive influence on citizenship behavior that will benefit the members of an online brand community.

**Method**

**Measures**

Our model for this study contained five constructs, namely, network centrality, social enhancement motivation, psychological ownership, citizenship behavior benefiting the brand community, and citizenship behavior benefiting the members of the brand community. The last four of these constructs produced attributive data and all the scale items we used were taken from the literature. The social enhancement scale consisted of two items adopted from Dholakia, Bagozzi, and Pearson (2004). The psychological ownership scale consisted of five items adopted from Van Dyne and Pierce (2004) and Baer and Brown (2012). The citizenship behavior benefiting brand community and citizenship behavior benefiting members of brand community scales consisted of five items each taken from Bove, Pervan, Beatty, and Shiu (2009). All items were measured on a 7-point Likert scale, with response options ranging from 1 = strongly disagree to 7 = strongly agree. For this study, we selected gender, age, educational background, occupation, and participation frequency as the five demographic characteristics to control network centrality.
Network centrality is a concept used to describe the structure of a social network. Given that the measurement of network centrality involves relational data, it is not transferrable to common scales. Thus, we used only instruments designed for measurement of the social network. In previous studies, researchers have suggested that the network centrality of an individual can be measured using the number of nodes related to that individual (Lee et al., 2011). Following the measurement method used by Lee et al., we performed the following two steps. First, we instructed the respondents to nominate five people they had contacted recently, according to a standard set of requirements. Second, we asked the respondents to specify their relationship with these five people. The specific question was “Who would you often ask for help when you encounter product problems in a brand community?” The measurement data consisted of the subjective answers of the respondents. The matrix formed by 0–1 data delivered the results.

Data Collection

We used the online sampling service of a professional website with lottery rewards to ensure the quality of the survey and efficient time control. We collected 1,121 survey forms within 10 days. After system selection and artificial screening, 412 valid forms were retained, 62.1% from male respondents and 37.9% from females. Of the respondents, 72.8% were aged between 20 and 32 years, indicating the dominant presence of young people in online brand communities.

We classified the data collected as relational (concerning network centrality) and attributive data. Firstly, we analyzed the relational data concerning network centrality with the social network analysis software UCINET6.0. Next, we obtained the degree centrality and betweenness centrality, encoding these data into the structural equation model. We then conducted quantitative analysis using the statistical software SPSS version 17.0 and SmartPLS version 20.0.

Results

We analyzed the reliability of social enhancement motivation, psychological ownership, citizenship behavior benefiting brand community, and citizenship behavior benefiting community members. The values of Cronbach’s $\alpha$ and composite reliability were above 0.79, meeting the criteria of strong reliability. Confirmatory factor analysis was used to test the convergent validity. All factor loadings of the items were above 0.5, which indicated high internal consistency of the constructs. The fit indices of the measurement model for comparative fit index (CFI), nonnormed fit index (NNFI), incremental fit index (IFI), and root mean square error of approximation (RMSEA), also indicated high convergent
Figure 1. Structural equation model.

Note. * $p < .05$ (two-tailed test); ** $p < .01$ (two-tailed test); *** $p < .001$ (two-tailed test).
validity ($\chi^2/df = 2.686, p < .01$, RMSEA = 0.064, CFI = 0.97, NNFI = 0.96, IFI = 0.97). All values of the average variance extracted (AVE) were above 0.50; and were significantly higher than the corresponding squared correlations among all latent constructs. These results suggested reliability and validity were acceptable for further tests. When we tested for common method bias, all the correlation coefficients among the constructs were between -0.009 and 0.686 (< 0.9), which suggests that common method bias was nonsignificant and the measuring instrument was appropriate for use in this study.

The $R^2$ values of degree centrality, betweenness centrality, psychological ownership, citizenship behavior benefiting brand community, and citizenship behavior benefiting members of brand community were 0.063, 0.047, 0.048, 0.49, and 0.72, respectively. All path coefficients exceeded the threshold value of 0.02, indicating a good level of model fit. The results of the structural equation model are shown in Figure 1. These results suggest that all hypotheses were supported. Furthermore, when considering control variables, only betweenness centrality was significantly influenced by participation frequency (coefficient = 0.129, $t = 2.019 > 1.96$). Gender, age, educational background, and occupation did not significantly affect either degree centrality or betweenness centrality.

Discussion

Based on social network, motivation, and embeddedness theories, we explored an antecedent and consequences of network centrality in a virtual brand community from a social network perspective. Similar to the findings of Kim, Sohn, and Choi, (2011), we found that social enhancement motivation was an important antecedent that positively affected the degree centrality and betweenness centrality of members of a virtual brand community. More specifically, a member with stronger social enhancement motivation than others had was likely to be positioned at the center of the social network. We found that two important consequences of network centrality, namely psychological ownership and citizenship behavior in a virtual brand community, were positively affected by network centrality. That is, the degree centrality and betweenness centrality of members were both significantly related to their psychological ownership within the community. The higher the degree centrality and betweenness centrality of a member, the stronger was his or her psychological ownership within the community, so that members became more likely to regard themselves as a part of the community. This finding is consistent with that reported by Lee et al. (2011), who found that the betweenness centrality of virtual brand community members positively influenced their attachment to the community. Moreover, we also found that stronger psychological ownership within the brand community corresponded to a greater likelihood of engaging in
citizenship behavior in the community that would benefit both the community and the members. This finding enriches the existing research within this field and expands previous study findings in which researchers demonstrated that psychological ownership can also lead to people performing extrarole behaviors (Van Dyne & Pierce, 2004). This means that a member who feels a strong sense of psychological ownership is likely to participate more actively than others do in the community, to visit the community more frequently than others do, and to help other members solve problems.

Our findings provide valuable guidance for designing marketing strategies. First, enterprises should be aware of the effect of social enhancement motivation on community members’ behavior. Marketers should encourage their consumers to participate actively in the community by motivating them to seek social enhancement. Second, marketers should pay attention to those members with high degree centrality and betweenness centrality in the virtual brand community, because these are the members who are most likely to contribute to the community according to the conclusion that network centrality positively affects citizenship behavior, benefiting brand community and other members. Furthermore, our findings in this study can help enterprises in establishing and strengthening brand loyalty and brand communities. Finally, we examined psychological ownership as the degree of effort the community members are willing to exert for the sake of the community. Hence, enterprises should take various measures to enable and encourage members to perceive their importance as individuals within the community, by motivating them to gravitate towards the center of a community, to gain additional information about the brand, and develop relationships with other members. Such measures can eventually enhance the members’ psychological ownership within the online brand community, and produce certain citizenship behaviors that will benefit the community.

To sum up, we developed a theoretical model to explain an antecedent and consequences of network centrality, and discussed the interrelationships among the six dimensions of this model. Our findings in this study supplement existing literature on consumer behavior and social networks in virtual brand communities, and have some implications for companies operating in this field.

Limitations and Directions for Future Research

This study has several limitations. First, the complexity of the model prompted us to introduce only one antecedent of network centrality, without investigating the other dimensions of motivation. Second, we used only degree centrality and betweenness centrality as indicators for network centrality, having excluded closeness centrality because the members of a virtual brand community are not fully connected to each other. Third, although we investigated the relationships among social enhancement motivation, network centrality, psychological
ownership, and citizenship behavior in a virtual brand community, we did not explore the mediating and moderating effects among these constructs. In addition, we considered only the structural embeddedness of social networks and did not consider relational embeddedness (e.g., relationship intensity and complexity). Last, online brand communities comprise not only a field of information convergence, but also serve as a platform for affective communication. Therefore, affective network centrality is also a topic worthy of further investigation.

References


