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電子化口碑效應：虛擬社群意識感的干擾角色

The Effects of Electronic Word of Mouth: The Moderating Role of the Sense of Virtual Community

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摘　　要

電子化口碑溝通在影響潛在消費者態度與其行為上扮演決定性的角色。網路空間提供一個平台，讓消費者發表和取得與產品/服務評論和消費經驗有關的資訊。迄今，有許多網路社群以討論產品/服務的消費為焦點，因此消費者能透過這些社群與其他參與者進行互動，進而瞭解產品/服務的評價。根據文獻，消費者會憑據自己與網路社群的關係，而非以與社群參與者的關係來評估網路資訊，因此網路社群本身便扮演評估資訊品質之參考者的功能。然而，沒有實證研究驗證社群會員對其虛擬社群所認知的關係品質（即虛擬社群意識）是否會干擾電子化口碑對產品判斷與消費決策的影響。本研究目的在實證虛擬社群意識是否會對線上產品評論對態度或購買意願的影響，產生干擾效果。本研究操弄正面口碑與負面口碑兩種情境問卷，並同時發行網路問卷與紙本問卷，正面口碑與負面口碑分別蒐集了 417 與 433 筆有效樣本。為了驗證潛在構面之間的干擾效果，本研究採用 Ping（1996）的「交互作用的結構方程模式（Interactive structural equation model, ISEM）」來檢驗本研究之假設。分析結果指出：(1)「電子化口碑認知影響力」在正面及負面口碑情境下，分別對「消費者的產品態度」產生顯著正面及負面的影響。(2)「虛擬社群意識」在正面與負面口碑情境下，皆對「消費者的產品態度」產生正面且顯著的影響。(3)「消費者的產品態度」在正面與負面口碑情境下，皆對「產品的購買意願」具

有正面且顯著的影響。(4)「虛擬社群意識」在正面與負面口碑情境下，皆會強化「電子化口碑認知影響力」對「消費者的產品態度」之影響（干擾效果）。(5)「電子化口碑認知影響力」、「虛擬社群意識」與其兩者之交互作用效果，會間接透過「消費者對產品的態度」為中介變數，對「產品的購買意願」產生影響。基於本研究，行銷人員在網路上進行口碑行銷策略時，應考量虛擬社群的社會與文化的角色與力量。除了對理論與實務之意涵進行探討，同時也提出本研究之限制與未來研究建議。

關鍵字：電子化口碑；虛擬社群意識感；遊戲線上社群；交互作用的結構方程模式

The Effects of Electronic Word of Mouth: The Moderating Role of the Sense of Virtual Community

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ABSTRACT

Electronic word-of-mouth communication (eWOM) plays a decisive role on influencing potential consumer attitude and behavior toward a product/service. Cyberspace provides the platform for consumers issuing and acquiring information about products/services evaluations and consumption experiences. To date, many online communities focus on discussing consumption of products/services. Consumers can interact with other participants through these communities. Since consumers frequently assess online information based on their relationship with communities rather than with individuals, online communities themselves function as referents for evaluating information quality. However, no empirical study has examined whether the relationship quality perceived by members toward their virtual communities (sense of virtual community, SOVC) moderates the effect of eWOM on product judgment and consumption decisions. This study aims to examine whether sense of virtual community moderate the perceived influence of online product evaluations on product attitude and purchase intention. Two scenarios about positive eWOM and negative eWOM for a fictitious game product were respectively manipulated, and online and written questionnaires were used to collect sample. The valid sample sizes were 417 for positive

eWOM scenario and 433 for negative eWOM scenario. To examine the moderating effect of two constructs in structural equation model (SEM), the Interactive structural equation model, (ISEM) of Ping (1996) was adopted to test research hypotheses. The analytical results indicate: (1) Perceived influence of eWOM (PIEW) positively and negatively affects consumer attitude toward a product (ATT) in the positive and negative eWOM scenario. (2) SOVC positively influences ATT in both scenarios. (3) ATT positively influences purchase intention (PINT) in both scenarios. (4) SOVC reinforced the influences of PIEW on ATT in both scenarios. (5) ATT mediates the direct effects of PIEW and SOVC, and the interactive effect between PIEW and SOVC on PINT. Concluding to this study, marketers should consider the social and culture role and power of virtual communities when implementing WOM strategy online. Several theoretical and managerial implications as wel research limitation and future suggestions are also discussed.

Key Words: Electronic word of mouth (eWOM); Sense of virtual community (SOVC); Online game community; Interactive structural equation model

ACKNOWLEDGEMENT

自碩士班畢業後選擇交通大學管理科學系繼續攻讀博士學位，追求自我成長的腳步不曾停歇，這一走，就是七年。這七年來，要感謝的人好多好多，沒有這些人的引領與支持，我難以堅定步伐地完成博士學位。你們，如同是航行於茫茫學術大海上那個指引我航向的羅盤與明燈，在此由衷致上最深切的謝意。

回憶這段艱辛的歲月，最感激的人莫過於恩師黃仁宏教授。這些年您不僅在論文上給予學生細心指導，平時也不忘關心學生的生活與近況。對於您的付出與關懷，學生銘記於心。此外承蒙台灣師範大學國際事務與全球戰略研究所所長周世玉教授，開南大學企業與創新管理學系林君信教授，交通大學經營管理所楊千教授，以及交通大學管理科學系王耀德教授對本論文的指正與建議，使其內容得以臻至嚴謹完備。

就讀博士班這段時間，前後待過新竹、台中及台北三個城市，回想這過程的點點滴滴，無不受到許多人的照顧。初到新竹的這段期間，感受到黃董、素琴姐、志成大哥、永瑞大哥、錫麟大哥、培林大哥、玉芬姊、佳誼、淑芳、千芬、若蓮、煒朋、炳麟、志強等同窗們的關懷與勉勵；後來棲身於台中時，承蒙淑婷學姊、育如學姊、容榕學姊的提攜與照顧，讓我得以全心地完成論文研究；最終在台北這個城市落腳後，宜棻學姊與巧真學妹也不時地給予鼓勵與打氣，真的很謝謝你們為我所做的一切！

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蕭登泰　　謹誌於

國立交通大學管理科學系

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CHAPTER 1 INTRODUCTION

The Internet has expanded the scope of human interactions into the online area. Many activities engaged in real world (*e.g.,* communication and trade) can be performed in the cyberspace. People are not only limited to converse, interact, and transact with other people live nearby. Through accessing the Internet world, people can find partners that have common interests or goals, associated with them, exchange information and emotion, and gradually, form virtual communities in the online world. According to report of Computer Industry Almanac (Jan. 4 2006), the worldwide Internet users have exceeded one billion in 2005, and expected to reach two billion in 2011. People spend considerable time participating in the activities of virtual communities, complying with their norms, and then obtaining a sense of belonging. People thus establish a sense of virtual community, *i.e.*, a psychological perception regarding the relationship between community member and the online community (Blanchard & Markus, 2004).[1]

Numerous virtual communities have developed around marketing interests or consumption-related information, and are termed "virtual communities of consumption" (Kozinets, 1999). Kozinets (1999) advocated carefully investigating virtual consumption communities as a potential avenue for implementing marketing efforts and business strategies,

[1] McMillan and Chavis (1986) proposed the model of "sense of community (SOC) to explain the evolvement and health of a community and realize what element will be used to constitute a physical community. Blanchard and Markus (2004) further extended the concept of SOC into virtual communities, and named "sense of virtual community (SOVC)." Based on the work of Blanchard and Markus (2004), Blanchard (2007) developed sense of virtual community measure which expanded from McMillan and Chavis' (1986) sense of community index. Several new items are generated to consider the unique components of sense of community in virtual communities.

because information (*e.g.*, product comments, criticisms, or user experiences) published via these online communities is closely related to product and service success. However, more researches still need to be conducted to understand virtual communities of consumption. Specifically, whether information received from a virtual community that people perceived higher sense of community has more influences on consumption decisions.

Internet plays a more influential role in disseminating word of mouth whatever positive or negative messages. Since information on online communities, called electronic word of mouth (eWOM), is easily accessible via the Internet, consumers frequently seek relevant product information on these virtual consumption communities rather than from inexperienced family members or friends. Because eWOMs frequently originate from market mavens or experienced users, they are considered trustworthy (Gelb & Johnson, 1995; Murray, 1991; Richins, 1983), and strongly influence attitude formation and purchase decisions (Bansal & Voyer, 2000; Brown, Broderick, & Lee, 2007).

Prior studies indicated that source credibility, similarity, and tie strength between seeker and source crucially influence information persuasiveness (Bansal & Voyer, 2000; Gilly, Graham, Wolfinbarger, & Yale, 1998). However, existing theories regarding word of mouth (WOM) may not properly explain the influence of eWOM on product evaluation owing to the anonymity and volatility of online identity. People in online communities interact with a "humanized" website, rather than with individuals, and assess information based on the website as a whole rather than based on individuals (Brown *et al.*, 2007). Thus, the social relationships and interactions among members of an online group are closely related to the influence of eWOM on consumer decisions. Clarifying the influence of the social power of online communities on the effects of eWOM thus is critical for understanding eWOM.

According to the accessibility-diagnosticity model (Feldman & Lynch, 1988; Herr, Kards, & Kim, 1991), when consumers perceive their interactions with online communities as high-quality, they consider information from those online communities to be more useful diagnostically than that derived from other online communities they perceive as low-quality. However, no empirical study has examined whether the sense of virtual community moderates the effect of eWOM on product judgment and consumption decisions. This study examines the interaction between consumer feelings regarding online communities and the perceived influence of received information on product judgment (attitude) and choice (purchase intention).

As described in Chapter 2, this study first discussed relevant literature and developed several research hypotheses, and then presented methodology of this study in Chapter 3. The testing results regarding research hypotheses were shown in Chapter 4, and then theoretical and managerial implication as well as limitation and suggestions for future research were discussed in the final chapter.

CHAPTER 2 LITERATURE REVIEW

2.1 Community Psychology

2.1.1 Definition of Community

The definition and development of communities are one of critical issues from the perspectives of sociology, anthropology, psychology, and sociological psychology (Gusfield, 1975; Hillery, 1955; Jones, 1997; McMillan & Chavis, 1986). Traditionally, a community usually represents a sociological group of individuals in a physical place that share common intent, belief, resources, preferences, need, risk, and others with each other. The individuals in a community mutually interact, influence, and shape identity and group cohesion to participate community activities. The typical exemplification of the physical communities are neighborhood, family, and even clubs or collections with common of interest and goals.

The definition of community varied with academic scholars, Hillery (1955) had reviewed 94 different definitions from academic researches, and found that three common elements for defining a community: (1) A community forms in a geographic boundary, (2) social interaction exists among people, and (3) common ties and interests share with each other. Stacey (1974) identified three major elements in defining community from sociological study: territory, social system, and sense of belonging. The territory is meant as a boundary within a community. Based on above, the notion of physical place is the focus of community studies that sociologists have adopted.

2.1.2 Sense of Community

In past community studies, psychological sense of community (SOC) is an integral and overarching psychological concept to conceptualize the spirit and meaning of community.

Psychological sense of community were first introduced by Sarason (1974), and she believed that psychological sense of community would be accomplished by "the perception of similarity with others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, the feeling that one is part of a larger dependable and stable structure" (p. 157).

Subsequent McMillan and Chavis (1986) reviewed several related researches about sense of community (Doolittle & MacDonald, 1978; Glynn, 1981; Riger & Lavrakas, 1981; Riger, LeBailly, & Gordon, 1981; Ahlbrant & Cunningham, 1979; Bachrach & Zautra, 1985) and developed the original theory regarding psychological sense of community, which has broadly adopted and discussed by subsequent researches in both placed-based communities (Chipuer & Pretty, 1999; Hill, 1996; Hughey, Speer, & Peterson, 1999; Long & Perlins, 2003; Obst, Smith, & Zinkiewicz, 2002; Obst & White, 2004; Perkins, Florin, Rich, Wandersman, and Chavis, 1990) and communities of interest (Burroughs & Eby, 1998; McMillan, 1996; Obst, Zinkiewicz, & Smith, 2002a, 2002b; Obst & White, 2004). McMillan and Chavis (1986) defined that "sense of community is a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p. 9). As aforementioned definition, the proposed conceptual framework of SOC has four major elements: (1) membership, (2) influence, (3) integration and fulfillment (reinforcement) of needs, and (4) shared emotional connection.

Membership, the first element of the sense of virtual community, is feelings of belonging to collective, and identifying and being identified in that community. McMillan and Chavis (1986) recognized five interrelated attributes related to membership: (1) boundaries, (2) emotional safety, (3) a sense of belonging and identification, (4) personal

investment, and (5) a common symbol system. Boundaries refer to an intangible and tangible space to distinguish people who are and who are not part of a group. People use boundaries to preserve personal space through common symbol system such as language, dress, or ritual, and to develop intimacy and feeling of emotional safety with others. Emotional safety is analogous to the concept of security, which is a sense that people are willing to disclose true feelings. Sense of belonging and identification concerns with the faith and anticipation that one pertains to the group and the degree that one is accepted by the group and devote him/her to the group. The implication of personal investment resembles to cognitive dissonance theory (McMillan and Chavis, 1986). With time investment on participating in a group, meaningful membership will be perceived. Finally, the last attribute of developing sense of membership is common symbol system. It is considered as a significant root in sustaining and molding group boundaries.

Influence, a sense of mattering, is a bidirectional concept. It is the feelings that members influence what the group becomes and how members are moderated and motivated intangibly by the community. According to its notion, the first force is that a group endows its members with rights or powers to control over the group. This force pulls members joining the group. The second force implies that group would hold influence power (e.g., group cohesions and norms) over its members. These two forces will occur simultaneously and interdependently. In addition, McMillan and Chavis (1986) further pointed out the force toward conformity is a consensually validation that members' behaviors are inclined to cohere and unite, and hence, group norms will be constructed.

The third element of the sense of virtual community is integration and fulfillment of needs (*i.e.*, reinforcement of needs), which is a feeling of the extent that members meet their needs from what they are rewarded since participating in a group. Motivation for seeking

reinforcement or needs fulfillment will bring a sense of togetherness if one's needs are properly satisfied in a group. Such rewards contain the status of being a member, the accomplishment of group as well as the perceived competence of others members. Although it is impossible to identify all the reinforcements (rewards), community can arrange and prioritize which need will be provided and first fulfilled through the directed force of shared values. When a community fit members well together, members' needs can be met.

The last element of the sense of community is shared emotional connection. It is the feelings of having similar beliefs, history, or experience that members in that group are willing to devote themselves to building sympathetically intimate relationships. Shared emotional connection serves as an affective ingredient concerning sense of community. Based on a shared history that community members can identify with, the community will provide members a location to contact with others, conduct qualified interactions, share critical events, and settle the problematic events. The more emotional involvement invests in a community, the more sense of honor (less humiliation) is perceived from that community, and members will thus be conscious of stronger sense of community. In some degree, the spiritual bond which is experienced among members also plays as a kind of spiritual symbol to promote the sense of community.

In addition to define the elements of the sense of community, McMillan and Chavis (1986) also discussed how attributes for each element interact mutually and how each element interrelates to incubate the sense of community. According to their perspectives, sense of community is not a static psychological situation, and its development will evolve and decay with time elapsed. Figure 2-1 showed the dynamics occurs within the elements. Five attributes of membership interact and enhanced with a circular model. For influence, more openness to influence for a member will lead to more power to influence the community, vice

versa. Also, the community power to influence members (norms) is determined by members needs for validation and community need for conformity. With respect to reinforcement, if a community is conducive to reinforce of members needs easily, members will develop the sense of community toward that community. Finally, two formulas explained the dynamics within shared emotional connection. First, the level of shared emotional connection bases on contact frequency and interaction quality. Second, the level of high-quality interaction is conditioned with the level of event closeness, the valence of shared events, and the glory to a community.

Further, McMillan (1996) expanded and renamed the definition of four elements for the sense of community: Spirit, Trust, Trade, and Art. First, membership is relabeled as spirit. The major task of a community is to make members feel emotionally safe to tell "the truth" through boundaries, which is a statement of personal own experience, and build the sense of belonging. Paying member dues serves as personal investment (cognitive dissonance) which provides people sense of entitlement to become a member. Second, the development of trust is a significant component for creating sense of influence. With the evolvement of norms order, authority based on principle, and justice for allocating power, people in community can build trustiness through exchanges of power. Third, the achievement of integrating and fulfilling members needs relied on creating a useful and trustworthy economy of trade with a driving force of similarity among members. A self-disclosed and fair economy implied that people intent to share similar values, and then process social exchanges with others who have different resources to approve their own needs. Fourth, the new implication of shared emotional connection is art. The essential of art is the member experience of contracting with others. Only dramatic collective experience that transmits the sense of "all for one and one for all" will become a collective art. McMillan (1996) mentioned the four principles about sense of community interrelated with "a self-reinforcing circle." Spirit stimulates trust,

and then trust supports trade in a community. These three powers create a shared story that is symbolized as art. Finally, art is valuable to maintain the spirit of belonging.

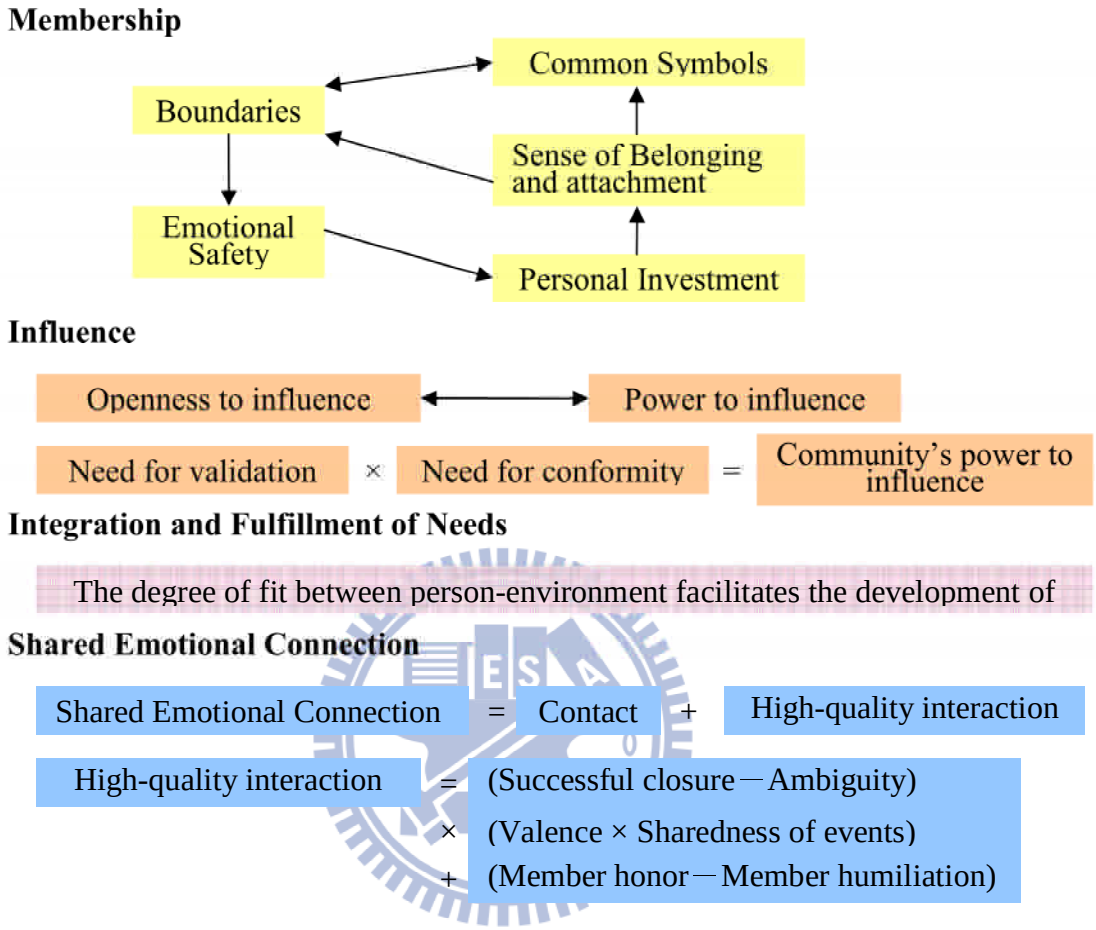

Figure 2-1 Elements and Dynamic Relationships of the Sense of Community

Source: Blanchard & Markus (2004, p. 68).

2.1.3 The Scale of Psychological Sense of Community

Since the concept of psychological sense of community proposed by Sarason (1974), several studies on developing scale of sense of community had been conducted (Davidson & Cotter, 1986; Doolittle & MacDonald, 1978; Glynn, 1981; Chavis, Hogge, McMillan, & Wandersman, 1986; Riger & Lavrakas, 1981; Riger *et al.*, 1981). Doolittle and MacDonald (1978) implemented factor analysis to construct "Sense of Community Scale." They identified

six factors related with community structure: (1) supportive climate, (2) family life cycle, (3) safety, (4) information interaction, (5) neighborly interaction, and (6) localism. Riger and Lavrakas (1981) recognized two distinct but correlated factors about attachment in community with factor analysis: social bonding and physical rootedness. Their works conceptualized the emotional feature included in the sense of community.

Glynn (1981), based on the study of Hillery (1995) study, identified 202 behaviors related to sense of community and developed respectively 60 items to gauge real and ideal psychological sense of community. In his work, these items were extracted into six dimensions by factor analysis: (1) objective evaluation of community structure, (2) supportive relationships in the community, (3) similarity and relationship patterns of community residents, (4) individual involvement in the community, (5) qualify of community environment, and (6) community security.

Chavis *et al.* (1986) empirically verified the theory of sense of community proposed by McMillan and Chavis (1986), and developed 23 items of Sense of Community Index (SCI) from 21 judges' perception about overall sense of community. With high degree of consensus among judges, SCI explained for 96% of the variance of mean judges' perception to sense of community. However, only 27% of the variance of self-reported rating of sense of community was predicted by SCI profile. Since original edition of SCI was limited to open-ended items, Chavis and his colleagues correct these items into short edition of 12 True/False-format items. Each of four elements in the sense of community (membership, influence, integration and fulfillment of needs, shared emotional connection) consisted of three items with obverse and reverse questions (see Chipuer & Pretty, 1999, p. 646). This short edition of SCI first published in the work of Perkins *et al.* (1990), however, it has not been verified whether these items are valid to measure each element of sense of community in

their study (only overall internal reliability coefficient was reported and alpha coefficient was 0.80).

Since SCI had been developed, it was adopted in different context. However, as the arguments of Hill (1996), indicated that sense of community diversified dependent on research settings. Chipuer and Pretty (1999) adopted 12 true/false-format SCI to review the factor structure and reliability of sense of community in the situations of neighborhood and workplace for adults and adolescents, respectively. Their findings sustained the four-element model of McMillan and Chavis (1986) but the agreement of item-to-factor is not obtained across different settings. They suggested that further research on modifying or adding scale of SCI should follow theory-driven method. Long and Perkins (2003) administrated a confirmatory factor analysis (CFA) to verify the established theoretical constructs for the sense of community. They considered that confirmatory factor analysis should be applied for confirming theoretical formulation of the sense of community instead of exploratory factor analysis. In addition, since several studies had critiqued that sense of community should be a one-dimensional construct (Bruckner, 1988; Davidson & Cotter, 1986), the authors suggested that adopting the descriptive methods to certify the model proposed by McMillan and Chavis (1986) model is useful to understand the gap between theory and empirical work. As a result, three-factor brief SCI (social connections, mutual concerns, and community values) are recommended with CFA technique.

Obst and White (2004) proceeded a CFA to examine the factor structure of SCI in three distinct communities (*i.e.*, neighborhood, student, and community of interest). Obst and White (2004) advocated that SCI is a cogent scale of measuring psychological sense of community under various contexts, and it is established and evolved based upon a comprehensive and confirmed theory. Rather than forgoing the established theory, it is

appropriate to modify SCI based on identical meanings proposed by McMillan and Chavis (1986). Ten of twelve items reserved in the study of Obst and White (2004), and only four items loaded on original factor. However, the four-dimensional structure remained unchanged. Obst and White (2004) also suggested that further scale development should be carried out to improve measurement of psychological sense of community.

With the controversies surrounding SCI, Peterson, Speer, and Hughey (2006) recently pointed out a methodological explanation about the disputation of SCI. They found that using negatively worded items in SCI have a restrained effect on internal consistent and stability of factor structure for the sense of community, because it may increase the complexity of scale and misdirect respondents to recognize another construct akin to central construct. Therefore, Obst and White (2004) suggested adding positively worded items for SCI grounded on accepted theoretical framework and avoiding using negatively worded items. Recent studies indicated that measure on the sense of community should continually advance as a more robust and generalized scale (Chavis & Pretty, 1999).

2.2 Virtual Community

2.2.1 Emergence of Virtual Communities

With the emergence and development of information technology, the public can easily access to the Internet. People create a virtual identity to process social interaction with others in the cyberspace (Baym, 1995; Rheingold, 1993a, 1993b; Rosie, 2004) and form a community without geographic requirements (Lee, Vogel, & Limayem, 2003; Ridings, 2006). Early researches disputed that nonverbal social cues of human communication, such as verbal nuances (e.g., gaze, tone, body language), physical context (e.g., meeting locations), and observable information about social characteristics (e.g., age, gender, race), are hardly

discovered under the media of computer-mediated communication (CMC). This phenomenon may inhibit the transferring of real and explicit meanings and causes low quality of communication that is opposite to face-to-face interaction (Korenman & Wyatt, 1996; Mackinnon, 1995). However, through using parallel methods (e.g., netiquette and emoticon), the distortion of meanings occurs in virtual communication can be compensated, and norms, standards, and traditions to appropriately behave in virtual environment can also be built. In this situation, a community can emerge and develop in a virtual environment with common interests and goals instead of geographical boundaries.

Gusfield (1975) discerned two types of community, *i.e.*, geographic community and relational community. Geographic community is one kind of the communities that associated with physical location such as neighborhood, town, and city. Relational community is one kind of the communities that is formed with quality of human relationships but not physical location, such as clubs, religious groups, or work groups, and it is usually shaped based on common of interests, hobbies, or activities. Virtual communities are one kind of communities that is usually established based on a common of interest without regarding the necessity of physical association. Despite the lack of nonverbal cues, the exchanges of social resources among individuals (*e.g.*, emotional support, sense of belonging) are obviously observed in online community (Brown *et al.*, 2007) as well as occurred in physical community. According to the definition of Gusfield (1975), virtual communities were grouped into one sort of relational community.

Similar to the definition of community, the definition of virtual community remains debatable and varied. Stone (1991) defined "virtual communities passage points for collections of common beliefs and practices that united people who were physical separated (p.85)." Rheingold (1993b) defined virtual community as "…social aggregation that emerge

from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace (p. 5)." Hagel and Armstrong (1997) defined "virtual communities are computer-mediated spaces where there is a potential for an integration of content and communication with an emphasis on member-generated content." Ridings, Gefen, and Arinze (2002) defined virtual communities as "groups of people with common interests and practices that communicate regularly and for some duration in an organized way over the Internet through a common location or mechanism (p.273)."

Lee *et al.* (2003) reviewed the definitions of virtual community proposed by past researchers, and proposed a working definition that included four common elements for building a virtual community: "A cyberspace supported by computer-based information technology, centered upon communication and interaction of participants to generate member-driven contents, resulting in a relationship being built up" (p. 51). Four identified elements are (1) cyberspace, (2) computer-based information technologies, (3) communication and interaction are the main focus and content of virtual community are driven by the participants, and (4) relationship. Compared to the definition of Hillery (1955), the place-based condition seems to not apply. However, Ridings *et al.* (2002) suggested that the virtual community do have a common "location" for members to meet and communicate. The location is not physical but it is an important medium to bring long-term interaction among participates who are geographically dispersed.

Ridings *et al.* (2002) identified four basic mechanisms for virtual community members to interact in a mutual location. The four mechanisms included: (1) Listservs (like e-mail distribution lists), (2) bulletin boards or Usenet newsgroups, (3) chat room, conferencing systems, or Internet relay chat (IRC), and (4) multi-user domains (MUDs). As Table 2-1

showed, listservs and bulletin board belong to asynchronous communications, which members read written messages and response in any time after reading. Chat rooms and MUDs are synchronous communications, which messages receive and reply almost at the same time like a face-to-face conversation. Besides, the communications of listservs and bulletin board are passive since members do not necessary to stay in the community when interacting with others. However, chat rooms and MUDs are active communication models, which members need to log in a community to when interacting with others. Finally, listservs, chat rooms, and MUDs need to register the community as members, however, bulletin board (Usenet) are readable publicly without registration.

However, not all of the virtual "settlements" are considered as virtual communities. Jones (1997) cautioned that virtual settlements are ubiquitous as long as computer-mediated interactions surpass the threshold level of some kind of measures (e.g., website flow). However, when sentimental or emotional bonds that members share in virtual settlements do not exist, a virtual community would not be formed. Also, several researchers questioned whether or not virtual communities are pseudo-communities as Beniger (1987) described, a community where impersonal associations constitute artificial personalized communication contrary to genuine, face-to-face communication (Jones, 1995; Rheingold, 1993a). Although such cautions were advised, computer-mediated communications indeed provide people a "socially produced space" to efficiently perform social contacts and further build social relationship as does in a community (Harasim, 1993; Jones, 1995). Similar to the contentions of Jones (1997) and sociological psychologists in the community studies (Cameron, 2004; Kasarda & Janowitz, 1974; Riger & Lavrakas, 1981; Fried, 1982), attachment is the imperative constituent for forming a healthy community.

Table 2-1 Four Basic Interactive Mechanisms between Virtual Communities

Mechanisms	Asynchronous/ Synchronous	Passive/Active	Need/not need to register as members
Listservs	Asynchronous	Passive	Yes
Bulletin board (Usenet)	Asynchronous	Passive	No
Chat rooms	Synchronous	Active	Yes
Multi-user domains (MUDs)	Synchronous	Active	Yes

Source: Modified from Ridings (2006, p. 117)

Based on relevant literatures, several distinct characteristics are discovered between virtual community and off-line community. First, besides place-based community (e.g., neighborhood), communities also included those have similar interests or goals (e.g., golf club and work group) (Burroughs & Eby, 1998; Hughey *et al.*, 1999; McMillan & Chavis, 1986). Virtual communities resemble to the latter, however, there is no definite goals and organizational structure in the virtual communities. Compared to off-line communities, the components of virtual community members are usually mixed in demographic variables (such as age, gender, and social status) but harmonized in interests, activities, and attitudes (Ridings, 2006; Roberts, Smith, & Pollock, 2002). Second, some nonverbal social cues (*e.g.*, tone, posture, and dress) are inhibited because the communications in virtual communities are written. Members read the messages in bulletin board may produce numerous meanings (Chidambaram & Jones, 1993; Mackinnon, 1995). Third, since it is not necessary for people meeting in face when they communicate with another, virtual community members are able to be anonymous. Based on this trait, people have larger freedom and smaller obstruction to

join into or leave from a virtual community (Roberts *et al.*, 2002; Wellman & Gulia, 1999). Moreover, anonymity helps members feel emotional safety and easy to pour themselves to others (Baym, 1995). However, anonymity may cause several problems. For example, abuse of trust and deceiving behavior easily appeared in a virtual setting. Even though some potential problems exist, however, the rapid growth of online community is still apparently observed nowadays.

2.2.2 Sense of Virtual Community

With the emergence of Internet and the popularity of virtual community, people spent more and more time on contacting with online groups. Since sense of community is extensively discussed in the physical surroundings, it is interested that whether analogous psychological perception (i.e., sense of virtual community) also exists in a virtual circumstance. Although few researches focused on exploring sense of virtual community, the four elements of McMillan and Chavis (1986) model (membership, influence, integration of needs, and shared emotional connection) also identified from many empirical studies (Baym, 1997; McLaughin, Osborne, & Smith, 1995; Kollock, & Smith, 1994; Phillips, 1996; Pliskin & Romm, 1997; Preece, 1999; Rheingold, 1993b). Furthermore, several researches uncovered that some degree of sense of community indeed exist in a virtual environment (Blanchard & Markus, 2004; Koh & Kim, 2004; Roberts *et al.*, 2002, Roberts, Smith, & Pollock, 2006).

Roberts *et al.* (2002) recognized and examined the elements of the sense of community under MOO settings against McMillan and Chavis (1986) model. Blanchard and Markus (2004) recommended the SOC model of McMillan and Chavis (1986) is one of important theoretic basis to develop the origins of sense of virtual community. In their study, six dimensions about sense of virtual community, included (1) recognition of members, (2)

support exchange, (3) emotional attachment, (4) sense of obligation, (5) personal relationships with members, and (6) identification of self and others, were explored from multiple sports newsgroups (MSN). Most dimensions in MSN were analogous to the dimensions of sense of community proposed by McMillan and Chavis (1986). Specifically, member recognition associated to membership; support exchange related to integration of needs, and emotional attachment and sense of obligation equated to the concept of shared emotional connection.

According to their observations of Blanchard and Markus (2004), influence was not experienced in MSN. Besides, the generation of self identity and identification of other members, and personal relationships with other members were two new features contrast to McMillan and Chavis (1986) model. However, Roberts *et al*. (2006) supposed identity creating and identification may place within membership, and relationship with members may put into shared emotional connection. In addition, Blanchard and Markus (2004) also proposed the processing framework to explain how sense of virtual community was developed. Three processes (exchanging support, creating and making identification, and producing trust) will work together to establish sense of virtual community, and each one is influenced by another process. As Figure 2-2 showed, frequent exchange of support among members will encourage participant to create self identify in distinguishing themselves and identify other identifies, and then common faith resulted from sense of being identified and identification will support individual produce trust toward virtual communities.

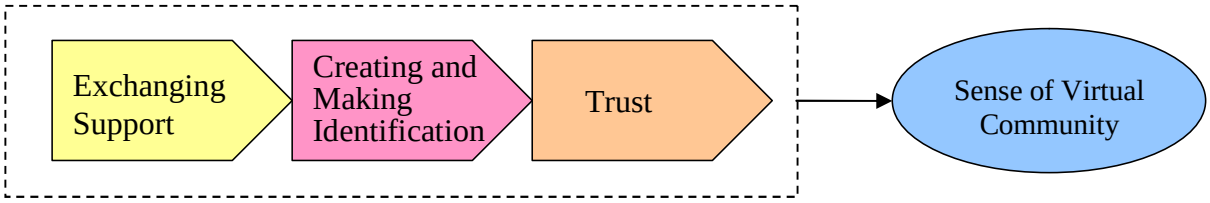

Figure 2-2. The Processing Framework of SOVC

Source: Modified from Blanchard and Markus (2004, p. 76).

Reviewing past studies, the theory and model of McMillan and Chavis (1986) was acceptably adopted into exploring sense of virtual community. Blanchard and Markus (2004) defined sense of virtual communities as a feeling of belonging and attachment toward a virtual community but it is not always happened in all virtual social groups. It directs members' social processes (*e.g.*, as exchanging support, creating norms, sustaining boundaries, and producing trust). While Blanchard and Markus (2004) and other researchers provided explicitly and extensively discussions about sense of virtual community, developing the measure of the sense of virtual community became an important research issue in understanding the evolution and influence of virtual community with members.

However, few studies have emphasized on developing the measure of sense of virtual community (Blanchard, 2007; Koh & Kim, 2004). Koh and Kim (2004) proposed a conceptual model of the sense of virtual communities, and empirically validated several antecedents that influenced members' sense of virtual community. Membership and influence, which were adopted from the theoretical model of McMillan and Chavis (1986), were introduced in their dimensions of the sense of virtual community. They also distinguished the concept of actual fulfillment of needs in their model from expected fulfillment of needs in McMillan and Chavis (1986) of the sense of community model, and considered it as one of antecedents of SOVC (e.g., enjoyability or usefulness). Furthermore, they regarded that shared emotional connection highly correlated with the concept of membership, and thus combined it with membership. In addition, one new construct, *immersion*, which was defined as "people feel the state of flow during virtual community navigation (p.77)," was included in measuring sense of virtual community. In a sample of 172 members of 44 virtual communities, three antecedents, community leaders' enthusiasm, available off-line activities, and enjoyability, had significantly effects on sense of virtual community.

Obst *et al.* (2002a, 2002b) reviewed the contemporary researches in the aspects of human ecology, sociology, and community psychology. They adopted the multidisciplinary scales to realize sense of community in an international community of common interest. In addition to the four elements of sense of community in McMillan and Chavis (1986) model, they also recognized the role of social identification theory on psychological sense of community. They also suggested it is necessary to thoroughly research virtually cyber-communities of similar interest. However, most SOC studies in virtual community to date still used the debatable SCI presented by Perkins *et al.* (1990) (Chipuer & Pretty, 1999; Obst & White, 2004). Therefore, Blanchard (2007) further devised the scale for sense of virtual community based on the work of McMillan and Chavis (1986) and their observations for online multiple sports newsgroups.

2.2.3 Virtual Communities of Consumption

Virtual communities are new arena for businesses to implement effective marketing communications (Hagel & Armstrong, 1997; Kozinets, 1999). Hagel and Armstrong (1997) regarded that people participated and interacted in a virtual community based on meeting their basic needs such as sharing common interest, forming intimate interpersonal relationships, or trading the information. Among different sorts of virtual communities, of interested is virtual communities of consumption where provides transaction of information. Kozinets (1999) mentioned e-tribes/virtual communities are substantial important to marketing and business strategies because many affiliations based upon consumption activities. Information and interactions generated from virtual communities will play an assistant role for social and consumption behavior. Walther (1992, 1995) and Kozinets (1999) thought that the learning of consumption knowledge is relevant to social relations with virtual communities of consumption. Continuously identifying as members in a virtual community

relies on the relationships with consumption activities and the social relationships with other members (Kozinets, 1999). Thus, in order to effectively communicate with online participants, companies must consider the cultural or social influence of virtual communities.

Kozinets (1999) further indicated three discrepancies between virtual communities marketing and traditional marketing in aspect of relationship marketing. First, online consumers may actively create consumption information rather than passively receive information and deeply involved in articulating their consumption experiences. Second, the marketer-derived information or word of mouth in online community has a significant influence on consumption activities. Virtual communities provide many-to-one or many-to-many communicative channel, and thus the influence of information will explosively and extensively increase. Third, the marketing information derived from online consumers does not merely constraint on benefiting product sales. It is potential to affect in multidimensional factor, such as loyalty and retention.

In summary, virtual communities of consumption provides an opportunity to conduct efficient and widespread marketing communications. It is helpful to perform marketing communications through realizing the social relationship of online participants.

2.3 Word-of-mouth Communication

2.3.1 Word of Mouth

Word-of-mouth communication (hereafter WOM) in marketing and consumer behavior has multifaceted influences on diffusion of technological innovation (Czepiel, 1974; Engel, Kegerreis, & Blackwell, 1969), development of new product (Arndt, 1967; Brooks, 1957; Dodson & Muller, 1978), formation of consumer attitudes and behaviors (Brown & Reingen, 1987), and choices and judgments of products (Herr *et al.*, 1991). WOM is broadly recognized as an important source of information on which consumers rely (Gilly *et al.*, 1998), and has more effective in persuading than mass media has (*e.g.*, advertising) (Gelb & Johnson, 1995) because consumers believe WOM will be more trustworthy (Murray, 1991).

Several factors explained how WOM works differently. Brown and Reingen (1987) categorized the source of WOM recommendation based upon tie strength, which is the closeness of the relationship between decision maker and recommendation source. They concluded weak tie functions as bridging two or more strong tie groups, and hence, is more facilitate to the flow of information. Strong tie, however, is important to the flow of information because of source credibility. Furthermore, prior knowledge level, perceived decision task difficulty level, and types of evaluative cues, will influence the choice of recommendation sources, that is, weak tie or strong tie (Duhan, Johnson, Wilcox, & Harrell, 1997). Money, Gilly, and Graham (1998) considered the culture factors in examining how different cultures influence the WOM referral behavior. Harrison-Walker (2001) discovered affective commitment positively related to WOM activity and praise, whereas high sacrifice commitment do not related to WOM communication. In addition, they concluded the impact of service quality on WOM communication depended on industry categories. Different customer groups also had different WOM behavior (Wangenheim & Bayon, 2004a).

To explore the influence of WOM on decision making, several researches employed the concept of perceived influence from a referral on decision (Wangenheim & Bayon, 2004a; Bansal & Voyer, 2000; Gilly *et al.*, 1998). From the perspective of information search, Gilly *et al.* (1998) developed a scale to measure perceived influence of sources on information seekers. Bansal and Voyer (2000) examined the relationships among noninterpersonal forces (e.g., receivers expertise, receivers perceived risk, senders expertise), interpersonal forces (e.g., ties strength, how actively WOM is sought), and perceived influence of WOM within a case of service purchase decision. Wangenheim and Bayon (2004b) suggested that perceived influence of WOM is a valid proxy variable of the true effect of a WOM referral. They concluded perceived similarity and expertise of a communicator had positive effects on perceived influence of WOM on decision of services switching, and the relationships were moderated by types of perceived risk.

In addition to positive WOM, some studies focused on researching negative WOM (Davidow, 2003; Halstead, 2002; Lau & Ng, 2001; Richins, 1983; Nyer & Gopinath, 2005; Wangenheim & Bayon, 2004a). Contrasted to positive WOM, negative WOM were recognized having larger impact on making evaluation (Lutz, 1975). Based on noticeable influence of negative WOM, Richins (1983) conducted a pilot study to explore the nature of negative WOM and identified several important variables to differentiate complaining behavior WOM, including the severity of dissatisfaction, the perceptions of blame for dissatisfaction, and the perceptions of retailer responsiveness. His study provided the fundamental framework on researching negative WOM. Halstead (2002) also discussed the role of negative WOM with customer complaints, and concluded negative WOM is a supplementary to complain behavior rather than a substitution of complaining. Lau and Ng (2001) examined the influence of individual factors included personality, attitudinal and involvement, and situational factor on negative WOM behavior.

2.3.2 Electronic Word of Mouth

Explosive development in information technology, the advent of Internet provides the opportunity for consumers to gather unbiased product from opinions of other consumers, and meanwhile, offers their own consumption-related advices by engaging in electronic word-of-mouth (Hennig-Thurau & Walsh, 2003). One of the most important capabilities for Internet opposite to traditional mass communication technologies is its bidirectionality. Through the characteristic of bidirectionality, online feedback mechanisms (e.g., electronic markets) can build extensive WOM networks (Dellarocas, 2003). This trait creates an abundant potential profit for marketing product in online environment.

Traditionally, WOM were defined as "all informal communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services or their sellers (Westbrook, 1987, p.261)." Extending the definition to online context, eWOM were defined as "any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004, p.39)." Dellarocas (2003) identified three differences to distinguish online feedback mechanisms from traditional WOM networks in realistic society. First, Internet brings an unparalleled scale to enlarge the effectiveness of WOM networks on influencing future profit. Second, the introduction of information technology allows website designer precisely measuring and controlling the powerful social force of WOM, but it is difficult to do in traditional WOM. Third, because of the volatile and anonymous nature of online identities, almost all contextual cues that facilitate to interpret the subjective information of communication are complete absent in online interaction.

Since WOM communication are believed to relate with the success of product, understanding the nature and impacts of electronic word-of-mouth (hereafter eWOM) is critical to marketing research. Godes and Mayzlin (2004) recommended using online conversations to research eWOM communication. However, they identified three significant challenges in measuring eWOM. First, it is difficult to directly observe the information that exchanged in private conversations. Second, because abundant conversations are presented in online environment, what aspect of these conversations should be measured is not clear. Finally, not only WOM is a driver of affecting future behavior, but also itself is an outcome of past behavior.

Although WOM plays an important role in determining market success and customer behavior, to date, only few researches centered on studying consumers eWOM communication (Hennig-Thurau *et al.*, 2004; Hennig-Thurau, & Walsh, 2003). Hennig-Thurau and Walsh (2003) focused on consumer opinion platforms and explored the motives why customers want to read online articulations (i.e., evaluations or descriptions about products/services and consumption experiences). In addition, these motives were further empirically verified having noticeable influences on buying and communication behavior. Furthermore, Hennig-Thurau *et al.* (2004) reviewed the studies about the motives for tradition WOM communication and recognized the motive for consumers posting their own evaluations on the Internet.

Brown *et al.* (2007) reviewed relevant studies about WOM and argued that existing theory may be unsuitable in explaining online WOM (i.e., eWOM) and its influence on evaluation and purchase. Three significant conceptual variables (tie strength, homophily, and source credibility), which are extensively discussed in offline WOM, are reinterpreted. For offline WOM, tie strength were defined as the degree of closeness within a social

relationship. In online environment, however, tie strength were defined as "the intensity of an interactive and personalized relationship between individual and a web site (Brown *et al.*, 2007, p. 10)". Brown *et al.* (2007) suggested that website functioned as proxies of individuals. People in online communities interacted with the humanized website rather than with individuals, and they considered information source comes from website but not from an individual. Thus, the dimensions about online WOM should be different to those of offline WOM. The mutuality and perceived closeness with online website is more meaningful than with individual. In this study, the concept regarding sense of virtual community was applied to measure the interactive quality between online members and online communities, and to verify the advocacy proposed by Brown *et al.* (2007).

2.4 Hypotheses Development

This study examined the effects of eWOM on attitude and purchase intention in the situation of initial purchase when one lacks relevant product information and product use experience. The study also examined whether the centripetal degree toward the online community where people acquire relevant product information will moderate the relationships of eWOM on product evaluation. In order to conscientiously verify the hypotheses, positive eWOM and negative eWOM were both considered. The development of hypotheses are discussed as below.

2.4.1 The Effect of Perceived Influence of eWOM on Attitude

The Internet enables consumers to gather unbiased product information from other consumers while also offering their own consumption-related advice via eWOM (Hennig-Thurau & Wals, 2003). Product comments and user experiences are easily communicated electronically by online community members. These messages are retained

and classified in bulletin boards or discussion forums according to common interests or activities, such that online community members can obtain product information to assist them in decision-making while simultaneously establishing relationships with other like-minded members to share own experiences.

Consumers recognize WOM as a key source of information (Gilly *et al.*, 1998), and moreover consider it more persuasive than mass media (*e.g.*, advertising) because they see it as more trustworthy than other information types (Gelb & Johnson, 1995; Murray, 1991; Richins, 1983). To examine the influence of WOM on decision-making, several studies employed the concept of "perceived influence of a referral on a decision" as a proxy variable for the true effect of specific WOM referrals (Bansal & Voyer, 2000; Gilly *et al.*, 1998; Wangenheim & Bayon, 2004b). From the perspective of information searching, information value is assessed after information-seekers conduct a series of information exchanges, and perceived influence of WOM is considered a valid proxy variable for the true effect of a WOM referral (Wangenheim & Bayon, 2004b). This study used "perceived influence of eWOM" as a surrogate of eWOM itself to examine its influence on the relationship between information and product attitude.

WOM communications are important in attitude formation and transformation (Brown & Reingen, 1987; Money *et al.*, 1998). Attribution theory holds that source credibility determines message persuasiveness (Buda, 2003; Kelley, 1967). Since WOM communications are more reliable and trustworthy than information from formal marketing channels (Gelb & Johnson, 1995; Richins, 1983), WOM strongly influences, and even converts attitude, particularly in the case of negative WOM (Halstead, 2002; Herr *et al.*, 1991; Mizerski, 1982; Richins, 1983). Product comments exchanged in online communities are also considered an influential "match point" in purchase decisions, because such comments

represent evaluations of consumption experiences, and are assigned greater credibility than the monotone and biased reviews of market experts or marketers with little or limited experience of using the product (Huang & Chen, 2006; Bickart & Schindler, 2001). Thus, WOM communications, whether verbal (Bansal & Voyer, 2000; Wangenheim & Bayon, 2004b) or electronic (Hennig-Thurau & Walsh, 2003; Hennig-Thurau, *et al.*, 2004), critically influence adoption and purchase decisions (Richins, 1983).

In side of verbally WOM diffusion, Bansal and Voyer (2000) researched the processes of word of mouth within a services purchase decision context. They explored the antecedents of the influence of word of mouth that information receiver perceived and implied the perceived influence of word of mouth positively related with receiver's purchase decision. Davidow (2003) examined the mediated role of word of mouth in complaint handling processes. Positive relationship was discovered between perceived fairness and purchase intention. Wangenheim and Bayon (2004b) demonstrated that perceived influence of a referral have positive relationship with services switching behavior.

In respect of electronically word-of-mouth dissemination, Hennig-Thurau and Walsh (2003) put the focus on consumer comments toward products/services in customer opinion platforms and detected motives and sequent behaviors for reading customer online articulations. Like verbal word of mouth, several motives for reading online comments have positive effects on changing buying behavior. However, not all of evaluations are admirable. A large part of evaluations are critical and arguable, that is, negative word of mouth. Many scholars supported negative word of mouth have more influence than does positive word of mouth (Halstead, 2002; Lutz, 1975; Richins, 1983).

Frequently, consumers may lack sufficient product information even after consulting with offline friends. They may access online communities to search for relevant information

to reduce uncertainty and avoid incongruities between expected and actual product performance (Bone, 1995). Thus, eWOM communications are expected to strongly influence attitude and purchase intention when consumers confront unfamiliar products (Solomon, 2004). Based on the literature, this study hypothesizes the following:

H1a: In a positive eWOM scenario, perceived influence of eWOM positively influences online member attitude towards a reviewed product.

H1b: In a negative eWOM scenario, perceived influence of eWOM negatively influences online member attitude towards a reviewed product.

2.4.2 The Effect of Sense of Virtual Community on Attitude

Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and the model of goal directed behavior (MGB) all consider subjective norms as antecedent why and how people behavior (Ajzen, 1991; Perugini & Bagozzi, 2001). Subjective norms implies the perceived social pressure for people to behave or not to behave. The concept of subjective norms is analogous to the sense of influence presented by McMillan and Chavis (1986). They suggested that members of a community feel the pressure for conformity to direct their behavior. However, some authors questioned whether subjective norms fully capture group effects of communities (Bagozzi & Dholakia, 2002).

Bagozzi and Dholakia (2002) discussed the model of compliance, internalization, and identification in the aspect of virtual community and proposed a modified MGB introducing three kinds of social variables (i.e., subjective norms, group norms, and social identity) to explain “we-Intentions” of virtual community members. These social variables are also similar to the four elements of SOC model, that is, the major constructs which SOVC factor model. Specifically, the role of group norms is similar to reinforcement of needs that relied

on shared values or goals perceived by members. In addition, self-categorization and affective commitment in social identity theory are analogous to the concept of membership and shared emotional connection in SOC model.

In the situation of initial purchase, people may search relevant product/service information in their online community when they cannot obtain the critical information from their family or friends in real life. In this case, this online community may play a important role on influencing purchase behavior of members. Based on above, it is expected that sense of virtual community implies the complete social function of a virtual community than does subjective norms, and thus, replace subjective norms into sense of virtual community. This study hypothesizes the following:

H2a: In a positive eWOM scenario, sense of virtual community positively influences online member attitude towards a reviewed product.

H2b: In a negative eWOM scenario, sense of virtual community positively influences online member attitude towards a reviewed product.

2.4.3 The Effect of Attitude on Purchase Intention

Attitude is strongly and positively related to purchase intention (Kim & Hunter, 1993). Kim and Hunter (1993) conducted meta-analysis to confirm the linkage of attitude-intention-behavior. According to TRA (Fishbein & Ajzen, 1975), and its revision, TPB (Ajzen, 1991), Attitude significantly influences behavioral intention, and intention mediates the relationship between attitude and actual behavior. Since this study investigated an artificial scenario and product, it could not observe actual purchase behavior. It used purchase intention as a proxy of actual purchase. Based on previous studies, this study hypothesizes the following:

H3a: In a positive eWOM scenario, online member attitude towards a reviewed product positively affects purchase intention.

H3b: In a negative eWOM scenario, online member attitude towards a reviewed product positively affects purchase intention.

2.4.4 The Moderating Effect of Sense of Virtual Community

Source-attractiveness model (Kelman, 1961), theory of social comparison (Festinger, 1954), and Match-up hypothesis (Kamins, 1990) are related to explain why perceived similarity of information sender increase the influence of the transmitted information. Several researchers confirmed that the influence of WOM on the receiver is strengthened when similar informants provide relevant information (Brown & Reingen, 1987; Price, Feick, & Higie, 1989; Gilly *et al.*, 1998). Brown and Reingen (1987), and Bansal and Voyer (2000) believed that the greater tie strength between sender and receiver, the greater the influence of WOM on the receivers purchase decision. Specifically, source similarity (Wangenheim & Bayon, 2004b) and expertise (Bansal & Voyer, 2000; Wangenheim & Bayon, 2004b) positively affected the influence of a WOM switching referral. In the studies of community, McMillan and Chavis (1986) advocated that the more similar the members in a community implied the higher sense of community will be perceived. Moreover, higher competence in functioning within the community or group means higher credibility for members assessing the information value comes from their subordinate community, and thus, higher sense of community will be resulted.

Information from online communities is generally considered as weak-tie strength referral (*i.e.,* the informants and receivers are dissimilar and unfamiliar) but it exerts a powerful influence because such online referrals can be rapidly and extensively

communicated (Brown & Reingen, 1987; Granovetter, 1973). Virtual communities offer enormous potential for business to implement effective marketing communications (Hagel & Armstrong, 1997; Kozinets, 1999). Kozinets (1999) pointed out that consumer-oriented virtual communities are important to marketing and business strategies because many community affiliations are centered on consumption activities. He advocated that members who continuously identify with virtual communities rely on the relationships of those communities to consumption activities, and the social relationships among members. Online communities comprise a social object that executes social functions with members just as if they were in offline communities (Brown *et al.*, 2007). Thus, to communicate effectively with potential consumers online, companies must consider the cultural and social influences of virtual communities.

With the emergence of the Internet and the popularity of virtual communities, people are spending more of their time interacting with online groups. Consequently, people are developing a sense of belonging and cohesion towards online communities, establishing behavioral norms, identifying with and coming to trust the problem-solving abilities of the community, and developing emotional attachments with other community members. When people participate in a virtual community, they become conscious of that community. This sense of a virtual community is a feeling of belonging and attachment towards a virtual community which does not always happened in all virtual social groups (Blanchard & Markus, 2004). Several studies have identified this type of consciousness in virtual environments (Blanchard & Markus, 2004; Koh & Kim, 2004; Roberts *et al.*, 2002; 2006).

According to the accessibility-diagnosticity model, message diagnosticity increases the likelihood of a piece of information being adopted in decision-making. When a message regarding a judgment or choice is perceived as diagnostic, consumers will assign a larger

weight to this message when forming their attitude, intentions, and behavior (Feldman & Lynch, 1988; Herr *et al.*, 1991). Several studies have confirmed that the influence of WOM on the receiver increases when informants similar to the receiver provide relevant information (Bansal & Voyer, 2000; Brown & Reingen, 1987; Gilly *et al.*, 1998; Price *et al.*, 1989). However, for a eWOM process the effects of traditional communicator attributes (*e.g.*, expertise, similarity, and tie strength) on perceived influence of WOM in an online context are unclear, since consumers have little knowledge of the degree of similarity between informants and themselves.

Accordingly, people may depend upon the degree of interaction and feeling towards the online community as a whole in determining eWOM credibility owing to interacting with a humanized website rather than with an individual (Brown *et al.* 2007). Therefore, when consumers perceive good quality relationships and interactions with their online community, they judge information from the online community as credible. That is, member sense of online community increases message diagnosticity, and thus intensifies the influence of eWOM on attitude. This study hypothesizes the following:

H4a: In a positive eWOM scenario, the relationship between the influence of eWOM and product attitude is stronger when sense of virtual community is higher.

H4b: In a negative eWOM scenario, the relationship between the influence of eWOM and product attitude is stronger when sense of virtual community is higher.

According to above hypotheses development, I compile all research hypotheses and expected direction, and shows in Table 2-2.

Table 2-2 Research Hypotheses and Expected Direction

	Hypotheses	Expected direction
H1a	In a positive eWOM scenario, perceived influence of eWOM positively influences online member attitude towards a reviewed product.	+
H1b	In a negative eWOM scenario, perceived influence of eWOM negatively influences online member attitude towards a reviewed product.	−
H2a	In a positive eWOM scenario, sense of virtual community positively influences online member attitude towards a reviewed product.	+
H2b	In a negative eWOM scenario, sense of virtual community positively influences online member attitude towards a reviewed product.	+
H3a	In a positive eWOM scenario, online member attitude towards a reviewed product positively affects purchase intention.	+
H3b	In a negative eWOM scenario, online member attitude towards a reviewed product positively affects purchase intention.	+
H4a	In a positive eWOM scenario, the relationship between the influence of eWOM and product attitude is stronger when sense of virtual community is higher.	+
H4b	In a negative eWOM scenario, the relationship between the influence of eWOM and product attitude is stronger when sense of virtual community is higher.	−

CHAPTER 3 METHODOLOGY

3.1 Conceptual framework

The research framework is shown as Figure 3-1. In Figure 3-1, sense of virtual community (SOVC) and perceived influence of eWOM (PIEW) were exogenous constructs. These two constructs were hypothesized to directly and indirectly influence two endogenous constructs, which were attitude (ATT) and purchase intention (PINT), and SOVC were hypothesized to moderate the effect of PIEW on ATT. In this research, two scenarios, positive eWOM and negative eWOM were manipulated and separately examined the relationship among constructs. According to the research hypotheses, PIEW were assumed having positive effect on ATT in the positive eWOM scenario (H1a) and negative effect on ATT in the negative eWOM scenario (H1b). For SOVC, this construct was hypothesized to positively influence ATT in the positive eWOM scenario (H2a) and in the negative eWOM scenario (H2b). Else, ATT were proposed positively affects PINT in the positive eWOM scenario (H3a) and in the negative eWOM scenario (H3b). Finally, the moderating effect of SOVC on the path from PIEW to ATT was inferred to have positive effect on ATT in the positive eWOM scenario (H4a) and negative effect in the negative eWOM scenario (H4b).

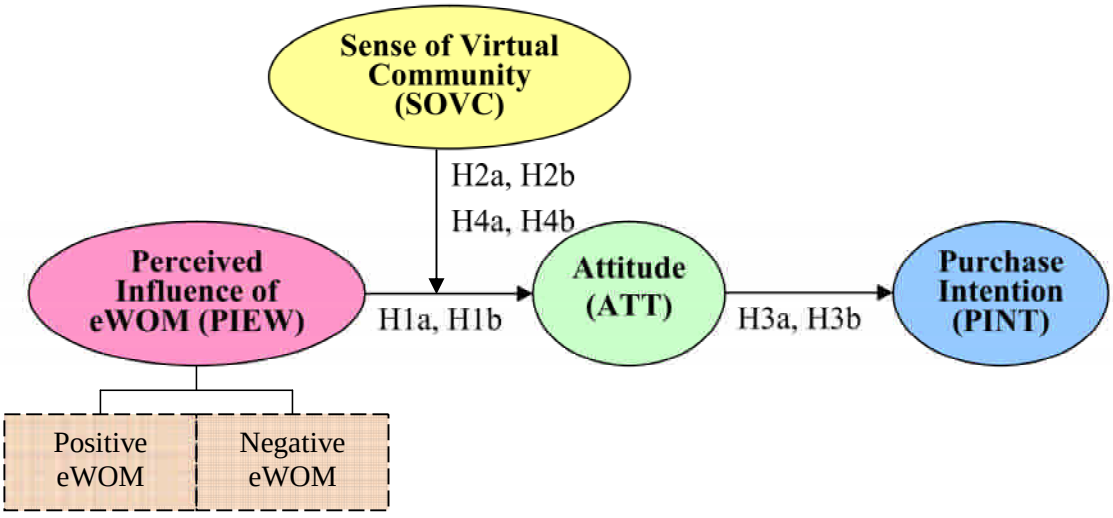

Figure 3-1 Conceptual Framework

3.2 Instruments and Data Collection

A survey was conducted to verify the impacts of eWOM on consumers attitude and behavioral intentions, and to test whether the relationship between members and the online community moderates the influence of eWOM on attitude in the positive eWOM scenario or the negative eWOM scenario.

In order to counterbalance the doubts of student sample and online sampling, two questionnaires, written and online, were designed congruently for data collection (see Appendix A). The online questionnaire was designed using an online survey website, and posted on two well-known online game community websites in Taiwan. The written questionnaires were administered by six instructors, all university lecturers or professors in northern, central, and southern Taiwan. Students in the courses taught by those instructors were invited to voluntarily participate in the survey, and their participation earned them extra course credits. To ensure sample quality, those administering the survey were instructed in proper survey administration.

Respondents were required to answer questions about their browsing habits in relation to online game communities, and moreover were asked to supply the names of the online game communities they frequented. To ensure the sample was representative, respondents who did not complete the names of the online game communities in which they participated were excluded from the analysis. Several questions about contact-period, membership, and opinion-posted behavior when joining an online community were questioned. For example, “Have you joined an online community about game product?” “How long do you participant in your online community?” “Do you frequently post your opinions in discussion forums?” “How often do you post your opinions per month in average?” “Do you join as a member in your online community?”

3.3 Scenario

This study manipulated a scenario and used a factitious product but not real product to avoid the past experiences of respondents affecting the analytical results. To design a neutral product, detail product attributes didn't also provide in the scenario. Game software was chosen as the reviewed target product in the scenario. Since game software is considered as an experienced product, it is difficult for consumers to evaluate product quality before experiencing product performance. Consumers may search more information for experienced product (*i.e.*, game) than functional product (*e.g.*, computer) from the opinions of market mavens or the use experiences of other consumers (word of mouth). In other words, word of mouth plays the influential role for consumers evaluating and choosing the experienced product. Therefore, game software is appropriate to be used as target product of eWOM in this study.

Since past studies supported positive WOM and negative WOM differently impacted consumer attitude and behavior, two scenarios were designed to represent positive and negative eWOM, respectively. The scenarios described a new game becoming available in the market, with the positive and negative scenarios differing in presenting four positive and four negative product comments, respectively, regarding the new game as the following:

> "*There is a new game, named 'GaMe', which is recently issues and aggressively advertises on TV. The advertising of 'GaMe' make you feel interested. However, you hesitate whether it is worthy to purchase this new game. Hence, you login your game discussion website (It is the one that you have previously referred to in the first section of this survey.), and read the product evaluations and comments about 'GaMe' that were issued by experienced players.*"

All positive and negative descriptions were adopted and modified from several online games discussion forums to ensure scenario authenticity. For positive evaluation, one of the descriptions is "*...I think 'GaMe' is an amusing game, and I got much fun in playing it. Not only the characters are diversified but also game setting and animation are vivid as true. Moreover, 'GaMe' is available to multiplayer-connected with my friends to enjoy together*." For negative evaluation, one of the descriptions is "*... 'GaMe' is a how terrible game. The designs of characters and animation are not fine, and the selectivity and ability balance of roles is limited. The worst thing is that sound effects and dubbing are not harmonious at all.*"

Respondents were required to read the scenarios and imagine that the comments were published on an online community that they regularly browsed. Before issuing the formal questionnaire, a scenario check was performed to ensure the realism of the scenarios and comments. Table 3-1 showed the frequency and percentage of scenario pretest. In the positive (negative) scenario, 89% (91%) of respondents supported that the content and meaning of four comments is positive (negative), and 83% (76%) of respondents considered that these descriptions mentioned important and relevant product attributes. Of 84% (84%) respondents agreed the statements are clear and easy to comprehend and 81% (90%) of respondents believed that scenario is real. About the influence of comments, 70% (76%) and 70% (89%) of respondents thought that the comments are persuasive to them and have impacts on purchase decision.

This check revealed that both scenarios were well-designed in terms of realism (M = 4.50, SD = 1.43 for positive scenario; M = 4.98, SD = 1.22 for negative scenario), relevance (M = 5.04, SD = 1.42 for positive scenario; M = 4.62, SD = 1.51 for negative scenario), influence (M = 2.97, SD = 1.44 for positive scenario; M = 5.67, SD = 1.08 for negative

scenario), persuasibility (M = 4.82, SD = 1.34 for positive scenario; M = 5.25, SD = 1.30 for negative scenario), and comprehensibility (M = 5.02, SD = 1.28 for positive scenario; M = 4.98, SD = 1.40 for negative scenario).[2]

3.4 Sample

A total of 972 responses were obtained (485 for the positive scenario and 487 for the negative scenario). Sixty-eight positive-scenario and 54 negative-scenario responses were eliminated because they lacked website names, had duplicate IP address, or were incomplete, yielding a useable sample size of 417 for the positive scenario and 433 for the negative scenario.

Table 3-2 exhibits the information about characteristics of respondents and membership in their communities. In the positive (negative) scenario, 45.8% (50.3%) of respondents was online-form samples and 54.2% (49.7%) came from written questionnaires. Roughly 50% of the sample were obtained from questionnaire forms submitted online. Regarding respondent demographics, the male-to-female ratio of the sample was 2:1 where 64.5% (/67.4%) for male and 35.3% (32.6%) for female. The majority were students aged younger than 24 years old where 65.5% (75.5%) for students and 71.0% (78.3%) for under 24 years of age. With randomly sampling, these ratios appear reasonable since male students are the main consumers of game products. On educational background, high school degree as well as university degree included 96.4% (98.4%) of respondents. Roughly 80.8% (87.1%) of respondents had less than $300 disposable income per month, and 59.5% (61.6%) of the respondents averaged over 4 hours per day online.

[2] The scenario check adopted seven-point Likert scale with the value of 1 (strongly disagree) to 7 (strongly agree), and sample sizes range from 103 to 115. All mean values were significantly greater than 4 at alpha value of .01(all the p values < .001).

Table 3-1 Sample Statistics for Scenario Check

Scenario check Items	Scenarios	M (SD)	Strongly disagree (1)	Disagree (2)	A little disagree (3)	F
1. These descriptions are positive	Positive (n=115)	5.90 (1.03)	0 (0.0%)	0 (0.0%)	3 (2.6%)	
	Negative (n=113)	1.93 (1.21)	52 (46.0%)	40 (35.4%)	6 (5.2%)	
2. These descriptions are negative	Positive (n=115)	2.24 (1.14)	32 (27.8%)	46 (40.0%)	21 (18.3%)	
	Negative (n=113)	6.15 (1.11)	1 (0.9%)	1 (0.9%)	2 (1.8%)	
3. These descriptions mention important product attributes	Positive (n=115)	5.04 (1.42)	1 (0.9%)	8 (7.0%)	11 (9.6%)	
	Negative (n=113)	4.62 (1.51)	3 (2.7%)	8 (7.1%)	16 (14.2%)	
4. These descriptions are clearly stated	Positive (n=114)	5.02 (1.28)	0 (0.0%)	5 (4.4%)	12 (10.5%)	
	Negative (n=112)	4.98 (1.40)	2 (1.8%)	4 (3.6%)	12 (10.7%)	
5. These descriptions are real	Positive (n=115)	4.50 (1.43)	6 (5.2%)	5 (4.3%)	11 (9.6%)	
	Negative (n=112)	4.98 (1.22)	2 (1.8%)	2 (1.8%)	7 (6.3%)	
6. These descriptions are persuasive	Positive (n=114)	4.82 (1.34)	2 (1.8%)	7 (6.1%)	10 (8.8%)	
	Negative (n=112)	5.25 (1.30)	1 (0.9%)	2 (1.8%)	10 (8.9%)	
7. These descriptions are Influential	Positive (n=103)	4.97 (1.44)	2 (1.9%)	7 (6.8%)	6 (5.8%)	
	Negative (n=107)	5.67 (1.08)	1 (0.9%)	0 (0.0%)	3 (2.6%)	

Note: M = mean; SD = standard deviation.

About membership characteristics, more than half of respondents come from one of popular game online communities in Taiwan, and the average contact period are about 32 months. 79.9% (85%) of respondents reported that they only read and do not often post the opinions in discussion forums, and 77.2% (76.0%) of respondents published their opinions less than three times per month. Finally, the percentage of possessing membership is 79.9% (79.9%). As Table 3-2 indicated, most demographic variables (e.g., gender, education, disposable expenditure, and time on Internet per day) and membership variables (e.g., frequency of publishing per month and membership owner) had no significant difference in distribution of population at alpha value of 0.05 between two scenarios. This result implies that respondents are approximately homogeneous in either positive eWOM scenarios or negative eWOM scenario.

3.5 Measures

Scales for measuring respondent perceptions were obtained from previous studies and carefully adapted to conform to the scenarios. All questionnaire items were measured using a six-point Likert scale (1 = strongly disagree, 6 = strongly agree) to avoid respondents inclining to response central answer. Table 3-3 lists the measures used in this study as well as their sources.

3.5.1 The Scale for Sense of Virtual Community (SOVC)

To evaluate the quality of relationship between respondents and their online communities, sense of virtual community (SOVC) was assessed by using a 22-item scale developed by Blanchard (2007). Twenty-two items, which included twelve SCI items and ten new items for gauging the unique components in virtual communities, were applied in the formal survey, and all negatively expressed questions were converted into positively

expressed items, as Peterson *et al.* (2006) suggested. To avoid respondent responses to sense of virtual community are influenced by scenario, respondents answered the questions before reading the scenario.

3.5.2 The Scale for Perceived Influence of eWOM (PIEW)

To assess the influence of online product comments, eight items from the scale of Gilly *et al.* (1998) dealing with the perceived influence of eWOM (PIEW) were employed and corrected to conform to the scenario (Bansal & Voyer, 2000; Wangenheim & Bayon, 2004b). The concept of perceived influence of eWOM is different to attitude, since attitude is a lasting and overall evaluation toward an object while the perceived influence of eWOM is a perceived value toward the information. In their study, ten-item scale was developed; however, only eight items were introduced and properly corrected to conform to the scenario of this study. After respondents read the scenario, they were required to answer these eight questions, i.e., how they perceive these product evaluations impact their purchase decision.

3.5.3 The Scale for Attitude (ATT) and Purchase Intention (PINT)

Four items for measuring attitude (ATT), and three items for gauging purchase intentions (PINT) were obtained from past studies (Bagozzi & Dholakia, 2002; Hu *et al.*, 1999; Perugini & Bagozzi, 2001). To ensure respondent responses based on exact target, the artificial game name mentioned in scenario was retained in each of items, for example, four items of ATT are: "*'GaMe' is appeal to me.*" "*I really like 'GaMe'.*" "It would be very desirable to have 'GaMe'." and "*I hold a positive evaluation toward 'GaMe'.*" three items of PINT are: "*I* intend to buy *'GaMe'.*" "*I have a plan to buy 'GaMe'.*" and "The intention of buying 'GaMe' to me is intense." Respondents answered questions regarding their attitude, and purchase intention following reading the comments regarding the target product.

Table 3-2 Sample Statistics for Research Sample

Items	Frequency (%) All samples (n=850)	Positive scenario (n=417)	Negative scenario (n=433)
Sample Origin			
Types of Questionnaire ($\chi^2(1)$ = 1.76, p = 0.18)			
Online sample	409 (48.1%)	191 (45.8%)	218 (50.3%)
Written sample	441 (51.9%)	226 (54.2%)	215 (49.7%)
Sample Characteristics			
Gender ($\chi^2(1)$ = 0.73, p = .39)			
Male	561 (66.0%)	269 (64.5%)	292 (67.4%)
Female	288 (33.9%)	147 (35.3%)	141 (32.6%)
Missing value	1 (0.1%)	1 (0.2%)	3 (0.7%)
Age [a] ($\chi^2(4)$ = 10.45, p = .03)			
13~18 years	114 (13.4%)	52 (12.5%)	62 (14.3%)
19~24 years	521 (61.3%)	244 (58.5%)	277 (64.0%)
25~30 years	148 (17.4%)	81 (19.4%)	67 (15.5%)
31~40 years	57 (6.7%)	33 (7.9%)	24 (5.5%)
Above 40 years	5 (0.6%)	5 (1.2%)	0 (0.0%)
Missing value	5 (0.6%)	2 (0.5%)	3 (0.7%)
Education ($\chi^2(2)$ = 2.86, p = .24)			
Under college	179 (21.1%)	92 (22.1 %)	87 (20.1%)
Undergraduate	649 (76.3%)	310 (74.3%)	339 (78.3%)
Graduate	20 (2.4%)	13 (3.1%)	7 (1.6%)
Missing value	2 (0.2%)	2 (0.5%)	0 (0.0%)
Occupation [a] ($\chi^2(4)$ = 14.50, p = .01)			
Students	600 (70.6%)	273 (65.5%)	327 (75.5%)
Employees	168 (19.8%)	99 (23.7%)	69 (14.9%)
Public official	8 (0.9%)	6 (1.4%)	2 (0.5%)
Waiting for work	44 (5.2%)	19 (4.6%)	25 (5.8%)
Others	28 (3.3%)	18 (4.3%)	10 (2.3%)
Missing value	2 (0.2%)	2 (0.5%)	0 (0.0%)

Items	Al
Disposable Income ($\chi^2(3)$ = 6	
Under NT5,000	436
NT5,001~10,000	278
NT10,001~15,000	78
Over NT 20,000	53
Missing value	5
Time on Internet Per day (χ^2(	
Under 2 hours	72
2~4 hours	260
4~6 hours	259
Over 6 hours	256
Missing value	3
Membership Characteristic	
Usually Publish in Online Fo	
No	701
Yes	140
Missing value	9
Frequency of Publishing Per	
0 times	333
1~3 times	318
4~6 times	92
7~9 times	20
Over 10 times	61
Missing value	26
Membership Owner ($\chi^2(1)$ =	
Not Member	165
Member	679
Missing value	6
Mean Contacting Time (mon	
Duration	32.

Note: [a] represents a statistical significance at α = 0.05 with the homogeneity χ^2 test of cross-table analysis between posit

Table 3-3 Research Scales Lists

Construct	Type	Item
Sense of Virtual Community (SOVC)	Moderating Constructs	sovc1: I feel at home in this group.
		sovc2: I can recognize the names most members in this group.
		sovc3: Many other group members know me.
		sovc4: I care about what other members think of my actions.
		sovc5: I have influence over what this group is like.
		sovc6: If there is a problem in this group, there are members here who
		sovc7: Members of this group share the same values.
		sovc8: I think this group is a good place for me to be a member.
		sovc9: Other members and I want the same things from the group.
		sovc10: Members in this group generally get along with each other.
		sovc11: It is very important to me to be a member of this group.
		sovc12: I expect to stay in this group for a long time.
		sovc13: I anticipate how some members will react to certain questions
		sovc14: I get a lot out of being in this group.
		sovc15: I have had questions that have been answered by this group.
		sovc16: I have gotten support from this group.
		sovc17: Some members of this group have friendships with each other.
		sovc18: I have friends in this group.
		sovc19: Some members of this group can be counted on to help others.
		sovc20: I feel obligated to help others in this group.
		sovc21: I really like this group.
		sovc22: This group means a lot to me.

Table 3-3 Research Scales Lists (Cont.)

Construct	Type	Item
Perceived Influence of eWOM (PIEW)	Exogenous Construct	piew1: These comments provide some new information about "GaMe." piew2: These comments will influence my choice about buying "GaMe." piew3: These comments mention some things I had not considered. piew4: These comments will change my mind about buying "GaMe." piew5: These comments help me make a decision about buying "GaMe." piew6: These comments are influential for me on buying "GaMe." piew7: These comments have influence on the factors about buying "Ga piew8: These comments are important to whether I buy "GaMe" or not.
Attitude (ATT)	Mediating Construct	att1: "GaMe" is appeal to me. att2: I really like "GaMe." att3: It would be very desirable to have "GaMe." att4: I hold a positive evaluation toward "GaMe."
Purchase Intention (PINT)	Endogenous Construct	pint1: I intend to buy "GaMe." pint2: I have a plan to buy "GaMe." pint3: The intention of buying "GaMe" to me is intense.

3.6 Data Analysis

Structural equation modeling (SEM) was executed to examine the hypotheses. SEM is especially efficient to analyze the cause-and-effect relationships among unobservable constructs (or latent constructs). Not only SEM analysis estimates the path relationships among latent constructs, but also simultaneously evaluates the measurement variance and error between observable indicators and corresponsive latent constructs.

However, in order to test the moderating effect of two constructs with SEM analysis, the two-step estimation procedure proposed by Ping (1996) were employed in this study. This technique is effective to quantify the effects of interaction between latent constructs that cannot be achieved by traditional ANOVA or multiple-sample SEM, and meanwhile, it can be done through LISREL program with SIMPLIS syntax (Cortina, Chen, & Dunlap, 2001). Thus, in this study, I replaced ANOVA and multiple-sample SEM method with a two-step interactive SEM technique of Ping (1996).

The data-analysis procedure and steps of this study are performed as followed. In the first phase, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were implemented to identify and examine the factor structures of SOVC. Sense of virtual community is considered a second-order-factor construct in the literature; however, its first-order factor structure is still unclear (Blanchard & Markus, 2004; Blanchard, 2007). Therefore, it is worthy to clarify the components of SOVC and facilitate follow-up analysis procedure when performing interactive SEM technique of Ping (1996).

For EFA, both samples of positive eWOM and negative eWOM are combined to explore the factor structure of SOVC with SPSS statistics software. The number of factor about SOVC was decided with the rule that the value of eigenvalue is larger than one, and the

factor-loading value of each item was assessed to explore the meaning of each factor. If the factor-loading value to anyone of factors was less than 0.4, this item was excluded from next EFA procedure utile no factor-loading value to anyone of factors was below 0.4. For the situation of two or above factor-loading values were greater than 0.4, item was classified to the factor which its factor-loading value is the highest.

After exploring the factor structure of SOVC, this alternative structure was confirmed by CFA with LISREL 8.54 software for positive eWOM samples and negative eWOM samples, respectively. If the estimated lambda value from one factor to corresponsive item was smaller than 0.6, this item will be excluded from next CFA procedure utile no estimated lambda value was below 0.6. Moreover, the goodness of fit to final CFA model was also evaluated, such as the value of chi square, RMSEA, GFI, AGFI , CFI and NFI etc.. For the sake of simplifying the complication of the interactive SEM technique proposed by Ping (1996), the weighted averages for each factor, which adopted the standardized estimated lambda value as weights, were produced to be treated as the indicators of SOVC constructs. Finally, the indicators of SOVC and the items of other constructs (i.e., PIEW, ATT and PINT) were also validated with another CFA procedure. All steps of this CFA were the same as above-mentioned.

In the second phase, the interactive SEM technique of Ping (1996) was applied to test the linear relationships amongbetween perceived influence of eWOM (PIEW), attitude (ATT), and purchase intention (PINT), and especially, the nonlinear effects of sense of virtual community (SOVC). According Ping (1996), interactive SEM technique is a two-step estimation procedure and the main steps are introduced as below:

Step 1: To transform the raw data as mean-centered data. Let the raw score of each item minus its item average.

Step 2: To produce the product indicators of interactive latent construct. The nonlinear indicators of interaction latent construct are created by multiplying the indicators of linear exogenous latent constructs. Specifically, the case that *i* indicators of latent construct X and *j* indicators of latent construct Z should produce *i*×*j* product indicators of interactive latent construct XZ.

Step 3: To estimate the first-step SEM with no interactive latent constructs (Figure 3-2), and to record estimated loadings (λ) and error variances (ε) for each indicator of linear exogenous latent constructs (X and Z), and variance-covariance matrix among linear exogenous latent constructs ($\sigma_X^2, \sigma_Z^2, \sigma_{XZ}$).

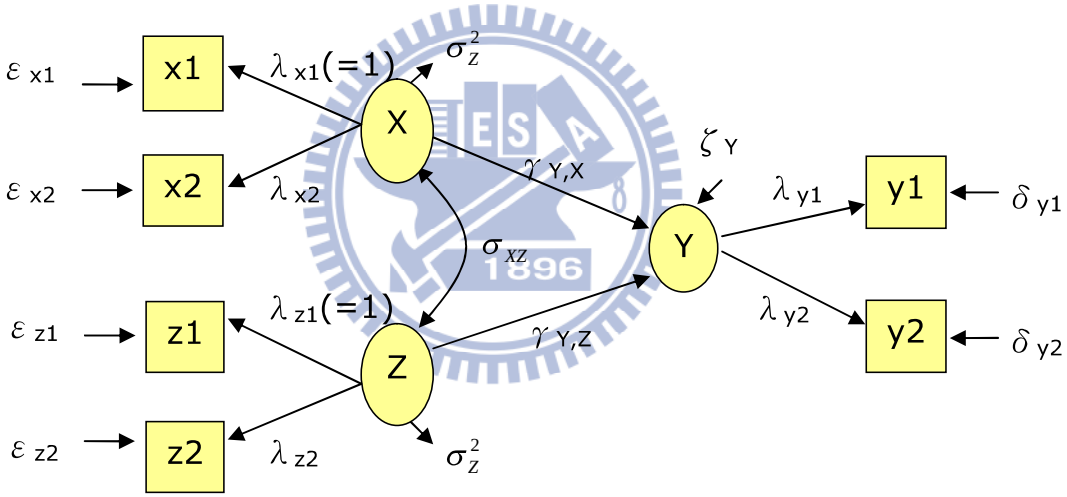

Figure 3-2 First-Step SEM for the Method of Ping (1996)

Step 4: To calculate the loadings and error variances of interactive indicators, and the variance of interactive latent construct. According to Ping (1996), the calculated formula of the loadings and error variances of product indicators, and the variance of interactive latent construct are shown as below:

$$\sigma_{XZ}^2 = \sigma_X^2 \sigma_Z^2 + (\sigma_{XZ})^2 \quad (1)$$

$$\lambda_{x_i z_j} = \lambda_{x_i} \lambda_{z_j} \quad (2)$$

$$\varepsilon_{x_i z_j} = \lambda_{x_i}{}^2 \sigma_X^2 \varepsilon_{z_j} + \lambda_{z_j}{}^2 \sigma_Z^2 \varepsilon_{x_i} + \varepsilon_{x_i} \varepsilon_{z_j} \quad (3)$$

Where X represents a linear exogenous latent construct which include i indicators, $x_1,...,x_i$; Z represents a linear exogenous latent construct which includes j indicators, $z_1,...,z_j$; XZ represents the interactive latent construct which includes $i \times j$ product indicators, $x_1z_1,...,x_iz_j$. σ_{XZ}^2, σ_X^2, and σ_Z^2 are the variances of XZ, X, and Z. σ_{XZ} is the covariance between X and Z. $\lambda_{x_i z_j}$, λ_{x_i}, and λ_{z_j} are the loadings of indicators of XZ, X, and Z. $\varepsilon_{x_i z_j}$, ε_{x_i}, and ε_{z_j} are the error variance of indicators of XZ, X, and Z.

Step 5: To estimate the second-step SEM with interactive latent constructs (Figure 3-3). The loadings and error variances for product indicators, and variance of interactive latent construct are calculated using the results of Step4. Finally, the interactive effect ($\gamma_{Y,XZ}$) are estimated by using a second-step SEM where these calculated loadings and error variances are specified as constants. In addition, the covariance between linear latent construct and interactive latent construct are set to zero, and the error covariance between product indicators which come from the identical linear indicator should be set to freely estimate.

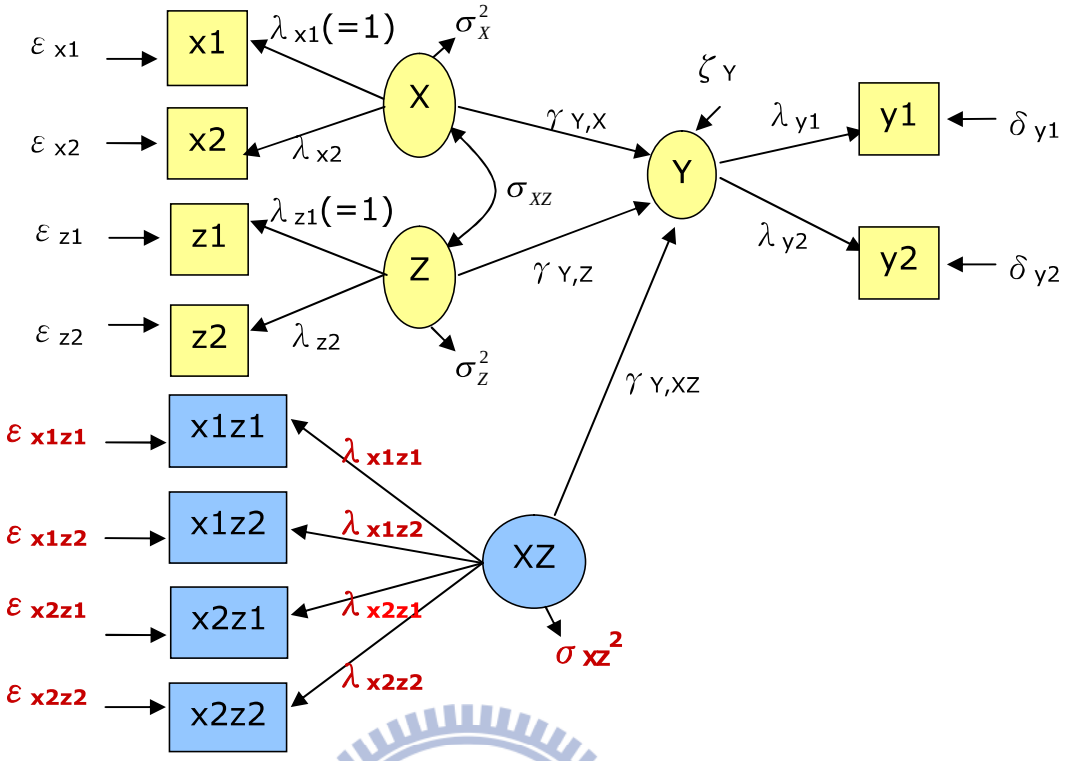

Figure 3-3. Second-Step SEM for the Method of Ping (1996)

In this study, linear exogenous latent constructs are perceived influence of eWOM and sense of virtual community, respectively, and their product represent the interactive latent construct. These constructs are hypothesized to have direct effects on attitude and indirect effects on purchase intention. All the paths were modeled and estimated with the interactive SEM method of Ping (1996).

CHAPTER 4 RESULTS

4.1 Descriptive Statistics for Research Scales

The descriptive statistics (mean, standard deviation, skewness, and Kurtosis) and correlation coefficients for all research items were showed in Table 4-1 and Appendix B. For mean, the values ranged from 2.35 to 4.66 in the positive eWOM situation and from 2.17 to 4.59 in the negative eWOM situation. According to Table 4-1, most of the means between two scenarios had no significant difference for SOVC items except sovc3, sovc7, and sovc10. For variance/standard deviation, the values ranged among 0.98 and 1.47 in both scenarios. Equally, most of the variances/standard deviations between two scenarios had no significant difference for SOVC items except sovc3, sovc5, and sovc7. These results confirmed that scenario had no significant effect on the response of SOVC items, and hence, conforming to the assumption that "Under randomization, the distribution of SOVC items score is equal between two scenarios."

However, scenario is anticipated having significant influence on the response of PIEW, ATT, and PINT items. As showed in Table 4-1, almost of the means between two scenarios had significant difference at alpha value of 0.05 (except piew1 and piew3). Especially, the scores in negative eWOM scenario were larger than those in positive eWOM scenario for PIEW items. This result supported the findings of past studies, i.e., negative product evaluations have more influence on consumer decision than positive product evaluation. Furthermore, the scores of ATT and PINT items were expected to be higher in positive eWOM scenario than those in negative eWOM scenario. Hence, this expectation was supported.

Table 4-1 Descriptive Statistics of Research Scales

Items	Positive eWOM (N=417)				Negative eWOM (N=433)			
	M	SD	SK	KU	M	SD	SK	KU
sovc1	4.66	1.02	-1.06	1.89	4.59	0.98	-0.79	1.23
sovc2	2.74	1.40	0.44	-0.75	2.67	1.33	0.49	-0.51
sovc3*	2.35	1.31	0.85	-0.02	2.17	1.21	1.00	0.36
sovc4	2.85	1.47	0.38	-0.78	2.98	1.43	0.20	-0.95
sovc5	2.35	1.32	0.78	-0.19	2.27	1.23	0.89	0.14
sovc6	4.36	1.22	-0.82	0.56	4.34	1.21	-0.77	0.38
sovc7*	4.06	1.24	-0.58	0.00	3.75	1.32	-0.38	-0.52
sovc8	4.40	1.26	-0.80	0.49	4.34	1.16	-0.59	0.37
sovc9	4.31	1.21	-0.58	0.15	4.22	1.17	-0.62	0.48
sovc10*	3.98	1.28	-0.46	-0.18	3.76	1.22	-0.25	-0.35
sovc11	3.72	1.35	-0.33	-0.52	3.71	1.27	-0.10	-0.44
sovc12	4.11	1.37	-0.56	-0.19	4.13	1.30	-0.35	-0.47
sovc13	4.34	1.20	-0.88	0.73	4.40	1.09	-0.62	0.37
sovc14	4.32	1.26	-0.80	0.41	4.34	1.14	-0.65	0.36
sovc15	4.55	1.28	-1.03	0.76	4.51	1.29	-0.81	0.16
sovc16	3.76	1.32	-0.45	-0.35	3.77	1.30	-0.34	-0.36
sovc17	4.06	1.33	-0.73	0.10	4.16	1.20	-0.58	0.26
sovc18	4.27	1.37	-0.75	-0.07	4.15	1.41	-0.63	-0.30
sovc19	4.34	1.16	-0.82	0.75	4.37	1.16	-0.69	0.36
sovc20	4.01	1.22	-0.48	0.08	3.91	1.21	-0.30	-0.13
sovc21	4.38	1.19	-0.68	0.36	4.39	1.10	-0.48	0.29
sovc22	3.90	1.34	-0.37	-0.33	3.85	1.32	-0.34	-0.41
piew1	4.09	1.15	-0.58	0.33	4.22	1.16	-0.59	-0.01
piew2*	3.82	1.36	-0.26	-0.58	4.49	1.28	-0.74	-0.01
piew3	3.72	1.21	-0.31	-0.14	3.77	1.34	-0.32	-0.60
piew4*	3.80	1.32	-0.38	-0.46	4.46	1.22	-0.71	0.16
piew5*	3.94	1.32	-0.42	-0.33	4.42	1.27	-0.75	0.11
piew6*	3.89	1.33	-0.33	-0.48	4.54	1.18	-0.71	-0.01
piew7*	3.75	1.26	-0.24	-0.38	4.44	1.23	-0.65	-0.09
piew8*	3.71	1.35	-0.25	-0.64	4.30	1.33	-0.56	-0.36
att1*	3.75	1.29	-0.33	-0.36	2.79	1.28	0.41	-0.43
att2*	3.58	1.28	-0.06	-0.36	2.72	1.24	0.51	-0.12
att3*	3.59	1.23	-0.06	-0.27	2.68	1.20	0.47	-0.04
att4*	3.73	1.21	-0.22	-0.17	2.79	1.19	0.30	-0.31
pint1*	3.27	1.32	0.04	-0.53	2.47	1.16	0.53	-0.16
pint2*	3.20	1.31	0.05	-0.53	2.46	1.18	0.58	-0.03
pint3*	3.04	1.33	0.22	-0.52	2.39	1.18	0.63	-0.04

Note: M = mean; SD = standard deviation; SK=Skewness; KU=Kurtosis; * represents statistical significance at α = .05 with the *t* test of the difference in means between the scenarios of positive and negative eWOM.

4.2 Factor Structure of SOVC

To identify the factor structures of SOVC, the samples for the two scenarios were combined and subjected to exploratory factor analysis (EFA) with maximum likelihood estimation. Promax rotation was used to consider the inter-factor correlations (McMillan & Chavis, 1986).[3] The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1970) is 0.936 larger than the value of 0.9. In addition, Bartlett sphericity test indicates that $\chi^2(190, N = 850)$ is 9458.7 ($p < .001$). These results show that the sample is marvelous for factoring (Kaiser & Rice, 1974).

Three factors with eigenvalues exceeding one were extracted after six iterations, while two items (sovc1 and sovc18) were deleted for having factor loadings below .40 (sovc18 was deleted after first-round EFA, and sovc1 was deleted after second-round EFA). The results of EFA are shown in Appendix C. These three factors can explain 53.76% of total variance for twenty items. All items whose factor loadings are above 0.4, and respectively loaded on single factor where nine items are loaded on the first factor, seven items are loaded on the second factor, and four items are loaded on the third factor. For correlation matrix among these three factors, all correlations are positive where correlation between factor 1 and factor 2 has the highest value of 0.74, and correlation between factor 1 and factor 2 is 0.29 and correlation between factor 2 and factor 3 is 0.30.

[3] McMillan and Chavis (1986) defined sense of community (SOC) as having four key elements: membership, influence, integration and fulfillment of needs, and shared emotional connection. Meanwhile, these four elements interrelated via "a self-reinforcing circle". Blanchard and Markus (2004) extended the concept of SOC to virtual communities, and named this extension "sense of virtual community (SOVC)." Blanchard (2007) further devised the scale of SOVC based on McMillan and Chavis (1986) and their observations of online multiple sports newsgroups. Thus, the three SOVC factors are expected to correlate.

In order to confirm model fitness for factor structure of SOVC in positive eWOM scenario and negative eWOM scenario, the remaining 20 items were used to implement confirmatory factor analysis (CFA) using the factor structures obtained from EFA. Table 4-2 presented four items (sovc6, sovc7, sovc9, and sovc10) are deleted owing to their standardized factor loadings falling below .60 in both scenarios.[4] The final CFA in Table 4-2 shows that nine items (sovc8, sovc11, sovc12, sovc14, sovc15, sovc16, sovc20, sovc21, sovc22) are loaded on first factor, three items (sovc13, sovc17, sovc19) are loaded on second factor, and four items (sovc2, sovc3, sovc4, sovc5) are loaded on the third factor.

Regarding the meanings of the three SOVC factors, according to the loaded items of each factor, the first SOVC factor is labeled *"Emotional Linkages (EL),"* the second is *"Anticipated Support (AS),"* and the third is "*Membership & Influence (M&I).*" Compared to the model of sense of community proposed by McMillan and Chavis (1986), the meaning of *Emotional Linkages* resembles the concept of *Shared Emotional Connection*, which interprets the affective component related to community consciousness. The meaning of *Anticipated Support* resembles that of *Reinforcement of Needs*, which explains the feeling that a member hopes that other community members will solve their problems. Finally, the meaning of *Membership & Influence* combines the concept of *Membership* and *Influence* into a single construct, and explains the feelings of belonging to, identifying with, and mattering to a community. These factors are identical to the findings of Blanchard and Markus (2004) regarding the origins of sense of virtual community (*i.e.*, recognition of members, exchange of

[4] Tabachnica and Fidell (2007) proposed a factor loading of .55 (30% of variance) as an appropriate boundary for a scale in social science research. This study used a higher value of 0.6, *i.e.*, 36% of variance, as the value of item-deleted decision.

support, emotional attachment, and personal relationships with members, sense of obligation, and self identity and identification with others).

Table 4-2 lists the results of standardized factor loadings of the three-factor SOVC model. All factor loadings for the two scenarios are significant ($p < .001$), with values ranging from .63 to .87 for emotional linkages, .71 for anticipated supports, .62 to .82 for membership & influence in the positive eWOM scenario and with values ranging from .66 to .83 for emotional linkages, .68 to .74 for anticipated supports, .60 to .88 for membership & influence in the negative eWOM scenario.

In the subsequent structural equitation model (SEM) analysis, the scores of three SOVC factors are averaged using the standardized factor loadings of respective items as weights. Additionally, all Cronbach α and composite reliability (CR) of the three SOVC factors show acceptable reliabilities (range from .74 to .93).[5] Furthermore, the convergent validity can be considered adequate while the average variance extractions (AVE) exceed the suggested minimum value of .50 (Fornell and Larcker, 1981) except for anticipated supports in the negative scenario which has AVE of only .49.

[5] The concept of composite reliability resembles Cronbach's alpha for assessing internal consistency reliability, and is calculated based on the factor loadings and error variances of loaded indicators (Fornell & Larcker, 1981). Bagozzi and Yi (1988) suggested .60 as the minimum value of composite reliability.

Table 4-2 Standardized Estimated Factor Loadings of Three-Factor SOVC Model

Correlations	Emotional linkages (EL)	Anticipated supports (AS)	Membership & influence (M&I)
EL	--	--	--
AS	0.76/0.53	--	--
M&I	0.33/0.35	0.34/0.26	--
sovc1	--	--	--
sovc2	--	--	0.81/0.88
sovc3	--	--	0.82/0.77
sovc4	--	--	0.62/0.60
sovc5	--	--	0.76/0.80
sovc6	--	--	--
sovc7	--	--	--
sovc8	0.77/0.71	--	--
sovc9	--	--	--
sovc10	--	--	--
sovc11	0.72/0.70	--	--
sovc12	0.74/0.80	--	--
sovc13	--	0.71/0.69	--
sovc14	0.85/0.80	--	--
sovc15	0.68/0.68	--	--
sovc16	0.63/0.70	--	--
sovc17	--	0.71/0.67	--
sovc18	--	--	--
sovc19	--	0.71/0.74	--
sovc20	0.73/0.66	--	--
sovc21	0.87/0.83	--	--
sovc22	0.83/0.81	--	--
Cronbach's α	0.93/0.92	0.74/0.74	0.82/0.80
AVE	0.58/0.56	0.51/0.49	0.57/0.59
CR	0.92/0.92	0.76/0.75	0.84/0.85

Note: SOVC = sense of virtual community; EL = emotional linkages; AS = anticipated support; M&I = membership & Influence; AVE = average variance extractions; CR = composite reliability. The numbers to the right of the slash are the results of the positive eWOM scenario, and those to the left of the slash are the results of the negative eWOM scenario. All factor loadings are statistically significant at α = .001. Six items, *i.e.*, sovc1, sovc6, sovc7, sovc9, sovc10, and sovc18, are excluded because their factor loadings do not satisfy the suggested minimum values in EFA (.40) and CFA (.60). $\text{AVE} = \sum_{i=1}^{P} \lambda_i^2 / (\sum_{i=1}^{P} \lambda_i^2 + \sum_{i=1}^{P} \text{Var}(\varepsilon_i))$; $\text{CR} = (\sum_{i=1}^{P} \lambda_i)^2 / ((\sum_{i=1}^{P} \lambda_i)^2 + \sum_{i=1}^{P} \text{Var}(\varepsilon_i))$, where λ_i represents standardized factor loading of indicator i (i = 1,2,…,P); $\text{Var}(\varepsilon_i)$ represents standardized error variance of indicator i (i = 1,2,…,P).

Model A in Table 4-3 shows the model fitness of the three-factor SOVC model, and reveals good fit in both scenarios. The three-factor SOVC model fits well in the two scenarios in that the ratios of chi square and degree of freedom are both less than 3 (2.41 for positive eWOM and 2.89 for negative eWOM), and the values of RMSEA are both smaller than 0.08 (0.058 for positive eWOM and 0.066 for negative eWOM) (McDonald & Ho, 2002). All fit indices for GFI, AGFI, NFI, NNFI, CFI, IFI, RFI, PGFI, PNFI, and CN satisfy the suggested criteria, so the model fit is acceptable (Doll, Xia, & Torkzadeh, 1994; Jöreskog & Sörbom, 1993; Marcoulides & Schumacker, 1996; Reisinger & Turner, 1999).

Correlations among the three SOVC factors can be employed to examine their discriminant validity. The correlations between EL and AS ($r(415) = .76$, $p < .001$), EL and M&I ($r(415) = .33$, $p < .001$), and AS and M&I ($r(415) = .34$, $p < .001$) in the positive eWOM scenario, and between EL and AS ($r(431) = .53$, $p < .001$), EL and M&I ($r(431) = .35$, $p < .001$), and AS and M&I ($r(431) = .26$, $p < .001$) in the negative eWOM scenario are all significantly smaller than one, indicating discriminant validity.[6] To summarize, all results suggest that the three-factor SOVC model exhibits good reliability and validity.

4.3 Evaluations of Measurement Model

In the subsequent SEM analysis, the scores of three SOVC factors (EL, AS, and M&I) were calculated by averaging standardized factor-loading values for respective indicators as weights. The mean (standard deviation) of EL, AS, and M&I are 4.14 (1.03), 2.31 (0.54),

[6] The correlation between EL and AS for the positive scenario: $\chi^2(1, N = 417) = 14.97$, $p < .001$ and for the negative scenario: $\chi^2(1, N = 433) = 54.47$, $p < .001$; the correlation between AS and M&I for the positive scenario $\chi^2(1, N = 417) = 153.52$, $p < .001$ and for the negative scenario: $\chi^2(1, N = 433) = 326.94$, $p < .001$; the correlation between EL and M&I for the positive scenario $\chi^2(1, N = 417) = 511.18$, $p < .001$ and for the negative scenario: $\chi^2(1, N = 433) = 403.94$, $p < .001$).

and 2.56 (1.11) for the positive scenario and 4.12 (0.97), 2.24 (0.49), and 2.50 (1.03) for the negative scenario. To evaluate the measurement quality, three-factor SOVC, and other constructs (*i.e.*, PIEW, ATT, and PINT), are combined and subjected to a CFA procedure. Two items in PIEW (piew1 and piew3) are removed because one of the standardized factor loadings in one of the two scenarios is less than .60. Additionally, the correlation analysis indicates that three Items, att1, att2, and pint1, had high linear correlations among other items ($r > .86$). To avoid multicollinearity within the SEM analysis, these items are excluded from the analysis.

Table 4-3 Goodness of Fit Statistics for SEM Models [a]

Fit Indexes	Model A	Model B	Model C	Criteria
df	88/83	55/54	391/391	--
χ^2	211.94/240.18	119.01/110.26	1011.18/908.67	--
Normed χ^2	2.41/2.89	2.16/2.04	2.59/2.32	1~3
RMSEA	0.058/0.066	0.053/0.049	0.062/0.055	< 0.08
SRMR	0.064/0.073	0.033/0.076	0.092/0.084	< 0.10
GFI	0.94/0.94	0.96/0.96	0.87/0.88	> 0.90
AGFI	0.91/0.89	0.93/0.94	0.83/0.85	> 0.80
PGFI	0.61/0.57	0.58/0.57	0.68/0.70	> 0.50
NFI	0.98/0.98	0.99/0.98	0.97/0.97	> 0.90
NNFI	0.98/0.98	0.99/0.99	0.98/0.98	> 0.90
PNFI	0.72/0.67	0.70/0.68	0.82/0.81	> 0.50
CFI	0.99/0.98	0.99/0.99	0.98/0.98	> 0.90
IFI	0.99/0.98	0.99/0.99	0.98/0.98	> 0.90
RFI	0.97/0.96	0.98/0.98	0.96/0.96	> 0.90
CN	230.56/206.45	295.50/308.06	193.55/207.84	> 200

Note: The numbers to the right of the slash are the results of the positive eWOM scenario, and those to the left of the slash are the results of the negative eWOM scenario. Model A = three-factor SOVC model; Model B = Measurement model for research constructs; Model C = the interactive SEM model of Ping (1996). df = degree of freedom; χ^2 = chi square; normed χ^2 = the ratio of chi-square value and its degree of freedom; RMSEA = root mean square error of approximation; SRMR=Standardized root mean square residual; GFI = goodness of fit index; AGFI = adjusted goodness of fit index; PGFI=parsimony goodness of fit index; NFI = normed fit index; NNFI= non-normed fit index; PNFI=parsimony normed fit index; CFI = comparative fit index; IFI=incremental fit index; RFI=relative fit index; CN=critical number.

Table 4-4 shows that all factor loadings are significant ($p < .001$), with values ranging from .36 to .89 for sense of virtual community, .80 to .94 for perceived influence of eWOM, .82 to .84 for attitude, and .87 to .96 for purchase intentions for positive eWOM scenario. For negative eWOM scenario, the estimated standardized loadings range from 0.39 to 0.92 for sense of virtual community, 0.84 to 0.91 for perceived influence of eWOM, from 0.89 to 0.91 for attitude, and 0.93 to 0.96 for purchase intentions. Although the standardized loadings of third SOVC factor, M&I, in both scenarios are low, it should not be removed to retain the integrity of factor structure for SOVC.

Regarding reliability and validity, the values of Cronbach's α and CR all show acceptable reliabilities (range from .69 to .96), and the values of AVE all exceed the suggested minimum value of .50. The convergent validity thus is confirmed (Fornell & Larcker, 1981). Regarding discriminate validity, the estimated correlations between SOVC and PIEW ($r(415) = .41$, $p < .001$), SOVC and ATT ($r(415) = .50$, $p < .001$), SOVC and PINT ($r(415) = .38$, $p < .001$), PIEW and ATT ($r(415) = .65$, $p < .001$), PIEW and PINT ($r(415) = .63$, $p < .001$), and ATT and PINT ($r(415) = .86$, $p < .001$) in the positive eWOM scenario, and between SOVC and PIEW ($r(431) = .35$, $p < .001$), SOVC and ATT ($r(431) = .26$, $p < .001$), SOVC and PINT ($r(431) = .21$, $p < .001$), PIEW and ATT ($r(431) = -.31$, $p < .001$), PIEW and PINT ($r(431) = -0.27$, $p < .001$), and ATT and PINT ($r(431) = .81$, $p < .001$) in the negative eWOM scenario are all significantly smaller than one, indicating discriminant validity.[7]

The fit statistics of Model B in Table 4-3 indicate acceptable model fit. With excellent fit statistics, the values of normed chi square are 2.16 for positive eWOM scenario and 2.04

[7] All chi-square values exceed 11 with 1 degree of freedom and their p values were significant at alpha = .001.

for negative eWOM scenario (less than the value of 3). The values of RMSEA (SRMR) are 0.053 (0.033) for positive eWOM and 0.049 (0.076) for negative eWOM (less than the value of 0.08). All fit indices for GFI, AGFI, NFI, NNFI, CFI, IFI, RFI, PGFI, PNFI, and CN satisfy the suggested criteria, so the model fit is acceptable (Jöreskog & Sörbom, 1993; Marcoulides & Schumacker, 1996). The above indicates that the measurement model possesses excellent reliability and validity.

4.4 Calculations of Product Indicators

According to the interactive SEM proposed by Ping (1996), the indicators of interactive latent constructs can be created by multiply the indicators of two linear latent construct. In this study, two linear latent constructs are SOVC and PIEW where SOVC have three composite indicators (EL, AS, and M&I) and PIEW contained six indicators (piew2, piew4, piew5, piew6, piew7, piew8) after confirming the measurement model. The product for SOVC and PIEW, interactive latent construct, is termed as PIEW×SOVC, and thus, 18 (3×6) product indicators were created (Figure 4-1).

Following the analytical steps introduced in section 3.6, the estimated un-standardized loadings, error variances for indicators and variance-covariance between constructs of first-phase SEM are presented in Table 4-5. Based on the formulas introduced in section 3.6, the calculated loadings and error variances for product indicators and variances for PIEW×SOVC are showed in Table 4-5. These calculated values will be set as constants when implementing the second-phase interactive SEM of Ping (1996).

Table 4-4 Standardized Factor Loadings and Error Variances of Measur

Correlation	SOVC		PIEW		ATT	
SOVC	--		--		--	
PIEW	0.411/0.346		--		--	
ATT	0.503/0.258		0.650/-0.309		--	
PINT	0.385/0.205		0.635/-0.267		0.857/0.806	
Indicators	Factor Loading	Error Variance	Factor Loading	Error Variance	Factor Loading	V
EL	0.886/0.924	0.215/0.147	--	--	--	
AS	0.888/0.754	0.212/0.431	--	--	--	
M&I	0.356/0.393	0.873/0.846	--	--	--	
piew1	--	--	--	--	--	
piew2	--	--	0.821/0.860	0.326/0.260	--	
piew3	--	--	--	--	--	
piew4	--	--	0.898/0.895	0.194/0.198	--	
piew5	--	--	0.885/0.845	0.217/0.285	--	
piew6	--	--	0.937/0.912	0.122/0.168	--	
piew7	--	--	0.832/0.880	0.307/0.225	--	
piew8	--	--	0.797/0.842	0.365/0.289	--	
att1	--	--	--	--	--	
att2	--	--	--	--	--	
att3	--	--	--	--	0.836/0.909	0.3
att4	--	--	--	--	0.815/0.894	0.3
pint1	--	--	--	--	--	
pint2	--	--	--	--	--	
pint3	--	--	--	--	--	
α	0.72/0.69		0.95/0.95		0.81/0.90	
AVE	0.567/0.526		0.745/0.762		0.682/0.813	
CR	0.777/0.751		0.946/0.951		0.811/0.897	

Note: SOVC = sense of virtual community; PIEW = perceived influence of electronic word of mouth; ATT = attitude toward linkages; AS = anticipated support; M&I = membership & Influence; AVE = average variance extractions; CR = compo are the results of the positive eWOM scenario, and those to the left of the slash are the results of the negative eWOM scen α = .001. Two items, *i.e.*, piew1 and piew3, are excluded for factor loadings not satisfying the suggested minimum va pint1, are removed owing to high correlations with other items. $\text{AVE} = \sum_{i=1}^{P} \lambda_i^2 / (\sum_{i=1}^{P} \lambda_i^2 + \sum_{i=1}^{P} \text{Var}(\varepsilon_i))$; $\text{CR} = (\sum$ standardized factor loading of indicator i (i = 1,2,…,P); $\text{Var}(\varepsilon_i)$ represents standardized error variance of indicator i (i =

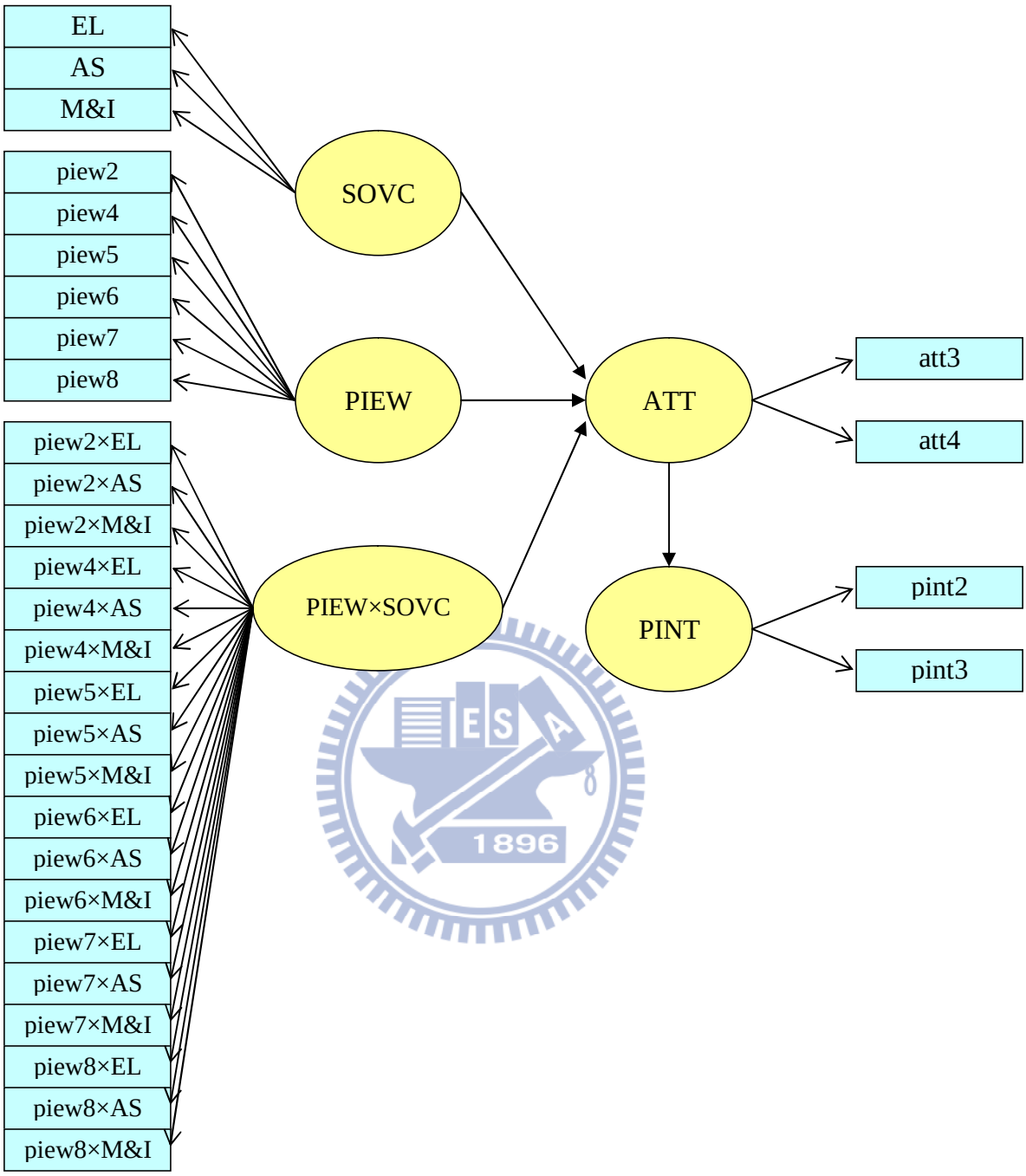

Figure 4-1 Interactive SEM of Ping (1996)

Note: SOVC = sense of virtual community; PIEW = perceived influence of eWOM; PIEW×SOVC = the interactive term of SOVC and PIEW; ATT = attitude toward product; PINT = purchase intention; EL=emotional Linkages; AS=anticipated Supports; M&I= membership & Influence.

Table 4-5 Calculated Loadings and Error Variances of Interactive Indicators

Linear Indicators	Positive Scenario		Negative Scenario	
	Factor Loadings	Error Variances	Factor Loadings	Error Variances
EL	1.000	0.217	1.000	0.137
AS	0.954	0.221	0.790	0.378
M&I	0.430	1.081	0.440	0.907
piew2	1.000	0.603	1.000	0.409
piew4	1.068	0.335	0.989	0.295
piew5	1.053	0.381	0.968	0.459
piew6	1.117	0.213	0.978	0.234
piew7	0.943	0.499	0.981	0.343
piew8	0.969	0.671	1.014	0.511
	Variance and Covariance			
σ^2_{SOVC}	0.840		0.801	
σ^2_{PIEW}	1.239		1.222	
$\sigma_{SOVX, PIEW}$	0.419		0.342	
Product indicators	Positive Scenario		Negative Scenario	
	Factor Loadings	Error Variances	Factor Loadings	Error Variances
piew2*EL	1.000	0.905	1.000	0.551
piew2*AS	0.954	0.867	0.790	0.821
piew2*M&I	0.430	2.085	0.440	1.543
piew4*EL	1.067	0.661	0.989	0.440
piew4*AS	1.018	0.643	0.781	0.711
piew4*M&I	0.459	1.942	0.435	1.397
piew5*EL	1.052	0.700	0.968	0.587
piew5*AS	1.004	0.679	0.765	0.836
piew5*M&I	0.452	1.955	0.426	1.526
piew6*EL	1.117	0.561	0.978	0.380
piew6*AS	1.066	0.552	0.773	0.647
piew6*M&I	0.480	1.936	0.430	1.309
piew7*EL	0.942	0.766	0.981	0.483
piew7*AS	0.899	0.735	0.775	0.746
piew7*M&I	0.405	1.807	0.432	1.431
piew8*EL	0.968	0.960	1.014	0.651
piew8*AS	0.923	0.917	0.801	0.924
piew8*M&I	0.416	2.085	0.446	1.682
$\sigma^2_{SOVC\times PIEW}$	1.216		1.096	

Note: all the numbers for linear indicators are un-standardized estimates. The numbers for product indicators were calculated based on the formulas in section 3.6, and set as constants in the second-phase SEM analysis.

4.5 The Results of Research Hypotheses

A two-step interactive SEM using the estimation procedure of Ping (1996) was applied to examine the proposed hypotheses (see Figure 4-1). This method can quantify the effects of interaction between latent constructs not achievable via traditional ANOVA or multiple-sample SEM. Indicators in mean-deviation form are the requisite to implement the method of Ping (1996) method, and uncomplicated calculations were performed. Figure 4-2 shows the estimated and standardized path coefficients of the interactive SEM in this study and the squared multiple correlations (SMC) in the situations of positive and negative eWOM. Moreover, the standardized factor loadings and construct correlations are shown in Table 4-6 and Table 4-7, and Mode C in Table 4-3 lists the model fit indexes of the interactive SEM of Ping (1996).

4.5.1 The Effects of eWOM on Attitude

H1a and H1b hypothesized that perceived influence of eWOM positively and negatively affects online member attitude towards a reviewed product in the positive and negative eWOM scenarios, respectively. The analytical results show that the un-standardized and standardized path coefficients in positive eWOM (b = 0.53, β = 0.57, $t(414) = 11.05$, $p < .001$) and negative eWOM (b = -0.46, β = -0.47, $t(430) = -8.96$, $p < .001$) are all significant in the expected direction, supporting H1a and H1b.

4.5.2 The Effects of SOVC on Attitude

H2a and H2b hypothesized that sense of virtual community positively affects online member attitude toward a reviewed product in both positive and negative eWOM scenarios. The analytical results show that the estimated and standardized path coefficients in positive eWOM (b = 0.30, β = 0.27, $t(414) = 5.56$, $p < .001$) and in negative eWOM (b = 0.45, β =

0.37, $t(430) = 6.59$, $p < .001$) are both statistically significant have positive value. Hence, H2a and H2b are both supported.

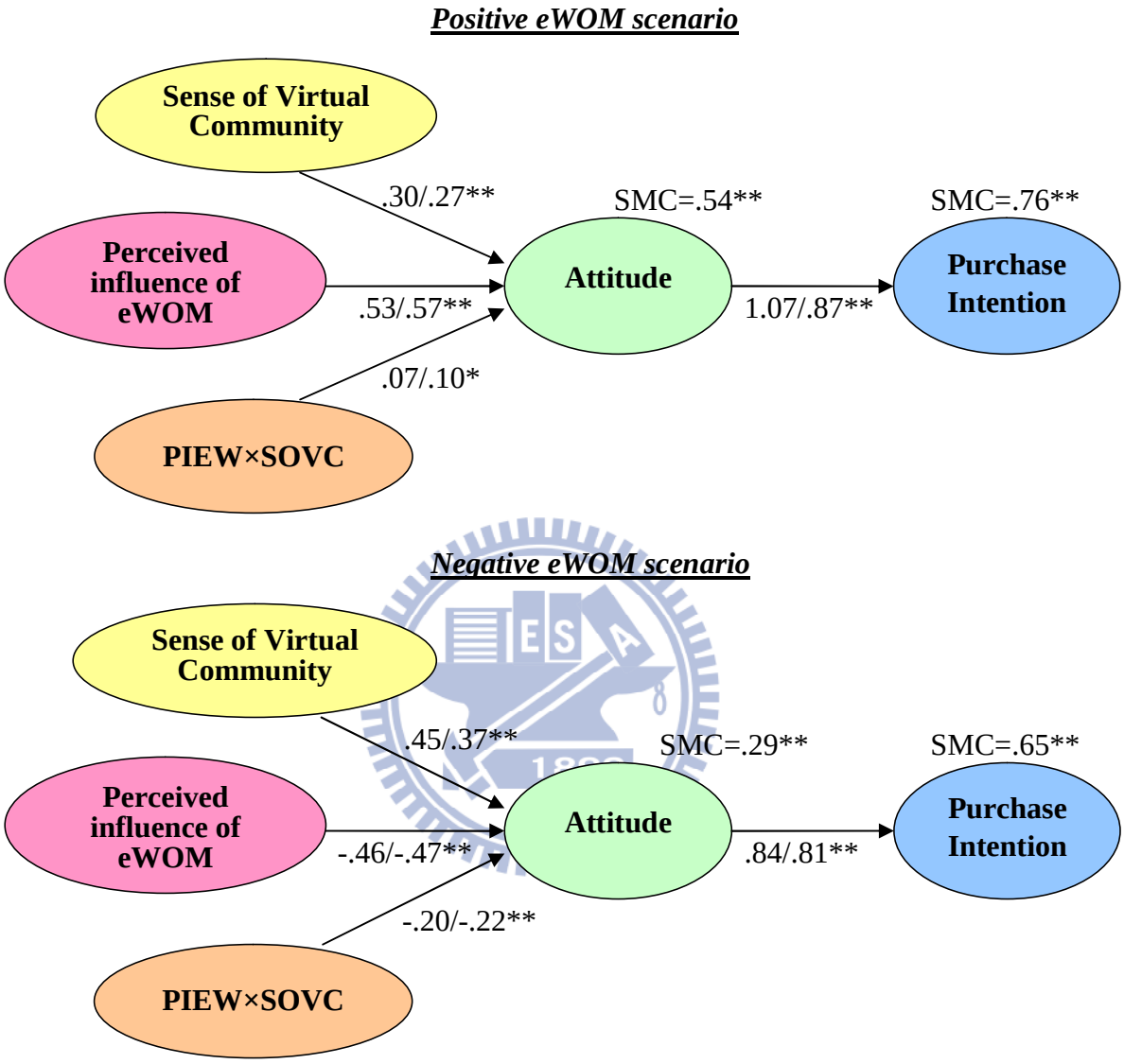

Figure 4-2 Estimated Path Coefficients of Interactive SEM of Ping (1996)

Note: The numbers to the right of the slash are un-standardized values and those to the left of the slash are standardized values; *: $p < .05$; **: $p < .01$.

4.5.3 The Effects of Attitude on Purchase Intention

H3a and H3b posited that attitude positively impacts purchase intention in both the positive and negative scenarios. The analytical results indicate that the estimated path coefficients from attitude to purchase intention are statistically significant have positive value (b = 1.07, β = 0.87, $t(416) = 18.94$, $p < .001$ in the positive scenario; b = 0.84, β = 0.81, $t(432) = 19.85$, $p < .001$ in the negative scenario).[8] Thus, H3a and H3b are supported.

4.5.4 The Moderating Effects of SOVC

H4a and H4b assumed that a sense of virtual community reinforces the relationship between the perceived influence of eWOM and consumer attitudes in both positive and negative eWOM scenarios. As Figure 4-2 shows, the standardized path coefficients in the positive eWOM scenario (b = 0.07, β = 0.10, $t(414) = 2.40$, p = .02) and negative eWOM scenario (b = -0.20, β = -0.22, $t(430) = -4.60$, $p < .001$) are both significant in the expected direction. Thus, H4a and H4b are supported.

[8] Attitude and purchase intention are closely correlated (β = .87 in positive eWOM and β = .81 in negative eWOM). The correlations may be unusually high compared with past studies. However, the meta-analysis of Kim and Hunter (1993) identified a strong average correlation between attitude and purchase intention (mean $r(92)$ = .87, and 95% C.I.: .83 < r < .91) after eliminating methodological artifacts. The magnitude of the correlation increases when attitudinal relevance is higher (for high attitudinal relevance, mean $r(77)$ = .86, and 95%C.I.: .81 < r < .91). In this study, the strength of the match between attitudinal and behavioral elements is high (see Kim & Hunter, 1993, p.341), and thus the high correlation between attitude and intention appears reasonable.

Table 4-6 Standardized Factor Loadings of Interactive SEM of Ping (1996)

Indicators	SOVC	PIEW	PIEW×SOVC	ATT	PINT
EL	0.892/0.934	--	--	--	--
AS	0.881/0.747	--	--	--	--
M&I	0.355/0.380	--	--	--	--
piew1	--	--	--	--	--
piew2	--	0.820/0.865	--	--	--
piew3	--	--	--	--	--
piew4	--	0.899/0.895	--	--	--
piew5	--	0.885/0.845	--	--	--
piew6	--	0.937/0.913	--	--	--
piew7	--	0.829/0.880	--	--	--
piew8	--	0.796/0.843	--	--	--
piew2×EL	--	--	0.825/0.846	--	--
piew2×AS	--	--	0.792/0.716	--	--
piew2×M&I	--	--	0.382/0.385	--	--
piew4×sEL	--	--	0.877/0.869	--	--
piew4×AS	--	--	0.870/0.737	--	--
piew4×M&I	--	--	0.416/0.397	--	--
piew5×EL	--	--	0.868/0.830	--	--
piew5×AS	--	--	0.861/0.702	--	--
piew5×M&I	--	--	0.409/0.376	--	--
piew6×EL	--	--	0.900/0.882	--	--
piew6×AS	--	--	0.894/0.749	--	--
piew6×M&I	--	--	0.432/0.405	--	--
piew7×EL	--	--	0.831/0.857	--	--
piew7×AS	--	--	0.824/0.726	--	--
piew7×M&I	--	--	0.386/0.391	--	--
piew8×EL	--	--	0.808/0.828	--	--
piew8×AS	--	--	0.801/0.700	--	--
piew8×M&I	--	--	0.371/0.375	--	--
att1	--	--	--	--	--
att2	--	--	--	--	--
att3	--	--	--	0.834/0.908	--
att4	--	--	--	0.804/0.892	--
pint1	--	--	--	--	--
pint2	--	--	--	--	0.958/0.956
pint3	--	--	--	--	0.881/0.928

Note: The right number of slash is the results of positive eWOM scenario, and the left one is the results of negative eWOM scenario. All numbers are statistically significant at $\alpha = 0.01$. The factoring-loading values of piew1 and piew3 which are under 0.60 during the CFA procedure were excluded. SOVC = sense of virtual community; PIEW = perceived influence of electronic word of mouth; PIEW×SOVC = the interactive term of SOVC and PIEW; ATT = attitude toward product; PINT = purchase intention.

Table 4-7 Correlations among Construct for Interactive SEM of Ping (1996)

Correlations	SOVC	PIEW	**PIEW×SOVC**	ATT	PINT	SMC
SOVC		0.410	--	0.503	0.440	
PIEW	0.343		--	0.683	0.597	
PIEW×SOVC	--	--		0.099	0.087	
ATT	0.212	-0.340	-0.218		0.874	0.536
PINT	0.171	-0.274	-0.176	0.806		0.764
SMC	--	--	--	0.285	0.650	

Note: The right-up triangle matrix is the correlation matrix for positive eWOM scenario, and left-down triangle matrix is the correlation matrix for negative eWOM scenario. SOVC = sense of virtual community; PIEW = perceived influence of electronic word of mouth; PIEW×SOVC = the interactive term of SOVC and PIEW; ATT = attitude toward product; PINT = purchase intention; SMC=squared multiple correlations.

4.5.5 The Individual Moderating Effects of SOVC

Since the overall moderating effect of SOVC is significant in both scenarios, this study further explores the individual moderating effect for the three factors of SOVC (*i.e.*, EL, AS, and MI) and their scale of that effect. Another simple interactive SEM technique proposed by Ping (1995) is used to test individual moderating effects. Model Ⅰ in Table 4-8 presents the overall moderating effect of SOVC using the method of Ping (1995), and the analytical results demonstrate that it yields similar estimates to the method of Ping (1996). These results indicate that the overall moderating effect of SOVC are significant for the positive eWOM scenario (b = .09, β = .12, t(414) = 2.70, p = .01) and the negative eWOM scenario (b = -.21, β = -.23, t(414) = -4.44, p < .001). Regarding the individual moderating effect, the two scenarios yield different and interesting findings. Models Ⅱ, Model Ⅲ, and Model Ⅳ in Table 4-8 indicate that for positive eWOM the moderating effects of EL (b = .07, β = .09, t(414) = 2.21, p = .03) and MI (b = .07, β = .10, t(414) = 2.17, p = .03) are significant but not that of AS (b = .08, β = .08, t(414) = 1.78, p = .08). Meanwhile, the same models indicate that for negative eWOM the moderating effects of EL (b = -.21, β = -.22, t(430) = -4.70, p

< .001) and AS (b = -.22, β = -.24, t(430) = -4.60, p < .001) are significant, but not that of MI (b = -.08, β = -.08, t(430) = -1.63, p = .10).

Table 4-8 Individual Moderating Effect of the Three SOVC Factors

Model	Cause Constructs	Effect Constructs			
		Positive eWOM		Negative eWOM	
		ATT	PINT	ATT	PINT
Model Ⅰ	PIEW	0.54/0.58(11.20)**	--	-0.45/-0.46(-9.00)**	--
	SOVC	0.30/0.26(5.46)**	--	0.45/0.37(6.57)**	--
	SOVCPIEW	0.09/0.12(2.70)**	--	-0.21/-0.23(-4.44)**	--
	ATT	--	1.07/0.87(19.02)**	--	0.84/0.81(19.91)**
Model Ⅱ	PIEW	0.54/0.58(12.15)**	--	-0.43/-0.45(-8.82)**	--
	EL	0.28/0.26(5.63)**	--	0.45/0.35(6.63)**	--
	ELPIEW	0.07/0.09(2.21)*	--	-0.21/-0.22(-4.70)**	--
	ATT	--	1.07/0.87(18.81)**	--	0.84/0.81(19.92)**
Model Ⅲ	PIEW	0.55/0.60(11.13)**	--	-0.41/-0.43(-7.92)**	--
	AS	0.30/0.22(4.60)**	--	0.38/0.28(4.62)**	--
	ASPIEW	0.08/0.08(1.78)	--	-0.22/-0.24(-4.60)**	--
	ATT	--	1.07/0.87(18.85)**	--	0.84/0.80(19.68)**
Model Ⅳ	PIEW	0.62/0.67(13.01)**	--	-0.27/-0.28(-6.02)**	--
	M&I	0.13/0.14(3.17)*	--	0.43/0.39(7.50)**	--
	MIPIEW	0.07/0.10(2.17)*	--	-0.08/-0.08(-1.63)	--
	ATT	--	1.08/0.89(18.96)**	--	0.83/0.81(20.00)**

Note: SOVC = sense of virtual community; EL = emotional linkages; AS = anticipated support; M&I = membership & Influence; PIEW = perceived influence of electronic word of mouth; SOVC = sense of virtual community; ATT = attitude toward product; PINT = purchase intention; SOVCPIEW = the interaction between SOVC and PIEW; ELPIEW = the interaction between EL and PIEW; ASPIEW = the interaction between AS and PIEW; MIPIEW = the interaction between M&I and PIEW. The numbers to the right of the slash are un-standardized values and those to the left of the slash are standardized values; the number in the bracket is the t value; *: p < .05; **: p < .01. All models are analyzed using the method of Ping (1995); Model Ⅰ models the overall moderating effect of SOVC with EL, AS, and M&I as indicators; meanwhile, Model Ⅱ, Model Ⅲ, and Model Ⅳ model the individual moderating effects of EL, AS, and M&I, respectively.

4.5.6 The Mediating Effects of Attitude

In this study, attitude is predicted to function as a mediating variable that channels the effects from perceived influence of eWOM to purchase intention, the effects from sense of

virtual community to purchase intention, and the effects between interactive effect and purchase intention in both scenarios. A series of tests about the mediating effect of attitude was conducted and based upon the procedure suggested by Baron and Kenny (1986).

About the effects among perceived influence of eWOM, attitude, and purchase intention, the direct effect from perceived influence of eWOM to purchase intention are significant (b = 0.53, β = 0.57, $t(414) = 11.05$, $p < .001$ in the positive scenario; b = -0.39, β = -0.39, $t(430)$ = -7.55, $p < .001$ in the negative scenario). However, the significant direct effect is greatly weakened in the positive eWOM scenario (b = 0.17, β = 0.15, $t(415) = 2.96$, $p = .003$) and becomes insignificant in the negative eWOM scenario (b = -0.02, β = -0.02, $t(431) = -0.55$, p = .58), after attitude was considered as mediated variable (Table 4-9: PIEW→PINT). The test evidences that attitude mediates partial and full effect between perceived influence of eWOM and purchase intention in the positive and negative scenario, respectively.

Regarding the effects among sense of virtual community, attitude, and purchase intention, the direct effect from sense of virtual community to purchase intention are significant (b = 0.30, β = 0.27, $t(414) = 5.56$, $p < .001$ in the positive scenario; b = 0.46, β = 0.37, $t(430) = 6.59$, $p < .001$ in the negative scenario). However, the significant direct effects become insignificant in both positive eWOM scenario (b = -0.11, β = -0.08, $t(415)$ = -1.72, p = .09) and the negative eWOM scenario (b = -0.01, β = -0.00, $t(431) = -0.12$, p = .90), after attitude was considered as mediated variable (see Table 4-9: SOVC→PINT). This result evidences that attitude mediates full effect between sense of virtual community and purchase intention in both positive and negative scenarios.

Concerning the effects among interaction effect, attitude, and purchase intention, a test to determine whether attitude mediates the moderating effect of H4a and H4b was also conducted. Table 4-9 shows that significantly direct effects from interaction term

(SOVCPIEW) to purchase intention (PINT) in the positive eWOM scenario (b = 0.07, β = 0.10, t(414) = 2.40, p = .02) and the negative eWOM scenario (b = -0.20, β = -0.22, t(430) = -4.60, p < .001) are obtained. After considering attitude as mediating variable, as shown in Table 4-9, the mediating test of attitude is not supported because the indirect effect from interactive term (SOVCPIEW) to attitude (ATT) is not significant in the positive eWOM scenario (b = 0.05, β = 0.07, t(415) = 1.48, p = .14), however, the significant direct effect becomes insignificant in the negative eWOM scenario (b = -0.01, β = -0.01, t(431) = -0.27, p = .79). Therefore, attitude fully mediates the moderating effect of a sense of virtual community in only negative scenario, which was termed as the effect of "mediated moderation" by Baron and Kenny (1986). In conclusion, Attitude can be empirically considered as antecedent mediating variable of purchase intention in this study.

Table 4-9 Tests for the Mediating Effects of Attitude

Direct effect：PIEW/SOVC/SOVCPIEW→PINT					
		Effect Constructs			
		Positive eWOM		Negative eWOM	
Cause Constructs		PINT		PINT	
PIEW		0.53/0.57**		-0.46/-0.47**	
SOVC		0.30/0.27**		0.45/ 0.37**	
SOVCPIEW		0.07/0.10*		-0.20/-0.22**	
Indirect effect：PIEW/SOVC/SOVCPIEW→ATT→PINT					
		Effect Constructs			
	Cause	Positive eWOM		Negative eWOM	
Direct path	Constructs	ATT	PINT	ATT	PINT
PIEW→PINT	PIEW	0.50/ 0.54**	0.17/ 0.15**	-0.45/-0.46**	-0.02/-0.02
	SOVC	0.30/ 0.26**	--	0.51/ 0.42**	--
	ATT	--	0.90/ 0.75**	--	0.83/ 0.80**
SOVC→PINT	PIEW	0.52/ 0.67**	--	-0.45/-0.46**	--
	SOVC	0.30/ 0.27**	-0.11/-0.08	0.51/ 0.42**	-0.01/-0.00
	ATT	--	1.14/ 0.92**	--	0.84/ 0.81**
SOVCPIEW→ PINT	PIEW	0.53/ 0.57**	--	-0.46/-0.47**	--
	SOVC	0.30/ 0.27**	--	0.45/ 0.37**	--
	SOVCPIEW	0.05/ 0.07	0.07/ 0.08*	-0.20/-0.22**	-0.01/-0.01
	ATT	--	1.08/ 0.87**	--	0.83/ 0.80**

Note: The numbers to the right of the slash are un-standardized values and those to the left of the slash are standardized values. *: p < .05; **: p < .01.

CHAPTER 5 DISCUSSIONS

5.1 Conclusions

The value and influence of eWOM differs from that of offline WOM because consumers cannot directly examine source credibility and their similarity with online informants. Brown *et al.* (2007) proposed that the relationship and interaction between online communities and their members substitutes for the relationship between individuals in assessing the influence of eWOM. This study aims to examine whether sense of virtual community moderates the influence of eWOM on consumers. The analytical results resembled the arguments of Brown *et al.* (2007), and indicated that consumer sense of virtual community reinforces the influence of eWOM on product attitudes and purchase intention.

According to the accessibility-diagnosticity model, consumer consciousness of a good relationship toward an online community enhances the diagnosticity and influence of online product comments (Feldman & Lynch, 1988; Herr *et al.*, 1991). Particularly in the case of negative comments, the reinforced (moderating) effect of the sense of virtual community (b = -0.20, β = -0.22, $t(430) = -4.60$, $p < .001$) is stronger than those of in the positive comments (b = 0.07, β = 0.10, $t(414) = 2.40$, $p = .02$).[9] This result resembles the findings of Herr *et al.* (1991) that extremely negative product comments have more ability (or diagnosticity) to facilitate people recognizing product quality than positive and neutral product comments do.

[9] The absolute difference in path coefficient of interaction between positive and negative eWOM is tested using the method of Paternoster, Mazerolle, and Piquero (1998), which uses the following formula: $Z = (b_1 - b_2)/\sqrt{SE_{b1}^2 + SE_{b2}^2}$. In result, the test is significant ($z = 2.46$, $p = .01$).

Additionally, the three factors of SOVC, *i.e.*, Emotional Linkages, Anticipated Support, and Membership & Influence, were explored and confirmed, and this study also assessed the individual moderating effect for the three SOVC factors. The results are interesting in that the source of the moderating effect for SOVC differs between positive and negative eWOM. Specifically, the moderating effect of SOVC primarily comes from *Emotional Linkages* and *Membership & Influence* but not from *Anticipated Support* for positive eWOM. However, the effect primarily derives from *Emotional Linkages* and *Anticipated Support* but not from *Membership & Influence* for negative eWOM. This finding implies that positive and negative eWOM differ intrinsically.

In this study, *Membership & Influence* resembles the feeling that members identify with and influenced by an online community, while *Anticipated Support* resembles the feeling that members view an online community as a product expert. When consumers face positive eWOM regarding unfamiliar products (*e.g.*, game software in this study), they attempt to seek information from close friends rather than remote experts to avoid expectation incongruity, because they may see experts as more likely than friends to be paid advertisers of the product (Bone, 1995; Brown & Reingen, 1987). Thus, the moderating effect derives from *Membership & Influence* but not *Anticipated Support* for positive eWOM. Meanwhile, when consumers face negative eWOM regarding unfamiliar products, they see product criticisms from trustable and capable experts as more believable than those from familiar friends, because they believe experts are more capable of identifying product drawbacks than familiar friends. Thus, the moderating effect derives from *Anticipated Support* but not *Membership & Influence* for negative eWOM.

5.2 Theoretical Implications

This study has shed light on several theoretic implications. First, this investigation links three critical research fields, *i.e.*, socio-psychology in community psychology, marketing in word-of-mouth communication, and consumer psychology in attitude and intention under a cyberspace environment. The research results reveal the influence of electronic word-of-mouth communications on consumer attitudes and behavioral intention in online societies when considering the social power of virtual community. Second, based on the perspective of virtual consumption communities advocated by Kozinets (1999), this study empirically supports virtual communities exerting social leverage on consumer behaviors. Third, as discussed earlier, assessing the influence of word-of-mouth communications online differs from assessing its influence offline because virtual communities replace individuals as the focus for assessing information value (Brown *et al.*, 2007). Researchers of eWOM should pay more attention to the interaction between websites and their contents. Finally, since the newly developed SOVC scale needed empirical evidence in its validity and application (Blanchard, 2007), this study also verifies the factor structure of SOVC in the case of online game communities.

5.3 Managerial Implications

This study suggests several management implications. First, online brand community developers should utilize the power of online communities to cultivate and maintain harmonious relationships among community members, thus enhancing the development of a strong sense of virtual community. Online community developers thus should establish a set of norms or netiquette to avoid destroying community harmony, and to ensure member emotional safety while participating in the community. Developers can also encourage members to initiate activities involving common topics, and empower them to control community development by permitting members appraise the behaviors or performances of

other members. Finally, a mentoring scheme can be established via which veterans are assigned to newcomers to facilitate the process of learning and adopting online community culture.

Second, online marketers should realize the influence of eWOM, since the Internet provides excellent access to information. Online marketers can benefit from the diffusion of positive eWOM via herding effects, such when abundant information helps potential consumers view the product positively (Huang & Chen, 2006). Also, a recommendation system or reward program can promote positive eWOM. However, the influence of eWOM runs in two directions, and negative comments can also flood online discussion forums. In contrast to WOM, eWOM can be preserved perpetually in online forums as a website ingredient. Additionally, since cyberspace provides complainers with a place to vent negative emotions (Halstead, 2002) it may encourage negative feedback over positive. Still, negative feedback provides an opportunity for online marketers recognize product defects or inefficiencies in the consumption process and respond appropriately. Online marketers should actively collect and systematically manage negative product comments, particularly those in highly-cohesive online communities.

5.4 Research Limitations and Suggestions

The study has several limitations which provide opportunities for future research. First, this study only considered one type of product (game software). Future investigations thus should consider different products (*e.g.*, durable goods) or services (*e.g.*, haircuts) to better understand the moderating effect of online communities. Second, this study only considered one decision situation (*i.e.*, initial purchase). Future studies could consider other decision situations, such as decisions regarding switching brands. Third, the model in this study used purchase intention, instead of actual purchase behavior, as one of the effect constructs.

Future research could examine the interactive effect between perceived influence of eWOM and sense of virtual community on actual purchase behavior.

Fourth, this study manipulated positive eWOM and negative eWOM scenarios for each including four product comments. However, the comments were all positively worded in the positive scenario and negatively worded in the negative scenario. The design of scenario departed from regular situation in real world since product/service seldom obtains fully positive or negative evaluations. Future research should design the scenario with realistic condition, i.e., mixing positive and negative eWOM in the scenario, and then examine the hypotheses in this study. Finally, to simplify the manipulation of scenario, this work focused on the influence of online information. However, the value of offline opinions is also decisive to product judgment and purchase decision under more general situation. To extend the work of Halstead (2002), whether these two types of information value are substitute for or complementary to this moderated effect in the present study claims for future works to clarify.

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APPENDIX

Appendix A: Research Questionnaires

Positive eWOM Scenario

問卷編號：G_____

親愛的受訪者您好：

這是一份學術性的研究問卷，懇請您依訪問員的指示按頁次順序填答，並仔細閱讀問題與情境。本問卷採無記名方式，資料僅供學術研究使用且不對外公佈，敬請安心做答，非常感激您的協助。

敬祝　身體健康、萬事如意

交通大學管理科學系博士生　蕭登泰　敬啟

第一部份　網路社群相關資料

1、您是否曾加入，或未加入但經常瀏覽**某一個**網路遊戲社群（如巴哈姆特、遊戲基地等具有討論區的網路遊戲社群）？

□是（**請填寫最常接觸的網路遊戲社群名稱：**_____）

□否（問卷到此結束！謝謝您的協助！）

2、您接觸這個網路遊戲社群大約有多久了？_____月

3、您經常在討論區上發表意見嗎？

□是，我時常在討論區上發表意見。　□否，我以閱讀別人所發表的言論為主。

4、承上題，請問你平均每月發表言論的次數大約是多少？　□0 次　□1~3 次　□4~6 次　□7~9 次　□10 次以上

5、您現在是否是這個網路遊戲社群的會員嗎？ □是，我是會員。 □否，我不是會員。						
第二部份 認知網路社群意識						
以下問題是要了解您與所屬網路遊戲社群之間的社群意識，請以**第一部分第 1 題所提到的網路遊戲社群**作為回答的依據對象。(註：請您**填滿**所回答的選項，分數範圍 1~6。分數越高表示同意程度越高。)	**非常不同意**	**不同意**	**有點不同意**	**有點同意**	**同意**	**非常同意**
1、在這個網路社群我感覺很自在。	1	2	3	4	5	6
2、在這個網路社群我能夠認出多數會員的名字。	1	2	3	4	5	6
3、這個網路社群大多數的會員認識我。	1	2	3	4	5	6
4、我會在乎這個網路社群的其他會員怎麼看待我的行動。	1	2	3	4	5	6
5、我能夠影響這個網路社群的發展。	1	2	3	4	5	6
6、如果這個網路社群有問題產生，會有人能夠解決。	1	2	3	4	5	6
7、這個網路社群的會員分享相同的價值觀。	1	2	3	4	5	6
8、我認為這個網路社群是值得我成為會員的好地方。	1	2	3	4	5	6
9、其他會員和我想從這個網路社群得到相同的東西。	1	2	3	4	5	6
10、這個網路社群的會員彼此能夠和睦共處。	1	2	3	4	5	6
11、成為這個遊戲社群網站的會員對我而言是很重要的。	1	2	3	4	5	6
12、我期待自己會長久留在這個網路社群。	1	2	3	4	5	6
13、我預期有些會員將針對這個社群的某些問題作出回應。	1	2	3	4	5	6
14、加入這個網路社群我獲益良多。	1	2	3	4	5	6
15、這個網路社群曾經解決過我的問題。	1	2	3	4	5	6
16、我曾經在這個網路社群得到支持。	1	2	3	4	5	6

17、這個網路社群中的某些會員彼此相互友好。	1	2	3	4	5	6
18、我有朋友在這個網路社群。	1	2	3	4	5	6
19、這個網路社群中的某些會員能被指望來幫助其他人。	1	2	3	4	5	6
20、我覺得有義務要幫助這個網路社群的其他人。	1	2	3	4	5	6
21、我真的喜歡這個網路社群。	1	2	3	4	5	6
22、這個網路社群對我來說意義重大。	1	2	3	4	5	6

第三部份　認知口碑影響力

請仔細閱讀以下的情境，並回答後續問題。

你對最近在電視上廣告打得很兇的一款新遊戲「GaMe」感到很有興趣，價格也很合理，但卻很猶豫是否值得購買。於是你登入所屬的網路遊戲社群之討論區（也就是第一部分第 1 小題所提到的社群網站的討論區），閱讀已經玩過「GaMe」的玩家所寫下的評語，你發現有幾篇評論描述如下：

X：『...我覺得「GaMe」真是一款好玩的遊戲，我從遊戲當中得到許多樂趣。不僅角色人物豐富多樣，背景動畫栩栩如生，有身歷其境的感受，而且還可多人連線，與朋友一同歡樂，享受一起組隊破敵的快感...』

Y：『...我喜歡「GaMe」，因為遊戲本身的劇情事件多變，你經常意想不到接下來去的地方會發生什麼事。人物、地點、事件的多變性，使得劇情高潮跌起，令人一刻不得喘息，這不是其他遊戲所能比擬的...』

W：『...如果你已經對傳統的遊戲模式感到無趣的話，那一定要試試「GaMe」，它是一款具有挑戰性的遊戲！創新多變的遊戲模式，你需要運用點智慧才能順利過關，每次過關後都有一種莫名的成就感產生...』

Z：『...在所有玩過的遊戲當中，我給「GaMe」的評價最高。我喜歡他的聲光效果，而且在操作上相當容易上手。遊戲流暢度很高，連線對戰也不太會 lag，每次玩這款

遊戲都能讓我的心情很愉悅...』						
請仔細思考以上評論對購買「**GaMe**」的影響，並回答下列問題。(註：請您**填滿**所回答的選項。分數範圍 1~6，分數越高表示同意程度越高。)	**非常不同意**	**不同意**	**有點不同意**	**有點同意**	**同意**	**非常同意**
1、以上評論提供一些關於「**GaMe**」的新資訊。	1	2	3	4	5	6
2、以上評論將左右我購買「**GaMe**」的決定。	1	2	3	4	5	6
3、以上評論提到一些我沒考慮到的因素。	1	2	3	4	5	6
4、以上評論會改變我是否購買「**GaMe**」的想法。	1	2	3	4	5	6
5、以上評論對決定是否購買「**GaMe**」是有幫助的。	1	2	3	4	5	6
6、以上評論對於我是否購買「**GaMe**」是有影響的。	1	2	3	4	5	6
7、以上評論對購買「**GaMe**」所考慮到的因素有很大的影響。	1	2	3	4	5	6
8、以上評論對是否決定購買「**GaMe**」是重要的。	1	2	3	4	5	6
第四部份　態度與行為意願						
在閱讀完上述對「**GaMe**」的評價後，請回答以下問題。(註：請您**填滿**所回答的選項。分數範圍 1~6，分數越高表示同意程度越高。)	**非常不同意**	**不同意**	**有點不同意**	**有點同意**	**同意**	**非常同意**
1、「**GaMe**」是吸引我的。	1	2	3	4	5	6
2、我很喜歡「**GaMe**」。	1	2	3	4	5	6
3、擁有「**GaMe**」將是令人滿意的。	1	2	3	4	5	6
4、我對「**GaMe**」抱持正面評價。	1	2	3	4	5	6

5、我打算去購買「**GaMe**」。	1	2	3	4	5	6
6、我計劃去買下「**GaMe**」。	1	2	3	4	5	6
7、我對購買「**GaMe**」的意圖很強烈。	1	2	3	4	5	6

第五部份　個人基本資料

1、您的性別是：□男　□女

2、您的年齡是：□13~18 歲　□19~24 歲　□25~30 歲　□31~40 歲　□41 歲以上

3、您目前最高學歷：□高中（職）以下　□大學（專）　□研究所以上

4、您目前的職業是：□學生　□上班族　□軍公教人員　□待業中　□其他_____

5、您每月平均可以花用多少錢？　□5,000 元以下　□5,001~10,000 元　□10,001~20,000 元　□20,001 元以上

6、您每天使用網路的平均時間大概有多少小時？

□2 小時以下　□2 小時以上 4 小時以下　□4 小時以上 6 小時以下　□6 小時以上

7、Email：_____（若您想得知研究結果歡迎填上，可自由填寫）

問卷到此結束，請您再次仔細檢查是否有題目漏答，非常感謝您的協助！

Negative eWOM Scenario

問卷編號：B_____

親愛的受訪者您好：

這是一份學術性的研究問卷，懇請您依訪問員的指示按頁次順序填答，並仔細閱讀問題與情境。本問卷採無記名方式，資料僅供學術研究使用且不對外公佈，敬請安心做答，非常感激您的協助。

敬祝　身體健康、萬事如意

交通大學管理科學系博士生　蕭登泰　敬啟

第一部份　網路社群相關資料

1、您是否曾加入，或未加入但經常瀏覽**某一個**網路遊戲社群（如巴哈姆特、遊戲基地等具有討論區的網路遊戲社群）？

□是（**請填寫最常接觸的網路遊戲社群名稱：**_____）

□否（問卷到此結束！謝謝您的協助！）

2、您接觸這個網路遊戲社群大約有多久了？_____月

3、您經常在討論區上發表意見嗎？

□是，我時常在討論區上發表意見。　□否，我以閱讀別人所發表的言論為主。

4、承上題，請問你平均每月發表言論的次數大約是多少？□0 次　□1~3 次　□4~6 次　□7~9 次　□10 次以上

5、您現在是否是這個網路遊戲社群的會員嗎？

□是，我是會員。　□否，我不是會員。

第二部份　認知網路社群意識						
以下問題是要了解您與所屬網路遊戲社群之間的社群意識，請以**第一部分第 1 小題所提到的網路遊戲社群**作為回答的依據對象。(註：請您**填滿**所回答的選項，分數範圍 1~6。分數越高表示同意程度越高。)	**非常不同意**	**不同意**	**有點不同意**	**有點同意**	**同意**	**非常同意**
1、在這個網路社群我感覺很自在。	1	2	3	4	5	6
2、在這個網路社群我能夠認出多數會員的名字。	1	2	3	4	5	6
3、這個網路社群大多數的會員認識我。	1	2	3	4	5	6
4、我會在乎這個網路社群的其他會員怎麼看待我的行動。	1	2	3	4	5	6
5、我能夠影響這個網路社群的發展。	1	2	3	4	5	6
6、如果這個網路社群有問題產生，會有人能夠解決。	1	2	3	4	5	6
7、這個網路社群的會員分享相同的價值觀。	1	2	3	4	5	6
8、我認為這個網路社群是值得我成為會員的好地方。	1	2	3	4	5	6
9、其他會員和我想從這個網路社群得到相同的東西。	1	2	3	4	5	6
10、這個網路社群的會員彼此能夠和睦共處。	1	2	3	4	5	6
11、成為這個遊戲社群網站的會員對我而言是很重要的。	1	2	3	4	5	6
12、我期待自己會長久留在這個網路社群。	1	2	3	4	5	6
13、我預期有些會員將針對這個社群的某些問題作出回應。	1	2	3	4	5	6
14、加入這個網路社群我獲益良多。	1	2	3	4	5	6
15、這個網路社群曾經解決過我的問題。	1	2	3	4	5	6
16、我曾經在這個網路社群得到支持。	1	2	3	4	5	6
17、這個網路社群中的某些會員彼此相互友好。	1	2	3	4	5	6

18、我有朋友在這個網路社群。	1	2	3	4	5	6
19、這個網路社群中的某些會員能被指望來幫助其他人。	1	2	3	4	5	6
20、我覺得有義務要幫助這個網路社群的其他人。	1	2	3	4	5	6
21、我真的喜歡這個網路社群。	1	2	3	4	5	6
22、這個網路社群對我來說意義重大。	1	2	3	4	5	6

第三部份　認知口碑影響力

請仔細閱讀以下的情境，並回答後續問題。

你對最近在電視上廣告打得很兇的一款新遊戲「GaMe」感到很有興趣，價格也很合理，但卻很猶豫是否值得購買。於是你登入所屬的網路遊戲社群之討論區（也就是第一部分第 1 小題所提到的社群網站的討論區），閱讀已經玩過「GaMe」的玩家所寫下的評語，你發現有幾篇評論描述如下：

W：『...「GaMe」真是一款糟透的遊戲。裡面的人物和動畫都不是做的很精緻，看起來很假，而且角色選擇性也不多，人物能力設定上也不平衡，更糟的是，連音效配音也很不協調...』

X：『...當初滿懷期待地買了這款「GaMe」來玩，一個月之後，我後悔了。它的遊戲介面很複雜，而且不容易操作，遊戲說明也寫得不清不楚。連線品質也差，伺服器經常斷線，或是關主機維修很久...』

Z：『...「GaMe」我玩了一段時間後，它就被其他遊戲給取代了。非常單調無趣的遊戲模式，漫無目的地在地圖上亂晃，不斷地打怪、升等，就這樣。遊戲完全沒有故事性，也沒有設定劇情，相當無聊...』

Y：『...沒有特色的一款遊戲，玩完之後我給它的評價相當地低。如果有朋友問我「GaMe」好不好玩，我會告訴他，不要浪費時間，不要浪費金錢...』

請仔細思考以上評論對購買「**GaMe**」的影響，並回答下列問題。(註：請您**填滿**所回答的選項。分數範圍 1~6，分數越高表示同意程度越高。)	**非常不同意**	**不同意**	**有點不同意**	**有點同意**	**同意**	**非常同意**
1、以上評論提供一些關於「**GaMe**」的新資訊。	1	2	3	4	5	6
2、以上評論將左右我購買「**GaMe**」的決定。	1	2	3	4	5	6
3、以上評論提到一些我沒考慮到的因素。	1	2	3	4	5	6
4、以上評論會改變我是否購買「**GaMe**」的想法。	1	2	3	4	5	6
5、以上評論對決定是否購買「**GaMe**」是有幫助的。	1	2	3	4	5	6
6、以上評論對於我是否購買「**GaMe**」是有影響的。	1	2	3	4	5	6
7、以上評論對購買「**GaMe**」所考慮到的因素有很大的影響。	1	2	3	4	5	6
8、以上評論對是否決定購買「**GaMe**」是重要的。	1	2	3	4	5	6
第四部份　態度與行為意願						
在閱讀完上述對「**GaMe**」的評價後，請回答以下問題。(註：請您**填滿**所回答的選項。分數範圍 1~6，分數越高表示同意程度越高。)	**非常不同意**	**不同意**	**有點不同意**	**有點同意**	**同意**	**非常同意**
1、「**GaMe**」是吸引我的。	1	2	3	4	5	6
2、我很喜歡「**GaMe**」。	1	2	3	4	5	6
3、擁有「**GaMe**」將是令人滿意的。	1	2	3	4	5	6
4、我對「**GaMe**」抱持正面評價。	1	2	3	4	5	6
5、我打算去購買「**GaMe**」。	1	2	3	4	5	6

6、我計劃去買下「**GaMe**」。	1	2	3	4	5	6
7、我對購買「**GaMe**」的意圖很強烈。	1	2	3	4	5	6

第五部份　個人基本資料

1、您的性別是：□男　□女

2、您的年齡是：□13~18 歲　□19~24 歲　□25~30 歲　□31~40 歲　□41 歲以上

3、您目前最高學歷：□高中（職）以下　□大學（專）　□研究所以上

4、您目前的職業是：□學生　□上班族　□軍公教人員　□待業中　□其他_____

5、您每月平均可以花用多少錢？　□5,000 元以下　□5,001~10,000 元　□10,001~20,000 元　□20,001 元以上

6、您每天使用網路的平均時間大概有多少小時？

□2 小時以下　□2 小時以上 4 小時以下　□4 小時以上 6 小時以下　□6 小時以上

7、Email：_____（若您想得知研究結果歡迎填上，可自由填寫）

問卷到此結束，請您再次仔細檢查是否有題目漏答，非常感謝您的協助！

Appendix B: Correlation Matrix for Research Variables

Items	sovc1	sovc2	sovc3	sovc4	sovc5	sovc6	sovc7	sovc8	sovc9	sovc10	sovc11	sovc12	sovc13
sovc1		.16	.04	.12	.03	.37	.26	.47	.36	.34	.29	.33	.34
sovc2	.20		.66	.49	.45	.11	.23	.21	.14	.21	.26	.22	.21
sovc3	.10	.66		.53	.62	.06	.25	.10	.06	.17	.18	.11	.12
sovc4	.15	.38	.49		.48	.20	.26	.21	.14	.21	.36	.26	.20
sovc5	.08	.40	.66	.48		.12	.23	.13	.08	.16	.25	.15	.10
sovc6	.36	.18	.08	.24	.07		.45	.49	.42	.38	.34	.34	.41
sovc7	.32	.28	.25	.30	.23	.39		.45	.49	.49	.35	.31	.33
sovc8	.57	.16	.07	.26	.11	.48	.34		.60	.49	.59	.60	.50
sovc9	.41	.16	.11	.26	.08	.38	.43	.45		.44	.47	.42	.45
sovc10	.28	.25	.21	.21	.17	.26	.47	.27	.41		.49	.45	.36
sovc11	.44	.32	.25	.42	.25	.30	.28	.62	.34	.33		.75	.43
sovc12	.44	.23	.12	.34	.14	.32	.21	.64	.34	.21	.71		.52
sovc13	.39	.12	.04	.24	.07	.43	.30	.50	.45	.28	.37	.48	
sovc14	.50	.19	.06	.25	.09	.41	.32	.60	.41	.27	.51	.66	.58
sovc15	.36	.15	.02	.20	.04	.37	.16	.49	.34	.18	.41	.53	.52
sovc16	.34	.35	.34	.39	.30	.33	.19	.46	.29	.23	.48	.53	.36
sovc17	.40	.22	.17	.29	.15	.35	.29	.42	.37	.29	.34	.42	.46
sovc18	.31	.26	.25	.29	.23	.27	.26	.35	.30	.21	.36	.40	.35
sovc19	.44	.20	.09	.26	.10	.42	.28	.48	.36	.29	.40	.46	.52
sovc20	.39	.35	.27	.46	.24	.39	.39	.46	.40	.29	.49	.50	.43
sovc21	.53	.24	.12	.28	.11	.35	.28	.59	.37	.28	.57	.69	.49
sovc22	.44	.24	.18	.36	.25	.34	.24	.57	.29	.22	.67	.67	.43
piew1	.22	-.09	-.04	.06	.01	.24	.11	.22	.13	.06	.12	.20	.33
piew2	.22	-.11	-.13	-.03	-.06	.23	.08	.30	.20	.06	.19	.26	.34
piew3	.07	-.06	-.05	.02	.02	.10	.04	.05	.06	.08	.08	.07	.06
piew4	.21	-.06	-.08	-.01	-.03	.21	.09	.23	.21	.11	.17	.22	.31
piew5	.19	-.03	-.05	.05	.01	.25	.13	.21	.23	.12	.16	.23	.32
piew6	.24	-.09	-.13	.00	-.06	.24	.05	.25	.24	.12	.19	.23	.30
piew7	.19	-.10	-.08	.02	-.01	.17	.07	.20	.21	.10	.16	.20	.25
piew8	.20	-.09	-.07	-.02	-.01	.13	.08	.19	.13	.13	.16	.17	.25
att1	.06	.26	.29	.33	.28	.12	.19	.13	.16	.15	.18	.19	.15
att2	.06	.28	.31	.33	.29	.11	.23	.11	.15	.18	.19	.17	.17
att3	.05	.26	.33	.33	.30	.11	.24	.12	.14	.16	.18	.15	.15
att4	.09	.27	.31	.34	.26	.12	.22	.10	.19	.21	.16	.13	.13
pint1	.07	.22	.32	.30	.30	.08	.14	.08	.10	.16	.15	.13	.10
pint2	.06	.22	.29	.28	.27	.09	.15	.10	.07	.13	.15	.13	.12
pint3	.06	.19	.31	.28	.28	.06	.14	.07	.09	.15	.15	.08	.08

Note: The right-up triangle matrix is the correlation matrix for positive eWOM scenario, and left -down triangle matrix is t

Correlation Matrix for Research Variables (Cont.)

	sovc20	sovc21	sovc22	piew1	piew2	piew3	piew4	piew5	piew6	piew7	piew8	att1	at
sovc1	.29	.40	.36	.19	.25	.07	.22	.24	.21	.16	.20	.24	.2
sovc2	.24	.23	.22	.13	.11	.15	.11	.12	.11	.13	.13	.13	.1
sovc3	.15	.13	.12	.09	.07	.12	.08	.06	.07	.14	.19	.05	.1
sovc4	.31	.27	.29	.17	.23	.18	.22	.21	.22	.21	.28	.20	.2
sovc5	.23	.17	.16	.03	.05	.02	.09	.08	.08	.15	.17	.10	.1
sovc6	.43	.47	.41	.18	.21	.03	.22	.29	.24	.20	.24	.22	.1
sovc7	.42	.40	.40	.18	.15	.18	.20	.20	.20	.19	.20	.23	.2
sovc8	.53	.67	.62	.21	.25	.11	.24	.28	.25	.22	.19	.28	.2
sovc9	.47	.52	.51	.19	.18	.10	.21	.23	.23	.22	.17	.22	.1
sovc10	.41	.45	.43	.14	.12	.15	.13	.17	.13	.12	.11	.20	.1
sovc11	.50	.63	.66	.14	.20	.14	.24	.26	.23	.22	.21	.24	.2
sovc12	.49	.65	.61	.16	.20	.13	.21	.26	.23	.15	.14	.23	.2
sovc13	.46	.58	.51	.26	.18	.14	.22	.26	.21	.21	.19	.27	.2
sovc14	.59	.74	.72	.25	.23	.16	.25	.31	.26	.24	.18	.32	.2
sovc15	.48	.58	.59	.23	.24	.12	.24	.31	.24	.23	.23	.22	.1
sovc16	.52	.50	.53	.22	.20	.18	.21	.27	.23	.28	.26	.29	.2
sovc17	.51	.55	.53	.23	.28	.19	.26	.32	.27	.29	.27	.31	.2
sovc18	.40	.41	.36	.17	.17	.09	.19	.23	.20	.23	.20	.22	.2
sovc19	.58	.60	.56	.22	.27	.07	.26	.35	.28	.28	.29	.30	.2
sovc20		.67	.70	.20	.21	.14	.28	.35	.31	.33	.27	.28	.2
sovc21	.57		.74	.22	.23	.12	.26	.33	.28	.27	.20	.32	.2
sovc22	.58	.73		.26	.25	.17	.28	.32	.27	.29	.28	.34	.3
piew1	.14	.19	.13		.58	.54	.49	.56	.49	.52	.51	.53	.5
piew2	.13	.25	.23	.57		.46	.75	.71	.76	.66	.69	.57	.5
piew3	.08	.11	.09	.20	.32		.49	.46	.47	.45	.44	.39	.3
piew4	.13	.24	.20	.54	.82	.32		.78	.85	.74	.74	.55	.5
piew5	.18	.29	.25	.54	.74	.31	.77		.84	.76	.71	.54	.4
piew6	.16	.26	.24	.54	.79	.29	.82	.76		.77	.73	.56	.5
piew7	.15	.21	.21	.48	.76	.28	.78	.74	.85		.79	.51	.4
piew8	.13	.23	.22	.53	.76	.28	.75	.71	.78	.83		.54	.5
att1	.28	.19	.18	-.08	-.23	.06	-.24	-.20	-.26	-.30	-.27		.8
att2	.30	.20	.19	-.08	-.25	.06	-.26	-.20	-.30	-.32	-.27	.89	
att3	.28	.17	.17	-.05	-.23	.02	-.22	-.19	-.28	-.30	-.25	.86	.8
att4	.31	.16	.16	-.07	-.23	.05	-.24	-.22	-.26	-.30	-.27	.78	.8
pint1	.21	.12	.14	-.07	-.21	.09	-.21	-.16	-.25	-.27	-.24	.73	.7
pint2	.22	.13	.15	-.07	-.21	.10	-.20	-.17	-.24	-.29	-.23	.72	.7
pint3	.21	.11	.15	-.10	-.23	.05	-.20	-.17	-.26	-.29	-.24	.68	.7

Note: The right-up triangle matrix is the correlation matrix for positive eWOM scenario, and left -down triangle matrix is t

Appendix C: The Results of Exploratory Factor Analysis for SOVC

Table C-1 Explained variance of Exploratory Factor Analysis for SOVC

	Initial statistics			Sum of square for extracted factor loading			Sum of square for rotated factor loading
Factor	eigenvalue	variance %	cumulate %	eigenvalue	variance %	cumulate %	Total
1	8.49	42.44	42.44	8.01	40.05	40.05	7.40
2	2.40	12.01	54.45	2.01	10.06	50.11	6.51
3	1.24	6.20	60.65	0.73	3.65	53.76	3.20
4	0.91	4.53	65.18				
5	0.69	3.43	68.61				
6	0.62	3.12	71.73				
7	0.59	2.96	74.69				
8	0.59	2.93	77.62				
9	0.58	2.88	80.50				
10	0.51	2.57	83.07				
11	0.49	2.45	85.52				
12	0.48	2.39	87.92				
13	0.41	2.06	89.98				
14	0.40	1.99	91.97				
15	0.33	1.66	93.63				
16	0.30	1.48	95.11				
17	0.28	1.42	96.53				
18	0.27	1.33	97.86				
19	0.23	1.16	99.02				
20	0.20	0.98	100.00				

Note: Factor extracted method adopted maximum likelihood estimation, and factor rotation method used Kasiser's normalized Promax method.

Table C-2 The Analysis of Exploratory Factor Analysis for SOVC

	Communalities		Rotated Factor Loading		
	Initial	Extracted	Factor 1	Factor 2	Factor 3
sovc2	0.49	0.52			0.69
sovc3	0.63	0.83			0.94
sovc4	0.41	0.41			0.54
sovc5	0.46	0.49			0.70
sovc6	0.38	0.42		0.68	
sovc7	0.40	0.41		0.71	
sovc8	0.59	0.59	0.54		
sovc9	0.43	0.45		0.64	
sovc10	0.35	0.30		0.48	
sovc11	0.66	0.64	0.88		
sovc12	0.66	0.69	0.97		
sovc13	0.47	0.47		0.45	
sovc14	0.69	0.70	0.65		
sovc15	0.56	0.52	0.52		
sovc16	0.50	0.47	0.40		
sovc17	0.44	0.44		0.45	
sovc19	0.48	0.47		0.41	
sovc20	0.55	0.53	0.43		
sovc21	0.69	0.70	0.76		
sovc22	0.69	0.70	0.86		
		Correlation Matrix among Factors			
		Factor 1	1.00		
		Factor 2	0.74	1.00	
		Factor 3	0.29	0.30	1.00

Note: Factor extracted method adopted maximum likelihood estimation, and factor rotation method used Kasiser's normalized Promax method.

Appendix D: SIMPLIS Syntax of LISREL for Ping (1996)

Positive eWOM Scenario

Observed variables: SOVC1 SOVC SOVC3 PIEW2 PIEW4 PIEW5 PIEW6 PIEW7 PIEW8 ATT1 ATT2 ATT3 ATT4 SN1 SN2 SN3 PINT1 PINT2 PINT3 WINT1 WINT2 WINT3 PBC1 PBC2 PS21 PS22 PS23 PS41 PS42 PS43 PS51 PS52 PS53 PS61 PS62 PS63 PS71 PS72 PS73 PS81 PS82 PS83

Raw data from file Positive417_IF.psf

Sample size: 417

Latent variables: SOVC PIEW ATT SN PINT WINT PBC PS

Relationships:

SOVC1=1*SOVC
SOVC2 SOVC3=SOVC
PIEW2=1*PIEW
PIEW4-PIEW8=PIEW
ATT3=1*ATT
ATT4=ATT
PINT2=1*PINT
PINT3=PINT
PS21=1.000*PS
PS22=0.954*PS
PS23=0.430*PS
PS41=1.067*PS
PS42=1.018*PS
PS43=0.459*PS
PS51=1.052*PS
PS52=1.004*PS
PS53=0.452*PS
PS61=1.117*PS
PS62=1.066*PS
PS63=0.480*PS
PS71=0.942*PS
PS72=0.899*PS
PS73=0.405*PS

PS81=0.968*PS

PS82=0.923*PS

PS83=0.416*PS

ATT= PIEW PS SOVC

PINT=ATT

SET THE ERROR COVARIANCE OF PIEW2 AND PIEW8 FREE

SET THE ERROR COVARIANCE OF PIEW7 AND PIEW8 FREE

SET THE VARIANCE OF PS TO (1.216)

SET THE ERROR VARIANCE OF PS21 TO 0.905

SET THE ERROR VARIANCE OF PS22 TO (0.867)

SET THE ERROR VARIANCE OF PS23 TO 2.085

SET THE ERROR VARIANCE OF PS41 TO 0.661

SET THE ERROR VARIANCE OF PS42 TO 0.643

SET THE ERROR VARIANCE OF PS43 TO 1.942

SET THE ERROR VARIANCE OF PS51 TO 0.700

SET THE ERROR VARIANCE OF PS52 TO 0.679

SET THE ERROR VARIANCE OF PS53 TO 1.955

SET THE ERROR VARIANCE OF PS61 TO 0.561

SET THE ERROR VARIANCE OF PS62 TO 0.552

SET THE ERROR VARIANCE OF PS63 TO 1.936

SET THE ERROR VARIANCE OF PS71 TO 0.766

SET THE ERROR VARIANCE OF PS72 TO 0.735

SET THE ERROR VARIANCE OF PS73 TO 1.807

SET THE ERROR VARIANCE OF PS81 TO 0.960

SET THE ERROR VARIANCE OF PS82 TO 0.917

SET THE ERROR VARIANCE OF PS83 TO 2.085

SET THE ERROR COVARIANCE OF PS21 AND PS22 FREE

SET THE ERROR COVARIANCE OF PS41 AND PS42 FREE

SET THE ERROR COVARIANCE OF PS51 AND PS52 FREE

SET THE ERROR COVARIANCE OF PS61 AND PS62 FREE

SET THE ERROR COVARIANCE OF PS71 AND PS72 FREE

SET THE ERROR COVARIANCE OF PS81 AND PS82 FREE

SET THE ERROR COVARIANCE OF PS21 AND PS23 FREE

SET THE ERROR COVARIANCE OF PS41 AND PS43 FREE

SET THE ERROR COVARIANCE OF PS51 AND PS53 FREE
SET THE ERROR COVARIANCE OF PS61 AND PS63 FREE
SET THE ERROR COVARIANCE OF PS71 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS81 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS23 FREE
SET THE ERROR COVARIANCE OF PS42 AND PS43 FREE
SET THE ERROR COVARIANCE OF PS52 AND PS53 FREE
SET THE ERROR COVARIANCE OF PS62 AND PS63 FREE
SET THE ERROR COVARIANCE OF PS72 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS82 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS41 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS51 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS61 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS41 AND PS51 FREE
SET THE ERROR COVARIANCE OF PS41 AND PS61 FREE
SET THE ERROR COVARIANCE OF PS41 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS41 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS51 AND PS61 FREE
SET THE ERROR COVARIANCE OF PS51 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS51 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS61 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS61 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS71 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS42 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS52 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS62 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS82 FREE
SET THE ERROR COVARIANCE OF PS42 AND PS52 FREE
SET THE ERROR COVARIANCE OF PS42 AND PS62 FREE
SET THE ERROR COVARIANCE OF PS42 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS42 AND PS82 FREE

SET THE ERROR COVARIANCE OF PS52 AND PS62 FREE
SET THE ERROR COVARIANCE OF PS52 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS52 AND PS82 FREE
SET THE ERROR COVARIANCE OF PS62 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS62 AND PS82 FREE
SET THE ERROR COVARIANCE OF PS72 AND PS82 FREE
SET THE ERROR COVARIANCE OF PS23 AND PS43 FREE
SET THE ERROR COVARIANCE OF PS23 AND PS53 FREE
SET THE ERROR COVARIANCE OF PS23 AND PS63 FREE
SET THE ERROR COVARIANCE OF PS23 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS23 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS43 AND PS53 FREE
SET THE ERROR COVARIANCE OF PS43 AND PS63 FREE
SET THE ERROR COVARIANCE OF PS43 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS43 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS53 AND PS63 FREE
SET THE ERROR COVARIANCE OF PS53 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS53 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS63 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS63 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS73 AND PS83 FREE
SET THE CORRELATION PIEW AND PS TO 0
SET THE CORRELATION SOVC AND PS TO 0
SET THE ERROR COVARIANCE OF PS22 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS42 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS43 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS52 AND PS61 FREE
SET THE ERROR COVARIANCE OF PS52 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS51 AND PS62 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS73 FREE
NUMBER OF DECIAL=3
Path diagram
Lisrel output: ns mi
End of problems

Negative eWOM Scenario

Observed variables: SOVC1 SOVC SOVC3 PIEW2 PIEW4 PIEW5 PIEW6 PIEW7 PIEW8 ATT1 ATT2 ATT3 ATT4 SN1 SN2 SN3 PINT1 PINT2 PINT3 WINT1 WINT2 WINT3 PBC1 PBC2 PS21 PS22 PS23 PS41 PS42 PS43 PS51 PS52 PS53 PS61 PS62 PS63 PS71 PS72 PS73 PS81 PS82 PS83

Raw data from file negative433_IF.psf

Sample size: 433

Latent variables: SOVC PIEW ATT SN PINT WINT PBC PS AS

Relationships:

SOVC1=1*SOVC

SOVC2 SOVC3=SOVC

PIEW2=1*PIEW

PIEW4-PIEW8=PIEW

ATT3=1*ATT

ATT4=ATT

PINT2=1*PINT

PINT3=PINT

PS21=1.000*PS

PS22=0.790*PS

PS23=0.440*PS

PS41=0.989*PS

PS42=0.781*PS

PS43=0.435*PS

PS51=0.968*PS

PS52=0.765*PS

PS53=0.426*PS

PS61=0.978*PS

PS62=0.773*PS

PS63=0.430*PS

PS71=0.981*PS

PS72=0.775*PS

PS73=0.432*PS

PS81=1.014*PS

PS82=0.801*PS

PS83=0.446*PS

ATT =SOVC PIEW PS

PINT=ATT

SET THE ERROR COVARIANCE OF PIEW2 AND PIEW8 FREE

SET THE ERROR COVARIANCE OF PIEW2 AND PIEW4 FREE

SET THE ERROR COVARIANCE OF PIEW7 AND PIEW6 FREE

SET THE ERROR COVARIANCE OF PIEW7 AND PIEW8 FREE

SET THE VARIANCE OF PS TO (1.096)

SET THE ERROR VARIANCE OF PS21 TO 0.551

SET THE ERROR VARIANCE OF PS22 TO 0.821

SET THE ERROR VARIANCE OF PS23 TO 1.543

SET THE ERROR VARIANCE OF PS41 TO 0.440

SET THE ERROR VARIANCE OF PS42 TO 0.711

SET THE ERROR VARIANCE OF PS43 TO 1.397

SET THE ERROR VARIANCE OF PS51 TO 0.587

SET THE ERROR VARIANCE OF PS52 TO 0.836

SET THE ERROR VARIANCE OF PS53 TO 1.526

SET THE ERROR VARIANCE OF PS61 TO 0.380

SET THE ERROR VARIANCE OF PS62 TO 0.647

SET THE ERROR VARIANCE OF PS63 TO 1.309

SET THE ERROR VARIANCE OF PS71 TO 0.483

SET THE ERROR VARIANCE OF PS72 TO 0.746

SET THE ERROR VARIANCE OF PS73 TO 1.431

SET THE ERROR VARIANCE OF PS81 TO 0.651

SET THE ERROR VARIANCE OF PS82 TO 0.924

SET THE ERROR VARIANCE OF PS83 TO 1.682

SET THE ERROR COVARIANCE OF PS21 AND PS22 FREE

SET THE ERROR COVARIANCE OF PS41 AND PS42 FREE

SET THE ERROR COVARIANCE OF PS51 AND PS52 FREE

SET THE ERROR COVARIANCE OF PS61 AND PS62 FREE

SET THE ERROR COVARIANCE OF PS71 AND PS72 FREE

SET THE ERROR COVARIANCE OF PS81 AND PS82 FREE

SET THE ERROR COVARIANCE OF PS21 AND PS23 FREE

SET THE ERROR COVARIANCE OF PS41 AND PS43 FREE
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SET THE ERROR COVARIANCE OF PS62 AND PS63 FREE
SET THE ERROR COVARIANCE OF PS72 AND PS73 FREE
SET THE ERROR COVARIANCE OF PS82 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS41 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS51 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS61 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS41 AND PS51 FREE
SET THE ERROR COVARIANCE OF PS41 AND PS61 FREE
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SET THE ERROR COVARIANCE OF PS41 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS51 AND PS61 FREE
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SET THE ERROR COVARIANCE OF PS51 AND PS81 FREE
SET THE ERROR COVARIANCE OF PS61 AND PS71 FREE
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SET THE ERROR COVARIANCE OF PS63 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS73 AND PS83 FREE
SET THE ERROR COVARIANCE OF PS51 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS52 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS72 FREE
SET THE ERROR COVARIANCE OF PS21 AND PS82 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS71 FREE
SET THE ERROR COVARIANCE OF PS22 AND PS81 FREE
SET THE CORRELATION PIEW AND PS TO 0
SET THE CORRELATION SOVC AND PS TO 0
NUMBER OF DECIAL=3
Path diagram
Lisrel output AD=OFF NS sc
End of problems

VITA

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生日：民國 68 年 8 月 6 日　　**籍貫**：台灣省高雄市

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- 國立中興大學行銷學系碩士　(90 年 9 月~92 年 6 月)
- 國立交通大學管理科學系博士班　(92 年 9 月~99 年 12 月)

經歷：

- 醒吾技術學院推廣教育中心兼任講師　(93 年 12 月~97 年 8 月)
- 育達商業科技大學行銷與流通管理系兼任講師　(97 年 8 月~98 年 1 月)
- 台灣電力公司企劃處企劃控制師　(99 年 3 月~迄今)

在學期間著作：

- 期刊論文
  - ♦ Huang, Jen-Hung, Hsiao, Teng-Tai*, & Chen, Yi-Fen. (Forthcoming). The effects of electronic word of mouth: The moderating role of the sense of virtual community. Journal of Applied Social Psychology. (SSCI, Accepted)
  - ♦ 陳宜棻、倪家雄、蕭登泰*，結合網站設計品質、設計特性與購物價值觀點探討旅遊網站消費者之購買意願，電子商務學報。(TSSCI，已接受)
  - ♦ 周世玉、蕭登泰*（民 94），顧客交易資料庫之探勘－以網路電話公司之非契約型顧客為例，資訊管理學報，第十二卷，第二期，183-199 頁。(TSSCI)
- 研討會論文
  - ♦ Teng-Tai Hsiao*, & Shu-Ting Chuang. (December 4th, 2009). The role of virtual community in disseminating electronic word of mouth. 2009 International Workshop on Mobile Systems, E-commerce and Agent Technology (MSEAT 2009), Tamsui, Taiwan.
  - ♦ Chang, Claire, Hsiao, Teng-Tai*, Che, Ming-Hung, Chiu, Wei-Jie, and Trappey, Charles (June 16th - 20th, 2005). Consumer Driven Computer Game Design. 2005 International DiGRA Conference, Vancouver, British Columbia, Canada.