The Influence of Opinion Leaders towards the Purchase Intentions of Consumers in the Virtual Communities of Consumption

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博士学位請求論文

The Influence of Opinion Leaders towards the Purchase Intentions of Consumers in the Virtual Communities of Consumption

（消費者バーチャルコミュニティーにおける消費者の購買意図に対するオピニオンリーダーの影響）

東北大学大学院経済学研究科
博士後期課程

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Abstract

With the development of Internet, the electronic word-of-mouth (eWOM) communication becomes popular and the consumer behavior changes greatly. After getting attentions and interests towards the products or services, the consumers now will choose to search eWOM information before purchasing, and share the experiences with others after purchasing in the online spaces, especially in the virtual communities of consumption. Meanwhile, they start to pay attention to the online opinion leaders who can filter the really useful information and provide some recommendations of products or services. Considering that opinion leaders and eWOM affect the consumers and play crucial roles in the marketing strategies, researchers have intense interests in studying opinion leaders and eWOM (J. Engel, Blackwell, & Miniard, 1990). With the development of Internet, more and more individuals who share similar interests gather online and lead to the virtual communities, such as the virtual communities of consumption. Prior researches show intense interests of researchers on the opinion leaders and eWOM in the virtual communities. For example, Kozinets, De Valck, Wojnicki, and Wilner (2010) pointed out that the online opinion leaders in the online communities affect the mechanism of eWOM dissemination, and that marketers can intervene the eWOM dissemination partly by utilizing opinion leaders. However, the mechanism of how opinion leaders affect the purchase intentions of consumers in the virtual communities is still unclear. Obviously, if the marketers could better understand the mechanism, they could develop better strategies for utilizing opinion leaders.

Meanwhile, after paying attention to the importance of the opinion leaders, the researchers and marketers find that sometimes it is difficult to identify opinion leaders directly before utilizing them. Because some virtual communities of consumption fail to provide the information of personal attributes, such as the number of followers. Under such situation, the marketers need to find out appropriate approaches to
identify opinion leaders. However, prior researches show that although there are many approaches used for identify the online opinion leaders, how to identify the online opinion leaders in the virtual communities of consumption is still unclear.

Consequently, this thesis focuses on two main questions.

1) How to explain the mechanism of how opinion leaders affect the purchase intentions of the consumers in the virtual communities of consumption?

2) How to identify opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

For the first question, because this research aims at investigating the influence on the purchase intentions of consumers, so the theories related to consumers are investigated.

Previous researches have confirmed the important influence of opinion leaders towards the behaviors of consumers (Chakrabarti, 2013; Dalrymple, Shaw, & Brossard, 2013) and have showed several typical models for explaining consumer behavior. After the literature review towards these models, four small questions are pointed out and answered, including 1) For this study, which traditional model of consumer behavior will be more suitable? 2) Whether can the original model be used for this study? 3) How did other researchers adjust this model for study? 4) How to design the model for this study based on the model selected as the basic model? Through answering these four small questions, the model for this study are built up.

For the second question, prior researches have confirmed three approaches for identifying online opinion leaders. However, there are actually two kinds of virtual communities of consumption, including the ones exhibiting the attributes of members, such as their number of followers and the ones which do not. Namely, inside the second kind of virtual communities, the opinion leaders cannot be identified directly. Hence, it becomes a question for the marketers to utilize the opinion leaders in such virtual communities. Previous researches indicate that few research is about identifying the opinion leaders in the virtual communities of consumption, let alone in the virtual communities of
consumption in which they cannot be identified directly. Hence, for filling in this research gap, a discussion based on the literature review is provided. Considering its unique advantages, Social Network Analysis (SNA) is found to be suitable for this study. Also, three small questions are pointed out and will be answered, including 1) How to identify the opinion leaders in such virtual communities of consumption? 2) What are the characteristics of such virtual communities of consumption? 3) How do the opinion leaders affect the eWOM dissemination?

Hence, for these two main questions, this thesis is divided into two parts, including Part 1 and Part 2.

The outlines of this thesis are shown as follows.

Chapter 1 was titled with “Introduction”. The background was introduced and the two research questions were explained. Then this chapter illustrated the theoretical implications, practical implications, key concepts, methodology and planned outlines.

Chapter 2 to 4 were for the Part 1 of this thesis. Part 1 was to investigate the mechanism of how opinion leaders affect the purchase intentions of consumers in the virtual communities of consumption.

Chapter 2 was titled with “Literature review”. This chapter began with the basic review on WOM and eWOM, offline and online opinion leaders and virtual communities. Then, the concepts related to consumer behavior were introduced and some typical models used for explaining the consumer behavior were listed. Particularly, the applications of the Technology Acceptance Model (TAM) and Information Adoption Model (IAM) on studying the purchase intentions summarized. The emphases of every research were discussed and the implications for further research were provided. Finally, a short introduction of tie strength was provided.

Chapter 3 was titled with “The model”. For designing the model for this thesis, four small questions were investigated and answered. For the first question, IAM was considered as the suitable model. For the second question, the original IAM was considered insufficient to be used for this study, because this thesis focused on the opinion leaders, and the IAM only focuses on the information and that new factors resulted from the
new environment needed to be considered. For the third question about how did other researchers adjust IAM for eWOM study, several researches were discussed. For the last question about how to design the model based on IAM for this study, the extended model was provided. As a result, for the model of this thesis, the factors related to opinion leaders, to the consumers and two supposed mediators were added to the original IAM models.

To be more specific, the factors of opinion leaders, including the source credibility, message quality and tie strength were investigated and the factors of consumers, including the trust towards the site, recommendation consistency, confirmation with prior belief were investigated. Furthermore, besides the perceived usefulness of information, the perceived risk and of message credibility were supposed to serve as mediators.

Then, this chapter provided the 15 hypotheses for these factors and defined these variables.

Chapter 4 was titled with “Empirical analyses”. The section 4.1 introduced the design process of the questionnaire, including designing the measurements of the variables, choosing China as the sample, explaining the specific method. Then the Chinese version of the questionnaire was purified through a small group of discussion and a pretest was held for testifying the reliability and validity of the questionnaire. As the result to the empirical analysis for 128 pieces of answers, two questions were deleted from the questionnaire and the final version of the questionnaire was obtained. The final questionnaire was sent out online in China and 347 pieces of answers were accepted.

The section 4.2 introduced the data analyses. This section began with the analyses of the basic information of the respondents, based on the data from the part 3 of the questionnaire. Secondly, the analysis of their online activities and choices were provided, based on the data from the part 1 of the questionnaire. Thirdly, the data of the part 2 of the questionnaire was analyzed. The specific steps of SEM analysis included the validity analysis, the reliability analysis, the discriminant validity analysis and the confirmatory factor analysis. Finally, with the empirical
analyses, the hypotheses were testified and the functions of those supposed mediators were investigated. As a result, among the 15 hypotheses, 13 hypotheses were supported and 2 hypotheses were not supported. Finally, the section 4.3 provided the discussion for Part 1.

Chapter 5 to 7 were for the Part 2 of this thesis. Part 2 was to identify the online opinion leaders in the virtual communities of consumption in which they could not be identified directly.

Chapter 5 was titled with “Literature review”. The approaches for identifying opinion leaders in the previous researches were collected and discussed. Three main approaches for identifying online opinion leaders were list, including the user attributes analysis, the text mining analysis and the network structure analysis. Particularly, Social Network Analysis (SNA) was one type of network structure analysis.

Considering the aim for Part 2, the SNA was selected after a comparison among these three types of approaches. Because of the unique advantages of SNA, three small questions were pointed out and answered.

For the first question, because that SNA was widely used for identifying online opinion leaders in the social network, the opinion leaders in the virtual communities of consumption could be identified by using SNA. For the second question, because SNA was widely used for analyze the structure of social network, the characteristics of the virtual communities of consumption could be investigated. For the third question, because SNA could be used to create several virtual scenarios based on the assumed changes in relationships, the influences of opinion leaders towards the eWOM dissemination could be analyzed by comparing the data with and without them. Hence, Part 2 chose to use SNA.

Then, the SNA and the indicators of the opinion leaders were introduced. For this study, the measurements of the central position and of the structure holes were considered as the indicators for the opinion leadership. Namely, the selected indicators include Indegree, OutDegree, Betweenness, InFarness, OutFarness, EffSize and ConStraint.

Chapter 6 was titled with “Design of the research”. This chapter
began with the introduction of randomly selected virtual community of consumption in China, called Changsha Tong. Then, the specific research approach and related measures were explained. Finally, it was pointed out that the data sources result from the posts in Changsha Tong in one week and the sampling method was the snowball sampling.

Chapter 7 was titled with “Data analyses”. The section 7.1 described the relationship matrix and the social diagram of the whole network. The section 7.2 and 7.3 were for analyzing the structure of the virtual community, by providing the analysis of the tie strength and of the small-world characteristics. The section 7.4 and 7.5 were for obtaining the data of the indicators of opinion leaders. The section 7.4 was about the analyses of centrality, including the analyses of Degree centrality, of Betweenness centrality and of Closeness centrality. The section 7.5 was about the analysis of structure holes. Then, the section 7.6 was about the identification and 18 opinion leaders and 5 potential opinion leaders were identified.

The section 7.7 provided the analysis of the influence of these opinion leaders on eWOM communication. After comparing the network data with and without these opinion leaders, the results confirmed that these opinion leaders increased the speed and scale of eWOM dissemination. The section 7.8 listed the results and the section 7.9 provided the discussion for Part 2.

Chapter 8 was titled with “Conclusion”. This chapter began with a brief summary of chapter 1 to 7 and provided the conclusions to the two empirical analyses. Then, the theoretical and practical implications, the major contribution, the limitation and ideas for future research were provided.

The major contributions of this thesis include five points and are provided as follows.

1) Part 1 of this thesis provides an integrated and unique model for explaining the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption from the perspective of the information adoption process of
consumers.

In order to investigate the influences of opinion leaders on the consumers, the Part 1 analyzes and summarizes the traditional models of consumer behavior and built up an extended model, based on the Information Adoption Model (IAM). In this new model, some factors related to opinion leaders and some factors related to the consumers are added. Furthermore, besides the perceived usefulness of information, two factors are supposed to be the mediators for this model.

After the empirical analysis, Part 1 confirmed that:
- From the side of opinion leaders, the influential factors of opinion leaders include source credibility, message quality and tie strength.
- From the side of consumers, their trust towards the site and the confirmation with prior belief are found to be influential.
- From the side of mediators, beside the perceived usefulness of information, the perceived risk and the message credibility are found to be influential.

By developing an integrated model and by confirming the influential factors of opinion leaders, this model provides new perspectives to the researches related to opinion leaders, especially the researches related to the influential factors of opinion leaders and the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption.

2) Part 1 of this thesis extended the original IAM uniquely and confirmed its applicability in studying the influences of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption.

As the literature review in the Part 1 indicates that although IAM was developed to explain the information adoption of individuals, it had been applied under different situations with different but additional factors and different subjects.

In order to investigate the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption, the Part 1 of this thesis also extended the IAM innovatively.
The unique parts of the new model include:

- The original IAM has been adapted to study the eWOM information adoption behavior and the purchase intentions of consumers. The model in this study was developed for studying the mechanism of how opinion leaders affect the purchase intention of individuals in the certain situation from the perspective of information adoption. Namely, the focus of the new model is opinion leader.
- The original IAM is critiqued for only focusing on the information perspective. For this study, the new model focuses on the perspectives of both opinion leaders and consumers.
- The original IAM only study the mediator called perceived usefulness. For this study, the model adds two mediators.
- The model in this study has utilized the IM in a new environment, namely the virtual communities of consumption. Hence, the unique model in this study and the empirical study provide the new idea of the researches related to IAM.

3) Part 1 of this thesis confirms the supposed mediators and besides the perceived usefulness of information, the newly added mediators include the perceived risk and message credibility.

Previous studies point out that the perceived risk and message credibility can serve as the mediators when studying the information adoption of individuals as in the travel website (Tseng & Wang, 2016) and as in the online communities (C.-W. Chen, Chen, & Hsu, 2011), respectively. As the results of this thesis, the perceived risk has negative influences on the information adoption directly and through the perceived usefulness of information indirectly. Meanwhile, the message credibility affects the information adoption directly and through the perceived usefulness of information indirectly.

The conclusions in this thesis can be considered as the supplement to the previous researches that in the virtual communities of consumption, the perceived risk and message credibility also have the intermediary functions towards the information adoption of consumers.

Consequently, the confirmation of the intermediary functions of
these two factors will enrich the researches related to these two factors and related to IAM.

4) Part 2 of this thesis provides one of the first empirical studies on utilizing SNA for identifying the online opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

Previous researches have shown that although there are many approaches for identifying online opinion leaders, few research identify the online opinion leaders in the virtual communities of consumption. Moreover, among the three main approaches for identifying online opinion leaders, SNA is the suitable one for filling the research gap. Also, based on the literature review, the measurements of central position and of structure holes are selected as the indicators of the opinion leadership.

As a result, the empirical study in the Part 2 enriches the researchers’ understanding towards the identification approaches of identifying opinion leaders in the virtual communities of consumption and towards the applicability of SNA.

5) The results of both Part 1 and Part 2 provide a unique investigation for and confirm the influences of the opinion leaders in the virtual communities of consumption from both the perspective of the information adoption process of consumers and from the perspective of social science.

The research of Kozinets, De Valck, Wojnicki, and Wilner (2010) has confirmed the influences of opinion leaders towards the eWOM dissemination in the online communities by indicating that opinion leaders usually spread the eWOM information to the consumers.

However, the mechanism of how opinion leaders affect the purchase intention of consumers is still unclear. Meanwhile, when facing with the virtual communities of consumption in which the opinion leaders cannot be identified directly, it becomes a question for the marketers to identify the opinion leaders. Furthermore, the specific influence of opinion
leaders towards the eWOM dissemination is not explained.

Through the empirical studies, the results serve as a supplement to the research of Kozinets et al. (2010) in four perspectives:

● The results in the Part 1 investigated and confirmed the influential factors of opinion leaders in the certain situation, including the message quality, source credibility and tie strength.

● The results in the Part 1 provided a model for explaining the mechanism of how opinion leaders affect the purchase intention of consumers in the virtual communities by building up and testifying an extended model based on IAM from the perspective of information adoption process of the consumers.

● The results in the Part 2 provided a useful approach to identify the online opinion leaders in the virtual communities of consumption in which they cannot be identified directly from the perspective of social science.

● The results in the Part 2 analyzed and figured out that the opinion leaders affect the speed and scale of the eWOM flow in such virtual communities of consumption.

Consequently, the results on the influences of opinion leaders obtained from Part 1 and Part 2 will enrich the researchers’ understandings towards the opinion leaders in the virtual communities of consumption.
Publications

Journal Papers

- YU WANG, The Influential Factors of Opinion Leaders towards Consumers’ Purchase Intention in Virtual Communities of Consumption, 東北大学研究年報, accepted on 8th, August, 2017.
- YU WANG, An empirical study on identifying opinion leaders in the online communities of consumption, Global Journal of Emerging Trends in e-business, Marketing and Consumer Psychology (ISSN 2311-3170), accepted

Conference Papers

- YU WANG, Identifying Opinion Leaders in the Online Communities of

- YU WANG, A theoretical model for studying the influence of opinion leaders towards the purchase intentions of consumers in the online community of consumption, Proceedings of the 319th International conference on science technology and management (ICSTM 2018), (forthcoming)
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</thead>
<tbody>
<tr>
<td>AVE</td>
<td>Average Variance Extracted</td>
</tr>
<tr>
<td>C</td>
<td>Confirmation with Prior Belief</td>
</tr>
<tr>
<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
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<tr>
<td>df</td>
<td>Degrees of Freedom</td>
</tr>
<tr>
<td>eWOM</td>
<td>Electronic Word-of-Mouth</td>
</tr>
<tr>
<td>EFA</td>
<td>Exploratory Factor Analysis</td>
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<td>ELM</td>
<td>Elaboration Likelihood Model</td>
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<td>GFI</td>
<td>Goodness-of-Fit Index</td>
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<td>IA</td>
<td>Information Adoption</td>
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<tr>
<td>IAM</td>
<td>Information Adoption Model</td>
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<tr>
<td>IDT</td>
<td>Innovation Diffusion Theory</td>
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<tr>
<td>MC</td>
<td>Message Credibility</td>
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<tr>
<td>MQ</td>
<td>Message Quality</td>
</tr>
<tr>
<td>PI</td>
<td>Purchase Intention</td>
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<tr>
<td>PR</td>
<td>Perceived Risk</td>
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<td>PU</td>
<td>Perceived Usefulness of Information</td>
</tr>
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<td>R²</td>
<td>The Squared Multiple Correlation of the Variable</td>
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<td>RC</td>
<td>Recommendation Consistency</td>
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<td>Root Mean Square Error of Approximation</td>
</tr>
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<td>SC</td>
<td>Source Credibility</td>
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<td>Structural Equation Modeling</td>
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<td>Squared Multiple Correlations</td>
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<td>T</td>
<td>Trust towards the Site</td>
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<tr>
<td>TAM</td>
<td>Technology Acceptance Model</td>
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<tr>
<td>TPB</td>
<td>Theory of Planned Behavior</td>
</tr>
<tr>
<td>TRA</td>
<td>Theory of Reasoned Action</td>
</tr>
<tr>
<td>TS</td>
<td>Tie Strength</td>
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<td>WOM</td>
<td>Word-of-Mouth</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>Delta Qui-Square</td>
</tr>
<tr>
<td>$\chi^2 / df$</td>
<td>The ratio of chi-square value to degrees of freedom</td>
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Chapter 1. Introduction

1.1. Background and research questions

1.1.1. Background

(1) The electronic word-of-mouth (eWOM) communication becomes popular and affects the psychological processes of consumers.

In the offline environment, the word-of-mouth (WOM) communication has received extensive attentions from both academics and practitioners for decades (De Bruyn & Lilien, 2004). It refers to the oral communication between a receiver and a communicator and the receiver perceives the information as non-commercial and concerning a brand, a product, or a service (Arndt, 1967b). The WOM communication is an important channel for people to obtain information (Van den Bulte & Joshi, 2007).

Nowadays, the Internet enables numerous information to be spread online within diversified channels and breaks the geographical distribution. With the new transmission pattern of information, individuals are able to use various network platforms online, such as the e-commerce websites, the third-party websites, the virtual communities, the blogs and so on. They begin to interact online and share information, to build relationships with others and even to make transaction (Kozinets, 1999; Wei Zhang & Watts, 2008). Obviously, they change their roles of passive receivers of advertisement to active participants. Hence, the eWOM communication becomes popular.

Obviously, eWOM communication affects consumers’ purchase intention greatly (Park, 2003; See-To & Ho, 2014). Also, because of popularity of eWOM communication, the psychological processes during the consumers’ purchase of a product or service changed.

To be more specific, in the traditional environment, the classic AIDMA model, proposed by Hall (1924), was widely used to explain the psychological processes during the consumers’ purchase of a product (see Figure 1). This model had 5 steps, including Attention, Interest,
Desire, Memory and Action. Namely, the consumers paid attention to a product, aroused the interest, desired for it and kept it into the memory. Then, the consumers would take the action for purchasing.

Nowadays, the psychological processes have been changed, because consumers can not only search, select and share information through Internet, but also interact with others.

In response to this change, Dentsu Incorporated (2008), the largest advertising agency in Japan proposed a new model called AISAS (see Figure 2), based on the AIDMA model. The new model has 5 steps, including Attention, Interest, Search, Action and Share. Namely, after paying attention to the product and having the interest, the consumers will search relevant eWOM information online to better evaluate the alternatives. Then they will purchase the product and share their experiences with others online.

This new marketing model indicates that the steps of searching and sharing information become crucial before the forming of consumers’ purchase intentions. These consumers gradually become to seek opinions for making more need-satisfying decisions (Punj & Staelin, 1983). Thanks to the Internet, which provides the users with the channels for communication, consumers can search and share information online and the communication between the sellers and buyers become unimpeded and efficient.

Figure 1. AIDMA
(Source: Hall, 1924)
(2) The online opinion leaders appear and affect others, such as the potential consumers in the virtual communities of consumption.

Facing with numerous eWOM information of the products or services, consumers feel it difficult to evaluate and judge all of them. The opinion leader offers a solution to the problem: when the potential consumers face with a complex choice, they can turn to the opinion leaders for help. The opinion leaders are individuals who actively receive information and send it out with their subject ideas to some degree to others (Arndt, 1967a). The definition of opinion leader indicates the importance of opinion leaders towards the eWOM dissemination. In addition, they can affect the attitudes or behaviors of others through WOM communication informally (Stern & Gould, 1988). Meanwhile, they are considered to be more influential and can create and spread more WOM than general individuals (J. Engel et al., 1990; Rogers, 1995).

To be more specific, through various communication channels, the opinion leaders affect the diffusion and adoption of new products, others’ choices (Chan & Misra, 1990; Goldsmith & De Witt, 2003) and decision-making process (Rogers & Cartano, 1962; Valente & Davis, 1999), and so on.

Furthermore, because of the development of Internet, the virtual communities appeared. The rapid improvement of technologies enables the information to be spread more quickly and the individuals with similar interests gradually gather online, leading to the appearance and popularity of virtual communities. The virtual communities, also called online communities, refer to online social aggregations which emerge when enough Internet users discuss long enough, with sufficient human feelings, to form online relationships (Rheingold, 1993). The virtual communities can be divided into four types, including the virtual communities of consumption, of interest, of fantasy and of relationship (Rheingold, 1993). To be more specific, individuals are able to purchase or sell products and services inside the virtual communities of
consumption, to discuss some common topics inside the virtual communities of interest, to have new identities inside the virtual communities of fantasy and to build up relationships with others in the virtual communities of relationship (Hagel & Armstrong, 1997).

Particularly, the virtual communities of consumption gather a great number of potential or actual consumers who like discussing and sharing information on products and services. The emergence of such virtual communities has transformed consumer information searching processes into “a source of community and understanding” (Kozinets, 1999). Hence, the individuals are able to not only search information, but also to share information, interact with others and cultivate relationships with them.

Inside such kind of virtual communities, the influences of opinion leaders become obvious. They usually give out evaluation or recommendation towards some products or services based on their purchase experiences or using experiences. Meanwhile, they act as role models for others to imitate (Chau & Hui, 1998). Then, members can utilize the information from opinion leaders to judge their own choices and make transaction. Under such situation, the opinion leaders exert both informational and interpersonal influence towards other members.

(3) With the eWOM and opinion leaders being popular, the eWOM dissemination in the virtual communities is also affected.

Considering the influences of eWOM communication on consumers, understanding the mechanism of eWOM dissemination will contribute greatly to marketers who want to utilize eWOM marketing to promote their products or services and to attract consumers.

For the mechanism of WOM/eWOM dissemination in the online communities, Kozinets et al. (2010) illustrates three models to review as in a series of three evolutionary shifts and these models include the Organic Inter-Consumer Influence Mode, the Linear Marketer Influence Model and the Network Co-Production Model. Since overlap has occurred, these models coexist.
  - The Organic Inter-Consumer Influence Model
The model is shown in the Figure 3. Early researchers have proved that conversations among buyers to spread WOM/eWOM are more influential than marketing communications (Kozinets et al., 2010; Rogers, 2003; Ryan & Gross, 1943). These interpersonal communications among consumers are about sharing the information about products or services. In this model, WOM serves as the organic part, because it occurs only between consumers and can hardly be affected by the markers. The marketers can only spread product information by terms of advertisements or promotions without further intervention. It is the consumers themselves who actively share their consumption experiences to help or warn others who have insufficient consumption experiences (Arndt, 1967b; Kozinets et al., 2010).

![Figure 3. The Organic Inter-Consumer Influence Model](source: Kozinets et al., 2010)

- The Linear Marketer Influence Model

The model is shown in the Figure 4. With the number of eWOM information increasing and the opinion leaders becoming popular, researchers began to notice the influence of influential individuals, namely the opinion leaders, during the process of spreading eWOM (Summers, King, Martin, & Jackson, 1976). These opinion leaders can efficiently convey the marketing messages and meanings to a wider population.

When compared to the marketers in the Organic Inter-Consumer
Influence Model, the biggest difference between these two models is that the marketers now can indirectly affect the opinion leaders by terms of advertisement or promotions. Namely, besides performing product notification to the public, Marketers also focus on using some traditional strategies to indirectly affect these influential individuals so as to facilitate the flow of the eWOM to some degree (Kozinets et al., 2010). By doing so, the marketers can intervene the eWOM communication to some degree.

![Figure 4. The Linear Marketer Influence Model](source: Kozinets et al., 2010)

- **The Network Co-Production Model**
  The model is shown in the Figure 5. Some marketers also begin to emphasize more on the relationship, rather than only focusing on the transaction and emphasizing the importance of the consumer networks, groups and communities (Kozinets et al., 2010). These marketers endeavor to not only affect consumers by utilizing the influences of opinion leaders, but also to cultivate one-to-one relationships with the consumers so as to further attract others. Namely, the marketers endeavor to facilitate the co-Production of the eWOM communications in consumer networks.

  The Network Co-Production Model has two distinguishing features.
Firstly, according to this model, the marketers turn to use new marketing strategies to actively target the potential consumers. For example, the consumer may be invited to experience the new products and be requested to leave their positive feedback online. Secondly, it is shown that the information is no longer flowed in one-way, but appears to be flowed inside the network of consumers.

![Diagram](image)

Figure 5. The Network Co-Production Model  
(Source: Kozinets et al., 2010)

The three models above indicate that consumers nowadays are both information senders and receivers, thus the companies can hardly monopolize the information any more.

The models proposed by Kozinets et al. (2010) explain the mechanism of the eWOM in the online communities. The marketers can utilize the eWOM communication in the virtual communities, as shown in the Organic Inter-Consumer Influence Model, or the opinion leaders, as shown in the Linear Marketer Influence Model, or specific individuals, as shown in the Network Co-Production Model. By doing so, these marketers can spread the marketing message and meanings more effectively and efficiently.
1.1.2. Research questions

From the analysis above, it indicates that opinion leaders can not only exert informational influences on others through the eWOM dissemination, but also exert interpersonal influences through the interaction with others. Hence, opinion leaders play vital roles in the marketing. For marketers, they can make full use of opinion leaders to strengthen the influences of their marketing strategies. Furthermore, the virtual communities of consumption, inside which individuals are interested in consumption, become popular and begin to be considered as a proper online space in which the marketers should employ marketing strategies for promoting products or services. Facing with the new electronic marketing environment, utilizing opinion leaders towards the eWOM communication to affect the purchase behaviors of consumers, becomes a focus of the researches related to opinion leaders.

Under this situation, two researches questions are pointed out in this thesis.

1) How to explain the mechanism of how opinion leaders affect the purchase intentions of the consumers in the virtual communities of consumption?

The models, proposed by Kozinets et al. (2010), explain the mechanism of the eWOM flow in the virtual communities and show how opinion leaders spread the information from marketers to the public. In such situation, marketers can utilize opinion leaders to spread information to potential or actual consumers and to affect them to some degree. However, it is still a question that how can these opinion leaders affect the potential consumers in the virtual communities. Hence, for the marketers who want to utilize opinion leaders, considering the informational and interpersonal influences of opinion leaders towards the consumers, they need to figure out the mechanism of how opinion leaders affect the purchases intention of consumers in the virtual communities of consumption. After finding out the influential factors of
opinion leaders, these marketers can develop more efficient and more effective strategies.

Because the aim is to investigate the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption, the theories related to consumers need to be studied so as to figure out the influential factors of opinion leaders on them.

Previous researches have pointed out some methods and theories for explaining the factors which affect intentions or behavior of consumers.

From the existing researches, the most influential models and theories on consumer behavior include Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1975), Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989), Theory of Planned Behavior (TPB) (Ajzen, 1991), Information Adoption Model (IAM) (Sussman & Siegal, 2003) and so on.

Among these models and theories, Technology Acceptance Model (TAM) (Davis, 1986) and Information Adoption Model (IAM) (Sussman & Siegal, 2003) are comparatively representative and practical for investigating the purchase intentions of Internet users.

On one hand, TAM is used to explain and to predict the determinants of individuals' acceptance of information technology (Davis et al., 1989) and is one of the most widely used model in the field of information system (Y. Lee, Kozar, & Larsen, 2003). Researchers have extended its explanatory power in many contexts, including banking technology, email, online games, desktop video conferencing and so forth (Ha & Stoel, 2009). Particularly, since online consumers exhibit the features of being both traditional consumers and computer users, some researchers use TAM to study their purchase intentions.

On the other hand, IAM is used to explain how individuals are affected by the online information (Sussman & Siegal, 2003). Since collecting and selecting online information play important roles in the purchase decision making process of consumers (J. F. Engel, Kegerreis, & Blackwell, 1969; Howard & Jagdish, 1969; Xia Wang, Yu, & Wei, 2012; D.
H. Zhu, Chang, & Luo, 2016), IAM has been used to study the purchase intentions.

In the existing researches, in order to increase the explanatory power of TAM and IAM, researchers have pointed out various extended models and applied the models to various situations respectively. However, the related research for using these models to investigate or explain the mechanism of how opinion leaders affect the purchase intentions of consumers is blank. Hence, in order to fill in the research gap, Part 1 is going to utilize the models related to consumer behavior for further study.

After the literature review, four small questions are explained and answered. These small questions include 1) For this study, which traditional model of consumer behavior will be more suitable? 2) Whether can the original model be used for this study? 3) How did other researchers adjust this model for study? 4) How to design the model for this study based on the model selected as the basic model?

After these four questions are answered, the model for the Part 1 can be built up and testified by empirical analyses.

2) How to identify opinion leaders in the virtual communities of consumption in which they cannot be identified directly?

The opinion leaders, who affect the attitudes or behaviors of the public through eWOM communication (Flynn, Goldsmith, & Eastman, 1996; Forbes, 2013; Goldsmith, Flynn, & Goldsmith, 2003; Rogers & Cartano, 1962; Stern & Gould, 1988), has been confirmed to exert their influences inside the social media (Momtaz, Aghaie, & Alizadeh, 2011; X. Song, Chi, Hino, & Tseng, 2007).

Considering the crucial influences of opinion leaders on the consumers, companies and marketers pay more and more attention to utilize the opinion leaders.

Furthermore, after the mechanism of how opinion leaders affect the purchase intentions of the consumers in the virtual communities of consumption being investigated from the Part 1 of this thesis, the companies and marketers can have a better understanding of the
influential factors of opinion leaders and of how to utilize them.

However, there are actually two kinds of virtual communities of consumption, including:

- Virtual communities of consumption exhibiting the attributes of members, such as their number of followers. Namely, inside such kinds of communities, the outsider can identify the opinion leaders directly, based on their standards.

- Virtual communities of consumption failing to exhibit the attributes of members, such as their number of followers. Namely, inside such kinds of communities, the outsider cannot identify the opinion leaders directly.

To be more specific:

Some virtual communities have the functions of exhibiting the attributes of the members, such as the number of followers. Inside such forums, the opinion leaders can be easily distinguished from other Internet users. Obviously, the more followers the individual has, the more likely will he or she be the opinion leader and the more influential this individual will be. After figuring out who are the opinion leaders, the members can follow them and are more likely to be affected by their recommendations. Meanwhile, the companies can also easily figure out opinion leaders and utilize them, such as cooperating with them for advertisements (Hirsh, 2001).

However, some virtual communities do not have this function and fail to show who are the opinion leaders directly. In such communities, some individuals send out posts and attract other members by knowledge or something else. They interact with the repliers actively, thus they can accumulate followers. The followers are willing to pay attentions to the posts from these influential individuals and are more likely to follow their recommendations. It is easy for followers to identify these influential factors by terms of ID, but for outsiders, such as marketers, it will be difficult to judge the influential individuals, let alone utilizing them for developing more effective marketing strategies. Admittedly, for the individuals who have already been opinion leaders in the real world, they can be better recognized by other members online. But for the
individuals who become the online opinion leaders directly, it will be
difficult for the marketers to recognize the opinion leaders.

Facing with this situation, it becomes a question that how to identify
opinion leaders in such virtual communities of consumption in which the
opinion leaders cannot be identified directly before utilizing them.

Prior researches show that there are many approaches to identify
online opinion leaders and that three main approaches for identifying
online opinion leaders include the user attributes analysis, the text
mining analysis and network structure analysis. However, few research is
about identifying the online opinion leaders in the virtual communities
of consumption, let alone in the virtual communities of consumption in
which they cannot be identified directly. Hence, in order to fill in the
research gap, the Part 2 is going to have an empirical study on identifying
these opinion leaders.

According to the literature review, social network analysis (SNA), one
type of network structure analysis, is found to be suitable for this
research because of its unique advantages. By using SNA, three small
questions can be analyzed and answered. These questions include: 1) How to identify the opinion leaders in such virtual communities of
consumption? 2) What are the characteristics of such virtual communities of consumption? 3) How do the opinion leaders affect the
eWOM dissemination?

Firstly, many researchers have used the social network analysis (SNA)
to identify the opinion leaders in many kinds of social networks.
Although few research is about using SNA in the virtual communities of
consumption. SNA is found to be suitable for such cases.

Secondly, SNA is widely used for studying the structure of social
network. Hence, utilizing SNA can investigate the characteristics of such
virtual communities of consumption.

Thirdly, although the influence of opinion leaders towards the eWOM
dissemination in the online communities has been confirmed and to be
existing by Kozinets et al. (2010), how do the opinion leaders affect the
eWOM dissemination in details is still unclear. One advantage of SNA is
that it could create several virtual scenarios based on the assumed
changes in relationships. Hence, when utilizing SNA to identify opinion leaders, the data with and without the opinion leaders can be compared and discussed. By doing so, how the opinion leaders affect the eWOM communication can be figured out.

By utilizing SNA, the answer to the third small questions can be answered.

1.2. Research significance and key concepts

1.2.1. Research significance

(1) Theoretical significance

The Part 1 of this thesis builds up an extended model to study the influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption and testifies it through the empirical analysis. The Part 2 of this thesis provides an empirical study of utilizing SNA to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly. Meanwhile, the characteristics of such virtual communities of consumption and the influence of opinion leaders towards the eWOM communication can be analyzed.

The result of this thesis will enrich the existing researches on the eWOM, opinion leaders, the virtual communities of consumptions, consumer behavior models and SNA.

To be more specific:

- The Part 1 builds up an integrated model based on the traditional models of consumer behavior to investigate the influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption. The result can enrich the studies related to the consumer behavior models.

- The Part 1 begins with the theories of opinion leaders and investigates the influential factors of opinion leaders. The result can deepen the understandings of opinion leaders and further enrich the
relevant researches of them.

- The part 2 utilizes social network analysis (SNA) to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly. The result can fill in the research gap about how to identify opinion leaders in such virtual communities of consumption and can extend the applicability of SNA.

- The part 2 uses SNA to analyze the influences of opinion leaders towards the eWOM dissemination in the virtual communities of consumption from the perspective of social network. The result can enrich the understanding of the influences of opinion leaders towards eWOM communication.

(2) Practical implications

The organizers of the virtual communities of consumption, the companies and the marketers can have a better understanding of opinion leaders from the perspective of the information adoption process of consumers in Part 1 and from the perspective of social science in Part 2.

For Part 1, after figuring out the mechanism of how opinion leaders affect the purchase intention of consumers in the virtual communities of consumption, the organizers of the virtual communities of consumption, the companies and marketers will deeply understand the influential factors of opinion leaders so as to utilize these factors and also have a better understanding towards how to cultivate opinion leaders.

For Part 2, for the virtual communities of consumption inside with the opinion leaders cannot be identified directly, figuring out an approach to identify them will help the organizers of the virtual communities and the marketers greatly. After the empirical study of this part, they can also use SNA to identify the opinion leaders in such virtual communities of consumption. Also, have a better understanding of the structure of the communities and of the influences of opinion leaders towards the eWOM communication will also help the organizers and marketers to take more effective and focused strategies.
1.2.2. Key concepts

(1) WOM and eWOM

Arndt (1967b) defined WOM as oral, person to person communication between a receiver and a communicator whom the receiver perceives as non-commercial concerning a brand, a product, or a service.

Then, with the appearance of Internet, consumers nowadays start to share their own opinions online by terms of electronic word-of-mouth (eWOM).

The eWOM refers to any positive or negative statement made by potential, actual, or former consumers 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).

(2) Online opinion leaders

The concept of opinion leader was introduced by Katz and Paul (1955) that the central and influential individuals act as the intermediaries between the mass media and the public: they obtain information from the mass media and further spread it to the public by strengthening or weakening it to some degree.

It is emphasized that opinion leaders affect the attitudes of the wider population, and stresses the fact that the influence of interpersonal communication towards the public is more frequent and more effective than the influence of the mass communication towards the same audience (Katz & Paul, 1955).

Other researchers also defined the opinion leaders. Opinion leaders are defined as those individuals who are the active receivers of word-of-mouth, who expose the most to mass media, and who tend to interpret the information with or without their own subject ideas to others (Arndt, 1968). They exert an unequal amount of influence on the
decision of others (Rogers & Cartano, 1962) and also can affect members in the social community because of special techniques, knowledge, personalities and other uniqueness (Kotler, 2001).

Because of the Internet, the online opinion leaders begin to appear and exert their influence towards others through the Internet.

(3) Virtual communities of consumption

Rheingold (1993) defined virtual communities as online social aggregations which emerge when enough Internet users discuss long enough, with sufficient human feelings, to form online relationships.

According to previous researches, the most well-known typology of virtual communities was illustrated by Hagel and Armstrong (1997) who classified virtual communities into four types, including virtual communities of interest, of relationship, of fantasy and of consumption. This study only focuses on the virtual communities of consumption, which refer to virtual communities focusing on facilitating consumption, serving to some kinds of commercial purposes, and encouraging participants to communicate and interact with others so as to make transactions (Hagel & Armstrong, 1997).

(4) Purchase intention

Purchase intention refers to the likelihood that a consumer will purchase a specific product (Ajzen & Fishbein, 1975; Dodds, Monroe, & Grewal, 1991; Schiffman & Kanuk, 2000). It can be used to predict the future purchase behavior of the individuals (Ajzen & Fishbein, 1975).

1.3. Methodology

For this research, various methods for data collection are used, including literature review method, small group discussion, questionnaires and snowball sampling. Then, for the data analysis, Part 1 uses the statistical method and Part 2 uses the social network analysis
method.

(1) Methods for data collection

- Literature review method

  Through the literature review, the current situation is analyzed and the research questions are identified. For Part 1, based on the original models, the model for this thesis is built up and the hypotheses are explained. Then, the questions in the questionnaire are designed.

  For Part 2, based on the existing identification approaches, the approach is selected for this study and the indicators of opinion leaders are decided.

- Small group discussion

  For Part 1, through the small group discussion, the readability problems and confusing words of the Chinese version of the questionnaire are purified.

- Questionnaire

  For Part 1, this thesis chooses to send out questionnaire through Internet for the empirical study.

- Snowball sampling

  For Part 2, after selecting the specific virtual community of consumption randomly, the snowball sampling is used for collecting one-week data for the continue analysis. This method will avoid the bias problem by considering all the members in the network in a specific time period.

(2) Data analysis methods

For Part 1:

  After obtaining the original data through the formal questionnaire, a variety of statistical methods to analyze the data and to validate the model are used. The relationships between the variables, the proposed research assumptions and theoretical models will be empirical testified.

  Part 1 uses Structural Equation Modeling (SEM) for data analysis, through the statistical analysis software, called SPSS 23 and AMOS 21.0. these pieces of software are commonly used in the social sciences.
specific data analyses can be divided into three steps:

- **Descriptive statistics analysis**
  
  It is to describe the overall information of the respondents to the questionnaire. The questionnaire collects data of the distribution of the sex, age, education level, incomes and other information of these respondents. With the information, a better understanding of these respondents will be obtained.

- **Validity analysis and reliability analysis**
  
  In order to evaluate the measurement of the items in the questionnaire, the validity and reliability analysis are used. For validity analysis, the KMO & Bartlett’s Test of Sphericity of factor analysis and the factor loadings of the data are measured. On the other hand, for reliability analysis, the Cronbach’s $\alpha$ is used.

- **Structural Equation Modeling (SEM)**
  
  The SEM is used to testify the model and to analyze the relationships among the variables. This study adapts the two-way approach for structural equation modeling (SEM) proposed by Anderson and Gerbing (1988). The first step is to test the measurement model, namely to test the latent constructs and their respective observed variables. Then the second step is to test the relationship of each variable, namely to test the hypotheses. The goodness-of-fit measures used in this research include $\chi^2$/df, GFI, RMSEA, AGFI, NFI, CFI, IFI.

For Part 2:

After the literature review on the related approaches for identifying opinion leaders, the Social Network Analysis is selected. The software used for data analysis includes UCINET 6.0, Netdraw, and SPSS 23. To be more specific:

- **Social Network Analysis (SNA)**
  
  SNA is used to study the structure of the virtual community and to identify the opinion leaders. Also, the influences from these opinion leaders towards the eWOM communication are analyzed.

  The research process of SNA is generally composed of eight steps, including:
1) Defining the research questions and the research focuses;  
2) Determining the network boundary and relationship dimensions;  
3) Selecting or designing the research tools;  
4) Collecting the original data by using snowball sampling;  
5) Converting the data to meet the format for the SNA software;  
6) Using the software to run the data analyses for studying the structure of the virtual community;  
7) Using the software to run the data analyses for gathering data related to the indicators for identifying opinion leaders;  
8) Making comparison and identifying the opinion leaders;  
9) Calculating and comparing the data of both having and deleting opinion leaders;  
10) Giving out discussions and conclusions

As for the step 7) for this thesis, the analyses include: analysis of tie strength, analysis of the small-world phenomenon, analyses of centrality, identification of opinion and the analysis of influences of opinion leaders on eWOM dissemination.

- Frequency analysis

In particular, the frequency analysis is used during the process of analyzing the In-degree centrality and Out-degree centrality.

1.4. Thesis outline and technical routes

1.4.1. Thesis outline

This thesis consists of eight chapters and is divided into two parts. The thesis begins with the chapter 1 for Introduction. Then Part 1 include Chapter 2, 3 and 4. Part 2 include Chapter 5, 6 and 7. Finally, Chapter 8 is for conclusion. To be more specific, the structure of the thesis is shown as follows:

**Chapter 1: Introduction**

This chapter introduces the research background and research question, explains the research significance and defines the key concepts.
for this thesis. Then, this chapter provides the thesis outline and technical routes.

Part 1: The influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption

Chapter 2: Literature Review

This chapter provides literature review for the key concepts, which include WOM and eWOM, opinion leader, virtual community, consumer and relevant models on consumer behavior. Furthermore, the applications of two models on the purchase intentions of consumers are collected and discussed. Finally, the concept of tie strength is briefly introduced.

Chapter 3: The model

This chapter begins with the discussion of how to builds up an extended model based on the existing researches. The four small questions are answered for developing the new model. After designing the model, the hypotheses and relevant variables are explained.

Chapter 4: Empirical analyses

This chapter is divided into 5 sections. The first section explains the design process of questionnaire and the second section lists the details of the descriptive statistical analysis on the data result from the respondents to the questionnaire. The third section provides the discussion for Part 1.

Part 2: Identifying the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

Chapter 5: Literature Review

This chapter gives an introduction to the literature related to this part, including the review of the identification of opinion leaders and the related researches on Social Network Analysis (SNA). Then, the details of SNA are outlined, including the basic introduction, basic principles, relevant theories and the indicators of opinion leaders.

Chapter 6: Design of the Research

This chapter introduces the related variables for empirical analysis, the sample and the research method. Finally, the sources of data and
sampling approach are introduced.

Chapter 7: Data Analyses

This chapter begins with analyses of the virtual community, including the analysis of tie strength and the analysis of the small-world phenomenon. Then, after a series of analyses towards the indicators of the opinion leaders, they are identified and their influences towards the eWOM communication are analyzed. Finally, this chapter provides the conclusions for Part 2.

Chapter 8: Conclusion

The final part gives a brief summary for chapter 1 to 7 and discusses the conclusion and implications of this thesis. Then, this chapter points out the major contribution and explains the limitations and suggestions for future research.

Appendices

The Appendices part outlines detailed documents used in this thesis.

References

The references part lists all the references used in this thesis.

1.4.2. Technical routes

The technical routes of this thesis are shown in the Figure 6.
Chapter 1. Introduction

Chapter 2. Literature review
  2.1. WOM and eWOM
  2.2. Opinion leaders and online opinion leaders
  2.3. Virtual Community
  2.4. Consumer

Chapter 3. The model
  3.1. Design of the model
  3.2. Hypotheses and definitions of variables for the

Chapter 4. Empirical analyses
  4.1. Design of the questionnaire
  4.2. Data analyses
  4.3. Discussion for Part 1

Chapter 5. Literature review
  5.1. The identification approaches of online opinion leaders
  5.2. Social Network Analysis (SNA)

Chapter 6. Design of the research
  6.1. Introduction of the selected virtual community of consumption----
  Changsha Tong
  6.2. Research method
  6.3. Research variables
  6.4. Data sources and sampling method

Chapter 7. Data analyses
  7.1. The relationship matrix and the social diagram
  7.2. Analysis of tie strength
  7.3. Analysis of the small-world phenomenon
  7.4. Analyses of centrality
  7.5. Analyses of the structural holes
  7.6. Identification of the online opinion leaders
  7.7. Influences of opinion leaders on eWOM dissemination
  7.8. Results
  7.9. Discussion for Part 2

Chapter 8. Conclusion
  8.1. Summary of Chapter 1 to 7
  8.2. Conclusions for this thesis
  8.3. The theoretical implications
  8.4. The managerial implications
  8.5. Major contributions
  8.6. Limitations and future research
Part 1. The influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption

The models, proposed by Kozinets et al. (2010), explain the mechanism of the eWOM flow in the virtual communities and point out how opinion leaders spread the information from marketers to the public. However, it is still a question that how can these opinion leaders affect the potential consumers in the virtual communities. In order to figure out and utilize the influential factors of opinion leaders, the researchers and marketers need to figure out the mechanism of how opinion leaders affect the purchases intention of consumers in the virtual communities of consumption at first.

Consequently, the Part 1 of this thesis will focus on figuring out this mechanism.

Chapter 2. Literature review

In this chapter, the key concepts of Part 1 are introduced in details, based on the prior researches. The section 2.1 is about WOM and eWOM, including the definitions, the typology of eWOM media, the influences and the differences of these two concepts. The section 2.2 introduces opinion leaders and online opinion leaders, including the
definitions, characteristics, the identification approaches, the influence and the types. The section 2.3 describes the virtual communities and the virtual communities of consumption. The definitions, the differences with real communities, the formation and evolution, the classification, the values and members of virtual communities are all described. The section 2.4 illustrates the consumers. It begins with the definitions of consumer behavior and of their purchase intentions and introduces several typical models for consumer behavior. Then the discussion on TAM and IAM is provided and the concept of tie strength is introduced.

2.1. WOM and eWOM

2.1.1. WOM

Word of mouth (WOM), both positive and negative has been studied for a long time from the 1960s (Richins, 1983). The Bass model (Mahajan, Muller, & Bass, 1990) proposes that consumers are influenced by two sources: media and WOM communication.

1) Definitions

Existing literature has provided different but similar definitions of WOM.

Arndt (1967a) defined WOM as oral, person to person communication between a receiver and a communicator whom the receiver perceives as non-commercial concerning a brand, a product, or a service.

Richins (1983) defined the WOM communication as the act of telling at least one friend or acquaintance about the dissatisfaction.

Westbrook (1987) described WOM as “all informal communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services or their sellers.”

Bone (1992) defined WOM as a group phenomenon. Namely, it is an exchange of comments, thoughts, and ideas among two or more
individuals in which none of them represent a marketing source.

Stern (1994) distinguished WOM from advertising in that WOM is face-to-face, interactive, ephemeral, spontaneous, and does not include such features as clever turns of phrases or jingles.

Blackwell, Miniard, and Engel (2001) pointed out that WOM refers to the information exchange of ideas, opinions, the information and so on between individuals.

2) Influence

WOM is considered as an important source of information (Derbaix & Vanhamme, 2003). It can affect product evaluations and decisions (Kiel & Layton, 1981; Mahajan et al., 1990; Price & Feick, 1984), services choices (Ennew, Banerjee, & Li, 2000; Keaveney, 1995), the process of diffusing information about new products (Vilpponen, Winter, & Sundqvist, 2006), and in particular, the consumers’ attitudes and behaviors (Bone, 1995; J. J. Brown & Reingen, 1987; C. M. Cheung, Lee, & Rabjohn, 2008). Meanwhile, WOM has a greater influence on consumer behavior than print advertisements, personal selling, and radio advertising in certain circumstances (J. F. Engel et al., 1969; Katz & Paul, 1955). It is considered to be more robust and credible than advertising messages to consumers (Berkman & Gilson, 1986).

Usually, the influence of WOM on consumers is mainly manifested in the processes before and after the purchase. WOM can help consumers in the process of evaluating of a product (De Bruyn & Lilien, 2004; Mahajan et al., 1990). Before making the purchase decision, consumers usually collect and select the WOM information, evaluate different products and eventually make the choice. After purchasing, consumers are still likely to continue pay attention to the WOM information so as to judge whether they have made a right decision, or sometimes they are willing to share experiences with others.
2.1.2. eWOM

The traditional (offline) WOM is confirmed to play a crucial role for consumers’ purchase decisions (Richins & Root-Shaffer, 1988). Then, with the appearance of Internet, consumers nowadays start to share their own opinions online by terms of electronic word-of-mouth (eWOM). The WOM, one of the most ancient mechanisms in the history of human society, is being given new significance by the unique property of the Internet (Dellarocas, 2003).

One of the most important capabilities of the Internet related to previous mass communication technologies is its bi-directionality (Dellarocas, 2003). With the growth of the Internet, online communication has become an important phenomenon (De Bruyn & Lilien, 2004) and it becomes easier for consumers to share information and opinions (Hennig-Thurau et al., 2004).

1) Definitions

The eWOM refers to any positive or negative statement made by potential, actual, or former consumers about a product or company, which is made available to a multitude of people and institutions via the Internet (Hennig-Thurau et al., 2004).

Also, Kietzmann and Canhoto (2013) defined eWOM as “any positive or negative statement communicated by potential, actual, or former customers about a product, service, brand, or a company, that is made available to other customers and/or institutions via the Internet, and in which the sources are considered independent of any commercial influence”.

2) A typology of eWOM media

Litvin, Goldsmith, and Pan (2008) point out that there are several types of medias which enables the eWOM to be spread and these medias include E-mail, Instant Messaging, Chatrooms, Websites, Product Review & Hate Sites, Newsgroups, Blog, virtual communities and so on. The communication scope of these medias differs from one-to-one, to
one-to-many and to many-to-many and the some of them are asynchronous while some of them are synchronous (See Figure 7).

![Figure 7. A typology of eWOM media](source: Litvin et al., 2008)

3) Influences

As a new form of WOM, eWOM has greater influence than WOM, because it has comparatively wider transmission range and faster speed, making its influence lager. Previous researches confirmed the influence of eWOM on product sales (Goldsmith & Horowitz, 2006), decision-making processes of consumers (De Bruyn & Lilien, 2004) and so on.

X. Zhang and Dong (2008) pointed out that marketers can track the process of spreading eWOM analyze the contents of it so as to effectively understand the consumer psychology and needs, better serve them, guide and control the eWOM information, reduce the influence of negative e-WOM and improve the effects of positive ones.
At the same time, the appearance and development of the network not only accelerate the speed of receivers getting eWOM information, reduce the time investment, but also enrich the eWOM information and contributes greatly to the frequency and scope of individuals’ interaction.

2.1.3. Differences of WOM and eWOM

Although WOM and eWOM are quite similar, researchers have emphasized the differences between them.

Firstly, for the medium, eWOM is spread through Internet while WOM is spread offline (Khammash, 2008; Martin & Lueg, 2013). The eWOM can be spread through E-mail, newsgroups, online forums, BBS, chatrooms and so no (Bickart & Schindler, 2001).

Secondly, for the scale and scope, eWOM can connect a larger number of people without geographical boundaries, compared to WOM (Helm, 2000; Subramani & Rajagopalan, 2003).

Thirdly, for interactive approach, eWOM enables the individuals to be able to have anonymous and non-physical contacts, which are impossible when spreading WOM (X. Zhang & Dong, 2008). This enables individuals to keep connected to each other around-the-clock, which further improves the possibilities of consumer-to-consumer communication; whereas, this also gives rise to some negative results, such as giving out fake information.

Fourthly, for contents and forms, WOM is transmitted via oral language and it is hard for being copied or saved. On the other hand, eWOM is transmitted via Voices, texts, photos, or videos or others and it can be copied and kept for a long time (X. Zhang & Dong, 2008). Hence, eWOM can be easier observed or measured when compared to WOM (C. M. Cheung & Thadani, 2012).
2.2. Opinion leaders and online opinion leaders

2.2.1. Opinion leaders

1) Definitions

The concept of opinion leader was introduced by Lazarsfeld, Berelson, and Gaudet (1944), when they theoretically introduced the Two-step flow of communication, and meanwhile, they highlighted the communicative role of the so-called “opinion leaders”. They found that interpersonal communication was more influential than the mass media. Furthermore, they found that the central and influential individuals acted as intermediaries between the mass media and the public: they obtained information from the mass media and further pass it to the public with strengthening or weakening it to some degree (Katz & Paul, 1955) (see Figure 8).

![Two-step flow of communication](image)

**Figure 8.** Two-step flow of communication
(The figure is made by the author.)

To be more specific, opinion leaders actively acquire and accept the information disseminated by the mass media, process and transmit them, while most of the general audience relies mainly on the interpersonal interaction with these opinion leaders to get information so as to guide
their actions. As a medium of information and as the roles to filter information, opinion leaders have crucial influence on the general audience. Namely, during this two-step process, the first step is mainly about a transfer of information and the second step represents spreading both the filtered information and the influence from opinion leaders.

Hence, it is clear that the two-step flow of communication emphasizes the influence of opinion leaders towards the attitudes of the wider population, and at the same time, stresses that the influence of interpersonal communication towards the general audience is more frequent and more effective than the influence of the mass communication towards the same audience. In particular, this theory emphasizes the importance of opinion leaders towards the eWOM communication.

Subsequent researchers also gave their definitions of opinion leaders. Arndt (1968) defined opinion leaders as those individuals who are the active receivers of WOM, who are exposed the most to mass media, and who tend to interpret the information with or without their own subject ideas to others.

Rogers and Cartano (1962) pointed out that “opinion leaders are individuals who exert an unequal amount of influence on the decision of others”.

Stern and Gould (1988) defined opinion leaders as the persons who affect the attitudes or behaviors of others through WOM communication informally.

Kotler (2001) defined opinion leaders as the individuals who affect others in the social community by terms of their techniques, knowledge, personalities and other attributes.

Rogers (2003) defined opinion leaders as individuals affecting others’ opinions about innovations.

2) Characteristics

Apparently, opinion leaders share some common attributes, although most of them have different backgrounds, live in different areas and
make various kinds of decisions. The researches on opinion leaders have unearthed some common characteristics of them, which enable them to be distinguished from other followers.

Corey (1971) concluded that compared to non-leaders, opinion leaders read more media about related topics and know more about the developments of the new products.

Robertson (1971) explained that opinion leaders are more directive, more innovative and more professional.

Weimann (1991) pointed out that several hundred studies on opinion leadership which have tried to figure out the characteristics of opinion leaders in the light of demographic and other variables, media exposure, social positions, and personality traits; while many studies focused on the education degree, gender, or social class of the opinion leaders, considering that these factors affect the opinion leadership. Moreover, some studies intended to relate personality traits such as conformity, responsibility, motivation or others to the status of opinion leaders.

Rogers (1995) pointed out that opinion leaders are individuals who are exposed greater to mass media, who have greater social participation and higher social status, and who are more innovative, compared to their followers.

Overall, the characteristics of opinion leaders can be summarized as following:

- **Professional**
  
  In the existing researches, professional knowledge related to the product is a crucial feature of opinion leaders.

  The leadership of opinion leaders is more likely to be connected to the knowledge and the discussion about a certain topic (Lyons & Henderson, 2005; Meng, 2012; Myers & Robertson, 1972; Sohn & Leckenby, 2005).

- **Innovative**
  
  Many researches indicate that the innovation is a significant attribute of opinion leaders and they are generally more innovative than their followers (Baumgarten, 1975; Gatignon & Robertson, 1985; Meng, 2012; Myers & Robertson, 1972; Rogers, 2003; Weimann, 1994).
**Involved**

The involvement of opinion leaders with a product class is considered as a feature which distinguishes them from non-leaders (Corey, 1971). The opinion leaders always show higher levels of involvement (Chan & Misra, 1990; Goldsmith et al., 2003; Meng, 2012), so they always talk about the products (Feick & Price, 1987).

Bloch and Richins (1983) considered opinion leadership as “a manifestation of enduring involvement in a product class” and considered the product involvement as a crucial reason for explaining why opinion leader talk about products.

**Socialized**

The social attribute is a very consistent attribute of opinion leaders from the early studies (Weimann, 1994). Opinion leaders are more likely to interact with relatives, friends or others, compared to other members (Meng, 2012; Troldahl & Van Dam, 1965).

Opinion leaders are well integrated in social networks, very active and able to activate the diffusion networks in a social system (Rogers, 1995). In the social network, opinion leaders act as models for their followers to imitate, spread information through the social communication via WOM and sometimes affect their followers directly by giving them advice or guidance for consumption (Flynn et al., 1996).

3) The identification approaches

Considering the functions of opinion leaders in the process of diffusion of information and on consumers, many enterprises and manufacturers try to utilize them to promote their products and services. Hence, how to identify the opinion leaders becomes a basic question in the field of related researches.

The most popular methods to identify opinion leaders include the feature recognition method and the questionnaire method (Meng, 2012).

On one hand, the feature recognition method is based on the clarification of characteristics of opinion leaders. The individuals in the specific areas with one or some characteristics of opinion leaders will be
identified and judged whether they are opinion leaders or not (Meng, 2012).

On the other hand, the questionnaire method is to give out questionnaire and analyze the data from the respondents. It was first pointed out by Rogers and Cartano (1962). Their original scale was modified by King and Summers (1970) and then again by Childers (1986) and most recently by Flynn et al. (1996).

Later, Weimann (1991) emphasized that “the role of interpersonal relations in the flow of information and influence, as revealed by previous studies, caused a growing interest in personal networks and in key positions in these networks”. Subsequently, Valente (1995) pointed out the approach called social network analysis and defined it as an approach to “analyze the pattern of interpersonal communication in a social system by determining who talks to whom”. It can also be used to investigate the flow of personal influence in a social system (Valente, 1995).

Furthermore, Rogers (1995) concluded four main methods of measuring opinion leadership and diffusion networks links: (1) sociometric, (2) informants’ ratings, (3) self-designating techniques, and (4) observations.

Valente and Pumpuang (2007) made a comprehensive review of the literature and concluded 10 methods to identify opinion leaders (see Table 1).

<table>
<thead>
<tr>
<th>Method</th>
<th>Technique</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Celebrities</td>
<td>Recruit well-know people who are national, regional or local celebrities</td>
<td>● Easy to implement</td>
<td>● Contradictory personal behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Preexisting opinion</td>
<td>● Difficult to</td>
</tr>
<tr>
<td>Approach</td>
<td>Description</td>
<td>Leaders</td>
<td>Recruit</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------</td>
<td>----------------</td>
</tr>
<tr>
<td>2. Self-selection</td>
<td>Volunteers are recruited through solicitation</td>
<td>● Easy to implement ● Low cost</td>
<td>● Selection bias ● Uncertain ability</td>
</tr>
<tr>
<td>3. Self-identification</td>
<td>Surveys use a leadership scale and those scoring above some threshold are considered opinion leaders</td>
<td>● Easy to implement ● Preexisting opinion leaders</td>
<td>● Selection bias ● Validity of self-reporting</td>
</tr>
<tr>
<td>4. Staff selected</td>
<td>Leaders selected based on community observation</td>
<td>● Easy to implement</td>
<td>● Staff misperceptions ● Leaders may lack motivation</td>
</tr>
<tr>
<td>5. Positional approach</td>
<td>Persons who occupy leadership positions such as clergy, elected official media, and business elites</td>
<td>● Easy to implement ● Preexisting opinion leaders</td>
<td>● May not be leaders for the community ● Lack of motivation ● Lack of relevance</td>
</tr>
<tr>
<td>6. Judge’s ratings</td>
<td>Knowledgeable community members identify opinion leaders</td>
<td>● Easy to implement ● Trusted by community</td>
<td>● Dependent on the selection of raters and their ability to rate</td>
</tr>
<tr>
<td>7. Expert identification</td>
<td>Trained ethnographers study communities to identify opinion leaders</td>
<td>● Implementation can be done in many settings</td>
<td>● Dependent on experts’ ability</td>
</tr>
<tr>
<td>8. Snowball</td>
<td>Index cases provide</td>
<td>● Implementation</td>
<td>● Validity may</td>
</tr>
<tr>
<td>Method</td>
<td>Method Description</td>
<td>Implementation Benefits</td>
<td>Limitations</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 9. Sample sociometric | Randomly selected respondents nominate opinion leaders and those receiving frequent nominations are selected | • Implementation can be done in many settings  
• Provides some measure of the social network | • Results are dependent on the representativeness of the sample  
• May be restricted to communities with less than 5,000 members |
| 10. Sociometric      | All (or most) respondents are interviewed and those receiving frequent nominations are selected | • Entire community network can be mapped  
• May have high validity and reliability | • Time-consuming and expensive to interview everyone  
• May be limited to small communities (i.e., less than 1,000 members) |

4) The influence

Glock and Nicosia (1963) emphasizes opinion leader that they act “not only as channels of information but also as a source of social pressure toward a particular choice, and of social support to reinforce that choice once it has been made”.
The opinion leaders are “those trusted and informed people who exist in virtual all primary groups, who are the ‘models’ for opinion within their group, who listen and read in the media, and who then pass on information and influence to their circle of relatives, friends and acquaintance” (Berelson & Steiner, 1964).

Rogers (1995) pointed out that opinion leaders are individuals who affect a wider population in the certain situations, and these personal influence is comparatively influential towards individuals in the process of adopting innovations than impersonal sources (Lionberger, 1951; Rahudkar, 1958).

Chau and Hui (1998) concluded that opinion leaders are considered to exert influence towards the decisions of other individuals through three ways, including (1) acting as role models for others to imitate, (2) spreading WOM information and (3) providing others with advice.

Rogers (2003) outlined that opinion leader could activate local network to spread the innovation, and that they enjoy the influential position in their communication structure. Namely they are at the center of the communication networks, which is made of interconnected individuals linked by flows of information. Obviously, opinion leaders can serve as social models whose innovative behavior is imitated by many others.

Goldsmith et al. (2003) claimed that because opinion leader can affect others’ search, purchase and choice through recommendations, they are important for promoting new products.

Furthermore, according to Valente and Pumpuang (2007), opinion leaders affect the behavior of others in their communities through at least four pathways, including raising awareness, persuading others, establishing or reinforcing norms and leveraging resources.

2.2.2. Online opinion leaders

1) Definition
The definition of online opinion leaders is quite similar to the ones of traditional opinion leaders, except for the fact that online opinion leaders exert their influence towards others through the Internet.

2) Types

Based on forming causes

According to Fu (2010), online opinion leaders can be divided into two types:

The first type is those who have been opinion leaders in the real world already. Some public figures, with high social status and influence in real life or who have already been successful, have a certain degree of influence offline and can become online opinion leaders easily. They have unique advantages online when considering spreading information.

The second type is those whose opinion leadership generate online directly. It is the openness of network that enables individuals to become online opinion leaders. With the desire to spread information, corresponding knowledge objectively and being access to the Internet, even the most ordinary netizens have the possibilities to share information, affect others and become opinion leaders in a certain aspect.

Based on common websites which the online opinion leaders use

According to He (2010), opinion leaders can be classified based on the common websites they use. Opinion leaders in the different websites exhibit the similar but not the same features. These websites include:

- **BBS**

  BBS is the abbreviation of the Bulletin Board System, which provides a platform for netizens to share information online. BBS has the typical environment of interpersonal communication and the online groups formed in the BBS always have a large number of participants. Most of these participants have fixed ID, share a more consistent understanding of the rules in the BBS, and are easier to cultivate relationship with others.

- **Blog/ Microblog**

  A blog is a discussion or informational site, which consists of entries
displayed in the chronological order and enables individuals to have their personal home page. Bloggers usually provide comments or diaries, images, videos and music, and sometimes allow visitors to leave messages so as to interact with these visitors. Microblog is another type of blog, which enables individuals to update brief text.

- **SNS**

  SNS is the abbreviation of the social networking service, a kind of platform enables users to display themselves, exchange and share information, and at the same time, places emphasis on the service form of maintaining relationship among users. In essence, it enables users to cultivate their social network online. SNS represents the online form of social network and most of SNS websites provides users with chances to participate in chatting, emailing, video sharing, writing blogs, discussing, playing games and others so as to promote their interaction, so it shows quite typical characteristics of interpersonal communication.

- **Instant messaging (IM) platform**

  IM refers to the network tool which enables users to synchronously transmit information and feedback and it includes chatting software, online chatting rooms and so on.

3) **Characteristics**

  Being similar to traditional opinion leaders, online opinion leaders also have intense interests towards popular products, have higher degree of involvement than others because of their interests, accumulated rich knowledge, and at the same time, take advantage of social activities to diffuse information.

  In addition, because online opinion leaders have mastered better computer skills, they comparatively depend more on the Internet.

  Besides these characteristics of traditional opinion leaders, some researches also analyze the additional characteristics of online opinion leaders. These characteristics include blurred social attributes, greater heterogeneity with followers, faster speed of establishing their position, less possibility to be misunderstood, new media habits, higher release frequency of information and so on (He, 2010; Rafaeli & Sudweeks, 1997;
2.3. Virtual Community

2.3.1. Virtual Community

1) Definitions

The study of virtual community has received a lot of attentions since the past decade.

Rheingold (1993) defined virtual communities as online social aggregations which emerge when enough Internet users discuss long enough, with sufficient human feelings, to form online relationships.

Stone (1991) defined virtual communities as collections of common beliefs and practices which enable separated Internet users to be connected.

S. Jones (1995) refers the virtual communities as communities formed through computer mediated communication.

Hagel and Armstrong (1997) defined virtual communities as “a broad subculture has emerged around thousands of fragmented bulletin board services, resulting in the creation of virtual communities that leverage the capabilities of network to connect people with each other and to fulfill their specific needs for communication, information, and entertainment.”

Other researchers also offered similar definitions of virtual community.

Beamish (1995) referred the community network as a network of connected computers and individuals could communicate electronically.

Q. Jones and Rafaeli (2000) defined the virtual communities as computer-mediated spaces enable individuals to attend and interact.

There are many definitions of virtual communities from the sociology, or technology, or commercial, or others perspective, but in essence, nearly all of these definitions have four similar components, including community, location, bonding and a shared purpose (Gupta & Kim,
Community. Community refers to all the members groups in the virtual communities, namely, the social network. These members may be not physically bound together (Rothaermel & Sugiyama, 2001).

Location. Virtual communities can be considered as places for individuals to develop, maintain relationships and to explore new opportunities (Gupta & Kim, 2004).

Bonding. The members in virtual communities have built virtual relationships with others. Their commitments to interact with others online can be considered as bonding (Etzioni & Etzioni, 1997).

Shared purpose. Virtual communities are formed out of one or several purposes, such as meeting with individuals needs of fantasy, interest, relationship, transaction (Hagel & Armstrong, 1997)

2) The differences between virtual communities and real communities

The virtual community can be considered as the extension of real community (Fox & Roberts, 1999).

When compared with traditional communities, the advantages of the virtual community are that it enables individuals to be connected without being in close proximity either spatially or temporally, and provides individuals with chances to enjoy their new online identities and even to build up new relationships, without being limited by their real appearance or other elements (Etzioni & Etzioni, 1997).

X. Xu and Wang (2007) concluded the difference between virtual communities and real communities as following (See Table 2).

Table 2. The difference between virtual communities and real communities
(Sources: X. Xu and Wang, 2007;
The Table is made by the author)
Although the virtual communities and real communities have so many differences, the common elements of both include the groups of individuals, their relationships and the differing roles of them in the communities. In essence, both kinds of communities are collections of individuals.

Consequently, the relationship between the virtual communities and real communities is not antagonistic, and they are only embodiment of the other one in a new space. Various ideas, norms and standards in the traditional community have seeped into the virtual communities and function.

3) Formation and Evolution
Tuckman (1965) pointed out that any community, whether traditional or virtual, evolves through five stages, including forming, norming,
storming, performing and adjourning. With the virtual community accumulate more and more members and as theses members begin to communicate and connect with others, the community as a whole develops and evolves.

Hagel and Armstrong (1997) pointed out that the virtual communities usually pass through four stages of evolution (See Table 3).

Table 3. Four stages of the evolution of virtual communities
(Source: Hagel and Armstrong, 1997; The Table is made by the author)

<table>
<thead>
<tr>
<th>Stage of evolution</th>
<th>Description</th>
<th>Key assumptions</th>
</tr>
</thead>
</table>
| Virtual villages         | Communities are highly fragmented but profitable businesses, each containing multiple, small sub-communities | • Low barriers to entry  
• Many entrants  
• Vendors participate across multiple communities  
• Network users disperse across multiple communities |
| Concentrated constellations | Concentration of core communities, and development of affiliate relationships with niche communities | • Increasing returns lead to concentration within “core” topics, such as travel  
• Niche communities benefit from affiliating with core communities |
| Cosmic coalitions        | Core communities aggregate across complementary                               | • Members find value in formation of coalitions, around common user interface.  
• Coalition organizers realize |
Integrated infomediaries

<table>
<thead>
<tr>
<th>Core Topic Areas</th>
<th>Economic Value by Integrating Marketing Programs and Member/Vendor Profiles Across Topic Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communities and coalitions evolve into agents for members, managing their integrated profiles to maximize value to members.</td>
<td>Members themselves represent the most efficient location for capture of profiles. Members assert ownership over their profiles. Specialized infomediaries can organize and maximize value of member profiles.</td>
</tr>
</tbody>
</table>

Hagel and Armstrong (1997) believe that “virtual communities will evolve from a highly fragmented group of businesses to a much more concentrated industry”. They emphasized that two key components of value creation in this process are that information need to be captured and that the growth options must be exploited aggressively (Hagel & Armstrong, 1997).

4) Classification

According to previous researches, various typologies of virtual communities have been pointed up and among them, the most well-known one is illustrated by Hagel and Armstrong (1997).

According to Hagel and Armstrong (1997), virtual communities serve to aggregate people and provide an environment in which customers can communicate and connect with others and the basis of this kind of interaction is on individuals’ desire to meet four basic needs, including interest, relationship, fantasy, and transaction. So Hagel and Armstrong (1997) distinguished four types of virtual communities: communities of interest, communities of relationship, communities of fantasy and communities of transaction (See Figure 9).
To be more specific:

- **Communities of interest.**
  These communities focus on sharing interest, knowledge and experience and are usually informational oriented, such as some recommendation sites. Users always have interests on the same topics and enjoy interacting with others. The objective of such virtual communities is entertainment.

- **Communities of relationships.**
  These communities focus on connecting individuals and helping them to cultivate deep personal relationships. The objectives of such virtual communities are relationship building, customer service, relationship marketing, information/knowledge sharing or enjoyment.

- **Communities of fantasy.**
  These communities focus on playing virtual games in the fantasy world and enable users to create their own virtual worlds, identities or stories or other. The objectives of such virtual communities are information/knowledge sharing or enjoyment.
Communities of transaction.

These communities focus on facilitating transaction and serve to some kinds of commercial purposes. Participants are encouraged to communicate and interact with others so as to make a deal. The objectives of such virtual communities are sales, auction or information/knowledge sharing.

It is crucial that these categories are not mutual exclusive and the community which only focuses on one kind of needs is hardly to be successful.

Meanwhile, based on the business purpose, Hagel and Armstrong (1997) also provided the other typology of virtual communities, by dividing virtual communities into two categories, including consumer-focused communities and business-to-business communities. The consumer-focused communities are further divided into three sub-groups which include geographic communities, demographic communities and topical communities. Meanwhile, the business-to-business communities are further divided into four subgroups which include vertical industry communities, functional communities, geographic communities and business category communities.

Other researchers also pointed out different classifications of virtual communities.


Porter (2004) classified virtual communities into two levels, including establishment and relationship orientation. The first-level groups include member-initiated and organization-sponsored communities. In the second-level groups, member-initiate virtual communities focus to cultivate social or professional relationships between their subscribers, while the organization-sponsored virtual communities aim to build up commercial, non-profit or government relationships.
Moreover, according to De Valck (2005), based on organizational structure in virtual communities, communities can be divided into six categories:

- **Commercial/Non-commercial**
  These communities vary in terms of the degree of commercialism. The commercial ones can get revenues from advertising, sponsorship or member fees or others, while the non-commercial ones do hardly purchase profits and may be, for example, formed in the academic circles.

- **Endorsed/Non-endorsed**
  Some virtual communities are endorsed or sponsored by certain companies, institutes or other organizations, while some virtual communities are independent.

- **Open systems/Closed systems**
  Virtual communities with open systems are open for everyone, while virtual communities with closed systems are limited to registered members or sometimes even to payed members.

- **Linking to real life community/Being truly virtual**
  Some virtual communities are based on the real world. For example, they may be geographically focused and most members are living in the same region and they are able to have face-to-face meetings. Contrarily, some virtual communities are being truly virtual, without any connection with real life.

- **Regulated/Non-regulated**
  Virtual communities vary in terms of the level of regulation. Some of them have strict regulations while some of them do hardly have any rules at all.

- **Registered participation/Non-registered participation.**
  Virtual communities vary in terms of the level of participant registration which is required.

5) The values of virtual communities
The Internet establishes and reinforces the connections between people and virtual communities can harvest benefits by meeting various
needs of people. Because of the potential values of the virtual communities, many companies have taken strategies for marketing. The virtual communities enable these companies to grasp and analyze the needs of members, to actively recommend them with various products or service, and to satisfy them. The member-generated contents and the information about personal attitudes and behavior bring great values to the marketers.

To be more specific, Hagel and Armstrong (1997) pointed out four perspectives of the commercial values of virtual communities, shown as follows:

- **Values for the organizers of the virtual communities**
  The evolution and development of virtual communities accelerate the development of E-commerce. The problems, such as the site traffic and the loyalty and willingness to purchase, can be address through the establishment of virtual communities.

- **Values for consumers**
  Virtual communities help their members to get access to various kinds of member-generated information, inside which the sellers can hardly monopolize the information any more. These virtual communities usually have a certain focus, such as focusing on consumption, and these virtual communities can attract the individuals with the similar interests. For example, the members in the virtual communities of consumption have great purchasing power.

- **Values for vendors**
  Virtual communities can help the vendors to expand their markets by reducing search costs, increasing the propensity for consumers to purchase, increasing their abilities to focus on the target consumers, getting feedbacks from consumers for improvement and so on. To be more specific, through the Internet and the virtual communities, vendors are able to find potential consumers more easily. Consumers can get enough information about the vendors and can accumulate their trust towards the online consumption. With the transaction histories or information about personal preference accumulated automatically by the system of the virtual communities, the vendors can focus more on
their target consumers and meanwhile, to grasp the real needs of these potential consumers.

Also, virtual communities can help the vendors to get access to consumers without those traditional intermediaries, to decrease investment for real stores and to have a broader reach.

- **Values for marketers**

  Virtual communities have gathered a lot of consumers with similar interests, and the marketers can get access to their consumers or potential consumers easily. By doing so, they can collect more first-hand data about these individuals and more feedbacks for improvements. Also, the eWOM communication become more powerful than the traditional advertisements and the marketers can utilize eWOM communication to attract more consumers.

6) **Members**

- **Members development**

  Considering that the virtual communities are created and maintained by the interaction among members, members are crucial for the virtual communities (Phillips, 1996). Hagel and Armstrong (1997) emphasized the importance of aggregating members and pointed out the four stages of it (See Figure 10).

![Figure 10. Four stages of members; development](Sources: Hagel and Armstrong (1997);)
From this figure, it can be seen that the strategies and the focuses for different stages are not similar. More importantly, only having a certain scale of members can virtual communities become profitable, and the core to attract and maintain members is to increase the interactive communication among members.

To be more specific, these four stages are:

- **Attract members**
  
  Virtual communities need not only to provide attractive contents, but also to take appropriate marketing means so as to appeal the Internet users, with free membership and usage.

- **Promote participation**
  
  Once individuals do get in, the challenge is to retain them. Virtual communities need to provide a variety of forms to increase the engagement of Internet users, such as increasing the member-generated content and the editorial/published contents or inviting guest speakers.

- **Build loyalty**
  
  As members begin to visit the sites regularly, virtual communities can retain members by cultivating member-to-member relationships and member-to-host relationships by means of providing chance for customized interaction, and meanwhile, strengthening the personalized service and unique advantages of the virtual communities.

- **Capture value**
  
  With a certain number of members, virtual communities need to seek their own commercial values so as to be profitable by increasing transaction opportunities, targeted advertising, and fees for premium services.

- **Typology of members**
  
  Furthermore, Hagel and Armstrong (1997) pointed out that the commercial potential of members are not equal to each other and these members can be divided into four categories.
• Browsers. Members enter into a virtual community as “browsers” for testing the waters.
• Builders. Overtime, browsers tend to become either “builder” or “users”. Builders are those members who are the most passionate about the community and who are the most active in contributing member-generated contents.
• Users. Sometimes they are called lurkers, who spend more time in the community than browsers and benefit from its information but who neither contribute significantly to member-generated content nor actively purchase products or services.
• Buyers. Buyers are those members who actively purchase products and services within the communities. These members may be among the most valuable of all.

Members are likely to represent a complex mix of elements from all four categories described.

Later, Kozinets (1999) divided the members in the virtual communities into four types, based on their participation:
• Tourists. They have few social ties with others and seldom attend any activity in the virtual communities.
• Mingers. They have strong ties with others, but they also seldom attend any activity in the virtual communities.
• Devotees. They have weak ties with others, but they have intense interests in the activities in the virtual communities.
• Insiders. They have strong ties with others and intense interests in the activities in the virtual communities.

• Member management

Whether a virtual community succeeds or not is affected by the number of its members. For example, with more data about members, the organizers of virtual communities will be able to have a more detailed profile of these members, to grasp more valuable information and to build more accurate plans for targeting these members according to their messages. Meanwhile, the community can attract more relevant sellers or companies to serve to members’ needs.
Hence, how to attract and maintain a large number of members is an important question.

According to Hagel and Armstrong (1997), the challenges of getting a mass of members include generating traffic, concentrating traffic and locking in traffic (See Table 4).

Table 4. The challenges of getting a mass of members
(Sources: Hagel and Armstrong, 1997; The table is made by the author)

<table>
<thead>
<tr>
<th>challenges</th>
<th>Specific moves</th>
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<tbody>
<tr>
<td>Generating traffic (getting more individuals to browse the site)</td>
<td>• Enter quickly&lt;br&gt;• Get people to pass through&lt;br&gt;• Generate awareness&lt;br&gt;• Partner for preemption</td>
</tr>
<tr>
<td>Concentrating traffic (getting individuals to spend more time in the site)</td>
<td>• Engage members&lt;br&gt;• Enhance the offerings&lt;br&gt;• Extract value</td>
</tr>
<tr>
<td>Locking in traffic (building up barriers to prevent individuals from changing to other sites)</td>
<td>• Foster personal relationships between members&lt;br&gt;• Accumulate and organize member-generated content&lt;br&gt;• Improve community functionality&lt;br&gt;• Tailor resources to individual member needs</td>
</tr>
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</table>

2.3.2. Virtual communities of consumption

The concept of virtual community of consumption results from Hagel and Armstrong (1997) who distinguished four types of virtual communities, including virtual communities of interest, of relationship,
of fantasy and of consumption. This typology is based on the four basic needs of human beings, which include needs of interest, relationship, fantasy, and consumption and which can be meet with in the virtual communities.

The virtual communities of consumption can be defined as ‘affiliative groups whose online interactions are based upon shared enthusiasm for, and knowledge of, a specific consumption activity or related group of activities’ (Kozinets, 1999). Notably, virtual communities of consumption serve to commercial purposes, like facilitating consumption, by encouraging participants to communicate and interact with others so as to make transactions.

2.4. Consumer

2.4.1. Definitions

1) Definitions of consumer behavior

The field of consumer behavior has the strongest historic root in the marketing strategy which evolved in the late 1950s, and many researchers pointed out their definitions of consumer behavior.

Walter and Gordon Paul (1970) defined it as ‘the process whereby individuals decide what, when, where, how and from whom to purchase goods and services’.

Enis (1980) referred it to ‘a process, which through Inputs (buying power, intra- and inter-personal influences marketing effort and environmental factors) and their use though process (perfection of wants, search, purchase decision, product use, and evaluation) and actions leads to satisfaction of needs and wants’.

Schiffman and Kanuk (2000) defined it as ‘the behavior that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs’.

According these and other definitions of consumer behavior, it is
clear that consumer behavior focuses on how individuals make their decisions on consumption, including what to buy, why to buy, when to buy, where to buy, how to pre-evaluate and post-evaluate, and so on.

2) Definitions of purchase intentions of consumers

Spears and Singh (2004) defined purchase intention as the conscious plan of individuals to purchase. It also refers to the subjective possibility of consumers buying a certain product (Bagozzi & Burnkrant, 1979; Dodds et al., 1991). The higher the purchase intention is, the more likely this consumer will buy the product (Schiffman & Kanuk, 2000).

With the Internet, the online purchase intention refers to the willingness degree of consumers for making online transactions (M. S. Featherman & Pavlou, 2003).

Previous researches have confirmed the influences of attitudes and intentions on the behavior of consumers and have indicated that after having attitudes and intentions, the consumers would have the purchase behavior (Ajzen & Fishbein, 1975; J. F. Engel et al., 1969).

2.4.2. Consumer behavior models

Previous researches show that consumer behavior is analyzed from different perspectives and is explained by different models. The most influential models and theories on consumer behavior include Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1975), Technology Acceptance Model (TAM) (Davis et al., 1989), Theory of Planned Behavior (TPB) (Ajzen, 1991), Information Adoption Model (IAM) (Sussman & Siegal, 2003) and so on.

1) Theory of Reasoned Action (TRA)

Ajzen and Fishbein (1975) pointed out the Theory of Reasoned Action (TRA), rooted in social psychology. It is widely used in the field of
consumer behavior, and mainly to explain the relationship between attitudes and behaviors. The model is shown in the Figure 11.

The basic idea of this model is that behavior depends on intentions, and these intentions, in turn, are affected by the attitude toward performing the behavior and the subjective norm. Meanwhile, it shows that the attitude and norm can not affect behavior directly, but they can affect behavior though affecting intentions. Consequently, this model is used to predict individuals’ behavior based on their attitudes and behavioral intentions.

Figure 11. Theory of Reasoned Action (TRA)
(Source: Ajzen and Fishbein, 1975)

2) Theory of Planned Behavior (TPB)

Ajzen (1985) added additional concept of perceived behavioral control to TRA and extended it into a new theory, which named the Theory of Planned Behavior (TPB). The model is shown in the Figure 12.

In this theory, intentions can be predicted or explained by the attitude toward the behavior, the subjective norm and the perceived behavioral control, and these intentions can be used to predict or explain behavior.
Being different from TRA, TPB can be used to analyze the behavior of individuals with incomplete volitional control. TRA supposes that people have complete control over their behavior. However, in fact, individuals’ behavior is affected by the external environment and the individuals can not completely control themselves. Hence, Ajzen (1985) added the perceived behavior control to TRA and pointed out TPB.

![Figure 12. Theory of Planned Behavior (TPB)](Source: Ajzen, 1985)

3) Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis et al. (1989), is based on TRA and is used to explain user acceptance of information systems and technology. The model is shown in the Figure 13.

The goals of this model are to explain the determinants of computer acceptance by measuring their intentions, and also to explain their intentions by their attitudes, subjective norms, perceived usefulness, perceived ease of use, and external variables. Here, the concepts of perceived usefulness, perceived ease of use and external variables are the additional factors of this model, when compared to TRA.

According to Davis et al. (1989), “Perceived usefulness (U) is defined
as the prospective user’s subjective probability that using a specific application system will increase his or her job performance within an organizational context. Perceived ease of use (EOU) refers to the degree to which the prospective user expects the target system to be free of effort.”

![Diagram of Technology Acceptance Model (TAM)](image)

Figure 13. Technology Acceptance Model (TAM)
(Sources: Davis et al., 1989)

In TAM, behavioral intention to use and perceived usefulness are the determinants of actual system use, and behavioral intention to use affects the actual system use. The attitude toward using and the subjective beliefs (including perceived usefulness and perceived ease of use) indirectly affect actual system use by affecting behavioral intention to use. Meanwhile, perceived usefulness and perceived ease of use affect behavioral intention to use together. Furthermore, perceived usefulness is controlled by external variables, while external variables and perceived ease of use work together to affect perceived usefulness.

4) Information Adoption Model (IAM)

When considering about the information adoption behavior of individuals, the Information Adoption Model (IAM), proposed by Sussman and Siegal (2003), is a widely used model for examining how individuals adopt information into their intentions and behaviors within the computer-mediated communication platforms. The model is shown
in the Figure 14.

IAM is derived from the Technology Acceptance Model (TAM) (Davis, 1989) and dual process models of informational influence (e.g. Elaboration Likelihood Model).

On one hand, TAM is used to explain users’ acceptance of information systems and technology. It can both explain the determinants of computer acceptance by measuring their intentions, and explain their intentions by their attitudes, subjective norms, perceived usefulness, perceived ease of use and external variables.

On the other hand, the Elaboration Likelihood Model (ELM) illustrates that informational influence can occur at any degree of receiver elaboration (Petty & Cacioppo, 1986). ELM is used to describe the change of attitudes form and to explain the processes underlying the effectiveness of persuasive communication. It demonstrates that the results of informational influence depend on the different influence routes, including a central route and a peripheral route. The central route is because of individuals’ careful consideration of the true merits of the information, which will cause a high level of elaboration, while the peripheral route is because of simple cues related to the information, without carefully thinking of the merits of it, which will lead to a low level of elaboration. Consequently, according to ELM, the quality of the arguments determines the degree of informational influence (Petty & Cacioppo, 1986).

Because ELM is useful to explain how the receivers are affected by the information within the message and can serves as a complement to the TAM, Sussman and Siegal (2003) integrated TAM and ELM together and used the argument quality as the central route, the source quality as the peripheral route, the perceived information usefulness as a mediator.

Here, the argument quality refers to influential strength of the message, and the source credibility refers to “a message recipient’s perception of the credibility of a message source, reflecting nothing about the message itself” (Sussman & Siegal, 2003).
2.4.3. Discussion on TAM and IAM

Among these models, previous researches indicate that TAM and IAM are widely used for studying the purchase intentions of consumers. The discussion of these related researches is shown as follows.

2.4.3.1. Applications of TAM on studying purchase intentions

Although TAM is developed to explain user acceptance of technology in the workplace at the beginning, it has been applied to different technologies (e.g. e-mail) under different situations (e.g. time and culture) with different control factors (e.g. gender and organizational type) and different subjects (e.g. Undergraduate students, MBAs and knowledge workers) (Y. Lee et al., 2003). Its applications have convinced researchers of its applicability in other technological adoption situations with appropriate adjustments (Gefen & Keil, 1998; Igbaria, 1993; O’cass & Fenech, 2003).

Particularly, TAM is used to analyze the online purchase intentions of Internet users and its applications have great theoretical and practical significances. It is mainly because that Internet users have dual characteristics of being both traditional consumers and information systems users (B. Cheng & Bao, 2003).

To be more specific, in the e-commerce settings, Internet users have
the characteristics of general consumers, such as searching for information, evaluating alternatives, purchasing, asking for after-sales and others. Meanwhile, because the online systems are computer-based and shopping online is finished through the interface of a web browser, online consumers have mastered a certain degree of computer skills. Namely, the process of Internet users accepting online shopping is similar to their process of accepting new technology. Hence, TAM can be used to study the online purchase intentions of Internet users.

According to the previous researches, the applications of TAM on online shopping intention of Internet users can be divided into three categories, including researches on:

1) Using the original TAM (Gefen & Straub, 2000);


To be more specific:
1) Using the original TAM

Gefen and Straub (2000) pointed out that the effects of perceived ease of use should be task-dependent when using TAM to study e-commerce adoption. It was supposed that perceived ease of use only affects IT adoption when the website was used to inquire about products, rather than being used to purchase products. 217 subjects at a large business school in the mid-Atlantic region of the United State were asked to finish a simulation experiment so as to collect data. The results showed that in the context of e-commerce adoption, perceived ease of use affected the intended inquiry directly and via perceived usefulness indirectly and that perceived ease of use affected the intended purchase via perceived usefulness indirectly, but failed to show significantly direct
influence on intended purchase.

2) Adding variables to the original TAM

Gefen et al. (2003) established a model for studying e-commerce adoption by utilizing TAM and adding an intermediary variable of trust. The external variables, including calculative-based, institution-based structural assurances, institution-based situational normality and knowledge-based familiarity, were added to the model. Students majored in business in a school in United States were chose to complete questionnaire and 213 answers were usable. The results revealed that having a site which consumers were familiar with increased their perceived ease of use and that the effect of trust, perceived usefulness and perceived ease of use affect the intention directly without affecting the attitude.

B. Cheng and Bao (2003) used TAM to investigate the determinants of consumers’ behavior of participating online shopping. The involved variables included perceived usefulness, perceived convenience, perceived safety, attitudes towards shopping online, intentions to shop online and really purchase online. Calls were made to respondents who were using a popular website in Zhejiang Province in China to fill in the questionnaire survey and 612 pieces of answers were accepted. The results showed that perceived usefulness, perceived convenience and perceived safety all affected consumers’ attitudes and intentions of shopping online.

Van der Heijden et al. (2003) added two intermediaries, including trust of online store and perceived risk, to the original TAM to explore the factors affecting consumers’ intentions to purchase online at an electronic commerce website. They used both a technology-oriented perspective and a trust-oriented perspective to start an empirical study. A group of undergraduate students who took a IS course at a Dutch academic institution were asked to answer the questionnaire and 228 pieces of answers were usable. The result showed that the trust in online stores affected perceived risk and these two factors both affected the attitude towards online purchasing and that the perceived ease of use
affected perceived usefulness and these two factors also affected the attitude towards online purchasing.

K. Yu and Song (2005) combined TAM with the variable of trust so as to analyze consumers’ online shopping intentions in the Business-to-Consumer (B2C) settings. A questionnaire was conducted and data was collected by sending random questionnaire to users of shopping websites in China (like taobao.com) and instant messaging software (like QQ). 146 pieces of answers were usable. The results showed that the perceived usefulness, perceived ease of use and trust were the antecedents of consumers’ attitudes, which further affected their intentions, and confirmed the intermediary function of trust.

J. Zhu (2005) added several intermediaries to the original TAM to explore the online shopping intention, and compared the differences in intentions, attitudes and influential factors among consumers with different degree of Internet using skills, frequency of browsing online stores and kinds of Internet experiences. The added intermediaries included perceived reliability, perceived product quality, perceived system quality and perceived service quality. Students in three universities in the west China and some staff from companies were asked to answer the questionnaire and 258 pieces of answers were accepted. The results showed that: 1) all the intermediaries affected both attitudes and the intentions of shopping online; 2) consumers with different degree of Internet using skills had different level of attitudes of shopping online, perceived product quality and perceived system quality; 3) the different frequency of browsing online stores and different kinds of Internet experiences had significant influences in all these variables except perceived system quality.

M. L. Liu and Li (2006) combined TAM with Innovation Diffusion Theory(IDT) and added two intermediary variables, including innovative features of consumers and perceived risk, to establish a consumer behavior model for the B2C e-commerce environment. The questionnaire was sent out by email and by post and 1010 pieces of answers were usable. The results provided supports for TAM and IDT in the B2C e-commerce environment and revealed that the perceived
convenience affected both the perceived usefulness and the attitudes towards shopping online and that the perceived risk and innovative feature of consumers had negative influences and positive influences on the attitudes towards shopping online respectively.

L. Zhu (2006) established a model to discuss about the factors which affect the intentions of consumers purchasing online. Compared to TAM, this model was added with three external variables, including perceived risk, perceived entertaining and subjective norms. The questionnaire was sent to university students and company staff who were all older than 18 and who had incomes and experiences of shopping online. Finally, 186 pieces of responses were accepted. The results revealed that: 1) TAM was effective for explaining consumers’ intentions of shopping online; 2) internet experience, only affected by demographic factor directly, was a crucial factor affecting consumers’ intentions of shopping online; 3) the perceived risk and perceived entertaining had negative and positive effects on Chinese consumers’ intentions of shopping online respectively; and 4) the subjective norms had a significant influence on the attitudes and intentions of shopping online.

L. Liu (2007) analyzed the factors affecting the intention of consumers purchasing online. TAM, perceived risk, and the reasonable composition of TPB and TRA were combined. Also, several external variables were added in the model, including the demographic variables, the Internet experience, the online shopping experiences, attitudes towards risk, purchasing habits, product knowledge and other individual difference variables. The questionnaire was sent to university student in Hunan Province in China and 216 pieces of answers were usable. The results showed that: 1) the Internet experience, the online shopping experiences, purchasing habits and product knowledge had positive influences on the perceived ease of use of online shopping; 2) different types of online consumers had different degree of perceived ease of use and of perceived risk; 3) the product knowledge and purchasing habits had positive influences on perceived usefulness; 4) the Internet experience, product knowledge, preference of risk had negative influences on perceived risks and so on.
Ye and Zhang (2014) built up a model, integrating both perceived risk and sales promotion to the original TAM. This extended model was to study the impact of sales promotion on online consumers’ purchase intention in the setting of a consumer-to-consumer (C2C) market. The survey data was collected from experienced buyers who frequently purchased items though Taobao.com, the most popular C2C e-commerce website in China. Finally, 214 pieces of usable responses were accepted. The results indicated that the original TAM was applicable in the online C2C market, that sales promotion affected perceived risk negatively and perceived ease of use positively and finally affected the purchase intention, and that perceived risk had negative influences on perceived ease of use, purchasing attitude and purchase intention.

3) Building up complex models based on TAM

Vijayasarathy (2002) incorporated additional constructs to the original TAM to study consumer intentions to use online shopping. The additional factors included compatibility, privacy, security, attitude, normative beliefs and self-efficacy. The selected participants, living in an upper mid-western US city answered the questionnaire and 281 pieces of valid answers were accepted. The results indicated that usefulness, ease of use, compatibility and security all affect consumers’ attitude and further affected their intention to use online shopping and that normative beliefs and self-efficacy also had positive influences on their intentions.

Shang et al. (2005) pointed out that not only extrinsic factors in TAM affected consumer behaviors, but also intrinsic factors, such as entertainment, should be taken into consideration. Hence, cognitive absorption and fashion involvement were added to TAM so as to explain online shopping intention and behavior. The questionnaire was sent to the members of a major computer magazine in Taiwan and also to students in three universities in Taiwan. Finally, 1128 answers were usable. The results revealed that perceived usefulness failed to show a significant influence on the online shopping intention and behavior and provided empirical support for the influences of perceived usefulness,
perceived ease of use and cognitive absorption on shopping online intention and behavior.

J. Li (2008) added the compatibility in the Innovation Diffusion Theory (IDT) into the classical TAM, used the website quality and perceived risk as external variables and trust as an intermediary to explore the consumers’ online shopping intentions. A questionnaire was conducted and 377 pieces of responses were accepted. The result showed that TAM was verified in this empirical study and that compatibility, website quality, perceived risk and trust all affected the consumers’ online shopping intentions.

Ha and Stoel (2009) integrated e-shopping quality, enjoying and trust into TAM to study consumer acceptance of e-shopping. Online surveys among college students were used and 298 pieces of valid answers were accepted. The results showed that the e-shopping quality for apparel products, which included web site design, customer service, privacy/security and atmospheric/experiential factor, affected trust, perceived ease of use and enjoyment and finally affected consumers’ attitudes toward e-shopping, that the perceived usefulness and the attitude toward e-shopping affected their intention to shop online, while perceived ease of use failed to show a significant influence on attitude, and that shopping enjoyment and trust affect consumers’ adoption of e-shopping.

Al-Gahtani (2011) built up a comprehensive model which described the factors driving individuals to accept online transaction by integrating three constructs into TAM. These constructs included trust, credibility and risk and four demographic variables were also incorporated into the model. The participants of the questionnaire were faculty members, staff and students in a major university in Saudi Arabia and finally 128 pieces of answers were usable. The results confirmed the influences of credibility, trust, risk on perceived usefulness, perceived ease of use and finally on intention for online transaction, and pointed out that the influences of individual’s age, gender, education level and work type towards intention for online transaction were partially confirmed.

Çelik and Yılmaz (2011) built up a model to investigate the consumer
acceptance of e-shopping in Turkey by adding external variables and intermediaries to the classical TAM. In this new model, the external variables included information quality, service quality, system quality and the intermediaries included perceived trust and perceived enjoyment. Members in three different forums were asked to answer the questionnaire online and 606 pieces of answers were accepted. The results revealed that: 1) information quality, service quality and system quality all affected the perceived ease of use which exerted a positive influence on perceived usefulness and the attitudes towards e-shopping; 2) perceived trust failed to show a significant influence on perceived usefulness but affected the attitudes; 3) perceived enjoyment exerted a positive influence on perceived usefulness and the attitudes, which affected the intentions.

Mao et al. (2014) established a model based on TAM, perceived risk and some external factors to investigate the influential factors of social media marketing towards consumer purchase intention. The involved external factors were the factors of social media marketing, including placement, marketing activities, experiential marketing and interaction. A questionnaire was sent to social media marketing platform users, which included college students and urban white-collar workers, and 283 usable answers were accepted. The results showed that all the factors of social media marketing affected perceived usefulness positively and perceived risk negatively, that perceived usefulness and perceived risk had positive influences and negative influences on purchase intention respectively.

Lim et al. (2016) pointed out a model based on TAM to study the factors affecting online shopping behavior and the mediating role of purchase intention by examining the relationship between subjective norm, perceived usefulness and online shopping behavior mediated by purchase intention. The questionnaire was sent to students between 19 and 34 years old in the University Malaysia Perlis and 662 pieces of valid answers were accepted. The results showed that subjective norm and perceived usefulness had positive influences on purchase intention and further affected online shopping behavior, while the relationship
between subjective norm and online shopping behavior, and the relationship between perceived usefulness and online shopping behavior were not significant.

2.4.3.2. Applications of IAM on studying purchase intentions

Since IAM was proposed in 2003, considering its history is comparatively short, its applications are not so much. Prior studies show that IAM is used in the studies about consumers’ information adoption process of the information from the website (McKnight & Kacmar, 2007), online community (C. M. Cheung et al., 2008), social network (Jin, Cheung, Lee, & Chen, 2009) and eWOM (C.-W. Chen et al., 2011; C. M. Cheung et al., 2008). In particular, it is used for studying the purchase intention of Internet users.

The relevant studies can be divided into two categories, including researches on: 1) adding variables to IAM (Erkan & Evans, 2016); and 2) building up complex models based on IAM (Alfina, Ero, Hidayanto, & Shihab, 2014; Gunawan & Huarng, 2015).

To be more specific:
1) Adding variables to IAM

Erkan and Evans (2016) studied the influence of eWOM on purchase intentions of consumers in the social media by integrating IAM and the related components of TRA. The variables in this model included information quality, information credibility, needs of information, attitude towards information, information usefulness, information adoption and purchase intention. Valid answers were from 384 students in UK universities. After analyzing the results, this study confirmed the influences of both information adoption and attitude towards information on the purchase intention and the influence of information usefulness on information adoption. Meanwhile, information quality, information credibility and needs of information were all found to affect
information usefulness.

2) Building up complex models based on IAM

Alfina et al. (2014) proposed an extended model by integrating IAM with trust to study the impact of cognitive trust and electronic word-of-mouth (eWOM) on purchase intention in C2C e-commerce site. The determinant of online shopping intention was supposed to be trust, and trust was further assumed to be affected by cognitive trust and adoption of eWOM information. Here, the cognitive trust was measured by three variables, including ability, benevolence and integrity, while the eWOM influence was measured by the IAM, namely the eWOM adoption was supposed to be affected by perceived eWOM usefulness and the latter was to be affected by source credibility and information quality. The questionnaire was distributed to Kaskus forum, the largest online shopping community in Indonesia and 114 valid answers were accepted and analyzed. The results showed that trust served as an influential factor for purchase intention and that trust was affected by both two cognitive trust variables, including the perception of ability and integrity of the seller, and the adoption of eWOM information.

Gunawan and Huarng (2015) emphasized the importance of understanding the viral marketing effects on consumers’ purchase intention in social network and media and built up an extended model was built by integrating IAM, Theory of Reason Action (TRA), perceived risk and social interaction together. The survey was conducted and the respondents were online users who used at least three major platforms of social network and media (e.g. Facebook, Youtube and Instagram) and who were college students in different majors in Indonesia. The results indicated that both source credibility and social influence affected users’ attitude towards information usefulness and further affected the behavioral intentions, that social influence affected behavioral intentions via subjective norms, and that perceived risk had a negative influence on the behavioral intentions.
### 2.4.3.3. Discussion

According to the analysis above, it is clear that in order to improve the explanatory power of TAM or IAM, new variables or other models have been introduced to the original models out of different emphases.

The emphases of different applications of TAM are shown in the Table 5.

#### Table 5. Various emphases of the applications of TAM
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Emphases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gefen &amp; Straub, 2000</td>
<td>TAM</td>
</tr>
<tr>
<td>Vijayasarathy, 2002</td>
<td>TAM+compatibility, privacy, security, attitude, normative beliefs and self-efficacy</td>
</tr>
<tr>
<td>Gefen, Karahanna, &amp; Straub, 2003</td>
<td>TAM+trust</td>
</tr>
<tr>
<td>B. Cheng &amp; Bao, 2003</td>
<td>TAM+ perceived convenience, perceived safety</td>
</tr>
<tr>
<td>Van der Heijden, Verhagen, &amp; Creemers, 2003</td>
<td>TAM+trust+perceived risk</td>
</tr>
<tr>
<td>K. Yu &amp; Song, 2005</td>
<td>TAM+trust</td>
</tr>
<tr>
<td>Shang, Chen, &amp; Lysander, 2005</td>
<td>TAM+cognitive absorption+fashion involvement</td>
</tr>
<tr>
<td>J. Zhu, 2005</td>
<td>TAM+ perceived reliability, perceived product/system/service quality</td>
</tr>
<tr>
<td>M. L. Liu &amp; Li, 2006</td>
<td>TAM+IDT+perceived risk</td>
</tr>
<tr>
<td>L. Zhu, 2006</td>
<td>TAM+TRA+perceived risk+perceived entertaining+subjective norms</td>
</tr>
<tr>
<td>L. Liu, 2007</td>
<td>TAM+TPB+TRA+perceived risk</td>
</tr>
<tr>
<td>J. Li, 2008</td>
<td>TAM+compatibility+website quality+perceived risk+trust</td>
</tr>
</tbody>
</table>
According to the Table 5, it is clear that 1) trust, 2) perceived risk and 3) other personal perceptions are three main emphases of researchers when they used TAM to study the online purchase intentions of Internet Users. Since the researchers are aiming at study the individuals’ intentions in the e-commerce settings, these three emphases are crucial.

To be more specific:

Firstly, because the outlook for e-commerce depends both on the technology acceptance of Internet users as transaction means and on their recognition of the Internet as a reliable environment (Al-Gahtani, 2011) and because trust could mitigate the feelings of uncertainty when something is unknown in the shopping process (Tan, Thoen, & Ramanathan, 2001), the influence of trust can hardly be neglected. Thus, many researchers have tested and have confirmed its influence when they studied the consumer purchase intention online (Al-Gahtani, 2011; Gefen et al., 2003; Ha & Stoel, 2009; J. Li, 2008; Van der Heijden et al., 2003; K. Yu & Song, 2005).

Secondly, because perceived risk, defined as the risk of the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service online (D. K. Kim, 2007), inevitably inhibits Internet users’ purchase intention, many researchers added perceived risk into their models and confirmed its negative influence on the purchase intentions of Internet users.

Thirdly, because consumer perception of price, quality, value and other affect consumers’ shopping behavior (Lichtenthal, Wilson, & Long, 1997), many researchers have investigated the influence of personal perceptions, including perceived convenience and perceived safety (B. Cheng & Bao, 2003), perceived reliability (Al-Gahtani, 2011; J. Zhu, 2005), perceived product/system/service quality (Çelik & Yilmaz, 2011; J. Zhu, 2005), perceived entertaining (Çelik & Yilmaz, 2011; L. Zhu, 2006), and have confirmed their positive influences on the purchase intention on the potential consumers online.

On the other hand, the emphases of different applications of IAM are shown in the Table 6.

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Emphases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfina, Ero, Hidayanto, &amp; Shihab, 2014</td>
<td>IAM+trust</td>
</tr>
<tr>
<td>Gunawan &amp; Huarng, 2015</td>
<td>IAM+perceived risk</td>
</tr>
<tr>
<td>Erkan &amp; Evans, 2016</td>
<td>IAM+needs of information</td>
</tr>
</tbody>
</table>

Similarly, the applications of IAM on the purchase intentions also emphasized on the personal perceptions, such as trust, perceived risk and needs of information.

Obviously, when extending TAM or IAM to study the purchase intentions of Internet users, researchers need to consider the new factors which are related to the individual themselves, such as their perceptions, and which result from the rapidly developing technology and environment so as to improve the explanatory power of the models.
Obviously, the differences in the online shopping environment may lead to different degrees of perceptions of these Internet users.

Furthermore, because Internet users tend to communicate and interact online and are gradually affected by others, social influence plays an important role in human behavior and decision making (Ajzen, 1991; Y. Lee et al., 2003; Taylor & Todd, 1995). Such influences can hardly be neglected. For example, because the appearance of virtual communities enables individuals to easily cultivate and maintain the relationships with others (Davis Mersey, Malthouse, & Calder, 2010; Haythornthwaite, 2005), the tie strength need to be taken into consideration. Tie strength is an important antecedent of purchase intention and decision (Smith, Menon, & Sivakumar, 2005; Xia Wang et al., 2012) and prior studies show that Individuals with strong ties always have greater trust to other others and share more feelings and opinions; meanwhile their information is considered to be more credible, when compared with that from individuals with weak ties (Bansal & Voyer, 2000; J. J. Brown & Reingen, 1987; Levin & Cross, 2004; Tsai & Ghoshal, 1998). Hence, researchers need to investigate the function of tie strength in this new context to gain a better understanding of tie strength.

2.4.4. Tie strength

1) Definition

Tie strength was first defined as the intensity of the social relationship between consumers or degree of overlap of two individuals’ friendship (Granovetter, 1973). Furthermore, the “strength” of ties is defined as a combination of time, intensity, mutual confiding, and the reciprocal services (Granovetter, 1973). The theory of “the strength of weak ties”, proposed by Granovetter (1973), explains the difference between “weak tie” and the more intimate “strong tie”. Namely, strong ties, such as the relationships of families and friends, represent closers
relationships than the weak ties (Chu & Kim, 2011).

2) Influence

Prior researches confirmed that tie strength affects information flows, such as the eWOM flows (Anderson & Gerbing, 1988; Bansal & Voyer, 2000; J. J. Brown & Reingen, 1987; Chu & Kim, 2011; Leonard-Barton, 1985).

Granovetter (1973) pointed out that weak tie is more important than strong tie, by emphasizing that the individuals connected by strong ties are highly homogeneous and the information spread through strong tie is similar; whereas, the individuals connected by weak ties are more heterogeneous and weak ties enable the diversified information to be spread between the different groups.

Some researchers have illustrated different opinions and emphasized that the strong ties are more influential than weak ties.

Individuals with strong ties interact more frequently and exchange more information, compared to individuals with weak ties (J. J. Brown & Reingen, 1987; Reingen & Kernan, 1986). Also, compared to weak ties, strong ties are more likely to affect the behavior of the information receivers (J. J. Brown & Reingen, 1987).

Bristor (1990) pointed out that the WOM network is a kind of social network of individuals who are involved in WOM communication and of the interpersonal relationships among these individuals and that such relationships can be described by “tie strength”. The strong tie enables the information to flow and be exchanged frequently in the small groups, while the weak tie is the bridge which enables the information to flow across different groups (Bristor, 1990).

Bone (1992) pointed out that the WOM generated in the groups with more strong ties is much more than that in the groups with more weak ties. J. Brown, Broderick, and Lee (2007) argued that Granovetter's claim is analyzed from a macro perspective, so it can be concluded that the weak tie contributes to the generation of new information in the groups; whereas, from a microscopic point of view, the strong tie has a bigger impact than weak tie on the individuals. Bansal and Voyer (2000)
emphasized that the information from friends with strong ties are perceived as more credible and these friends are more likely to provide opinions. Rindfleisch and Moorman (2001) pointed out that the strong ties inside the network is important sources of information for members, because inside such network, these members have emotional intimacy, high degree of mutual trust, high frequency of interaction and long interaction time.

Chapter 3. The model

Chapter 3 is about the model and includes two sections. The section 3.1 is about the design of the model. For this purpose, based on the analyses above, four small questions are explained and answered. These small questions include 1) For this study, which traditional model of consumer behavior will be more suitable? 2) Whether can the original model be used for this study? 3) How did other researchers adjust this model for study? 4) How to design the model for this study based on the model selected as the basic model? Then, the section 3.2 begins with the model for this thesis and related hypotheses. Subsequently, the variables are introduced.

3.1. Design of the model

In order to design the model for this thesis, 4 questions were pointed out. The answers are shown as follows:
3.1.1. For the first small question

The first small question is: for this study, which traditional models of consumer behavior will be more suitable?

From the discussion part in section 2.4.3.3, many researchers have used TAM and IAM for studying the purchase intentions of consumers. However, when applying the models for studying the eWOM communication, the explanatory power of TAM is limited while IAM is more applicable. There are two main reasons:

On one hand, although TAM is a widely-accepted theory, it is criticized for its limited applicability of eWOM communication study. TAM mainly focuses on how intentions towards using a system are formed, but neglects the social processes (Riffai, Grant, & Edgar, 2012; Sussman & Siegal, 2003). However, the eWOM communication refers to the process of information flowing from the information sender to the receivers (Bansal & Voyer, 2000) and in this process, the interaction from information senders to receivers is necessary. Hence, the explanatory power of TAM for studying the eWOM communication is inadequate.

On the other hand, as IAM explains the information adoption behavior of Internet users who communicate through computer-mediated platforms, many researchers have applied it for studying the information communication (C. M. Cheung et al., 2008; Jin et al., 2009; Tseng & Wang, 2016), especially the eWOM communication (C.-W. Chen et al., 2011; M. Y. Cheung, Luo, Sia, & Chen, 2009).

Considering that this study aims at investigating the influential factors of opinion leaders towards the purchase intentions on consumers through eWOM communication, IAM is more applicable.

3.1.2. For the second small question

The second small question is: whether the original IAM can be used for this study?

Although IAM is used to analyze individuals’ adoption to the
information (C. M. Cheung et al., 2008), it is criticized for only focusing on the characteristics of information (Erkan & Evans, 2016). Also, the changes in the environment may result in the inadequate explanatory power of IAM. Hence, based on the real situations, many researchers have added variables to the original IAM (Erkan & Evans, 2016; Tseng & Wang, 2016; D. H. Zhu et al., 2016), and many researchers have built up new model based on the original IAM (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009; Gunawan & Huarng, 2015; Jin et al., 2009; C.-Y. Li, 2013).

This study focuses on opinion leaders, thus the original IAM, which only focuses on the information, is insufficient. Meanwhile, this study focuses on the virtual communities of consumption, which is a new environment. More factors need to be taken into consideration.

Therefore, this research will design an extended model, based on IAM to investigate the influential factors of opinion leaders towards customers’ purchase intention in the virtual communities of consumption.

3.1.3. For the third small question

The third small question is: how did other researchers adjust IAM for eWOM study?

Previous researches show that C. M. Cheung et al. (2008) utilized IAM to investigated the adoption of online opinions, namely eWOM, in online customer communities. The result confirmed the influence of the usefulness of information towards information adoption, and the significance influences of the relevance and comprehensive of argument quality on information usefulness. The major contribution of this study is that it applied the IAM to study eWOM and confirms the applicability of the original IAM on the eWOM study.

Later, in order to increase the applicability of IAM, M. Y. Cheung et al. (2009) investigate the influential factors towards the adoption of eWOM
by adding more variables and replacing the mediated variable of information usefulness with the perceived eWOM review credibility. The results concluded that three informational determinants, including argument strength, source credibility and confirmation with prior belief, and two normative determinants, including recommendation consistency and recommendation rating, all affected the eWOM review adoption via perceived eWOM review credibility. Noticeably, this study confirmed the influences from two factors, including confirmation with prior belief and recommendation consistency on perceived eWOM review credibility.

These two researches all confirm that IAM is applicable to eWOM study (C. M. Cheung et al., 2008; M. Y. Cheung et al., 2009). Meanwhile, the influences from two factors, including confirmation with prior belief and recommendation consistency, on perceived eWOM review credibility are confirmed (M. Y. Cheung et al., 2009).

Furthermore, because the influence of perceived information credibility towards perceived usefulness is confirmed by McKnight and Kacmar (2007), C.-W. Chen et al. (2011) have added three factors, including confirmation with prior belief, recommendation consistency, and credibility into IAM to investigate which factors affect information adoption, and further to explain how eWOM in the online communities affects the consumption decision (See Figure. 15).

The results showed that 1) the argument quality and source credibility affected the perceived usefulness; 2) all the argument quality, source credibility, confirmation with prior belief and recommendation consistency affected the credibility; 3) the credibility affected the perceived usefulness; and 4) both perceived usefulness and credibility affected the information adoption. However, the R² (Explained Variance) of information adoption is 0.54 and it means that the explanatory power of both perceived usefulness of information and the message credibility towards the information adoption is only 54%. Although the variance was improved when compared with the result from McKnight and Kacmar (2007) and from M. Y. Cheung et al. (2009), it is indicated that there are still more factors affecting the information adoption besides
information usefulness and credibility.

![Diagram of research model](image)

**Figure 15.** The research model of C.-W. Chen et al. (2011).
(Sources: C.-W. Chen et al., 2011)

### 3.1.4. For the fourth small question

The fourth small question is: based on IAM, how to design the model for this study?

Part 1 aims at investigating the mechanism of how opinion leaders affect the purchase intentions of consumers in the virtual communities of consumption. For this purpose, the literature review and discussion have been provided above and have provided implications to develop the model for this study.

1) About the subjects which should be involved in the model

As explained in the Chapter 1, Kozinets et al., (2010) has provided a model to explain the mechanism of how opinion leaders affect the eWOM flow in the online communities, as shown in the Figure 16.
From this figure, it can be concluded that during the process of opinion leaders spreading eWOM information to the consumers and affecting them, the opinion leaders, eWOM information, consumers and virtual communities of consumption are all involved.

Hence, when developing the model for explaining the mechanism of how opinion leaders affect the purchase intentions of consumers in the virtual communities of consumption, all these involved elements should be considered.

Namely, the model for this study should involve the factors related to opinion leaders, eWOM information, consumers and virtual communities of consumption.

Considering that the eWOM here refers to the information send out by the opinion leaders, the eWOM should be considered together with opinion leaders. Also, considering that the potential or actual consumer are all in the virtual communities of consumption, the influences of such virtual communities on the consumers should be considered together with the consumers.

Consequently, the factors from opinion leaders and consumers should be taken into consideration.

2) About how to utilize IAM
The discussion in the sections 3.1.1, 3.1.2 and 3.1.3 indicate that

- For this study, IAM is more suitable, compared to TAM. Because TAM is critiqued for neglecting the social influence.
- For this study, the original IAM, which only focus on information, is insufficient. Because this study aims at studying the influential factors of opinion leaders and also focuses on the new environment, namely the virtual communities of consumption.
- Out of different research purposes, the researchers have made different adjustments to the original IAM for increasing its explanatory power under different situations with different factors and different subjects.

Based on the discussion above, the model for this study will be developed with some adaptions to the original IAM.

3) About the factors related to consumers which should be considered in the model

Prior researches on TAM or IAM have provided theoretical implications on the factors related to consumers which should be considered in the model of this study.

As shown in the section 2.4.3, prior researchers have applied either TAM or IAM on studying purchase intentions within different situations and with different additional factors. Meanwhile, as provided in the section 3.1.3, the prior researchers also applied the IAM on studying information adoption behavior with some adaptions, such as adding new factors or building up complex models. These researches have provided theoretical implications for the factors which should be considered when applying the models within different situations.

On one hand, as provided in the section 2.4.3, the prior researches about the applications of both TAM and IAM on studying purchase intentions have indicated that the trust and perceived risk are two emphases which many researchers investigated when they studied the online cases.

- The influence of trust has been tested and confirmed by many researchers when they studied the consumer purchase intention
online by extending the TAM or IAM (Al-Gahtani, 2011; Alfina et al., 2014; Gefen et al., 2003; Ha & Stoel, 2009; J. Li, 2008; Van der Heijden et al., 2003; K. Yu & Song, 2005).

It is mainly because that the outlook for e-commerce depends both on the technology acceptance of Internet users as transaction means and on their recognition of the Internet as a reliable environment (Al-Gahtani, 2011) and that trust could mitigate the feelings of uncertainty when something is unknown in the shopping process (Tan et al., 2001).

- The influence of perceived risk has been tested and confirmed by many researchers when they studied the consumer purchase intention online by extending the TAM or IAM (Al-Gahtani, 2011; Gunawan & Huarng, 2015; Ha & Stoel, 2009; J. Li, 2008; L. Liu, 2007; M. L. Liu & Li, 2006; Mao et al., 2014; Van der Heijden et al., 2003; Ye & Zhang, 2014; L. Zhu, 2006)

It is mainly because that perceived risk, defined as the risk of the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service online (D. K. Kim, 2007), inevitably inhibits Internet users’ purchase intention.

On the other hand, as provided in the section 3.1.3, the prior researches about the applications of IAM on studying information adoption behavior have indicated that the recommendation consistency, the confirmation with prior belief, and the message credibility are three emphases which many researchers investigated when they studied the process of information adoption (Chen, Chen, & Hsu, 2011; M. Y. Cheung, Luo, Sia, & Chen, 2009).

Recommendation consistency is defined as the extent to which the recommendation is consistent with other individuals’ experiences of the same product or service (Wei Zhang & Watts, 2003). And the confirmation with prior belief is defined as the level of confirmation/disconfirmation between consumers’ prior beliefs and the received information (M. Y. Cheung et al., 2009). The message credibility refers to the perceived believability of the message (Fogg et al., 2001). When the individuals received the eWOM, they usually compare
this information with others information and with their prior belief so as to judge credibility of the message and to further adopt it (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009).

Through the research of C.-W. Chen et al., (2011), these three factors are confirmed to be influential to the information adoption process of consumers.

4) About designing the model for this study

With the conclusion above, the model will be designed as follows.

Obviously, when studying the mechanism of how individuals adopt the eWOM information in the online communities of electronic products, C.-W. Chen et al., (2011) provided a comparatively thorough model based on the prior researches. Hence, for this study which investigates the mechanism of how opinion leaders affect the eWOM information adoption of consumers and further affect their purchase intentions in the virtual communities of consumption, the model of C.-W. Chen et al., (2011) can be used as a reference. Notably, as explained before, the study of C.-W. Chen et al., (2011) focused on the eWOM adoption behavior in the online communities of electronic products, while this study focuses on the influence of opinion leaders and on the environment of virtual communities of consumption. Namely, the model for this study is not to improve the model of C.-W. Chen et al., (2011), but to use it as a reference for building up a new model to explain a different phenomenon.

Consequently, based on the discussion above, the model of this study is designed as followed.

- From the side of opinion leaders

  From the side of opinion leaders, the message quality, source credibility and tie strength should be investigated.

  It is mainly because that the definition of opinion leaders indicates that they exert both informational influences and interpersonal influences on others (Katz & Paul, 1955). Meanwhile, as the information source, their credibility is also important.
To be more specific:

Firstly, through spreading eWOM information to the public, opinion leaders can exert informational influences on them (Katz & Paul, 1955). Such kind of influences can be measured through their message quality. In this study, the message quality is defined as the influential strength of the message from opinion leaders, and it can be evaluated the content, format, accuracy, ease of use, timeliness and so on. The Elaboration Likelihood Model indicates that strong arguments can lead to favorable responses of the receivers, while weak arguments may lead to negative reactions (Petty, Cacioppo, & Goldman, 1981). This variable exists in the original IAM and is confirmed to affect the information adoption of consumers (Chen et al., 2011; C. M. Cheung, Lee, & Rabjohn, 2008; Jin, Cheung, Lee, & Chen, 2009; McKnight & Kacmar, 2007; Sussman & Siegal, 2003).

Secondly, through interacting with others in the virtual communities, opinion leaders can exert interpersonal influences on them (Katz & Paul, 1955). Such kind of social influences can be measured through their tie strength. The “strength” of interpersonal ties is defined as a combination of time, emotional intensity, mutual confiding, and the reciprocal services (Granovetter, 1973). In this study, the tie strength between opinion leaders and consumers is defined as the perceived tightness of the relationship between them. In the virtual communities of consumption, some members frequently interact with others, leading to their strong ties with others, while some members seldom leave any comment, leading to their weak ties with others. The information from members with strong ties always is considered to be more credible (Bansal & Voyer, 2000; Brown & Reingen, 1987; Levin & Cross, 2004; Tsai & Ghoshal, 1998).

Thirdly, the opinion leaders themselves, as the information source, their source credibility should also be added to the model. Source credibility refers to the receivers’ perceptions of the expertise and trustworthiness of the sources (Hovland, Janis, & Kelley, 1953; Sussman & Siegal, 2003). In this thesis, the source credibility is defined as the extent to which the consumer considers the information source (namely,
the opinion leader) is competent and reliable. This variable exists in the original model and is confirmed to affect the information adoption of consumers (Chen et al., 2011; C. M. Cheung et al., 2008; Jin et al., 2009; McKnight & Kacmar, 2007; Sussman & Siegal, 2003).

Consequently, from the side of opinion leaders, the message quality, source credibility and tie strength should be investigated.

● From the side of consumers

From the side of consumers, trust towards the site, recommendation consistency and confirmation with prior belief are added.

Prior researches have indicated that when studying the information adoption process of consumers, the recommendation consistency and the confirmation with prior belief should be taken into consideration (Chen et al., 2011; M. Y. Cheung et al., 2009). Furthermore, because the consumers are in the virtual communities, their trust towards the site should also be considered.

To be more specific:

Firstly, because previous researches have also confirmed the significant influence of recommendation consistency towards eWOM information adoption (Chen et al., 2011; C. M. Cheung & Thadani, 2012), the recommendation consistency should also be considered in the cases of adopting the information from opinion leaders. Recommendation consistency is defined as the extent to which the recommendation is consistent with other individuals’ experiences of the same product or service (Zhang & Watts, 2003). In this study, recommendation consistency is defined as the extent to which the recommendation from a certain opinion leader is consistent with other opinion leaders’ recommendations of the same product or service. When the members are searching eWOM information towards a certain product or service in the virtual communities, they are facing with various information. At this time, they need to compare the information. If the information from one source is highly consistent with opinions from others, the consumer is more likely to perceive this information as credible (Zhang & Watts, 2003).
Secondly, because previous researches have confirmed that confirmation with prior belief affects the eWOM information adoption (Chen et al., 2011; M. Y. Cheung et al., 2009), it should be taken into consideration when studying the adoption of information from opinion leaders. Confirmation with prior belief is defined as the level of confirmation/disconfirmation between consumers’ prior beliefs and the received information (M. Y. Cheung et al., 2009). In this study, confirmation with prior belief is defined as the level of confirmation between consumers’ prior beliefs and the received information from opinion leaders. As in the virtual communities of consumption, if the eWOM information from the source confirms the consumers’ existing beliefs, the information will be considered as more credible by the consumers (Chen et al., 2011).

Thirdly, because this study focuses on the new environment, namely the virtual communities of consumption, the perception towards the environment should be considered. Furthermore, the trust towards the site needs to be considered. An online consumer’s trust is defined as consumer’s subjective beliefs that the selling entity will fulfill the transactional obligations as much as the consumer understands (D. J. Kim, Ferrin, & Rao, 2008). In this study, the trust towards the site is defined as consumers’ subjective beliefs that the site will fulfill the transactional obligations as much as the consumer understands. The trust towards the site generally results in the lower level of the perceived risk when individuals are shopping at the site (Jarvenpaa et al., 1999; Van der Merwe & Van Heerden, 2009) and the credibility of the message which they receive (J. Brown et al., 2007; X. Cheng, 2011).

Consequently, from the side of consumers, trust towards the site, recommendation consistency and confirmation with prior belief are added.

- From the side of consumers (for mediators)
  From the side of consumers, the mediators of perceived risk and message credibility should be considered.
  From the research of Chen et al. (2011), it can be known that the
explanatory power of both perceived usefulness of information and the message credibility towards the information adoption is only 54%. Namely, more mediators should be taken into consideration when the researchers want to explain the influential factors towards the information adoption behavior of consumers.

For this study, besides the perceived usefulness of information, the message credibility and perceived risk respectively are taken into consideration.

On one hand, the message credibility is important when studying the information adoption behavior. The message credibility refers to the perceived believability of the message (Fogg et al., 2001). In this study, message credibility is defined as the perceived believability of the message from the opinion leaders. Previous researches confirmed the influence of perceived message credibility towards perceived usefulness of information and consumers’ information adoption behavior in the online communities (Chen et al., 2011; M. Y. Cheung et al., 2009) or in the unfamiliar advice website (McKnight & Kacmar, 2007). When the consumers receive the information from the opinion leaders, the higher the perceived message credibility is, the more likely these consumers will adopt the information.

On the other hand, the perceived risk should be considered when studying the cases in the new environment, namely the virtual communities of consumption. Perceived risk refers to the risk of the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service (Dowling & Staelin, 1994) or the consumers’ beliefs of the negative outcomes from e-commerce (D. K. Kim, 2007). In this study, perceived risk is defined as the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service online. Previous researches confirmed that the trust towards the site results in the lower level of the perceived risk when individuals are considering shopping online, while this trust-antecedent ‘perceived risk’ negatively affects the attitude towards shopping online (Jarvenpaa, Tractinsky, & Saarinen, 1999; Van der Merwe & Van Heerden, 2009) and
inhibits perceived usefulness of information and information adoption (M. Featherman, 2001; M. S. Featherman & Pavlou, 2003). If the individuals have a high level of perceived risk, they may search more information for judging the usefulness of the information before making final decisions (Cho & Lee, 2006; Dowling & Staelin, 1994; Flanagin, Metzger, Pure, Markov, & Hartsell, 2014). For example, the perceived risk is confirmed to affect the information adoption directly and through the perceived usefulness indirectly in the travel websites (Tseng & Wang, 2016).

Hence, from the side of consumers, the mediators of perceived risk and message credibility should be considered.

Consequently, inside this new model, the characteristics of opinion leaders and consumers are integrated into IAM. From the perspective of opinion leaders, the factors including message quality, source credibility and tie strength are added. And from the perspective of consumers, the trust towards the site, recommendation consistency, confirmation with prior belief are added. Furthermore, this model also investigates the influences of the mediators, including the perceived risk, perceived usefulness of information and message credibility.

3.2. Hypotheses and definitions of variables for the model

The model for this thesis is shown in the Figure 17.
Figure 16. The model for this thesis
(The figure is made by the author.)
(In this model, the lines with light black represent the supposed negative influences and the lines with black represent the supposed positive influences.)

3.2.1. Hypothesis

This thesis includes 15 hypotheses, listed as follows:

H1a: In the virtual communities of consumption, trust towards the site affects the perceived risk negatively.

H1b: In the virtual communities of consumption, trust towards the site affects the message credibility positively.

H2a: In the virtual communities of consumption, message quality affects the consumers’ perceived usefulness of information positively.

H2b: In the virtual communities of consumption, message quality
affects the message credibility positively.

H3a: In the virtual communities of consumption, source credibility affects the consumers’ perceived usefulness of information positively.

H3b: In the virtual communities of consumption, source credibility affects the message credibility positively.

H4: In the virtual communities of consumption, tie strength affects the message credibility positively.

H5: In the virtual communities of consumption, recommendation consistency affects the message credibility positively.

H6: In the virtual communities of consumption, confirmation with prior belief affects the message credibility positively.

H7a: In the virtual communities of consumption, perceived risk affects the perceived usefulness of information negatively.

H7b: In the virtual communities of consumption, perceived risk affects the information adoption negatively.

H8: In the virtual communities of consumption, perceived usefulness of information affects the information adoption positively.

H9a: In the virtual communities of consumption, message credibility affects the perceived usefulness of information positively.

H9b: In the virtual communities of consumption, message credibility affects the information adoption positively.

H10: In the virtual communities of consumption, information adoption affects the purchase intention positively.
3.2.2. Variables

1) Trust towards the site

Previous researches have emphasized the importance of online trust which serves as a driver for e-commerce adoption (McKnight, Choudhury, & Kacmar, 2002a, 2002b). An online consumer’s trust is defined as consumer’s subjective beliefs that the selling entity will fulfill the transactional obligations as much as the consumer understands (D. J. Kim, Ferrin, & Rao, 2008).

The trust towards the site leads to a lower level of the perceived risk when individuals are shopping at the site, while this trust-antecedent ‘perceived risk’ negatively affects the attitude towards shopping online (Jarvenpaa, Tractinsky, & Saarinen, 1999; Van der Merwe & Van Heerden, 2009).

On the other hand, individuals’ trust towards the site partly results in the credibility of the message which they receive, because the websites are perceived as actors for individuals to interact with (J. Brown et al., 2007; X. Cheng, 2011).

Consequently, in this study, the trust towards the site is defined as consumers’ subjective beliefs that the site will fulfill the transactional obligations as much as the consumer understands. And the hypotheses are:

H1a: In the virtual communities of consumption, trust towards the site affects the perceived risk negatively.

H1b: In the virtual communities of consumption, trust towards the site affects the message credibility positively.

2) Message quality

The Elaboration Likelihood Model (ELM) indicates that strong arguments are logically sound and can yield favorable responses of the receivers, while weak arguments are skeptical and may lead to negative reactions (Petty, Cacioppo, & Goldman, 1981). The positive influence of message quality on perceived usefulness of information and on information adoption are confirmed by IAM and its application.
researches (C.-W. Chen et al., 2011; C. M. Cheung et al., 2008; Jin et al., 2009; McKnight & Kacmar, 2007; Sussman & Siegal, 2003). Additionally, the quality of message can be evaluated by its content, format, accuracy, ease of use, timeliness and so on (Doll & Torkzadeh, 1988). On the other hand, prior researches have confirmed the influence from source credibility to the message credibility (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009).

Consequently, in this study, the message quality is defined as the influential strength of the message from opinion leaders, and it can be evaluated the content, format, accuracy, ease of use, timeliness and so on. And the hypotheses are:

H2a: In the virtual communities of consumption, message quality affects the consumers’ perceived usefulness of information positively.

H2b: In the virtual communities of consumption, message quality affects the message credibility positively.

3) Source credibility

Source credibility refers to the receivers’ perceptions of the expertise and trustworthiness of the sources (Hovland, Janis, & Kelley, 1953; Sussman & Siegal, 2003). The positive influences of source credibility on perceived usefulness of information and on the information adoption are confirmed by IAM and its application researches (C.-W. Chen et al., 2011; C. M. Cheung et al., 2008; Jin et al., 2009; McKnight & Kacmar, 2007; Sussman & Siegal, 2003). On the other hand, prior researches have confirmed the influence from source credibility to the message credibility (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009; Wathen & Burkell, 2002).

Consequently, in this study, the source credibility is defined as the extent to which the consumer considers the information source (namely, the opinion leader) is competent and reliable. And the hypotheses are:

H3a: In the virtual communities of consumption, source credibility affects the consumers’ perceived usefulness of information positively.

H3b: In the virtual communities of consumption, source credibility affects the message credibility positively.
4) Tie strength

The theory of “the strength of weak ties”, proposed by Granovetter (1973), explains the difference between “weak tie” and the more intimate “strong tie”. The “strength” of interpersonal ties is defined as a combination of time, emotional intensity, mutual confiding, and the reciprocal services (Granovetter, 1973). Individuals with strong ties always have greater trust to others and share more feelings and opinions; and the information from these information senders is considered to be more credible by the receivers, when compared with that from senders who have weak ties with them (Bansal & Voyer, 2000; J. J. Brown & Reingen, 1987; Levin & Cross, 2004; Tsai & Ghoshal, 1998). Particularly, tie strength serves as an antecedent for process of consumers’ making purchase decisions in the virtual communities (Kozinets, 1999) and in the online peer communication (Smith et al., 2005; Xia Wang et al., 2012).

Consequently, in this study, the tie strength between opinion leaders and consumers is defined as the perceived tightness of the relationship between them. And the hypotheses are:

H4: In the virtual communities of consumption, tie strength affects the message credibility positively.

5) Recommendation consistency

Recommendation consistency is defined as the extent to which the recommendation is consistent with other individuals’ experiences of the same product or service (Wei Zhang & Watts, 2003). In an online community, with different eWOM concerning the same product or service but from different experienced individuals, consumers need to collect and compare the information. If the current recommendation from an opinion leader is highly consistent with opinions from others, the consumer is more likely to perceive this information as credible (Wei Zhang & Watts, 2003). Previous researches have also confirmed the significant influence of recommendation consistency towards information credibility in the online recommendation or online
communities (C.-W. Chen et al., 2011; C. M. Cheung & Thadani, 2012).

Consequently, in this study, recommendation consistency is defined as the extent to which the recommendation from a certain opinion leader is consistent with other opinion leaders’ recommendations of the same product or service. And the hypothesis is:

H5: In the virtual communities of consumption, recommendation consistency affects the message credibility positively.

6) Confirmation with prior belief

Confirmation with prior belief is defined as the level of confirmation/disconfirmation between consumers’ prior beliefs and the received information (M. Y. Cheung et al., 2009). Prior beliefs affect the evaluations of to-be-acquired information (C.-W. Chen et al., 2011; Wei Zhang & Watts, 2003). As in the virtual communities of consumption, if the eWOM from opinion leaders confirms the consumers’ existing beliefs, the information will be considered as more credible by the consumers (C.-W. Chen et al., 2011).

Consequently, in this study, confirmation with prior belief is defined as the level of confirmation between consumers’ prior beliefs and the received information from opinion leaders. And the hypothesis is:

H6: In the virtual communities of consumption, confirmation with prior belief affects the message credibility positively.

7) Perceived risk

The concept of “perceived risk” was introduced to the marketing field by Bauer (1960), who emphasized that this kind of subjective risk (perceived risk) is different from objective risk (risk in the real world). Perceived risk refers to the risk of the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service (Dowling & Staelin, 1994) or the consumers’ beliefs of the negative outcomes from e-commerce (D. K. Kim, 2007).

A lot of empirical evidence suggest that perceived risk inhibits perceived usefulness of information and information adoption (M. Featherman, 2001; M. S. Featherman & Pavlou, 2003) and also the
consumers’ attitudes towards shopping online (Jarvenpaa et al., 1999; Van der Heijden et al., 2003). High perceived risk may force individuals to look for more information to judge the usefulness of information before making final decisions (J. Cho & Lee, 2006; Dowling & Staelin, 1994; Flanagin, Metzger, Pure, Markov, & Hartsell, 2014). Furthermore, the perceived risk is confirmed to affect the information directly and through the perceived usefulness indirectly when considering the information adoption process on the travel websites (Tseng & Wang, 2016).

Consequently, in this study, perceived risk is defined as the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service online. And the hypotheses are:

H7a: In the virtual communities of consumption, perceived risk affects the perceived usefulness of information negatively.

H7b: In the virtual communities of consumption, perceived risk affects the information adoption negatively.

8) Perceived usefulness of information
Perceived usefulness refers to the user’s subjective feelings that using a specific application system will improve his/her job performance within an organizational context (Davis et al., 1989). Similarly, the perceived usefulness of information refers to the subjective feelings of individuals towards the usefulness of information (C. M. Cheung et al., 2008).

The positive influence of perceived usefulness of information on information adoption is confirmed by IAM and its application researches (C.-W. Chen et al., 2011; C. M. Cheung et al., 2008; Jin et al., 2009; McKnight & Kacmar, 2007; Sussman & Siegal, 2003). Furthermore, other researchers also confirmed the influence of perceived usefulness of information towards purchase intentions (K.-T. Lee & Koo, 2015).

Consequently, in this study, perceived usefulness of information is defined as the extent to which people consider the information from opinion leaders as useful, after evaluating its validity. And the hypothesis is:
H8: In the virtual communities of consumption, perceived usefulness of information affects the information adoption positively.

9) Message credibility
Message credibility refers to the perceived beliefability of the message (Fogg et al., 2001). Credibility is a crucial factor affecting the persuasiveness of a message (Petty et al., 1981). The information with high credibility is credible and can be trust (McKnight & Kacmar, 2007). Previous researches confirmed the influence of perceived information credibility towards perceived usefulness of information and consumers’ information adoption behavior in the online communities (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009) or in the unfamiliar advice website (McKnight & Kacmar, 2007).

Consequently, in this study, message credibility is defined as the perceived believability of the message from the opinion leaders. And the hypothesis is:

H9a: In the virtual communities of consumption, message credibility affects the perceived usefulness of information positively.

H9b: In the virtual communities of consumption, message credibility affects the information adoption positively.

10) Information adoption
Information adoption in the online context refers to the extent to which people accept the information after evaluating its validity (Wei Zhang & Watts, 2008). The process of adopting eWOM plays an important role in the process of consumers’ making purchase decision (Xia Wang et al., 2012).

According to the application researches of IAM, the information adoption behavior affects the purchase intention of consumers in the C2C e-commerce site (Alfina et al., 2014) and in the social media (Erkan & Evans, 2016; Gunawan & Huarng, 2015).

Consequently, in this study, information adoption is defined as the extent to which consumers adopt the information from the opinion leaders. And it follows that:
H10: In the virtual communities of consumption, information adoption affects the purchase intention positively.

Chapter 4. Empirical analyses

Chapter 4 provides the result of the empirical analyses for Part 1 and is divided into 4 sections. The section 4.1 provides the design process of the questionnaire, including the measurements of the variables, the choice of the research sample and the explanation of the specific method. Then, a small group of discussion and the pretest for the questionnaire are held for improving the questionnaire and getting the formal version. The section 4.2 outlines the data analyses, including the analyses on the basic information of the respondents, the analyses on respondents’ experiences of online activities and choices, the validity analysis, the reliability analysis, the discriminant validity analysis, testing hypotheses, results and testing mediators. The sections 4.3 provides the discussion for Part 1.

4.1. Design of the questionnaire

4.1.1. Measurements of the variables

In this study, the related variables include trust towards the site, message quality, source credibility, tie strength with receivers, recommendation consistency, confirmation with prior belief, perceived risk, perceived usefulness of information, message credibility and information adoption and purchase intention.

1) Trust towards the site
In this study, the trust towards the site is defined as consumers’ subjective beliefs that the site will fulfill the transactional obligations as much as the consumer understands.

This study sets up a scale for trust towards the site so as to measure consumers’ perceptions of the authority and reliability of the site itself. Based on the related studies (B. Chen, 2008; Van der Heijden et al., 2003; Zeithaml, Berry, & Parasuraman, 1996), three items are used to measure trust towards the site, as shown in the Table 7.

Table 7. Measurement of trust towards the site
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust towards the site</td>
<td>T 1</td>
<td>This website itself is trustworthy.</td>
<td>B. Chen (2008); Van der Heijden et al. (2003); Zeithaml, Berry, and Parasuraman (1996)</td>
</tr>
<tr>
<td></td>
<td>T 2</td>
<td>I think that the information in this website is credible.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T 3</td>
<td>I think that the information in this website is professional.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Like rt type scale, ranging from strongly disagree (1) to strongly agree (7).

2) Message quality

In this study, the message quality is defined as the influential strength of the message from opinion leaders, and it can be evaluated the content, format, accuracy, ease of use, timeliness and so on.

Doll and Torkzadeh (1988) pointed out that in the online environment, the main items used to measure the quality of message include the content, accuracy, format, ease of use and timeliness. Delone and McLean (2003) used accuracy, relevance, understand-ability, completeness, currency, dynamism, personalization, and variety to measure the quality of information. C. M. Cheung et al. (2008) analyzed the eWOM and concluded that argument quality, including relevance,
timeliness, accuracy, comprehensiveness, affected the information usefulness and further affected the information adoption.

Based on the above analysis, four items are used to measure message quality, as shown in the Table 8.

Table 8. Measurement of message quality
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message quality</td>
<td>MQ 1</td>
<td>The message from this opinion leader is highly relevant to the product itself.</td>
<td>Doll and Torkzadeh (1988); Delone and McLean (2003); C. M. Cheung et al. (2008)</td>
</tr>
<tr>
<td></td>
<td>MQ 2</td>
<td>The message from this opinion leader has timeliness.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MQ 3</td>
<td>The message from this opinion leader convey correct information.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MQ 4</td>
<td>The message from this opinion leader is comprehensive.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7).

3) Source credibility

In this study, the source credibility is defined as the extent to which the consumer considers the information source (namely, the opinion leader) is competent and reliable.

According to this definition, the source credibility, namely the credibility of opinion leaders, need to be considered from two perspectives, including their expertise and trustworthiness.

Based on the related studies (Bhattacharjee & Sanford, 2006; M. Y. Cheung et al., 2009; Sussman & Siegal, 2003), three items are used to measure source credibility, as shown in the Table 9.
Table 9. Measurement of source credibility
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source credibility</td>
<td>SC 1</td>
<td>The opinion leader who provided this message is knowledgeable on this topic.</td>
<td>Bhattacherjee and Sanford (2006); M. Y. Cheung et al. (2009); Sussman and Siegal (2003)</td>
</tr>
<tr>
<td></td>
<td>SC 2</td>
<td>The opinion leader who provided this message appeared to be an expert on this topic.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC 3</td>
<td>The opinion leader who provided this message is credible.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Likert scale, ranging from strongly disagree (1) to strongly agree (7).

4) Tie strength

In this study, the tie strength between opinion leaders and consumers is defined as the perceived tightness of the relationship between them.

Frenzen and Davis (1990) gathered data for four indicators of tie strength, including closeness, intimacy, support, and association. Here, closeness was measured by asking respondents to rate their relationship with a target individual on a 10-point scale. Intimacy was measured by respondents’ reported likelihood of sharing confidence with target individuals. Support was measured by respondents’ reported likelihood of extending everyday assistance to target individuals. Association was measured by respondents’ professed likelihood of spending a nice afternoon with target individuals.

However, in the virtual community, the opinion leaders and WOM receivers can hardly spend a whole afternoon together in person. So, the association needs not to be measured in this study.

Based on the above analysis, three items are used to measure tie
strength, as shown in the Table 10.

Table 10. Measurement of tie strength  
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tie strength</td>
<td>TS 1</td>
<td>I have a close relationship with this opinion leader.</td>
<td>Frenzen and Davis (1990)</td>
</tr>
<tr>
<td></td>
<td>TS 2</td>
<td>I am willing to support this opinion leader, if needed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TS 3</td>
<td>I am willing to spend time in communicating with the opinion leader.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7).

5) Recommendation consistency

In this study, recommendation consistency is defined as the extent to which the recommendation from a certain opinion leader is consistent with other opinion leaders’ recommendations of the same product or service.

Based on the related studies (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009; Wei Zhang & Watts, 2008), three items are used to measure recommendation consistency, as shown in the Table 11.

Table 11. Measurement of recommendation consistency  
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommendation consistency</td>
<td>RC 1</td>
<td>The information provided by this opinion leader is consistent with information from other opinion leaders.</td>
<td>C.-W. Chen et al. (2011); M. Y. Cheung et al. (2009);</td>
</tr>
</tbody>
</table>
The information provided by this opinion leader is similar to information from other opinion leaders. (Wei Zhang and Watts, 2008)

The opinion leader providing this information has consistent or similar interests as other opinion leaders on the same topic.

Respondents need to evaluate all items on a seven-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (7).

6) Confirmation with prior belief

In this study, confirmation with prior belief is defined as the level of confirmation between consumers’ prior beliefs and the received information from opinion leaders.

Based on the related studies (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009; Wei Zhang & Watts, 2008), three items are used to measure confirmation with prior belief, as shown in the Table 12.

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmation with prior belief</td>
<td>C 1</td>
<td>The information provided by this opinion leader supports my impression of the product or service.</td>
<td>C.-W. Chen et al. (2011); M. Y. Cheung et al. (2009); Wei Zhang and Watts (2008)</td>
</tr>
<tr>
<td></td>
<td>C 2</td>
<td>The information provided by this opinion leader reinforces the information I have got about this product or service before.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C 3</td>
<td>The information provided by this opinion leader is consistent or similar to information from other opinion leaders on the same topic.</td>
<td></td>
</tr>
</tbody>
</table>

Table 12. Measurement of confirmation with prior belief
(The Table is made by the author.)
7) Perceived risk

In this study, perceived risk is defined as the consumers’ perceptions of the uncertainty and adverse consequences when they are going to purchase a product or service online. Based on the related study (Van der Heijden et al., 2003), four items are used to measure perceived risk, as shown in the Table 13.

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived risk</td>
<td>PR 1</td>
<td>I think that the risk of purchasing a product through this site is small.</td>
<td>Van der Heijden et al. (2003)</td>
</tr>
<tr>
<td></td>
<td>PR 2</td>
<td>I think that the potential for loss of purchasing a product through this site is high.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PR 3</td>
<td>I think that the potential for profit of purchasing a product through this site is high.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PR 4</td>
<td>I think that a good transaction can probably be done through this site.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7).

8) Perceived usefulness of information

In this study, Perceived usefulness of information is defined as the
extent to which people consider the information from opinion leaders as useful, after evaluating its validity.

Based on the related study (C.-W. Chen et al., 2011; Sussman & Siegal, 2003), three items are used to measure perceived usefulness, as shown in the Table 14.

Table 14. Measurement of perceived usefulness of information
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness of information</td>
<td>PU 1</td>
<td>I think that the information from this opinion leader is valuable.</td>
<td>C.-W. Chen et al. (2011);</td>
</tr>
<tr>
<td></td>
<td>PU 2</td>
<td>I think that the information from this opinion leader is helpful.</td>
<td>Sussman and Siegal (2003)</td>
</tr>
<tr>
<td></td>
<td>PU 3</td>
<td>I think that the information from this opinion leader can increase my understanding of the product or service.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7).

9) Message credibility

In this study, message credibility is defined as the believability of the message from the opinion leaders.

Based on the related study (C.-W. Chen et al., 2011; Sussman & Siegal, 2003), three items are used to measure message credibility, as shown in the Table 15.

Table 15. Measurement of message credibility
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
</tr>
</thead>
</table>
Respondents need to evaluate all items on a seven-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (7).

10) Information adoption

In this study, information adoption is defined as the extent to which consumers adopt the information from the opinion leaders.

Based on the related study (C.-W. Chen et al., 2011; Sussman & Siegal, 2003), four items are used to measure information adoption, as shown in the Table 16.

Table 16. Measurement of information adoption
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information adoption</td>
<td>IA 1</td>
<td>I agree with the action suggested in the information from this opinion leader.</td>
<td>C.-W. Chen et al. (2011); Sussman and Siegal (2003)</td>
</tr>
<tr>
<td></td>
<td>IA 2</td>
<td>I pay close attention to the information from this opinion leader and follow his or her suggestion.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IA 3</td>
<td>The information from this opinion leader motivates me to take action.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IA 4</td>
<td>The information from this opinion leader enhances my effectiveness</td>
<td></td>
</tr>
</tbody>
</table>
Respondents need to evaluate all items on a seven-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7).

11) Purchase intention

In this study, purchase intention is defined as consumers’ intentions to purchase a product or service in the future.

Based on the study of Coyle and Thorson (2001), three items are used to measure purchase intention, as shown in the Table 17.

Table 17. Measurement of purchase intention
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NO.</th>
<th>Contents</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase intention</td>
<td>PI 1</td>
<td>It is very likely that I will purchase the product recommended by this opinion leader.</td>
<td>Coyle and Thorson (2001)</td>
</tr>
<tr>
<td></td>
<td>PI 2</td>
<td>I will purchase the product recommended by this opinion leader next time when I need such kind of product.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PI 3</td>
<td>I will definitely try the product recommended by this opinion leader.</td>
<td></td>
</tr>
</tbody>
</table>

Respondents need to evaluate all items on a seven-point Likert type scale, ranging from strongly disagree (1) to strongly agree (7).

4.1.2. The research sample--China

For this thesis, China is selected as the sample. The reason is that the situations in China are very representative. In China, more and more individuals begin to use Internet and shop online, and many virtual
communities of consumption provide these Internet users with a space for interaction with others. Furthermore, the opinion leaders inside these virtual communities become popular and affect others greatly.

According to the 39th China Internet Network Development State Report, published by China Network Information Center (CNNIC), in 2016, the scale of overall net citizens in China increased greatly.

To be more specific, as of December 2016, the Internet users in China increased to 731 million, increased by a total of 42.99 million throughout the year. The Internet penetration rate was 53.2% and increased 2.9% when compared with the amount of it in 2015.

The data of the Internet users in China from 2006 to 2016 shows the increasing trend (see Figure 18).

Figure 17. The scale of Chinese netizen and the Internet penetration (Pillar: the amount of Chinese netizen; Line: Internet penetration; the units: 10 thousand) (Source: China Network Information Center, 2017)

Meanwhile, more and more individuals get used to make transactions and communicate online.

On one hand, according to the 39th China Internet Network Development State Report, as of December 2016, the Internet consumers in China increased to 467 million, which took up 63.8% of the
total number of Chinese netizens.

On the other hand, with the development and expansion of Internet, Internet users become able to interact with others through various channels, such as social media, blogs, shopping websites and so on.

Hence, the Chinese situation is very representative and is suitable for the study in Part 1. This thesis chooses to utilize the sample from China.

4.1.3. The specific method

4.1.3.1. About the design of questionnaire

The questionnaire is divided into three parts. Part 1 consists of questions about respondents’ online activities and choices. Part 2 consists of questions about opinion leaders and purchase intention, and includes 11 variables and 36 items, all formed on the basis of existing theories. Part 3 consists of questions about some basic information of respondents. The design of the part 3 of this questionnaire is based on the 39th China Internet Network Development State Statistic Report. And in order to avoid respondents’ self-defense psychology to be unwilling to disclose their personal information, part 3 is put as the last part of this questionnaire.

Furthermore, two questions in Part 1 of the questionnaire are set up to rule out respondents who don’t meet with the requirements of this research. The question 6 is “In these virtual communities of transaction, have you got experiences of finding commodity information because of the recommendations of opinion leaders?”. And the question 7 is “What kind of opinion leaders will you usually pay attention to or will you be willing to pay attention to?”. If the respondents answered with “never” to either of these two questions, their answers will be deleted.
4.1.3.2. About the respondents

The respondents to the questionnaire must meet the following requirements:

- The research objects know how to use Internet.
- The research objects consider Internet as a source of getting production information.
- The research objects have experiences in searching information through virtual communities of consumption and in understanding the recommendation of opinion leaders.
- Respondents need to recall the last experience of their paying attention to the recommendations from the opinion leader in the virtual communities of consumption and answer the questions.

Admittedly, every individual has their standard for judging others are opinion leaders are not some individuals may think that the person with 500 followers can be considered as opinion leaders, and some may think that that the person with 500,000 followers can be considered as opinion leaders. Especially for some virtual communities which do not show the attributes of members, such as their follower number. Hence, the respondents have the power to judge whether the individual can be considered as their opinion leaders or not and need to recall their last experience.

4.1.3.1. The sample size

Many articles used from 250 to 500 research objects (Schumacker & Lomax). For example, Bentler and Chou (1987) suggested that a ratio as low as five subjects per variable would be enough for normal and elliptical distributions and that a ratio of at least 10 subjects per variable would be enough for other distributions.
4.1.4. Data analysis approach

1) Measurement standards of reliability and validity

The validity and the reliability of the questionnaire should be measured so as to test the quality of the measures.

★ The validity

Generally, the higher the validity is, the better the questionnaire is. There are two types of validity measures, including the content validity and the construct validity (H. Li, 2004).

The content validity is to measure the degree to which the meaning of the construct is explained by the items. Generally, the measurement of content validity requires the researchers’ judgements and the result is subjective (H. Li, 2004). In this thesis, the content validity is controlled by utilizing the mature scales obtained from previous researchers; meanwhile, a focus group will be interviewed with the questionnaire for refining the questionnaire at the item-generation stage (Churchill Jr, 1979). With their help, the slight nuances of meanings in statements of the items can be identified and be refined so as to get a more precise item pool. This discussion is necessary, because the questionnaire is first designed in English and is translated to Chinese for the respondents. After that, content validity of the questionnaire in this thesis can be met.

The construct validity is “the extent to which a set of measured variables actually represents the theoretical latent construct those variables are designed to measure” (Hair, Black, Babin, & Anderson, 2010). The measurement of construct validity is based on statistical approaches and the result is objective.

There are two types of construct validity, including the convergent validity and discriminant validity.

On one hand, the convergent validity refers to the degree to which the items converge on the same construct (Hair et al., 2010). There are several ways to measure convergent validity, and one approach is to check the Average Variance Extracted (AVE). Fornell and Larcker (1981) pointed out that the validity of the construct is questionable when the AVE for this construct was less than 0.5. Hair et al. (2010) pointed out
that the validity of construct is accepted when the factor loadings of the
construct is higher than 0.5.

On the other hand, the discriminant validity represents the degree to
which the measurement model of a construct is free from redundant
items. The measurement of discriminant validity is to compare the
square root of average variance extracted (AVE) value with the squared
correlations between each pair of constructs. (Fornell & Larcker, 1981)
pointed out that the square root of AVE value should be less than the
squared correlation values.

Generally, if the confirmation factor analysis (CFA) is used to test the
model, the convergent validity and discriminant validity of the latent
variables need to be measured. If the exploratory factor analysis (EFA) is
used to test the model, the factor analysis needs to be used. For
pretesting the questionnaire, the EFA will be used.

Factor analysis can be used to reduce data by seeking latent variables
that are reflected in the manifest variables. The specific methods include
principal axis factor, maximum likelihood, generalized least squares,
unweighted least squares. After the initial extraction of factors, many
types of rotations can be done, including orthogonal rotations and
oblique rotations. Although the analysts can determine the number of
factors that they want to extract, they are looking for simple structure,
which is the pattern of results that each variable load onto the only one
factor.

Before the factor analysis, the test that whether this data fits the
factor analysis needs to be conducted and generally, the measurement is
based on the value of Kaiser Meyer Olkin (KMO) and Bartlett’s Test of
Sphericity. In most academic and business studies, KMO & Bartlett’s Test
of Sphericity of factor analysis play a crucial role for accepting the
sample adequacy. It varies between 0 and 1. The value of 0 indicates the
diffusion in the pattern of correlations and that factor analysis are not
suitable to be used, while the value close to 1 indicates the compact
patterns of correlations and that factor analysis are suitable to be used.
When \(KMO \geq 0.6\), the sample is acceptable (Kaiser, 1974). For the
Bartlett’s Test of Sphericity, the P value should be less than 0.05 for the
significance (Hair et al., 2010) and when its value $\leq 0.5$, the sample is not acceptable (Kaiser, 1974).

After making sure that factor analysis is appropriate for these data, the validity is further measured by factor loadings of the data. Namely, after meeting the requires above, this research will employ the factor analysis, mainly the principal component analysis with varimax rotation method. The goal is to make sure different items are explained by different underlying factors, and each factor explains more than one item.

To be more specific, the components (factors) with their Eigenvalues greater than 1 will be extracted. The extracted components should explain more than 60% of the total variance. If so, these extracted factors can represent the original items.

Then, through the varimax rotation, the loadings of each item onto each factor will be shown. There are three requirements (Hair et al., 2010): Firstly, if one variable became one factor directly, it would be deleted because of lacking internal consistency. Secondly, only variables with a factor loading of 0.5 or above should be retained. Thirdly, the closer to 1 of the factor loading of each variable towards their factor and the closer to 0 of the factor loading of each variable towards other factor, the better the result is. If one variable has the factor loadings larger than 0.5 on two different factors, this variable should be deleted.

- The reliability

  Reliability in statistics and psychometrics refers to the overall consistency of a measure. A measure with a high reliability is the one which can produce similar results under consistent conditions. In this study, Cronbach's $\alpha$ is used to measure the internal consistency of this set of items so as to estimate the reliability of these items widely in the social sciences. As for its measurement standard, many scholars consider that when $\alpha \geq 0.7$, the internal consistency is acceptable (Nunnally, 1967).

2) Structural Equation Modeling (SEM)
The SEM is a statistical methodology with techniques for theory developing and testing (Hair et al., 2010). It can be used to testify the relationships among the dependent and independent variables in the theoretical model.

The SEM include two steps, including the confirmatory factor analysis (CFA) and testing the structural model (Anderson & Gerbing, 1988). CFA is test whether the data fit a hypothesized measurement model or not and testing the structural model means to test the relationships of each variable, namely to test the hypotheses.

Noticeably, the hypothesized model should “fit” the sample data for these two steps of SEM. For this purpose, the goodness-of-fit measures are widely used. These indexes include the ratio of chi-square value to degrees of freedom ($\chi^2$/df), goodness of fit index (GFI), root mean square error of approximation (RMSEA), adjusted goodness of fit index (AGFI), normed fit index (NFI), comparative fix index (CFI), incremental fit index (IFI) and so on. Among these indexes, Hair et al. (2010) recommended to use at least four of them for testing whether the hypothesized model fit the measurement model and structural model. Hence, this research would use some of these indexes. Furthermore, the hypotheses would be further tested by using the C.R.(t-value), critical value (p-value) and standardized estimates.

4.1.5. Focus group and pretesting the questionnaire

4.1.5.1. Focus group

As introduced in the section 4.1.4, the focus group is necessary for discovering the readability problems and confusing instructions (Bryman & Bell, 2015). For this questionnaire, 5 pieces of the Chinese version were sent to the focus group to have a discussion of the items' wordings. Because of the unclear meanings, some questions were revised. After a thorough discussion and revision, a new version of the questionnaire was obtained.
4.1.5.2. Data sources for pretest

In order to gather the data for pretesting the questionnaire, Convenience Sampling, a statistical method of gathering data by selecting participants out of their easy access, is used and 182 pieces of questionnaire were received. The answers with “never” for question 6 and question 7 in the Part 1 of the questionnaire were deleted. Namely, the respondents who answered either “never have the experiences of finding commodity information because of the recommendations of opinion leaders in these virtual communities of transaction” or “never pay attention to opinion leaders and will never willing to do that from now” were neglected. Furthermore, after deleting invalid answers, 128 pieces of valid answers were accepted. Then, the data was analyzed by terms of SPSS 23 to test the reliability and validity of the scale.

4.1.5.3. Pretest

The evaluation of the sample data through pretesting includes two parts.

(1) The validity analysis

The KMO and Bartlett’s test of sphericity are used for testing the data is proper for CFA or not. The KMO is for testing the sample adequacy and the Bartlett’s test of sphericity is for testing the suitability of using factor analysis for this empirical study (Hair et al., 2010). When $KMO \geq 0.6$, the sample is acceptable (Kaiser, 1974). For the Bartlett’s Test of Sphericity, the P value should be less than 0.05 for the significance (Hair et al., 2010) and when its value $\leq 0.5$, the sample is not acceptable (Kaiser, 1974).

KMO and Bartlett’s test of sphericity was computed by SPSS 23 and the results are shown in the Table 18.
According to the Table 18, the KMO value of the data was 0.772, higher than 0.7 and the Bartlett’s Test of these items was highly significant (p<0.001), with its value reached 2991.850. Hence, the validity of this questionnaire was good enough and factor analysis was appropriate for this questionnaire.

Then the factor analysis, mainly the principal component analysis with varimax rotation method, was employed. The eigenvalues associated with each linear component before extraction, after extraction and after rotation were shown in the Table 19.

Table 19. Total Variance Explained for the pretest
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative%</td>
</tr>
<tr>
<td>2</td>
<td>2.698</td>
<td>7.494</td>
<td>42.607</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It is clear that 11 components (factors) with their respective eigenvalues being greater than 1 were extracted from 36 items and these 11 components together explained 78.665% of the total variance, which was greater than 60%, of the variance in the original set of factors. Hence, these extracted factors could represent the original variables highly.

Then, according to the rotated component matrix as shown in the Table 20, the loadings of each variable onto each factor were identified. Factor loadings less than 0.5 were suppressed in this table. Only variables with a factor loading of 0.5 or above should be retained (Hair et al., 2010). Hence, PR3 was deleted. And IA3 loaded highly onto the first factor while IA1, IA2 and IA4 loaded highly onto the second factor. Hence, IA3 was deleted, too.
Table 20. Rotated Component Matrix for the pretest
(The table is made by the author.
Only variables with a factor loading of 0.5 or above are retained in this table.)

<table>
<thead>
<tr>
<th></th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>T1</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td></td>
</tr>
<tr>
<td>MQ1</td>
<td></td>
</tr>
<tr>
<td>MQ2</td>
<td></td>
</tr>
<tr>
<td>MQ3</td>
<td></td>
</tr>
<tr>
<td>MQ4</td>
<td></td>
</tr>
<tr>
<td>SC1</td>
<td></td>
</tr>
<tr>
<td>SC2</td>
<td></td>
</tr>
<tr>
<td>SC3</td>
<td></td>
</tr>
<tr>
<td>TS1</td>
<td></td>
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<tr>
<td>TS2</td>
<td></td>
</tr>
<tr>
<td>TS3</td>
<td></td>
</tr>
<tr>
<td>RC1</td>
<td></td>
</tr>
<tr>
<td>RC2</td>
<td></td>
</tr>
<tr>
<td>RC3</td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td></td>
</tr>
<tr>
<td>PR1</td>
<td>.735</td>
</tr>
<tr>
<td>PR2</td>
<td>.839</td>
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<tr>
<td>PR3</td>
<td></td>
</tr>
<tr>
<td>PR4</td>
<td>.761</td>
</tr>
<tr>
<td>PU1</td>
<td></td>
</tr>
<tr>
<td>PU2</td>
<td></td>
</tr>
<tr>
<td>PU3</td>
<td></td>
</tr>
<tr>
<td>MC1</td>
<td></td>
</tr>
</tbody>
</table>
After deleting PR3 and IA3 and re-running the analysis, a new rotated component matrix was shown in the Table 21. The new value of KMO was 0.776 and the cumulative rotation sums of squared loadings were 79.604%. Hence, the validity is confirmed.

Table 21. A new Rotated Component Matrix
(The table is made by the author.)

<table>
<thead>
<tr>
<th></th>
<th>Components</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>T1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td>.884</td>
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<tr>
<td>T2</td>
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<td></td>
<td></td>
<td></td>
<td>.728</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>.758</td>
</tr>
<tr>
<td>MQ2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>.760</td>
</tr>
<tr>
<td>MQ3</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>.673</td>
</tr>
<tr>
<td>MQ4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.629</td>
</tr>
<tr>
<td>SC1</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC3</td>
<td>.840</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>.870</td>
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<td>TS2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.818</td>
</tr>
</tbody>
</table>
(2) The reliability analysis

The reliability refers to the consistency of a measure of a concept (Bryman & Bell, 2015). As for its measurement standard, when $\alpha \geq 0.7$, the internal consistency is acceptable (Nunnally, 1967).

The result of the reliability analysis was shown in the Table 22. It is clear that the value of Cronbach’s Alpha for every variable was higher than 0.7 and it demonstrates a strong consistency among the items of each variable. Meanwhile, as for each item, the value of Cronbach’s $\alpha$ if item deleted is lower than the value of Cronbach’s Alpha of the variable,
and the CITC of them was higher than 0.5, so every item could be retained.

Table 22. The reliability analysis
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>CITC</th>
<th>Cronbach's α if item deleted</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>T1</td>
<td>0.754</td>
<td>0.745</td>
<td>0.844</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>0.686</td>
<td>0.807</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>0.703</td>
<td>0.799</td>
<td></td>
</tr>
<tr>
<td>MQ</td>
<td>MQ1</td>
<td>0.531</td>
<td>0.716</td>
<td>0.758</td>
</tr>
<tr>
<td></td>
<td>MQ2</td>
<td>0.520</td>
<td>0.720</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MQ3</td>
<td>0.591</td>
<td>0.683</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MQ4</td>
<td>0.584</td>
<td>0.685</td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>SC1</td>
<td>0.835</td>
<td>0.891</td>
<td>0.921</td>
</tr>
<tr>
<td></td>
<td>SC2</td>
<td>0.839</td>
<td>0.890</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SC3</td>
<td>0.850</td>
<td>0.880</td>
<td></td>
</tr>
<tr>
<td>TS</td>
<td>TS1</td>
<td>0.696</td>
<td>0.858</td>
<td>0.867</td>
</tr>
<tr>
<td></td>
<td>TS2</td>
<td>0.797</td>
<td>0.770</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TS3</td>
<td>0.751</td>
<td>0.809</td>
<td></td>
</tr>
<tr>
<td>RC</td>
<td>RC1</td>
<td>0.723</td>
<td>0.798</td>
<td>0.853</td>
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<tr>
<td></td>
<td>RC2</td>
<td>0.748</td>
<td>0.773</td>
<td></td>
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<tr>
<td></td>
<td>RC3</td>
<td>0.704</td>
<td>0.812</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>C1</td>
<td>0.736</td>
<td>0.741</td>
<td>0.828</td>
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<td></td>
<td>C2</td>
<td>0.719</td>
<td>0.729</td>
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</tr>
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<td></td>
<td>C3</td>
<td>0.642</td>
<td>0.825</td>
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</tr>
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<td>PR</td>
<td>PR1</td>
<td>0.712</td>
<td>0.784</td>
<td>0.845</td>
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<td>PR2</td>
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<td>0.761</td>
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<td></td>
<td>PR4</td>
<td>0.691</td>
<td>0.809</td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>PU1</td>
<td>0.781</td>
<td>0.830</td>
<td>0.883</td>
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<tr>
<td></td>
<td>PU2</td>
<td>0.791</td>
<td>0.817</td>
<td></td>
</tr>
</tbody>
</table>
4.1.6. The formal questionnaire

(1) Design of the formal questionnaire

This study used a small group of discussion to revise the questionnaire pretested the questionnaire and deleted two questions. Then, this study added the questionnaire instructions, questions about the experience of paying attention to opinion leaders, questions about population statistics and others to form the formal questionnaire. The questionnaire begins with instructions and a brief description to the specific requirements of the respondents who are going to fill in the questionnaire. Secondly, questions 1 to questions 8 are asking about the experiences of respondents’ paying attention to opinion leaders, followed by question 9 to question 44 asking respondents’ shopping intentions. Lastly, questions about respondents’ genders, ages, education, income are shown. The English and Chinese versions of the formal questionnaire are shown in the Appendices.

(2) Data collection and sample profiles

The data was collected through the Questionnaire Star System, the largest professional questionnaire system in China. After uploading the questionnaire online, a URL was made and could be sent out by Wechat
to individuals. The specific time period of collecting data was from June 17\textsuperscript{th}, 2016 to June 30\textsuperscript{th}, 2016. Within these two weeks, 499 pieces of answers were received. Two types of answers were deleted. Firstly, if the answers are not complete, namely not all the questions were answered, the answers are deleted. Secondly, the answers with “never” for question 6 and question 7 in the Part 1 of the questionnaire were deleted. Namely, the respondents who answered either “never have the experiences of finding commodity information because of the recommendations of opinion leaders in these virtual communities of transaction” or “never pay attention to opinion leaders and will never willing to do that from now” are neglected. Hence, after deleting invalid answers, 347 pieces of valid answers were accepted.

4.2. Data analyses

After gathering the data, this section firstly had the analyses on the basic information of the respondents and on respondents’ online activities and choice. Then, this section provided the descriptive statistical analyses to the observed variables, including the validity analysis, the reliability analysis, the discriminant validity analysis, confirmatory factor analysis and so on.

4.2.1. Analyses on the basic information of the respondents

(1) Gender

The result of question 1 in the Part 3 of the questionnaire is shown in the Table 23. It indicates that the ratio for men and women in this sample was 42.9: 57.1. According to the 39th National Internet Development Statistics Report, reported by China Internet Network Information Center (CNNIC), until December, 2016, the ratio for men and women in China was 52.4: 47.6. Hence, the ratio of this sample is
reasonable, especially considering that the virtual community of consumption usually gathers more female consumers.

Table 23. The data of gender
(The table is made by the author.)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>149</td>
<td>42.9</td>
</tr>
<tr>
<td>Women</td>
<td>198</td>
<td>57.1</td>
</tr>
<tr>
<td>Total</td>
<td>347</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(2) Age

The result of question 2 in the Part 3 of the questionnaire is shown in the Table 24. It indicates that the respondents from 19-29 years old group took up 61.7% of the total sample and that the respondents from 30-39 years old group took up 20.5% of the total sample. According to the 39th National Internet Development Statistics Report, reported by China Internet Network Information Center (CNNIC), until December, 2016, the Internet users in China from 20-29 years old group took up the highest percentages and it took up 30.3% of the total Chinese. The Internet users in China from 30-39 years old group took up 23.3% of the total Chinese. Considering that this virtual community is for consumption, it is reasonable that it gathers a lot of younger Internet users.

Table 24. The data of age
(The table is made by the author.)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 18 years old</td>
<td>2</td>
<td>.6</td>
</tr>
<tr>
<td>19-29 years old</td>
<td>214</td>
<td>61.7</td>
</tr>
<tr>
<td>30-39 years old</td>
<td>71</td>
<td>20.5</td>
</tr>
<tr>
<td>Older than 40</td>
<td>60</td>
<td>17.3</td>
</tr>
</tbody>
</table>
(3) Education

The result of question 3 in the Part 3 of the questionnaire is shown in the Table 25. It indicates that the respondents having bachelor degree took up 51.6% of the total sample and the respondents having master degree or higher took up 29.4% of the total sample. According to the 39th National Internet Development Statistics Report, reported by China Internet Network Information Center (CNNIC), until December, 2016, only 11.5% of the total Chinese netizens have bachelor degree or higher. It is understandable, because the individuals with higher degree may understand more about the importance of this questionnaire to the author and may be more willing to fill in this questionnaire.

Table 25. The data of education
(The table is made by the author.)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>high school or below</td>
<td>18</td>
<td>5.2</td>
</tr>
<tr>
<td>technical college</td>
<td>48</td>
<td>13.8</td>
</tr>
<tr>
<td>bachelor degree</td>
<td>179</td>
<td>51.6</td>
</tr>
<tr>
<td>master degree or higher</td>
<td>102</td>
<td>29.4</td>
</tr>
<tr>
<td>Total</td>
<td>347</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(4) Job

The result of question 4 in the Part 3 of the questionnaire is shown in the Table 26. It indicates that the percentage of general staff in companies was the highest, namely 29.4% of the total sample, while the percentage of students was the second highest, namely 21.9% of the total sample. According to the 39th National Internet Development
Statistics Report, reported by China Internet Network Information Center (CNNIC), until December, 2016, the percentage of students was the highest, namely 25.0% of the total Internet users, which the percentage of freelance and of general staff in companies were the second and third highest, namely 22.7% and 11.9% of the total Internet users. Hence, the ratio of this sample is reasonable.

Table 26. The data of job
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>students</td>
<td>76</td>
<td>21.9</td>
</tr>
<tr>
<td>government-related staff</td>
<td>42</td>
<td>12.1</td>
</tr>
<tr>
<td>company managers</td>
<td>53</td>
<td>15.3</td>
</tr>
<tr>
<td>general staff in companies</td>
<td>102</td>
<td>29.4</td>
</tr>
<tr>
<td>professionals</td>
<td>43</td>
<td>12.4</td>
</tr>
<tr>
<td>business service staff</td>
<td>3</td>
<td>.9</td>
</tr>
<tr>
<td>freelance</td>
<td>18</td>
<td>5.2</td>
</tr>
<tr>
<td>retired</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>unemployed/laid-off</td>
<td>6</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>347</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(5) Income

The result of question 5 in the Part 3 of the questionnaire is shown in the Table 27. It indicates that the percentage of respondents with income of 5001-10000-yuan was the highest, namely 30.8% of the total sample, while the percentage of the 3001-5000-yuan group is the second highest, namely 24.8% of the total sample. This result indicates that most of the respondents had an income higher than 3001. According to the 39th National Internet Development Statistics Report, reported by China Internet Network Information Center (CNNIC), until December,
2016, the percentage of Internet users with income of 3001-5000-yuan was the highest, namely 23.2% of the total Internet users, while the percentage of the 2001-3000-yuan group is the second highest, namely 17.7% of the total sample. Hence, the ratio of this sample is reasonable, especially considering that this virtual community of consumption gathers many members who enjoy shopping.

Table 27. The data of income
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 1500 yuan</td>
<td>49</td>
<td>14.1</td>
</tr>
<tr>
<td>1501-3000 yuan</td>
<td>40</td>
<td>11.5</td>
</tr>
<tr>
<td>3001-5000 yuan</td>
<td>86</td>
<td>24.8</td>
</tr>
<tr>
<td>5001-10000 yuan</td>
<td>107</td>
<td>30.8</td>
</tr>
<tr>
<td>more than 10000</td>
<td>65</td>
<td>18.7</td>
</tr>
<tr>
<td>total</td>
<td>347</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(6) The time period of using Internet

The result of question 6 in the Part 3 of the questionnaire is shown in the Table 28. 79.8% of the respondents had used Internet for more than 5 years. This result indicates that most of the respondents had using Internet for more than 5 years.

Table 28. The data of the time period of using Internet
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>within 1 year</td>
<td>2</td>
<td>.6</td>
</tr>
<tr>
<td>1-2 years</td>
<td>6</td>
<td>1.7</td>
</tr>
<tr>
<td>2-3 years</td>
<td>16</td>
<td>4.6</td>
</tr>
<tr>
<td>3-4 years</td>
<td>22</td>
<td>6.3</td>
</tr>
</tbody>
</table>
(7) The history of purchasing commodity online

The result of question 7 in the Part 3 of the questionnaire is shown in the Table 29. 47.8% of the respondents had the history of purchasing commodity online for more than 5 years. The percentages of respondents with 3-4 years experiences and with 4-5 years were similar, which took up 17.6% and 16.1% respectively. This result indicates that most of the respondents had the history of purchasing commodity online more than 2 years.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>within 1 year</td>
<td>11</td>
<td>3.2</td>
</tr>
<tr>
<td>1-2 years</td>
<td>18</td>
<td>5.2</td>
</tr>
<tr>
<td>2-3 years</td>
<td>35</td>
<td>10.1</td>
</tr>
<tr>
<td>3-4 years</td>
<td>61</td>
<td>17.6</td>
</tr>
<tr>
<td>4-5 years</td>
<td>56</td>
<td>16.1</td>
</tr>
<tr>
<td>more than 5 years</td>
<td>166</td>
<td>47.8</td>
</tr>
<tr>
<td>total</td>
<td>347</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(8) The history of searching commodity information online:

The result of question 8 in the Part 3 of the questionnaire is shown in the Table 30. 22.8% of the respondents had searched commodity information online for more than 5 years. 19.6% and 18.7% of the respondents had done it for 2-3 years or 3-4 years. This result indicates
that most of the respondents had the history of searching commodity information online more than 1 year.

Table 30. The data of the history of searching commodity information online
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 1 year</td>
<td>49</td>
</tr>
<tr>
<td>1-2 years</td>
<td>50</td>
</tr>
<tr>
<td>2-3 years</td>
<td>68</td>
</tr>
<tr>
<td>3-4 years</td>
<td>65</td>
</tr>
<tr>
<td>4-5 years</td>
<td>36</td>
</tr>
<tr>
<td>more than 5 years</td>
<td>79</td>
</tr>
<tr>
<td>total</td>
<td>347</td>
</tr>
</tbody>
</table>

(9) The frequency of shopping online per month

The result of question 9 in the Part 3 of the questionnaire is shown in the Table 31. 44.4% of the respondents shopped online per month for 1-3 times, and 29.1% for 4-6 times. Even 16.4% of the respondents had the frequency more than 7 times. This result indicates that most of these respondents had the habits of shopping online per month more than once.

Table 31. The data of the frequency of shopping online per month
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than once</td>
<td>35</td>
</tr>
<tr>
<td>1-3 times</td>
<td>154</td>
</tr>
<tr>
<td>4-6 times</td>
<td>101</td>
</tr>
<tr>
<td>more than 7 times</td>
<td>57</td>
</tr>
</tbody>
</table>
(10) The total time spent in the webpage every time in average:

The result of question 10 in the Part 3 of the questionnaire is shown in the Table 32. The percentages of respondents who spend 10-20 minutes, 20-30 minutes and 30 minutes-1 hour are similar and took up 23.9%, 27.7% and 24.2% respectively. This result shows that most of the respondents are willing to spend more than 10 minutes in the webpage every time in average.

Table 32. The data of the total time spent in the webpage every time in average
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 10 minutes</td>
<td>31</td>
</tr>
<tr>
<td>10-20 minutes</td>
<td>83</td>
</tr>
<tr>
<td>20-30 minutes</td>
<td>96</td>
</tr>
<tr>
<td>30minutes-1 hour</td>
<td>84</td>
</tr>
<tr>
<td>more than 1 hour</td>
<td>53</td>
</tr>
<tr>
<td>total</td>
<td>347</td>
</tr>
</tbody>
</table>

(11) The frequency of visiting the website:

The result of question 11 in the Part 3 of the questionnaire is shown in the Table 33. 27.4% of the respondents visited the website once per week. The percentages of the respondents visiting the website twice per week and more than 4 times per week were the same and took up 21.6% respectively. Meanwhile, 18.7% of the respondents visited the website 3 times per weeks. It is shown that most of the respondents generally visited the website at least once per week.
Table 33. The data of the frequency of visiting the website
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>once per week</td>
<td>95</td>
</tr>
<tr>
<td>twice per week</td>
<td>75</td>
</tr>
<tr>
<td>three times per week</td>
<td>65</td>
</tr>
<tr>
<td>four times per week</td>
<td>37</td>
</tr>
<tr>
<td>more than four times per week</td>
<td>75</td>
</tr>
<tr>
<td>total</td>
<td>347</td>
</tr>
</tbody>
</table>

(12) The total money spending online per month:

The result of question 12 in the Part 3 of the questionnaire is shown in the Table 34. The percentages of 301-500-yuan group and 501-1000-yuan group were the highest and are 21.6% and 20.5% respectively. The percentages of 101-200-yuan group, 201-300-yuan group and 1001-2000-yuan group were similar and about 13% respectively. It indicates that a certain percentage of the respondents had the shopping power.

Table 34. The data of the total money spending online per month
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 yuan or less than 100 yuan</td>
<td>34</td>
</tr>
<tr>
<td>101-200 yuan</td>
<td>43</td>
</tr>
<tr>
<td>201-300 yuan</td>
<td>48</td>
</tr>
<tr>
<td>301-500 yuan</td>
<td>75</td>
</tr>
<tr>
<td>501-1000 yuan</td>
<td>71</td>
</tr>
<tr>
<td>1001-2000 yuan</td>
<td>45</td>
</tr>
<tr>
<td>more than 2001 yuan</td>
<td>31</td>
</tr>
<tr>
<td>total</td>
<td>347</td>
</tr>
</tbody>
</table>
4.2.2. Analyses on respondents’ experiences of online activities and choices

(1) The main shopping approach

The result of question 1 in the Part 1 of the questionnaire is shown in the Table 35. It indicates that 70.9% of respondents sometimes shopped offline, sometimes shop online and their choices depended on the commodity type. Also, the percentage of respondents mainly shopping in the online stores was 21.9%, higher than the percentage of respondents mainly shopping in the offline stores. Obviously, most of the respondent shop online and the commodity type become a main reason accounting for their choice.

Table 35. The data of the main shopping approach
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Amount</td>
<td>Percentage</td>
<td>(%)</td>
</tr>
<tr>
<td>The main shopping approach</td>
<td>1) mainly shopping in the offline stores</td>
<td>25</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) mainly shopping in the online stores</td>
<td>76</td>
<td>21.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) sometimes shopping offline, and sometimes shopping online. It depends on the commodity type</td>
<td>246</td>
<td>70.9</td>
<td></td>
</tr>
</tbody>
</table>

(2) The most suitable commodity type to be purchased online

The result of question 2 in the Part 1 of the questionnaire is shown in
the Table 36. It indicates that respondents choosing commodity related to fashion (such as clothing, cosmetics, etc.) took up 31.1%, which was the highest, while respondents choosing commodity related to culture (such as books, movies, dramas, etc.) took up 29.4%, which was the second highest. And respondents choosing the commodity related to technology (such as electronic products, high-tech products, etc.) and commodity related to lifestyle (such as food, household goods, daily necessities, etc.) took up 22.5% and 17.0% respectively. Obviously, the commodity related to fashion and culture could be considered as the most suitable commodity types to be purchased online by these respondents.

Table 36. The data of the most suitable commodity type to purchase online
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The most suitable commodity type to purchase online</td>
<td>1) commodity related to fashion (such as clothing, cosmetics, etc.)</td>
<td>108</td>
<td>31.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) commodity related to technology (such as electronic products, high-tech products, etc.)</td>
<td>78</td>
<td>22.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Commodity related to culture (such as books, movies, dramas, etc.)</td>
<td>102</td>
<td>29.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Commodity related to lifestyle (such as food, household goods, daily necessities, etc.)</td>
<td>59</td>
<td>17.0%</td>
<td></td>
</tr>
</tbody>
</table>
(3) The choice of searching for commodity information online before purchasing it

The result of question 3 in the Part 1 of the questionnaire is shown in the Table 37. It indicates that respondents who usually do that took up 62.5%, who sometimes do that took up 26.8% and who occasionally do that took up 10.7%. Obviously, most of these respondents usually searched information online.

Table 37. The data of the choice of searching for commodity information online before purchasing it
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
<th>Amount</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will you search for commodity information online before purchasing it?</td>
<td>1) usually</td>
<td>217</td>
<td>62.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) sometimes</td>
<td>93</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) occasionally</td>
<td>37</td>
<td>10.7</td>
<td></td>
</tr>
</tbody>
</table>

(4) The sources of commodity information

The result of question 4 in the Part 1 of the questionnaire is shown in the Table 38. It indicates that respondents answered with “word-of-mouth” took up 39% and “recommendations from opinion leaders” took up 28.2%. Meanwhile, respondents consider “recommendations from friends” as a main source took up the similar percentages as the respondents consider “brand advertisements” as a main source, 15.3% and 13.5% respectively. And respondents answering “others” took up 4.0%. Obviously, other than brand advertisement, most of the respondents begin to consider the WOM or recommendation from opinion leaders as their main sources of commodity information.
Table 38. The data of the sources of commodity information
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>the sources of commodity information</td>
<td>1) word-of-mouth</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>2) recommendations from opinion leaders</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>3) recommendations from friends</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>4) brand advertisements</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>5) others</td>
<td>14</td>
</tr>
</tbody>
</table>

(5) The virtual communities which is most frequently used

The result of question 5 in the Part 1 of the questionnaire is shown in the Table 39. It indicates that respondents who most frequently use Taobao took up the most, namely 52.2% and Dangdang was listed as the second, namely 15.3% and the Jumeiyoupin accounted for the third, namely 8.9%. Obviously, in China, the most frequently used and the most popular virtual communities of transaction type online was Taobao.

Table 39. The data of the virtual communities which is the most frequently used
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>The virtual communities which</td>
<td>1) Taobao</td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td>2) Dangdang</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td></td>
<td>53</td>
</tr>
</tbody>
</table>
is most frequently used is:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3) Jumeiyoupin</td>
<td>31</td>
<td>8.9</td>
</tr>
<tr>
<td>4) Meilishuo</td>
<td>15</td>
<td>4.3</td>
</tr>
<tr>
<td>5) Xiachufang</td>
<td>13</td>
<td>3.7</td>
</tr>
<tr>
<td>6) Woaigouwu</td>
<td>6</td>
<td>1.7</td>
</tr>
<tr>
<td>7) Mogujie</td>
<td>13</td>
<td>3.7</td>
</tr>
<tr>
<td>8) Mafengwo</td>
<td>7</td>
<td>2.0</td>
</tr>
<tr>
<td>9) Zhongguancunzaixian</td>
<td>18</td>
<td>5.2</td>
</tr>
<tr>
<td>10) Aikaqiche</td>
<td>3</td>
<td>.9</td>
</tr>
<tr>
<td>11) Tgbus</td>
<td>2</td>
<td>.6</td>
</tr>
<tr>
<td>12) shoujizhijia</td>
<td>5</td>
<td>1.4</td>
</tr>
</tbody>
</table>

(6) The experiences of finding commodity information because of the recommendations of opinion leaders

The result of question 6 in the Part 1 of the questionnaire is shown in the Table 40. It indicates that respondents answered with “occasionally” took up the most, namely 47.5%, and “sometimes” took up 37.8%. The respondents usually do that took up only 14.7%. (For this question, the respondent who answer “never” were neglected and the piece of answer were deleted.) Obviously, most of the respondents begin to be affected by the recommendations of opinion leaders.

Table 40. The data of the experiences of finding commodity information because of the recommendations of opinion leaders
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>the experiences of finding commodity information because of the</td>
<td></td>
<td>Amount</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>the experiences of finding commodity information because of the</td>
<td>1) usually</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>2) sometimes</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>3) occasionally</td>
<td>165</td>
</tr>
</tbody>
</table>
(7) The type of opinion leaders which the respondents usually pay attention to or be willing to pay attention to

The result of question 7 in the Part 1 of the questionnaire is shown in the Table 41. It indicates that respondents choosing opinion leaders related to fashion took up the most, namely 47.0%, and the ones related to technology and culture took up the similar percentage, namely 20.2% and 18.2% respectively. And respondents choosing opinion leaders related to lifestyle only took up 14.7%. (For this question, the respondent who answer “never” were neglected and the piece of answer were deleted.) Obviously, opinion leaders related to fashion are most popular to the public.

Table 41. The data of the experiences of the type of opinion leaders which the respondents usually pay attention to or be willing to pay attention to

(The table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>the type of opinion leaders which the respondents usually pay attention to or be willing to pay attention to</td>
<td>1) related to fashion (such as clothing, cosmetics, etc.)</td>
<td>163</td>
<td>47.0</td>
</tr>
<tr>
<td></td>
<td>2) related to technology (such as electronic products, high-tech products, etc.)</td>
<td>70</td>
<td>20.2</td>
</tr>
<tr>
<td></td>
<td>3) related to culture (such as books, movies, dramas,</td>
<td>63</td>
<td>18.2</td>
</tr>
</tbody>
</table>
(8) Interests in commodity labeled with “some opinion leaders recommend”

The result of question 8 in the Part 1 of the questionnaire is shown in the Table 42. It indicates that 53.9% of the respondents said that they maybe do that and 23.9% of them answered with “never”. Meanwhile, 6.1% of them chose “certainly” and 16.1% chose “never pay attention to that”. Obviously, even if the public do hardly pay attention to the opinion leaders who recommend the commodity before, half of respondents may be interested in such kind of commodity.

Table 42. The data of interests in commodity labeled with “some opinion leaders recommend”
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Answers</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Amount</td>
</tr>
<tr>
<td>will be you interested in commodity labeled with “some opinion leaders</td>
<td>1) certainly</td>
<td>21</td>
</tr>
<tr>
<td>recommend”</td>
<td>2) maybe</td>
<td>187</td>
</tr>
<tr>
<td></td>
<td>3) never</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>4) never pay attention to that</td>
<td>56</td>
</tr>
</tbody>
</table>
4.2.3. Validity analysis

KMO and Bartlett's test of sphericity was computed by SPSS 23 and result are shown in the Table 43.

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling</th>
<th>.935</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>9573.343</td>
</tr>
<tr>
<td>df</td>
<td>595</td>
</tr>
<tr>
<td>Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

According to the Table 43, the KMO value of the data was 0.935, higher than 0.7 and the Bartlett’s Test of these items was highly significant (p<0.001), with its value reaches 9573.343. Hence, the validity of this questionnaire was good enough and factor analysis was appropriate for this questionnaire.

Then the factor analysis, mainly the principal component analysis with varimax rotation method, was employed. The eigenvalues associated with each linear component before extraction, after extraction and after rotation are shown in the Table 44.

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
</tbody>
</table>
It is clear that 11 components (factors) with their respective eigenvalues being greater than 1 were extracted from 34 variables and these 11 components together explained 82.258%, greater than 60%, of the variance in the original set of factors. Hence, these extracted factors could represent the original variables highly.

Then, according to the rotated component matrix, as shown in the Table 45, the loadings of each variable onto each factor were identified.

Table 45. Rotated Component Matrix
(The table is made by the author.)
<table>
<thead>
<tr>
<th>Components</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>.837</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>.829</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>.838</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MQ1</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MQ2</td>
<td>.769</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>MQ3</td>
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<td></td>
<td></td>
<td></td>
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<td>.713</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SC2</td>
<td></td>
<td>.838</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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</tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC1</td>
<td></td>
<td></td>
<td>.817</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>.811</td>
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</tr>
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<td>.748</td>
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<td></td>
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</tr>
<tr>
<td>C1</td>
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<td></td>
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</tr>
<tr>
<td>C2</td>
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<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PR1</td>
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<td></td>
<td></td>
<td>-.766</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PR2</td>
<td></td>
<td></td>
<td></td>
<td>-.777</td>
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</tr>
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<td>-.796</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PU2</td>
<td>.792</td>
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<td></td>
<td></td>
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</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU4</td>
<td>.852</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.790</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.805</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.734</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IA1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>.698</td>
</tr>
<tr>
<td>IA2</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.788</td>
</tr>
</tbody>
</table>
According to this table, the validity of this questionnaire is confirmed.

4.2.4. Reliability analysis

The results of the reliability analysis are shown in the Table 46. It is clear that the value of Cronbach’s Alpha for every variable was higher than 0.7 which demonstrated a strong consistency among the items of each variable.

Table 46. The Reliability analysis
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>3</td>
<td>0.956</td>
</tr>
<tr>
<td>MQ</td>
<td>4</td>
<td>0.889</td>
</tr>
<tr>
<td>SC</td>
<td>3</td>
<td>0.805</td>
</tr>
<tr>
<td>TS</td>
<td>3</td>
<td>0.911</td>
</tr>
<tr>
<td>RC</td>
<td>3</td>
<td>0.894</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>0.917</td>
</tr>
<tr>
<td>PR</td>
<td>3</td>
<td>0.856</td>
</tr>
<tr>
<td>PU</td>
<td>4</td>
<td>0.926</td>
</tr>
<tr>
<td>MC</td>
<td>3</td>
<td>0.862</td>
</tr>
<tr>
<td>IA</td>
<td>3</td>
<td>0.875</td>
</tr>
<tr>
<td>PI</td>
<td>3</td>
<td>0.926</td>
</tr>
</tbody>
</table>
4.2.5. Discriminant validity analysis

The discriminant validity is always used for evaluating the construct validity of a test (Campbell & Fiske, 1959). Discriminant validity refers to the degree to which measures of different traits are unrelated.

The criterion commonly is used to assess the degree of shared variance between the latent variables of the model by calculating the Average Variance Extracted (AVE) (Fornell & Larcker, 1981). AVE measures the level of variance captured by a construct versus the level due to measurement error. The AVE values above 0.5 are considered acceptable, and above 0.7 are considered very good. Furthermore, another judgment standard is that if the AVE value of one factor is all larger than the correlation coefficient of this factor to other factors, the factor is acceptable (Fornell & Larcker, 1981).

The results of the discriminant validity analysis are shown in the Table 47.

<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>MQ</th>
<th>SC</th>
<th>TS</th>
<th>RC</th>
<th>C</th>
<th>PR</th>
<th>PU</th>
<th>MC</th>
<th>IA</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>0.93</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MQ</td>
<td>.527</td>
<td>**</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>.416</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS</td>
<td>.461</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC</td>
<td>.476</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>.461</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 47. The Discriminant Validity analysis
(The table is made by the author.)
<table>
<thead>
<tr>
<th></th>
<th>**</th>
<th>**</th>
<th>**</th>
<th>**</th>
<th>**</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR</td>
<td>-.521</td>
<td>-.505</td>
<td>-.405</td>
<td>-.421</td>
<td>-.396</td>
<td>-.350</td>
</tr>
<tr>
<td></td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>PU</td>
<td>.383</td>
<td>.518</td>
<td>.516</td>
<td>.440</td>
<td>.421</td>
<td>.405</td>
</tr>
<tr>
<td></td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>MC</td>
<td>.458</td>
<td>.514</td>
<td>.421</td>
<td>.502</td>
<td>.456</td>
<td>.505</td>
</tr>
<tr>
<td></td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>IA</td>
<td>.511</td>
<td>.550</td>
<td>.419</td>
<td>.474</td>
<td>.441</td>
<td>.381</td>
</tr>
<tr>
<td></td>
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<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
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</tr>
<tr>
<td>PI</td>
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<td>.390</td>
<td>.453</td>
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<tr>
<td></td>
<td>7</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

Note: **. P<0.01

According to the Table 47, the square root of every AVE value belonging to each factor was higher than 0.707, and was larger than any correlation among any pair of factors. Namely, the 11 factors of the construct explained more variance than do the factors of other constructs.

Consequently, this model has a good discriminant validity.

### 4.2.6. Confirmatory factor analysis

This study adapts the two-way approach for structural equation modeling (SEM) proposed by Anderson and Gerbing (1988). The first step is to test the measurement model, namely to test the latent constructs and their respective observed variables. Then the second step is to test the relationship of each variable, namely to test the hypotheses.

Confirmatory Factor Analysis (CFA) refers to a special form of factor analysis and the objective of it is to test whether the data fit a hypothesized measurement model, based on theories (Preedy & Watson,
Hair et al. (2010) has pointed out that the validity of CFA should be tested through two steps, including the goodness-of-fit indices assessment and the construct validity assessment. For the goodness-of-fit measures, Hair et al. (2010) mentioned that at least four measures should be used.

Hence, in order to measure the degree to which the hypothesized model “fit” the sample data for both structural and measurement models, the goodness-of-fit measured, used in this research and provided by Hair et al. (2010), are shown in the Table 48.

Table 48. The goodness-of-fit measures
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Goodness of Fit Index</th>
<th>Acceptable Threshold Levels (p-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute fit indices</td>
<td></td>
</tr>
<tr>
<td>The ratio of chi-square value to degrees of freedom ($\chi^2/df$)</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Goodness of fit index (GFI)</td>
<td>&gt;0.8</td>
</tr>
<tr>
<td>Root mean square error of approximation (RMSEA)</td>
<td>&lt;0.05 (good fit)</td>
</tr>
<tr>
<td></td>
<td>0.05-0.08 (acceptable)</td>
</tr>
<tr>
<td>Incremental fit indices</td>
<td></td>
</tr>
<tr>
<td>Adjusted goodness of fit index (AGFI)</td>
<td>Maximum of 1</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>0.9 (ideal)</td>
</tr>
<tr>
<td>Comparative fit index (CFI)</td>
<td>0.8 (acceptable)</td>
</tr>
<tr>
<td>Incremental fit index (IFI)</td>
<td></td>
</tr>
</tbody>
</table>
4.2.6.1. Confirmatory factor analysis for each factor

The standards whether the measurement model is acceptable or not are:
1) The standard estimates should be higher than 0.7 and lower than 0.95.
2) The residual should be positive and significant.
3) The C.R. (composite reliability) should be higher than 0.7.
4) The AVE (Average Variance Extracted) should be higher than 0.5.

(1) T

By using AMOS 21.0 to run a CFA, the measurement model for T is shown in the Figure 19 and the results are shown in the Table 49. This factor is formed by three questions. Thus, although the measurement model could be recognized, the goodness of fit of this model could not be shown. Hence, the validity of the test can be judged from the value of every standardized estimate (Hou, Wen, & Cheng, 2004).

According to the Table 49, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.956 and higher than 0.7; 4) the value of AVE was 0.879 and higher than 0.5. Consequently, this measurement model is acceptable.
Figure 18. The measurement model for T
(The figure is made by the author.)

Table 49. Confirmatory factor analysis and the validity analysis for T
(The table is made by the author.)

<table>
<thead>
<tr>
<th>factor</th>
<th>Indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>T3</td>
<td>1</td>
<td></td>
<td>0.941</td>
<td></td>
<td>0.885</td>
<td>0.956</td>
<td>0.879</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.032</td>
<td>0.032</td>
<td>32.525</td>
<td>***</td>
<td>0.928</td>
<td>0.861</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td>1.063</td>
<td>0.031</td>
<td>34.422</td>
<td>***</td>
<td>0.944</td>
<td>0.891</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(2) MQ

By using AMOS 21.0 to run a CFA, the measurement model for MQ is shown in the Figure 20 and the result is shown in the Table 50 and the Table 51.

According to the Table 49, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.890 and higher than 0.7; 4) the value of AVE was 0.670 and higher than 0.5.

According to the Table 51, it is clear that $\chi^2$/df=2.472<3; GFI=0.993>0.9; AGFI=0.964>0.8; NFI=0.994>0.9; IFI=0.996>0.9; GFI=0.996>0.9; RMSEA=0.065<0.07.

Consequently, this measurement model was acceptable.
Figure 20. The measurement model for MQ
(The figure is made by the author.)

Table 50. Confirmatory factor analysis and the validity analysis for MQ
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>factor indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQ</td>
<td>MQ4</td>
<td>1</td>
<td></td>
<td></td>
<td>0.763</td>
<td>0.582</td>
<td>0.89</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>MQ3</td>
<td>1.08</td>
<td>0.069</td>
<td>15.668***</td>
<td>0.83</td>
<td>0.689</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MQ2</td>
<td>1.072</td>
<td>0.067</td>
<td>16.094***</td>
<td>0.853</td>
<td>0.728</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MQ1</td>
<td>1.115</td>
<td>0.072</td>
<td>15.562***</td>
<td>0.825</td>
<td>0.681</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 51. Test of goodness-of-fit for MQ
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
<th>IFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.472</td>
<td>0.993</td>
<td>0.964</td>
<td>0.994</td>
<td>0.996</td>
<td>0.996</td>
<td>0.065</td>
</tr>
</tbody>
</table>

(3) SC
By using AMOS 21.0 to run a CFA, the measurement model for SC is shown in the Figure 21 and the result is shown in the Table 52.

According to the Table 52, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.816 and higher than 0.7; 4) the value of AVE was 0.599 and higher than 0.5. Consequently, this measurement model was acceptable.

![Figure 19. The measurement model for SC](The figure is made by the author.)

<table>
<thead>
<tr>
<th>factor</th>
<th>indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>SC3</td>
<td>1.002</td>
<td>0.086</td>
<td>11.675</td>
<td>***</td>
<td>0.781</td>
<td>0.61</td>
<td></td>
<td>0.599</td>
</tr>
<tr>
<td>SC2</td>
<td></td>
<td>1.074</td>
<td>0.093</td>
<td>11.522</td>
<td>***</td>
<td>0.86</td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC1</td>
<td></td>
<td>0.669</td>
<td>0.448</td>
<td></td>
<td></td>
<td>0.816</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(The Table is made by the author.)
(4) TS

By using AMOS 21.0 to run a CFA, the measurement model for TS is shown in the Figure 22 and the result is shown in the Table 53.

According to the Table 53, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.912 and higher than 0.7; 4) the value of AVE was 0.755 and higher than 0.5. Consequently, this measurement model was acceptable.

![Figure 20. The measurement model for TS](The figure is made by the author.)

Table 53. Confirmatory factor analysis and the validity analysis for TS

(The Table is made by the author.)

<table>
<thead>
<tr>
<th>factor</th>
<th>index</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>TS3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>0.89</td>
<td>0.792</td>
<td>0.912</td>
<td>0.775</td>
</tr>
<tr>
<td>TS2</td>
<td>1.064</td>
<td>0.047</td>
<td>22.692</td>
<td>***</td>
<td>0.907</td>
<td>0.823</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS1</td>
<td>0.974</td>
<td>0.047</td>
<td>20.615</td>
<td>***</td>
<td>0.843</td>
<td>0.711</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(5) RC

By using AMOS 21.0 to run a CFA, the measurement model for RC is shown in the Figure 23 and the result is shown in the Table 54.

According to the Table 54, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.894 and higher than 0.7; 4) the value of AVE was 0.738 and higher than 0.5. Consequently, this measurement model was acceptable.

![Figure 21. The measurement model for RC](image)

(The figure is made by the author.)

<table>
<thead>
<tr>
<th>factor indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC</td>
<td>RC3</td>
<td>1</td>
<td></td>
<td></td>
<td>0.853</td>
<td>0.728</td>
<td>0.894</td>
<td>0.738</td>
</tr>
<tr>
<td>RC2</td>
<td>1.041</td>
<td>0.054</td>
<td>19.362</td>
<td>***</td>
<td>0.886</td>
<td>0.785</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
By using AMOS 21.0 to run a CFA, the measurement model for C is shown in Figure 24 and the result is shown in Table 55.

According to Table 55, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.917 and higher than 0.7; 4) the value of AVE was 0.786 and higher than 0.5. Consequently, this measurement model was acceptable.

Figure 22. The measurement model for C
(The figure is made by the author.)

Table 55. Confirmatory factor analysis and the validity analysis for C

<table>
<thead>
<tr>
<th>factor</th>
<th>Indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>C3</td>
<td>1</td>
<td>0.046</td>
<td>22.224</td>
<td>***</td>
<td>0.877</td>
<td>0.769</td>
<td>0.917</td>
<td>0.786</td>
</tr>
<tr>
<td>C2</td>
<td>1.032</td>
<td></td>
<td>0.046</td>
<td>22.224</td>
<td>***</td>
<td>0.893</td>
<td>0.797</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(7) PR

By using AMOS 21.0 to run a CFA, the measurement model for PR is shown in the Figure 25 and the result is shown in the Table 56.

According to the Table 56, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.856 and higher than 0.7; 4) the value of AVE was 0.666 and higher than 0.5. Consequently, this measurement model was acceptable.

<table>
<thead>
<tr>
<th>factor</th>
<th>index</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR</td>
<td>PR3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>0.762</td>
<td>0.581</td>
<td>0.856</td>
<td>0.666</td>
</tr>
</tbody>
</table>

Figure 23. The measurement model for PR
(The figure is made by the author.)

Table 56. Confirmatory factor analysis and the validity analysis for PR
(The Table is made by the author.)
(8) PU

By using AMOS 21.0 to run a CFA, the measurement model for PU is shown in the Figure 26 and the result is shown in the Table 57 and the Table 58.

There is an overlap between PU1 and PU2, so they may have an error and the residual of e3 and the residual of e4 are relevant. After adding the relationship between e3 and e4 to re-run the CFA, according to the Table 57 it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.921 and higher than 0.7; 4) the value of AVE was 0.746 and higher than 0.5.

According to the Table 58, it is clear that $\chi^2$ /df=2.071<3; GFI=0.997>0.9; AGFI=0.970>0.8; NFI=0.998>0.9; IFI=0.999>0.9; GFI=0.999>0.9; RMSEA=0.056<0.07.

Consequently, this measurement model was acceptable.

![Figure 24. The measurement model for PU](The figure is made by the author.)
Table 57. Confirmatory factor analysis and the validity analysis for PU  
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>factor</th>
<th>index(es)</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU</td>
<td>PU4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.891</td>
<td>0.794</td>
<td>0.921</td>
</tr>
<tr>
<td></td>
<td>PU3</td>
<td>0.945</td>
<td>0.04</td>
<td>23.381</td>
<td>***</td>
<td>0.9</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU2</td>
<td>0.911</td>
<td>0.044</td>
<td>20.667</td>
<td>***</td>
<td>0.843</td>
<td>0.711</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU1</td>
<td>0.903</td>
<td>0.046</td>
<td>19.497</td>
<td>***</td>
<td>0.817</td>
<td>0.667</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 58. Test of goodness-of-fit for PU  
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
<th>IFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.071</td>
<td>0.997</td>
<td>0.970</td>
<td>0.998</td>
<td>0.999</td>
<td>0.999</td>
<td>0.056</td>
</tr>
</tbody>
</table>

(9) MC

By using AMOS 21.0 to run a CFA, the measurement model for MC is shown in the Figure 27 and the result is shown in the Table 59.

According to the Table 59, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.863 and higher than 0.7; 4) the value of AVE was 0.678 and higher than 0.5. Consequently, this measurement model was acceptable.
Figure 25. The measurement model for MC  
(The figure is made by the author.)

Table 59. Confirmatory factor analysis and the validity analysis for MC  
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>factor</th>
<th>Indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC</td>
<td>MC3</td>
<td>1</td>
<td></td>
<td></td>
<td>0.867</td>
<td>0.752</td>
<td>0.863</td>
<td>0.678</td>
<td></td>
</tr>
<tr>
<td>MC2</td>
<td></td>
<td>0.903</td>
<td>0.057</td>
<td>15.854</td>
<td>***</td>
<td>0.808</td>
<td>0.653</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC1</td>
<td></td>
<td>0.939</td>
<td>0.06</td>
<td>15.632</td>
<td>***</td>
<td>0.793</td>
<td>0.629</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(10) IA

By using AMOS 21.0 to run a CFA, the measurement model for MC is shown in the Figure 28 and the result is shown in the Table 60.

According to the Table 60, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.876 and higher than 0.7; 4) the value of AVE was 0.702 and higher than 0.5. Consequently, this measurement model was acceptable.
Table 60. Confirmatory factor analysis and the validity analysis for IA
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Indexes</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>IA3</td>
<td>1</td>
<td>0.826</td>
<td>0.682</td>
<td></td>
<td>0.876</td>
<td>0.702</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IA2</td>
<td>1.056</td>
<td>0.061</td>
<td>17.229</td>
<td>***</td>
<td>0.88</td>
<td>0.774</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IA1</td>
<td>0.986</td>
<td>0.06</td>
<td>16.321</td>
<td>***</td>
<td>0.806</td>
<td>0.65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(11) PI

By using AMOS 21.0 to run a CFA, the measurement model for MC is shown in the Figure 29 and the result is shown in the Table 61.

According to the Table 61, it is clear that 1) all the values of standardized estimates were higher than 0.7 and meanwhile lower than 0.95; 2) the residual was positive and significant; 3) the value of C.R. was 0.926 and higher than 0.7; 4) the value of AVE was 0.807 and higher than 0.5. Consequently, this measurement model was acceptable.
Figure 27. The measurement model for PI  
(The figure is made by the author.)

Table 61. Confirmatory factor analysis and the validity analysis for PI  
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>factor</th>
<th>index</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-Value)</th>
<th>P</th>
<th>Standardized estimates</th>
<th>SMC</th>
<th>C.R. (composite reliability)</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>PI3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>0.926</td>
<td>0.857</td>
<td>0.926</td>
<td>0.807</td>
</tr>
<tr>
<td>PI2</td>
<td></td>
<td>0.959</td>
<td>0.038</td>
<td>24.991</td>
<td>***</td>
<td>0.89</td>
<td>0.792</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI1</td>
<td></td>
<td>0.938</td>
<td>0.039</td>
<td>24.362</td>
<td>***</td>
<td>0.878</td>
<td>0.771</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2.6.2. Confirmatory factor analysis for the whole model

Seven goodness-of-fit measures are used in this study for testing the structural model, including the ratio of chi-square value to degrees of freedom ($\chi^2$/df), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), comparative fix index (CFI) and root mean square error of approximation (RMSEA). The recommended criteria for these measures are shown in
the Table 48.

On the other hand, the hypotheses would be tested by using path estimates, C.R. (t values) and P values. When t values \( \geq 1.96 \) and the P value \( \leq 0.05 \), the relationships between variables can be considered significant.

By using AMOS 21.0 to run a CFA to the whole samples, the results are shown in the Figure 30, Table 62 and the Table 63. Meanwhile, the values of path coefficient are shown in the Figure 29.

![Figure 30. The data of the whole model](image)
(The figure is made by the author.)

The result of test of goodness-to-fit is shown in the Table 62.
Table 62. Test of goodness-of-fit test for the whole model
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
<th>IFI</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.411</td>
<td>0.896</td>
<td>0.876</td>
<td>0.925</td>
<td>0.977</td>
<td>0.977</td>
<td>0.034</td>
</tr>
</tbody>
</table>

According to the Table 62, it is clear that $\chi^2$/df=1.411<3; GFI=0.896>0.8; AGFI=0.876>0.8; NFI=0.925>0.9; IFI=0.977>0.9; GFI=0.977>0.9; RMSEA=0.034<0.07.

Consequently, these goodness-of-fit measures were achieved on the test for the structural model and this measurement model was acceptable.

Table 63. Path coefficient for the whole model
(The Table is made by the author.)

<table>
<thead>
<tr>
<th></th>
<th>Standardized estimates</th>
<th>Unstandardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-value)</th>
<th>P</th>
<th>R-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR</td>
<td>--- T</td>
<td>-0.597</td>
<td>-0.557</td>
<td>0.051</td>
<td>**</td>
<td>0.357</td>
</tr>
<tr>
<td>MC</td>
<td>--- MQ</td>
<td>0.238</td>
<td>0.23</td>
<td>0.066</td>
<td>***</td>
<td>0.52</td>
</tr>
<tr>
<td>MC</td>
<td>--- SC</td>
<td>0.134</td>
<td>0.223</td>
<td>0.107</td>
<td>0.037</td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>--- RC</td>
<td>0.048</td>
<td>0.054</td>
<td>0.077</td>
<td>0.695</td>
<td>0.487</td>
</tr>
<tr>
<td>MC</td>
<td>--- TS</td>
<td>0.197</td>
<td>0.194</td>
<td>0.066</td>
<td>2.944</td>
<td>0.003</td>
</tr>
<tr>
<td>MC</td>
<td>--- C</td>
<td>0.217</td>
<td>0.217</td>
<td>0.064</td>
<td>3.385</td>
<td>***</td>
</tr>
<tr>
<td>MC</td>
<td>--- T</td>
<td>0.088</td>
<td>0.077</td>
<td>0.053</td>
<td>1.446</td>
<td>0.148</td>
</tr>
<tr>
<td>PU</td>
<td>--- PR</td>
<td>-0.169</td>
<td>-0.165</td>
<td>0.051</td>
<td>-3.27</td>
<td>0.001</td>
</tr>
<tr>
<td>PU</td>
<td>--- MC</td>
<td>0.189</td>
<td>0.196</td>
<td>0.069</td>
<td>2.828</td>
<td>0.005</td>
</tr>
<tr>
<td>PU</td>
<td>--- MQ</td>
<td>0.231</td>
<td>0.233</td>
<td>0.065</td>
<td>3.595</td>
<td>***</td>
</tr>
<tr>
<td>PU</td>
<td>--- SC</td>
<td>0.316</td>
<td>0.548</td>
<td>0.111</td>
<td>4.958</td>
<td>***</td>
</tr>
<tr>
<td>IA</td>
<td>--- PR</td>
<td>-0.438</td>
<td>-0.383</td>
<td>0.051</td>
<td>-7.544</td>
<td>***</td>
</tr>
<tr>
<td>IA</td>
<td>--- PU</td>
<td>0.247</td>
<td>0.221</td>
<td>0.055</td>
<td>4.018</td>
<td>***</td>
</tr>
</tbody>
</table>
The Table 63 shows that 13 hypotheses were found significant because their C.R. (t-value) were higher than 1.96 and their P value were smaller than 0.05. Meanwhile, two hypotheses were not found significant.

<table>
<thead>
<tr>
<th>IA</th>
<th>--&lt;-- MC</th>
<th>0.208</th>
<th>0.193</th>
<th>0.056</th>
<th>3.463</th>
<th>***</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>--&lt;-- IA</td>
<td>0.577</td>
<td>0.633</td>
<td>0.063</td>
<td>10.054</td>
<td>***</td>
</tr>
</tbody>
</table>

Note: S.E = Standard Error, C. R=Critical Ratio (t-value), P = Significance Value (***, p<0.001; **, p<0.01; *, p<0.05)

4.2.7. Testing hypotheses

(1) H1a: In the virtual communities of consumption, trust towards the site (T) affects the perceived risk (PR) negatively.

According to the Table 63, the variability between T and PR, namely the value of $R^2$, was 35.7% and reached the middle level of standard. (The standard for $R^2$ is: if it<0.33, the variability is weak; if 0.33<it<0.66, the variability reaches the middle level; and if it>0.67, the variability is high.) Meanwhile, the absolute value of standardized estimates was 0.597 (t=10.859, p<0.001), so T had a significant negative influence on PR, namely the H1a was supported.

(2) H1b: In the virtual communities of consumption, trust towards the site (T) affects the message credibility (MC) positively.

H2b: In the virtual communities of consumption, message quality (MQ) affects the message credibility (MC) positively.

H3b: In the virtual communities of consumption, source credibility (SC) affects the message credibility (MC) positively.

H4: In the virtual communities of consumption, tie strength (TS) affects the message credibility (MC) positively.

H5: In the virtual communities of consumption, recommendation
consistency (RC) affects the message credibility (MC) positively.

H6: In the virtual communities of consumption, confirmation with prior belief (C) affects the message credibility (MC) positively.

According to the Table 63, the variability among MQ, SC, RC, TS, C, T and MC, namely the value of $R^2$, was 52% and reached the middle level of standard. (The standard for $R^2$ is: if $R^2<0.33$, the variability is weak; if $0.33<R^2<0.66$, the variability reaches the middle level; and if $R^2>0.67$, the variability is high.) Meanwhile, the absolute value of standardized estimates of MQ and MC was 0.238 ($t=3.483$, $p<0.001$), of SC to MC was 0.134 ($t=2.087$, $p=0.037$), of RC to MC was 0.048 ($t=0.695$, $p=0.487$), of TS to MC was 0.197 ($t=2.944$, $p=0.003$), of C to MC was 0.217 ($t=3.383$, $p<0.001$) and of T to MC was 0.088 ($t=1.446$, $p=0.148$). Hence, MQ, SC, TS, C all had significant influences on MC, namely H2b, H3b, H4, H5 were supported. Whereas, RC and T failed to show significant influences on MC, namely H1b and H5 were not supported.

(3) H2a: In the virtual communities of consumption, message quality (MQ) affects the consumers’ perceived usefulness of information (PU) positively.

H3a: In the virtual communities of consumption, source credibility (SC) affects the consumers’ perceived usefulness of information (PU) positively.

H7a: In the virtual communities of consumption, perceived risk (PR) affects the perceived usefulness of information (PU) negatively.

H9a: In the virtual communities of consumption, message credibility (MC) affects the perceived usefulness of information (PU) positively.

According to the Table 63, the variability among MQ, SC, PR, MC, and PU, namely the value of $R^2$, was 47.4% and reached the middle level of standard. (The standard for $R^2$ is: if $R^2<0.33$, the variability is weak; if $0.33<R^2<0.66$, the variability reaches the middle level; and if $R^2>0.67$, the variability is high.) Meanwhile, the absolute value of standardized estimates of MC and PU was 0.189 ($t=2.828$, $p=0.005$), of MQ to PU was 0.231 ($t=3.595$, $p<0.001$), of PR to PU is -0.169 ($t=-3.27$, $p=0.001$), of PR to PU is -0.169 ($t=-3.27$, $p=0.001$) and of SC to PU was 0.316
Hence, MC, MQ, PR and SC all had significant influences on PU, namely H2a, H3a, H7a, H9a were supported.

(4) H7b: In the virtual communities of consumption, perceived risk (PR) affects the information adoption (IA) negatively.

H8: In the virtual communities of consumption, perceived usefulness of information (PU) affects the information adoption (IA) positively.

H9b: In the virtual communities of consumption, message credibility (MC) affects the information adoption (IA) positively.

According to the Table 63, the variability among PR, PU, MC and IA, namely the value of $R^2$, was 49.3% and reached the middle level of standard. (The standard for $R^2$ is: if it<0.33, the variability is weak; if 0.33<it<0.66, the variability reaches the middle level; and if it>0.67, the variability is high.) Meanwhile, the absolute value of standardized estimates of PR and IA is -0.438 ($t$=-7.544, $p<0.001$), of PU and IA was 0.247 ($t$=4.018, $p<0.001$), and of MC and IA was 0.208 ($t$=3.463, $p<0.001$). Hence, PR had a significant negative influence on IA and PU and MC had significant positive influences on IA, namely H7b, H8, H9b were supported.

(5) H10: In the virtual communities of consumption, information adoption affects the purchase intention positively.

According to the Table 63, the variability between IA and PI, namely the value of $R^2$, was 33.3% and reached the middle level of standard. (The standard for $R^2$ is: if it<0.33, the variability is weak; if 0.33<it<0.66, the variability reaches the middle level; and if it>0.67, the variability is high.) Meanwhile, the absolute value of standardized estimates of IA and PI was 0.577 ($t$=10.054, $p<0.001$). Hence, IA had a significant positive influence on PI, namely H10 was supported.
4.2.8. Results

The results of the hypotheses are shown in the Table 64. Only the H1b and H5 were not supported and other hypotheses were all supported.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Supposed path</th>
<th>Standardized estimates</th>
<th>S.E.</th>
<th>C.R. (t-value)</th>
<th>P</th>
<th>result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>( - ) PR</td>
<td>T</td>
<td>-0.597</td>
<td>0.051</td>
<td>-10.859</td>
<td>*** Was supported</td>
</tr>
<tr>
<td>H2b</td>
<td>( + ) MC</td>
<td>MQ</td>
<td>0.238</td>
<td>0.066</td>
<td>3.483</td>
<td>*** Was supported</td>
</tr>
<tr>
<td>H3b</td>
<td>( + ) MC</td>
<td>SC</td>
<td>0.134</td>
<td>0.107</td>
<td>2.087</td>
<td>0.037 Was supported</td>
</tr>
<tr>
<td>H5</td>
<td>( + ) MC</td>
<td>RC</td>
<td>0.048</td>
<td>0.077</td>
<td>0.695</td>
<td>0.487 Was not supported</td>
</tr>
<tr>
<td>H4</td>
<td>( + ) MC</td>
<td>TS</td>
<td>0.197</td>
<td>0.066</td>
<td>2.944</td>
<td>0.003 Was supported</td>
</tr>
<tr>
<td>H6</td>
<td>( + ) MC</td>
<td>C</td>
<td>0.217</td>
<td>0.064</td>
<td>3.385</td>
<td>*** Was supported</td>
</tr>
<tr>
<td>H1b</td>
<td>( + ) MC</td>
<td>T</td>
<td>0.088</td>
<td>0.053</td>
<td>1.446</td>
<td>0.148 Was not supported</td>
</tr>
<tr>
<td>H7a</td>
<td>( - ) PU</td>
<td>PR</td>
<td>-0.169</td>
<td>0.051</td>
<td>-3.27</td>
<td>0.001 Was supported</td>
</tr>
<tr>
<td>H9a</td>
<td>( + ) PU</td>
<td>MC</td>
<td>0.189</td>
<td>0.069</td>
<td>2.828</td>
<td>0.005 Was supported</td>
</tr>
<tr>
<td>H2a</td>
<td>( + ) PU</td>
<td>MQ</td>
<td>0.231</td>
<td>0.065</td>
<td>3.595</td>
<td>*** Was supported</td>
</tr>
</tbody>
</table>

Table 64. The results of the hypotheses
(The Table is made by the author.)
Table 65. Testing mediators
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized effect estimates</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Total Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC--&gt;IA</td>
<td>0.250</td>
<td>0.117</td>
</tr>
<tr>
<td>PR--&gt;IA</td>
<td>-0.507</td>
<td>-0.645</td>
</tr>
<tr>
<td>Indirect Effects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to this table,

1) In the path “MC-->PU-->IA”, the function of the intermediary PU was tested and the ratio of this function was $0.047/0.25 = 18.8\%$. Namely, MC affected IA directly and affects IA through PU indirectly.

2) In the path “PR-->PU-->IA”, the function of the intermediary PU was tested and the ratio of this function was $-0.046/-0.507 = 9.1\%$. Namely, PR affected IA directly and affects IA through PU indirectly.

Consequently, the perceived risk and the message credibility served as the mediators in this model.

4.3. Discussion for Part 1

The empirical results show that only two hypotheses were not supported. Meanwhile, the variables explained 35.7\% variance in perceived risk (PR), 52\% variance in message credibility(MC), 47.4\% variance in perceived usefulness of message(PU), 49.3\% variance in information adoption(IA) and 33\% variance in purchase intention(PI).

This model explained these variables well and most values of the path coefficient were significant in $p < 0.05$ and $P < 0.01$. Besides the relationships between trust towards the site (T) and message credibility (MC), and between recommendation credibility (RC) and message credibility (MC) were not supported, others were all supported. The results are comparatively reasonable and will be explained in the following.
4.3.1. For the influential factors

1) From the opinion leaders side

The results indicated that the hypotheses related to the opinion leaders were all supported, namely H2a, H2b, H3a, H3b, and H4 were all supported.

Hence, the results of this empirical study indicate that:

- In the virtual communities of consumption, message quality affects the consumers’ perceived usefulness of information positively.
- In the virtual communities of consumption, message quality affects the message credibility positively.
- In the virtual communities of consumption, source credibility affects the consumers’ perceived usefulness of information positively.
- In the virtual communities of consumption, source credibility affects the message credibility positively.
- In the virtual communities of consumption, tie strength affects the message credibility positively.

2) From the consumers side

The results indicated that the hypotheses related to the consumer were partly supported, namely H1a, H6, H7a, H7b, H8, H9a, H9b and H10 were all supported and H1b and H5 were not supported.

Hence, the results of this empirical study indicate that:

- In the virtual communities of consumption, trust towards the site affects the perceived risk negatively.
- In the virtual communities of consumption, confirmation with prior belief affects the message credibility positively.
- In the virtual communities of consumption, perceived risk affects the perceived usefulness of information negatively.
- In the virtual communities of consumption, perceived risk affects the information adoption negatively.
- In the virtual communities of consumption, perceived usefulness of information affects the information adoption positively.
- In the virtual communities of consumption, message credibility
affects the perceived usefulness of information positively.

- In the virtual communities of consumption, message credibility affects the information adoption positively.
- In the virtual communities of consumption, information adoption affects the purchase intention positively.

However, two hypotheses were not supported.

On one hand, the result failed to show a significant relationship between trust towards the site and message credibility, namely H1b was not supported. It is not consistent with some researchers’ finding (J. Brown et al., 2007; X. Cheng, 2011). One possibility explanation may be that in this study, the message credibility refers to the credibility of the information from opinion leaders, rather than the general WOM or online comments. Because the information senders are opinion leaders themselves, rather than the site, whether the message is credible is more likely to be related to opinion leaders and less likely to be related to the site. Meanwhile, the opinion leaders may release the same message on different sites and thus consumers using different sites can get the same message, making them focus less on the sites which they are using. As a result, consumers may focus more on the opinion leaders. Consequently, their trust towards the site falls to show the significant relationship with the message credibility.

On the other hand, the result failed to show a significant relationship between recommendation consistency (RC) and message credibility MC, namely H5 was not supported. It is not consistent with some researchers’ findings (C.-W. Chen et al., 2011; M. Y. Cheung et al., 2009; Wei Zhang & Watts, 2008). It is clear that other aspects of opinion leaders, including MQ, SC and TS, affects MC, except for RC. One possibility explanation may be that when consumers in the virtual communities of consumption are judging the credibility of information, they focus more on the quality of the message sent out by the specific opinion leaders, the credibility of this opinion leader and their personal relationships with this opinion leader, rather than details related to other opinion leaders in the virtual community. Namely, they judge the credibility of the information from
the specific opinion leader and hardly take other opinion leaders’ messages as reference or seldom make a comparison. Furthermore, because the information exchange in the virtual community of consumption is based on the real experiences, opinion leaders need to have authentic consumption and using experiences so as to express their ideas towards the items, otherwise it is difficult to persuade the public and to exert the corresponding influence. In other words, the opinion leader’s personal experiences attract consumers. Hence, RC may not have an added effect on MC, thus fails to show significant relationship with MC.

3) From the supposed mediators side
   The results indicate that:
   - Message credibility (MC) affected information adoption (IA) directly and affected IA through perceived usefulness of information (PU) indirectly
   - Perceived risk (PR) affects information adoption (IA) directly and affected IA through perceived usefulness of information (PU) indirectly.

4.3.2. For the explanatory ability of the model

1) For the $R^2$ (Explained Variance) of information adoption
   As explained in the section 3.1, the model for this study was designed based on several researches related to IAM.
   C.-W. Chen et al. (2011) have added three factors to the original IAM, including confirmation with prior belief, recommendation consistency, and credibility into IAM to investigate which factors affect information adoption, and further to explain how eWOM in the online communities affects the consumption decision.
   For this study, the $R^2$ (Explained Variance) of information adoption is 0.54 and it means that the explanatory power of both perceived
usefulness of information and the message credibility towards the information adoption is only 54%. Although the variance was improved when compared with the result from McKnight and Kacmar (2007) and from M. Y. Cheung et al. (2009), it is indicated that there are still more factors affecting the information adoption besides information usefulness and credibility.

Under such situation, the model of this study was designed. The perceived risk, the perceived usefulness of information and the message credibility are supposed to serve as the intermediators and to affect information adoption and finally to affect the purchase intention.

However, the $R^2$ (Explained Variance) of information adoption is 49.3% and it means that the explanatory power of the perceived risk, the perceived usefulness of information and the message credibility towards the information adoption is only 49.3%. Compared to the results of C.-W. Chen et al. (2011), the result of this study was not improved. However, considering that study focused on studying the influences of eWOM and this study focuses on the studying the influences of opinion leaders, namely the subjects are different, the result of this study is acceptable.

2) For the $R^2$ (Explained Variance) of purchase intention

The $R^2$ (Explained Variance) of purchase intention is 0.33 and it means that the explanatory power of the information adoption towards the information adoption is 33.3%.

Hence, this result is acceptable (The standard for $R^2$ is: if it<0.33, the variability is weak; if 0.33<it<0.66, the variability reaches the middle level; and if it>0.67, the variability is high).

Furthermore, this result also indicates that there are more factors affecting the purchase intention and that these factors need to be taken into consideration in the future study.
Part 2. Identifying the online opinion leaders in the virtual communities of consumption in which they cannot be identified directly

The Part 1 of this thesis has already investigated and confirmed the influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption. With the results of Part 1, the companies or marketers can make better use of these opinion leaders.

However, as it is introduced in the Chapter 1, there are actually two kinds of virtual communities of consumption, including:

- Virtual communities of consumption exhibiting the attributes of members, such as their number of followers. Namely, inside such kinds of communities, the outsider can identify the opinion leaders directly, based on their standards.
- Virtual communities of consumption failing to exhibit the attributes of members, such as their number of followers. Namely, inside such kinds of communities, the outsider cannot identify the opinion leaders directly.

To be more specific, on one hand, when companies and marketers are facing with the virtual communities of consumption exhibiting the attributes of members, they can figure out the opinion leaders directly based on their standards. For example, some marketers may think the members with more than 500 followers as the opinion leaders, and some of them may consider the members with more than 50,000 members as the opinion leaders.

However, on the other hand, when companies and marketers are facing with the virtual communities of consumption failing to exhibit the attributes of members, it is difficult for them to identify who are the opinion leaders, let alone to utilize them.

Facing with this situation, it becomes a question that how to identify opinion leaders in the virtual communities of consumption in which the opinion leaders cannot be identified directly before utilizing them.
Chapter 5. Literature review

This chapter provides the literature review for Part 2. The section 5.1 begins with the review of the identification approaches of online opinion leaders. The three main approaches, including the user attributes analysis, text mining analysis and network structure analysis, are introduced and the approach for this study is chosen. The section 5.2 provides a detailed introduction for the Social Network Analysis, including the basic introduction, basic principles, relevant theories and the indicators of opinion leaders.

5.1. The identification approaches of online opinion leaders

5.1.1. The main approaches

Compared to the traditional opinion leaders, because of the network anonymity, the online opinion leaders can hide their information, such as their jobs or ages. Hence, the traditional approaches for identifying opinion leaders, introduced in the section 2.2.1, are not all suitable for identifying the online opinion leaders.

For identifying online opinion leaders, many researchers have testified and confirmed some new approaches. According to existing researches, there are three main approaches used for identifying online opinion leaders introduced, as follows.

(1) User attributes analysis

Many researchers have analyzed the attributes of users so as to
identify online opinion leaders.

Xiaofan Wang, Li, and Chen (2006) proposed a model for identifying online opinion leaders in the micro-blogging by utilizing the number of concerns, the number of fans, the number of texts and whether they are certificated or not.

H. Yu (2008) selected five characteristics of opinion leaders as the indicators, including the number of posts, the number of replies, the total number of posts, the value of response and the value of identity. Here, the value of response referred to the total number of the positive votes and of the negative votes and the value of identity referred to the total number of the absolute values of positive votes and of negative votes. Then, these indicators were utilized to identify the opinion leaders in a virtual community of political topics.

Based on the study of H. Yu (2008), Jue Wang, Zeng, Zhou, and Wu (2011) had an empirical study on identifying the online opinion leaders in the BBS and the additional indicators of opinion leaders included the average length of the replies sent out and the average length of the replies received. Here, the average length of the replies sent out counted the average length of the replies which the posters sent out and the average length of the replies received counts the average length of the replies which the posters obtained.

Jiang, Zhu, and Ding (2011) identified the online opinion leaders in the BBS of a certain university in China and the related indicators for opinion leaders included the degree of influence, the degree of support, the frequency of sending out posts and the ability of solving problem. Here, the degree of influence referred to the ability to affect others, and the degree of support referred to the number of repliers which express others’ support to the posters. The frequency of sending out posts refers to the time intervals among the posters sending out posts and the ability of solving problem refers to the number of others who approved the posts.

R. S. Burt (1999) held an empirical study on identifying the online opinion leaders in the virtual communities of interests and the indicators included the total number of replies, the amount of traffic, the number
of posts, the number of relies from the posters, the number of the value of identity.

H. Ding and Wang (2010) established an index system for the online opinion leaders in the SNS. The indexes included the neutral level, the active level, the cohesive power and the infectious degrees. These four indexes were subdivided into twelve indicators, including being the administrators or not, the number of friends, the number of concerns, the number of posts, the frequency of posts, the type of posts, the number of repliers and so on.

X. Ding et al. (2010) proposed an attribute matrix to identify online opinion leaders by using the degree of recognition, the active level, the self-persistence degree and the debate ability as indicators.

K. Xu and Chen (2010) built up a public opinion leader influence transmission model for BBS and the indicators included the degree of being active, the degree of being concerned and the degree of being acknowledged.

S. Zhu, Zheng, and Chen (2011) built up a X-means iterative clustering screening model and used it to cluster the attributes of online opinion leaders so as to identify them.

Z. Liu and Liu (2011) utilized the Analytic Hierarchy Process to analyze the attributes of users and to identify the online opinion leaders inside the microblogging based on indicators of the user influence and active level.

Y. Li, Hu, Xiong, Ma, and Zhang (2013) pointed out that online opinion leaders could be identified and evaluated by three indicators, including the active level, the transmission level and coverage level, used Analytic Hierarchy Process to calculate the weights of users based on these attribute characteristics and ranked the users with highest weight as opinion leaders.

Weizhe Zhang, Li, He, and Wang (2014) utilized the social network attribute, content attribute and inherent attribute to identify online opinion leaders based on Markov logic networks.

(2) Text mining analysis
Many researchers have focused on the contents of the posts, and analyzed the influences of the words inside the contents so as to identify online opinion leaders. The strongest advantage of this approach is that the positive opinion leaders can be distinguished from the negative ones (K. Song, Wang, Feng, Wang, & Yu, 2012).

One typical example of this approach is the Influence Diffusion Model (IDM) (Matsumura, Ohsawa, & Ishizuka, 2002). IDM is a model for discovering influential comments, individuals and terms from online discussions, by analyzing the relations of comments showing the flow of influence, and by emphasizing that the individuals’ ideas are expressed through texts.

Based on IDM, Shi, Fang, Zeng, and Wang (2008) provided a revised version for identifying online opinion leaders. Fan, Zhao, Fang, and Li (2013) also introduced the concepts of effective key words and the probability of word propagation under the same interest space to the original IDM and verified their new model which measures the influence of forums posts.

Other researchers also have used text mining analysis to identify online opinion leaders.

Agarwal, Liu, Tang, and Yu (2008) identified the influential bloggers in a community by using the indicators which included the evaluation of blog texts, the number of references, the blog contents, the length and the degree of novel and so on.

F. Li and Du (2011) utilized the number and quality of the contents to identify opinion leaders in the online social blogs.

K. Song et al. (2012) measured the similarity between comments for implicating links so as to detect the positive opinion leaders in the community, called Sina News.

(3) Network structure analysis

This approach is to analyze the structure of the network for identifying opinion leaders. Obviously, the networks are formed by individuals who are connected by the flows of information and the opinion leaders are taking the central and influential positions in the
interpersonal communication networks (Weimann, 1994), thus this approach is useful for identifying opinion leaders in the network.

The related researches include two categories:

The first one is to utilize the classical network topology analysis, such as the PageRank, to identify the opinion leaders.

PageRank is a computing technology of web page rank, based on the Random Surfer Model in search engine, to calculate the number of hyperlinks among different web pages (Page, Brin, Motwani, & Winograd, 1998). The value of a web page depends on the frequency of Internet users browsing. The higher the PageRank number of a certain web page is, the more convincing its recommendation of its related page is. Meanwhile, the less the hyperlinks which a web page provides, the more convincing its recommendation of its related page is.

The PageRank algorithm is widely used to identify the online opinion leaders in BBS and one example is the research of Ning and Wan (2013). Furthermore, many new algorithms were proposed based on the PageRank algorithm so as to identify online opinion leaders in eBay (Lam & Wu, 2009), in a network (Cruz, Vallejo, Enri, & Troyano, 2012; Zhou & Zeng, 2009), in a blog (X. Song et al., 2007), in BBS (X. Yu, Wei, & Lin, 2010; Zhai, Xu, & Jia, 2008), in Twitter (Weng, Lim, Jiang, & He, 2010), in the Internet forum (Wu et al., 2015) and so forth.

For some examples: X. Yu et al. (2010) proposed the LeaderRank algorithm considering the emotion hidden in the replies. Weng et al. (2010) utilized the Microblog-Rank algorithm by analyzing the relationships among the comments of users. Y. Lin, Li, Liu, and Fan (2013) pointed out the TwitterRank algorithm which focuses on the concerns of individuals and the similarity of topics in the Twitter.

The second approach is to use social network analysis (SNA) to identify opinion leaders.

Social network analysis (SNA) refers to the process of investigating social structures through the use of network and graph theories (J. Liu, 2004). It is to investigate social structures by using network and graph theories, and to be more specific, by using nodes (individuals or things within the network) and the ties or edges (interactions) that connect
these nodes (Wasserman & Faust, 1994). It is an approach to utilize social structure to directly study how patterns of ties allocate resources in a social system (Wasserman & Faust, 1994), and it can also be used to study the Internet cases (Park, 2003). It is an interdisciplinary technique which can be used not limited to the field of sociology.

SNA is based on a theoretical framework that considers social reality as a relational structure, rather than a group of atomized individuals (Wasserman & Faust, 1994; Wellman & Berkowitz, 1988). It also considers that the network structures affect the development of interactive processes, the flow of exchange and the produced results (Freeman, 1978; Wellman & Berkowitz, 1988). Hence, SNA describes the relations and patterns in the networks (Wasserman & Faust, 1994), traces the flow of information and discover why such social networks help to explain the behavior of the members (Garton, Haythornthwaite, & Wellman, 1997).

In particular, the network analysis approach has been widely used for identifying the offline opinion leaders (Scott, 1992; Valente & Pumpuang, 2007; Wasserman & Faust, 1994). Now, for the online cases, it is still useful.

Previous researches show that SNA is widely used to identify online opinion leaders in BBS (Gao & Yang, 2007), in blogs (Y. Chen & Liu, 2015); in Microblogs (D. Wang & He, 2013; J. Zhang, Sun, & Wang, 2014; Zhao, 2013), in college student groups (Luo & Xi, 2012), in social networks (Y. Cho, Hwang, & Lee, 2012), in a virtual community of knowledge (M. Liu, Hu, & Li, 2014; L. Wang & Ma, 2009) and in a virtual community of interests (Juan Wang, Cao, Jiang, & Tang, 2013).

5.1.2. The approach chosen for this study

Previous researchers show that there are three main approaches for identifying online opinion leaders. Considering that every approach has its advantages and disadvantages, researchers need to choose the
approach based on their research aims (B. Li & Zhuang, 2013).

For this thesis, the Part 2 is aiming at identifying the opinion leaders in the virtual communities of consumption inside which they cannot be identified directly. The literature review shows that few research focuses on identifying opinion leaders in the virtual communities of consumption. Hence, this part aims at having an empirical study on identifying the opinion leaders in the virtual communities of consumption. With this research purpose, the user attributes analysis and the text mining analysis are not suitable.

On one hand, the user attributes analysis is to utilize the basic attributes of individuals for judging whether these people are opinion leaders or not. Because Part 2 is focusing on the virtual communities of which fail to provide the functions of showing the attributes of individuals so as to identify opinion leaders directly, this approach is not suitable for this study.

On the other hand, the text mining analysis is to utilize the texts in the posts or replies to identify the opinion leaders, but neglect the relationships of different posts or the interactive relationships among individuals. Since individuals are interacting with others in the virtual communities of consumption and since Part 1 have already confirmed the influences from opinion leaders towards other people in the social network, this approach is also not suitable for this study.

For this research, SNA is more suitable. There are three reasons.

Firstly, in the traditional cases, the network analysis is also utilized to identifying opinion leaders in the communities (Berelson & Steiner, 1964; Scott, 1992; Wasserman & Faust, 1994).

Secondly, using SNA has the unique advantages which distinguish it from other approaches as follows:

- SNA, analyzing the pattern of interpersonal communication, scrutinizes relationships with the directions and strength of the relationships (F. Li & Du, 2011; Valente, 1995).
- It enables the researchers to study the specific actor, the individuals’ groups and the whole community and thus enriches their understandings on the interaction and influence inside the
community (Galaskiewicz & Wasserman, 1993).

- It generates various social network maps showing communicative relationships among members of a social system by terms of the computer software (D. K. Kim, 2007).

- It can be used to create several virtual scenarios based on the assumed changes in relationships. For example, it can be used to identify the situation after disconnecting one opinion leader with all other members (D. K. Kim, 2007).

Thirdly, the online opinion leaders, acting as influential nodes in the social network, have more network relationships with other members than the ordinary members (Goldenberg, Han, Lehmann, & Hong, 2009). Their network relationships are not only important criterions for identifying them, but also the basis and essence of their influences (Ho & Dempsey, 2010). Hence, using SNA to analyze their network relationships can help the researchers identify opinion leaders easily and have better understandings of their influences (Goldenberg et al., 2009; Iyengar, Van den Bulte, & Valente, 2011).

Consequently, considering the unique advantages of SNA, three small questions are pointed out and will be answered. These three questions include 1) How to identify the opinion leaders in such virtual communities of consumption? 2) What are the characteristics of such virtual communities of consumption? 3) How do the opinion leaders affect the eWOM dissemination?

To be more specific, for the second question, the literature review also indicates that SNA is found to be widely used for analyzing the network structure. By utilizing SNA, the characteristics of the virtual communities of consumption can be investigated. For example, the tie strength in the virtual communities can be studied.

For the third question, SNA can be used to create several virtual scenarios based on the assumed changes in relationships. Namely, utilizing SNA can compare the eWOM dissemination in a virtual community with and without the opinion leaders. The eWOM communication can be viewed as a flow of information that is propagated through social network nodes, represented by a single actor,
and the network structure, expressed as a relationship between the various actors. When the message about a product or service is spread from a node to another node, the information flow is generated. Hence, by comparing the data with and without the opinion leaders, the influences of opinion leaders towards the eWOM dissemination can be figured.

Consequently, Part 2 chooses to use SNA. It can not only fill in the research gap that few research identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly, but also provide a better understanding towards the virtual communities of consumption and towards the influences of opinion leaders on the eWOM dissemination.

5.2. Social Network Analysis (SNA)

5.2.1. Basic introduction

The social network is a set of nodes (such as individual actors or organizations) and of the dyadic ties between these actors (namely their relationship) (J. Liu, 2004; Wasserman & Faust, 1994) (see Figure 31).
The members and the relationships inside the virtual communities form the social networks of the communities. The nodes are also called social actors, representing the community members. The lines represent their relationships, and structure of the social network shows that the individuals are connected by their social relations (Garton et al., 1997; Wellman & Berkowitz, 1988). Hence, studying the social network enables the researchers to understand the way in which a group of individuals gather in a social space and the particular meanings of the particular structures of them (Otte & Rousseau, 2002).

The four basic concepts in the social network include actor, relationship, tie and the network (J. Liu, 2004).

(1) Nodes
The nodes in the social network represent the actors in the society. Such actors can be individuals, collective social units and so on.

In this thesis, the nodes refer to the members inside the virtual communities of consumption.

(2) Relationship
The relationships in the social network represent the interaction between the actors. It is characterized by the content, the direction and the intensity (Garton et al., 1997). Here the content of the relationship refers to the information flowed among the actors. The direction of the relationship refers to the direction from one actor to another one and it has two types, including directional one and non-directional one. The strength of the relationship refers to the number and frequency of the messages shared by the actors.

In this thesis, the contents refer to the information shared by the members. And only the directional relationship is analyzed.

(3) Ties
The tie represents a specific relationship between a pair of actors (Haythornthwaite, 2005). Resources, such as information, flow through
ties and networks (Wellman, 1983). Ties are also characterized by the content, the direction and the strength. It is often divided into two types, including the strong tie and the weak tie (Marsden & Campbell, 1984). Weak ties refer to those connections that are less frequent and not intimate, such as the relationship between colleagues. Weak ties enable the information to be spread among different sources and enable the individual to communicate and connects others in the heterogeneous groups. On the other hand, Strong ties refer to connections like kinship and friend relationships. Strong ties maintain the homogeneous groups and serves as the basis of the contacts between the individuals and the outside world.

In this thesis, the ties represent the relationships between the members inside the virtual communities of consumption.

(4) Network

A network is a collection of relationships. The social network refers to the set of relationships between social actors.

- Two typical networks.

There are two typical networks, including ego-centered network and whole network (J. Liu, 2004). These two networks correspond to two different social network analysis methods.

The first one is the ego-centered network analysis. It focuses on a specific actor, analyses his or her relationships with others, and explores the social network of this actor, such as the size, the differences and the attributes (J. Liu, 2004). This kind of analysis is applicable to individual hierarchical analysis of actors in the large networks (Laumann, Marsden, & Prensky, 1983). This approach is especially useful when the population is huge, or the boundaries of the population are hard to define (Garton et al., 1997).

The second one is the overall network analysis. It refers to analyzing the relationships among all the actors within a specified range, such as organizations, departments and relatives (Garton et al., 1997; J. Liu, 2004). This approach needs to gather the data of all the relationships in the specified range. For example, when studying a specified range with
20 actors, 380 (20 X 19) relationships need to be taken into account. Obviously, the calculation is intensive and generally requires computer-assisted calculations. This kind of analysis is applicable to the analysis of virtual communities as a whole.

- Two tools for showing the network structure

  For showing the network structure, there are two tools, including the socio-gram and social matrix (J. Liu, 2004).

  The socio-gram consists of lines representing the actors and the nodes. Inside the diagram, if a line directed from the node $i$ to the node $j$, the node $i$ and $j$ have a relationship. If the connection is non-directional, then the socio-gram is undirected, otherwise it is a directed graph. In a direct graph, the certain value of the line between two nodes represents their tie strength. The advantage of a socio-gram is that it shows the relationships directly. But when the number of actors are huge, the graphics will become quite complicated, and it will be difficult to analyze the relationship structure.

  On the other hand, the social matrix consists of the values representing the time of interaction between one actor to another. Inside the matrix, the specific number of $X_{ij}$ represents how many times does the member $i$ reply to the poster $j$. If the member $i$ left one message to the member $j$, and member $j$ was willing to interact several times with the member $i$, then the value of $X_{ij}$ will be more than 1.

  Furthermore, the most common types of SNA include the survey method and the content analysis method (R. Chen, 2012).

  The survey method is to ask members to fill in the questionnaire so as to identify their relationships with others. For example, the members may be asked about their most close friends or about the individuals who they consider to be the most prestigious. After gathering the results, researchers will calculate the data of each individual with the number they are selected by others and thus obtain the attribute data.

  The content analysis method is to use the information saved in the
process of online communication directly, which include the number of posts, the number of replies and others, to calculate the attribute data of relationships among members, and use some indexes to identify the online opinion leaders.

5.2.2. Basic principles

The researchers usually deeply study the network structures, like the network pattern beneath the complicated social systems, so as to learn about how the network structures, including normative prescriptions, personal attributes, and dyadic relationships, affect the social behavior and social change (Wellman, 1983).

According to Wellman (1983), the basic principles of SNA include: (1) Ties in the network are asymmetric but reciprocal. Meanwhile, the contents and intensity of these ties are different. (2) Ties link the members inside the network both directly and indirectly. Hence, the ties must be analyzed within a larger network structure. (3) The structure of ties is not random and thus results in the network clusters, boundaries, and cross-linkages. (4) Cross-linkages connect not only individuals but also clusters. (5) The complex network structure and asymmetric ties result in the uneven distribution of scarce resources. (6) In order to get access to the scarce resources, the competitive and collaborative relationships among the members are formed.

To be more specific:

The principle (1) indicates that the material resources and information resources flow through the links and network, but the flow of resources is asymmetric in the quantity and types. Although the relationship is asymmetric, this relationship is reciprocal.

The principle (2) indicates that some social connections are not voluntary and these connections may result from the needs of work or life. Through direct and indirect relationships, the sources are able to flow in a larger range, and form a larger group.
The principle (3) contains two weak assumptions: Firstly, the relationship in the network is usually transitive. Secondly, the number and the strength of the links which one person maintains is limited. The former assumption emphasizes that more people will form a larger group. But the latter indicates that these links cannot be infinite expanded, so there is a certain network boundary and there are some coexist parts.

The principle (4) indicates that the nodes in the network can be both individuals and groups, including organizations, countries or other units. When studying such groups and their interrelationships, there is no need to think about the internal relationships that make up these groups.

The principle (5) connects the concept of social networks with the scarce resources in economics. Due to the asymmetry of the relationships and the limitation of the network groups, the flow of resources in the social network structure is imbalanced. As a result, the positions of the actors inside the social network are different and their abilities and approaches to obtain resources are also different.

The principle (6) emphasizes the inherent attributes of the social system. Namely, in order to compete for the scarce resources, the structural competition exists. On the other hand, it also emphasizes that in order to get scarce resources, in a hierarchical network with asymmetric relationships, actors must cooperate with others to obtain common resources. Their behaviors lead to the factions and alliances.

5.2.3. Relevant theories

The main theories about complex social system include Six degrees of separation and the Small world theory and so on; while the crucial theories about the social network theory include interpersonal ties (strong ties and weak ties), structural holes and so on.

In this thesis, only the theories of Six degrees of separation, the Small world theory, interpersonal ties and structural holes will be used. Their
introductions are provided as follows.

- **Six degrees of separation**
  Six degrees of separation was originally pointed out by Karinthy (1929). Six degrees of separation is the theory indicating that everyone and everything can be connected in maximum of six steps.

- **Small world theory**
  Based on the research of the six degrees of separation, Watts and Strogatz (1998) presented a mathematical theory of the small world phenomenon, describing the networks as “highly clustered, like regular lattices, yet have small characteristic path lengths, like random graphs”. This small-world phenomenon is used to describe that most values of average path length inside the big and real network are smaller than what we used to imagined. It is a basic phenomenon inside the social network and it indicates that everyone could contact others within a few intermediaries.

  If a network has the small world characteristics, the information flow in this network is usually smooth and members can quickly communicate and exchange information. Otherwise, the information flow in the network is slow, and the members cannot quickly exchange information. This will seriously affect the circulation of information, which may lead to negative results damage the optimization of the network structure. In this situation, a certain approach to accelerate the information flow in the network is necessary.

  To better explain this small-world phenomenon, Watts and Strogatz (1998) introduced the model of network with the characteristics of the small-world phenomenon. Such kind of network lies somewhere between the completely regular network and the completely random network. Compared to the completely random network, the small-world network has higher clustering coefficient and lower characteristic path length (See Figure 32).
Inside the small-world, the signal-propagation speed, computational power, the synchronizability, especially the infectious diseases, spread more easily in small-world networks than in regular lattices (Watts & Strogatz, 1998).

If the characteristic path length $L$ and clustering coefficient $C$ of the network meet with:

\[
L \geq L_{\text{random}} \\
\text{and } C \gg C_{\text{random}}
\]

Then the network can be considered as a small-world ($L_{\text{random}}$: the characteristic path length of the random graph with the same number of vertices and average number of edges per vertex. $C_{\text{random}}$: the clustering coefficient of the random graph with the same number of vertices and average number of edges per vertex)(Watts & Strogatz, 1998).

- Interpersonal ties (strong ties and weak ties)
  
  As introduced in the section 2.4.4 in the Part 1 of this thesis, the concepts of interpersonal ties, which include the strong ties, weak ties and absent ties, were concluded by Granovetter (1973). Individuals with weak ties provide access to more diverse types of resources because they are in different social networks and thus have different resources.
(Garton et al., 1997). Weak ties serve as bridges for those people who are not so familiar with each other and are responsible for most structure of social networks, whereas, actors with strong ties connect closely and sometimes received overlaps information (Granovetter, 1973). Individuals with strong ties are more likely to share their resources (Garton et al., 1997; N. Lin & Westcott, 1991; Wellman & Wortley, 1990).

- Structural holes

According to R. Burt (1995), who pointed out the concept of structural holes, defined it as “relationship of non-redundancy between two contacts. The hole is a buffer, like an insulator in an electric circuit. As a result of the hole between them, the two contacts provide network benefits that are in some degree additive rather than overlapping.” Namely, individual who is taking the structural hole position is connecting with many individuals who do not connect with each other (see Figure 33).

![Figure 30. The structural holes](The figure is made by the author.)

If two actors in the social network were connected by distance “2”, rather than distance “1”, there would be a structural hole between them...
The actor who masters the structural hole can master more flows of information in the network (R. S. Burt, 1992). Structural hole is a kind of competitive advantage for the network members who want to utilize their information advantages to become brokers and thus to obtain the benefits of information and controlling. The opinion ‘leaders’ can be considered as opinion “brokers” who carry information across the social boundaries (R. S. Burt, 1999).

5.2.4. The indicators of opinion leaders

When consider the features of social networks, the concepts of network location and network role are crucial (J. Liu, 2004). The network locations represent a series of individual actors embedded in the social network. The roles in the network appear when these locations are connecting together and illustrate the relationship patterns among actors.

More and more researchers begin to use the network location to analyze the influences and functions of different positions in the network. Rogers (2003) outlined that opinion leader could activate local network to spread the innovation, and that they enjoy the influential position in their communication structure. Namely they are at the center of the communication networks, which is made of interconnected individuals linked by flows of information. Valente and Davis (1999) pointed out that opinion leaders are more central and more influential than other members inside the community. L. Wang (2009) found that inside the virtual communities of knowledge, the members in the central positions are more influential than the members in other positions. Xie (2010) concluded that the members with higher degree centrality serve as opinion leaders and they can affect others. Zaheer and Bell (2005) illustrated that the actors who occupy the structure holes can get access to various resources. These researchers all analyzed the positions and
advantages resulting from the network structure and identified the key influential nodes through studying the network structure.

According to J. Liu (2004), the central position, the structural hole position, and the edge position are three typical network locations in the social network. The nodes taking the edge positions are at the edge of the network structure and have fewer connections to the actors in the network, with limited capacity for information identification, acquisition, transmission and control. Since the nodes in such position participate in fewer social activities, connect with and affect few actors, they can hardly be opinion leaders.

Therefore, only the nodes taking central positions and the structural hole positions are always deemed as the individuals who are more able to be opinion leaders. The introductions of these two positions are provided as follows.

(1) The central position

The nodes taking the central positions refer to the individual actors in a social network who have many connections with other members and who are in the center of the network. From the socio-gram, it can be seen that the actors taking the central positions have more connections with other members, be more active, more prestigious and more powerful, when compared with the actors taking the edge positions (Freeman, 1978). Such individuals are the hubs of the network. Their positions show their control of the access of the other members to information and their domination towards the connectivity of the network. Also, these individuals are more likely to get promotion (R. S. Burt, 1992), get power (Brass, 1984) and social support (Ibarra, 1993).

The indicators for judging whether the node is in the central position or not are called Centrality measures and include the Degree centrality, Betweenness centrality and Closeness centrality (Freeman, 1978). The member with the greatest value of network centrality can be deemed as the opinion leader for this network (D. K. Kim, 2007). The Centrality measures are used to identify the influential actors in the network by figuring out the actors who have the most relationships with others.
Wasserman and Faust (1994) pointed out that the central actor has many ties. Meanwhile, Valente (1995) connects the central actor with opinion leader by emphasizing that opinion leaders have higher centrality than others.

To be more specific, these centrality measures are: the Degree centrality is to measure the sum of the paths of the node connecting with others. It can be subdivided into the InDegree centrality, which represents the number of the replies received by the posters from the repliers, and the OutDegree centrality, which represents the number of the repliers sent by a specific node to others. The Betweenness centrality is to measure the sum of times that the node is in the shortcut of many other pair nodes. Namely, it is to measure the control degree of the node towards the overall resources inside the network. The Closeness centrality measures how close a node is to other actors in the network.

(2) The structural hole position

The structural hole position refers to the location of a third party who can connect two individuals who otherwise will be separate. The nodes taking such kind of position have a key connection effect and they can control more information flow in the network (R. S. Burt, 1992). They can control, identify and transmit the information, and thus can collect information from different channels. So, they could enjoy the benefit from this information and become the opinion leaders.

The indicators of structure holes include Effect Size (EffSize), Efficiency, Constraint, and Hierarchy. The Effective Size (EffSize) represents the nonredundant contacts of a node and it measures the effective size of ego's network. The value of it is the number of ego’s network minus the redundancy value of this network. The value of Efficiency is equal to the result of the effective size being divided by the actual size of the point in the ego network. The Constraint measures the extent to which the node’s network limits his or her time and energy. And the Hierarchy indicates the extent to which the constraint is concentrated on a single individual. Among these four indicators, the EffSize and Constraint are widely used as the indicators of structure
(3) Discussion of the chosen indicators

Only utilizing the value of degree centrality to judge whether an individual is opinion leader or not is not enough (Van der Merwe & Van Heerden, 2009). If the degree centrality of a node is high, this node can be considered as in the central position of this network. However, the high value of degree centrality may result from a high value of InDegree centrality or a low value of OutDegree centrality. The high InDegree centrality can only explain that others are willing to ask for information from this node and a low OutDegree centrality can only explain that this node is not an active information sender. Consequently, only having a high degree centrality can hardly prove that this node has the “authority”.

Similarly, only utilizing the value of structure hole to judge whether an individual is opinion leader or not is not enough (Xie, 2010). For example, if two nodes have the same values of Constraint, it is still difficult to judge which node has the advantageous position. The Constraint only describes the closeness of one node directly or indirectly connecting with others. The higher the value of Constraint is, the less structures holes this node has. On the other hand, the degree centrality is able to identify the nodes with the superior position.

Furthermore, prior researches on utilizing SNA to identify opinion leaders indicate that these researchers chose different indicators for identifying opinion leaders, as shown in the Table 66.

Table 66. Researchers’ choice on the indicators for identifying opinion leaders
(The Table is made by the author.)

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Indicators of opinion leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. Wang &amp; Ma, 2009</td>
<td>● The structural position (EffSize; ConStraint)</td>
</tr>
<tr>
<td>Authors</td>
<td>Methods</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Juan Wang, Cao, Jiang, &amp; Tang, 2013</td>
<td>The central position (InDegree; OutDegree; Betweenness; InFarness; OutFarness)</td>
</tr>
<tr>
<td>J. Zhang, Sun, &amp; Wang, 2014</td>
<td>The central position (InDegree; OutDegree)</td>
</tr>
<tr>
<td>Gao, 2007</td>
<td>The central position (InDegree; OutDegree)</td>
</tr>
<tr>
<td>Zhao, 2013</td>
<td>The central position (InDegree; OutDegree; Betweenness)</td>
</tr>
<tr>
<td>Luo &amp; Xi, 2012</td>
<td>The central position (InDegree; OutDegree)</td>
</tr>
<tr>
<td></td>
<td>The structural position (EffSize; ConStraint)</td>
</tr>
<tr>
<td>M. Liu, Hu, &amp; Li, 2014</td>
<td>The central position (InDegree; OutDegree; Betweenness; InFarness; OutFarness)</td>
</tr>
<tr>
<td></td>
<td>The structural positions (EffSize; ConStraint)</td>
</tr>
</tbody>
</table>

Obviously, the choice of these indicators depends on the researchers and is subjective. Different choices of the indicators may lead to different results.

Consequently, in this thesis, in order to have a more thorough result, the indicators of these two positions will be integrated for identifying the opinion leaders. Namely, the indicators of opinion leadership used in this thesis include:

- InDegree
- OutDegree
- Betweenness
- InFarness
- OutFarness
- EffSize
- ConStraint
Chapter 6. Design of the research

This chapter provides the design process of the empirical research in Part 2 and includes four sections. The section 6.1 introduces the randomly selected virtual community of consumption in China and it is called Changsha Tong. The section 6.2 describes the research method and the section 6.3 explains the research variables. Finally, the section 6.4 explains the data sources and the sampling method.

6.1. Introduction of the selected virtual community of consumption---- Changsha Tong

Considering that China is very representative, as explained in the section 4.1.2 in the Part 1 of this thesis, the sample of the Part 2 of this thesis is chosen randomly among the virtual communities of consumption in China. Also, because this thesis is going to study how to identify opinion leaders in the virtual communities of consumption in which they cannot be identified directly, the randomly selected virtual community of consumption must meet with the requirement that the virtual community does not provide the function of showing the personal attributes of the members, such as the number of their followers or of their posts.

Hence, Changsha Tong is randomly selected and meets with this requirement.

The Changsha Tong is an online community which provides its members with an open platform to publish and receive information about life, emotion, products and so on (See Figure 34).

The Changsha Tong is divided into six parts, including the parts about
shopping, wearing, panic purchasing, parenting, foods and group buying. The shopping part is the biggest part of the Changsha Tong. According to its introduction, its average Page View per day reached 200 thousand, and IP per day reached 30 thousand in the August, 2013. According to the data from Changsha Tong, until August, 2013, the registered members reached 530 thousand, and they were mainly aging from 23 years old to 35 years old. The ratio of male to female is 3:7. Members are sharing their shopping experiences and leaving recommendations of products or services inside this part. Consequently, the members of this shopping part represent a large online group of potential consumers.

This community is in line with the status quo of China's network development. According to the 39th National Internet Development Statistics Report, reported by China Internet Network Information Center (CNNIC), until December, 2016, the total number of Chinese Internet users reached 731 million and the Internet penetration rate reached 53.2%. The Chinese Internet users are mainly aging from 10 years old to 39 years old. Until December, 2016, the user group from 10 years old to 39 years old accounted for 73.7% of the total netizens. On the other hand, inside this group, the users from 20 years old to 29 years old accounted for the highest proportion of 30.3% and the proportion for the users aging 10-19-year-old and 30-39-year-old accounted for 20.2% and 23.2%, respectively.
6.2. Research method

This thesis is to use SNA for identifying opinion leaders in the virtual communities of consumption. The content analysis method is chosen. The tools, including UCINET 6.0, Netdraw and SPSS 23, are used for dealing with data.

Based on interaction way, the members are divided into three types, including the posters, the repliers and the bystanders. In this thesis, the posters refer to the members who send out posts and who represent the core part of the community. The repliers refer to those who reply to the posters by leaving comments and the number of their comments can affect the degree to which the posters are popular. The bystanders never leave comment, so they never affect others. But they are also likely to be affected by the posters and the repliers. Because the data of the bystanders can hardly be collected and researched, the SNA only focuses on the posters and the repliers.

So, the identification steps taken here are:

Figure 31. The Screenshot of Changsha Tong
(The figure is made by the author.)
1) Collecting the original data by using snowball sampling;
2) Converting the data to meet the format for the SNA software;
3) Using the software to run the data analyses for studying the structure of the virtual community;
4) Using the software to run the data analyses for gathering data related to the indicators for identifying opinion leaders;
5) Making comparison and identifying the opinion leaders;
6) Calculating and comparing the data of both having and deleting opinion leaders;
7) Giving out discussions and conclusions

Especially, as for the step 4) for this thesis, the analyses include: analysis of tie strength, analysis of the small-world phenomenon, analyses of centrality, identification of opinion and the analysis of influences of opinion leaders on eWOM dissemination.

**6.3. Research measures**

(1) Clustering coefficient

The clustering coefficient is used to measure the degree to which nodes in a graph tend to cluster together.

In most real-world networks, especially in some social networks, nodes tend to create tightly knit groups characterized by a relatively high density of ties (Holland & Leinhardt, 1971).

The local clustering coefficient of a vertex in a graph quantifies how close its neighbors are to being a complete graph (Watts & Strogatz, 1998) and is used as an indicator of identifying whether a graph is a small-world network (Watts & Strogatz, 1998).

A graph $G=(V,E)$ formally consists of a set of vertices $V$ and a set of edges $E$ between them. An edge $e_{ij}$ connects vertex $v_i$ with vertex $v_j$. The number of vertices is defined as $k_i$, and $n_i$ is designed as the immediately connected neighbor of a vertex. Then the local clustering coefficient for directed graphs is given as
\[ C_i = \frac{\{e_{jk} : v_j, v_k \in N_i, e_{jk} \in E\}}{k_i(k_i - 1)} \]

(2) Characteristic path length

The geodesic distance \( d_{ij} \) between two vertices \( i \) and \( j \) in a graph refers to the number of edges in a shortest path (Bouttier, Di Francesco, & Guitter, 2003). For a directed graph \( G \) with \( N \) nodes, then the characteristic path length, also called the average path length for a network, is defined as the average value of every two vertices (Xiaofan Wang et al., 2006). Hence, the characteristic path length is given us:

\[
L = \frac{1}{N(N + 1)} \sum_{i \neq j} d_{ij}
\]

(3) Density

The density is an indicator for the general level of connectedness of the graph and it is the number of links divided by the number of vertices in a complete graph with the same number of nodes (Otte & Rousseau, 2002). The point with the highest degree or most adjacencies is the most central point (Freeman, 1978). For a directed graph \( G \) with \( N \) nodes, the density \( D \) is given as:

\[
D = \frac{L}{n(n-1)}
\]

\( (L \) refers to the number of links) \( D = 0 \) when members have no interaction, and \( D = 1 \) when all the members interact with each other.

(4) Degree centrality

Degree centrality can be defined as the number of ties that a given node has. Inside a network, a member who connects with many other members has the advantage of conveying messages. In the network analysis, such kind of advantage is measured by the degree centrality.
Degree centrality is used to measure who is the most important focus. The higher degree centrality one member has, the more ties and the higher status will this member has. Hence, this member could convey the message to more members and affect more individuals.

Furthermore, the number of head ends adjacent to a node is called the InDegree of the node and the number of tail ends adjacent to a node is its OutDegree. The sum of the InDegree and the Outdegree is the degree of a node. More precisely, the degree of node \( d_i \) is given as:

\[
d_i = \sum_j a_{ij}
\]

Where \( a_{ij} = 1 \) if there is a link between nodes \( i \) and \( j \), and \( a_{ij} = 0 \) if there is no such link (Freeman, 1978).

(5) Betweenness centrality

Betweenness centrality of a node is the number of times this node needs a given node to reach another node. Inside a network, Betweenness centrality is used to describe the cases that one node is connected to others which are not connected without this node. Namely without this node, the information transmission will be interrupted. Hence, Betweenness centrality can be used to show the control degree of the node towards the overall resources inside the network. If one node has a high value of Betweenness centrality, it indicates that this node is in the shortcut of many other pair nodes.

The Betweenness centrality of node \( i \) is given as:

\[
b(i) = \sum_{j,k} \frac{g_{jk}}{g_{jk}}
\]

Where \( g_{ik} \) is the number of the shortest paths from node \( j \) to node \( k \) \((j,k \neq i)\), and \( g_{ijk} \) is the number of the shortest paths from node \( j \) to node \( k \) passing through node \( i \).

(6) Closeness centrality
The closeness centrality of a node is the value of the total distance (in the graph) of this node from all other nodes. In a network, the closer a node to other nodes, the easier for this node to transmit and get information and the less likely will this node be controlled by other nodes. If so, the node is more possible to be in the central position of the network. Hence, it can be used to measure how quickly a node get access to all other nodes through minimized steps.

The closeness centrality of node \( i \) is given as:

\[
C_i = \sum_{j=1}^{n} d_{ij}
\]

Where \( d_{ij} \) is the number of links in a shortest path from node \( i \) to node \( j \).

(7) EffSize

The effective size, also known as EffSize, refers to the nonredundant contacts of a node. The value of it is the number of ego’s network minus the redundancy value of this network. The higher the EffSize is, the more nonredundant contacts does the node have and the more likely will the structure holes exist (R. Burt, 1995).

The effective size of node \( i \) is given as:

\[
\sum_{j} \left[ 1 - \sum_{q} p_{iq} m_{jq} \right], \quad q \neq i, j.
\]

Here, \( j \) represents all the nodes connected with node \( i \), \( q \) is another node besides \( i \) or \( j \). \( p_{iq} \) represents the proportion of \( i \)’s energy invested in relationship with \( q \), And \( m_{jq} \) represents the \( j \)’s interaction with \( q \) divided by \( j \)’s strongest relationship with anyone. The redundancy in network is calculated by summing up this product across all nodes \( q \). One minus this expression expresses the nonredundant portion of relationship.

The less one node is connected with other nodes, the higher the effective size will be and the more possible will this node has structural holes.
(8) ConStraint

The ConStraint measures the extent to which the node’s network limits his or her time and energy. It is given as:

\[
c_{ij} = \left( p_{ij} + \sum_{q} p_{iq} p_{qj} \right)^2, \quad i \neq q \neq j
\]

Here, \( j \) represents all the nodes connected with node \( i \), \( q \) is another node besides \( i \) or \( j \). \( p_{iq} \) represents the proportion of \( i \)'s energy invested in relationship with \( q \), And \( p_{qj} \) represents the proportion of \( q \)'s energy invested in relationship with \( j \).

The lower the Constraint is, the more open the network will be and it would be more possible to have structural holes.

6.4. Data sources and sampling method

This thesis selected the members in the shopping part of the Changsha Tong as the research target. Since it is different to get the details of all the members inside the whole website, this research chose to use the snowball sampling to collect the data of the members and selected the posts in a week as the data sources. The specific data is shown in the Table 67.

<table>
<thead>
<tr>
<th>Date (Year/Month/Day)</th>
<th>The number of total posts</th>
<th>The number of selected posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016/12/26</td>
<td>184</td>
<td>70</td>
</tr>
<tr>
<td>2016/12/27</td>
<td>162</td>
<td>58</td>
</tr>
<tr>
<td>2016/12/28</td>
<td>188</td>
<td>53</td>
</tr>
</tbody>
</table>
It is noticed that the general posts will not get replied anymore after one week in this virtual community. In order to get precise data, when the author collecting data on 14th, Jan, 2017, the data from 20 days before, namely 26th, Dec, 2016, was selected as the beginning day for the data collection. In one week, from 26th, Dec, 2016 to 1st, Jan, 2017, this shopping part had 1193 pieces of new posts. The posts related to shopping were selected and others were deleted, such as the posts only for chatting. Finally, 408 posts were selected and 1024 members were involved.

Taking the large number of members of Changsha Tong into account, the number of 408 indicates that most members were silent. Without leaving messages, the silent members are considered to be unlikely to affect others. Hence, lacking the data of these members would not affect the results of this thesis.

<table>
<thead>
<tr>
<th>Date</th>
<th>Posts</th>
<th>Replies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016/12/29</td>
<td>180</td>
<td>72</td>
</tr>
<tr>
<td>2016/12/30</td>
<td>155</td>
<td>53</td>
</tr>
<tr>
<td>2016/12/31</td>
<td>155</td>
<td>49</td>
</tr>
<tr>
<td>2017/01/01</td>
<td>169</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>1193</td>
<td>408</td>
</tr>
</tbody>
</table>

Chapter 7. Data analyses

This chapter is about the data analyses for Part 2. The section 7.1 explains the relationship matrix and the social diagram for the data. The section 7.2 and 7.3 are for analyzing the structure of the virtual community. The section 7.2 is the analysis of tie strength in this virtual community and the section 7.3 provides the analysis of the small-world
phenomenon. The section 7.4 and 7.5 are for obtaining the data of the indicators of opinion leaders, namely, these two sections are for the analysis in the section 7.6. The section 7.4 provides the analysis of centrality, including the analysis of Degree centrality, the analyses of the OutDegree and of the InDegree, the clustering analysis of the OutDegree and of the InDegree, the analysis of Betweenness centrality and the analysis of Closeness centrality. The section 7.5 provides the analysis of structure holes and the section 7.6 is about the analysis of the indicators’ data and the identification. The section 7.7 provides the analyses of the influences of opinion leaders on eWOM dissemination and the section 7.8 lists all the results obtained through the analyses above. Finally, the section 7.9 provides the discussions for Part 2.

7.1. The relationship matrix and the social diagram

For the data, the relationship matrix and the social diagram of this network are shown as follows:

(1) The relationship matrix.

By the sampling method introduced before, the one-week data of the shopping part of Changsha Tong was collected, from 26th, Dec, 2016 to 1st, Jan, 2017. There were 1024 members who had left messages online and thus a 1024*1024 matrix was obtained. The relationship matrix is shown in the Table 68 (Limited by the space, only the information of first 10 members is shown).

Inside the matrix, the specific number of \( X_{ij} \) represents how many times does the member \( i \) reply to the poster \( j \). If the member \( i \) left one message to the member \( j \), and member \( j \) was willing to interact several times with the member \( i \), then the value of \( X_{ij} \) will be more than 1.

For example, the number “3” in the second line and the third row means that “倩倩砣” interacted with “满天都是馨馨” and left comments...
to “满天都是馨馨” for 3 times.

Table 68. The relationship matrix
(The Table is made by the author.)
(Limited by the space, only the information of first 10 members is shown)

<table>
<thead>
<tr>
<th></th>
<th>满天都是馨馨</th>
<th>倩倩砣</th>
<th>dengya_wen</th>
<th>老傅</th>
<th>teroyo</th>
<th>lovejamt</th>
<th>xixihaha86</th>
<th>细鱼嫩子</th>
<th>chy901</th>
<th>zcx</th>
</tr>
</thead>
<tbody>
<tr>
<td>满天都是馨馨</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>倩倩砣</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>dengya_wen</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>老傅</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>teroyo</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>lovejamt</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>xixihaha86</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>细鱼嫩子</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>chy901</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>zcx</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(2) The social diagram.

Figure 34 shows the network diagram for the sample members in the shopping part of Changsha Tong. The nodes in this figure represent the members and the texts near the nodes are the ID of the member. Every line means that the connecting two members have a relationship.

From this figure, it can be seen that this network is relatively large. For example, in this figure, the nodes in the periphery of the circle are hanging point.

The network diagram also shows the positions of the members. It can be seen that some members are at the central positions and some
are at the edge position. The more the members are in the central part, the more their relationships have. At the same time, the members in the middle of the network have closer relationships with others than the members in the more marginal position. Contrarily, the members in the marginal position have little relationships with others.

Furthermore, there are 15 isolated nodes, listed as a line in the Figure 35.
Figure 32. The screenshot of the social diagram
(The figure is made by the author.)

The advantage of a socio-gram is that it shows the relationships directly. But when the number of actors are huge, the graphics will become quite complex, and it will be difficult to analyze the relationship structure.

7.2. Analysis of tie strength

From 2016/12/26 to 2017/01/01, there were 408 new posts inside the shopping part of Changsha Tong and 1024 members were involved. The total number of comments was 5599, namely the average posting volume was 0.398 and the average replying volume was 5.468.

Two conclusions were obtained as follows.

1) Except for a small number of them, the majority of members had a low degree of participation for giving out posts.

Through the data, it can be seen that the numbers of posters and of repliers were different.

On one hand, for the data of how many members sent out posts, 820 members, taking up 80% of the total members, posted nothing in this one week and 184 members, taking up about 17.9% of the total members, posted more than 3 times in this week. Other members sent out posts at least 1 times but less than 3 times.

On the other hand, for the data of how many members replied to posts, 24 members, taking up about 2.34% of the total members, replied to nobody and 576 members, taking up about 56.25% replied less than 3 times. Other members replied more than 3 times.

2) Except for a small number of them, the majority of members have a low degree of interaction. Namely, the tie strength of the members in
this community is mainly weak.

The strength of ties can be measure by the frequency of contacts (Garton et al., 1997; Granovetter, 1973; D. K. Kim, 2007). In this thesis, the members who interacted with others less than 3 times are considered to have weak ties and the ones with more than 3 times are considered to have strong ties with others.

Hence, in this community, only 2.29% of the community members were strongly connected with others and a vast majority of these members have weak ties. Because in terms of the frequency of interaction among members, there were 5599 replies in total and the number of interactions more than three times was only 127.

Consequently, most of them had weak ties.

7.3. Analysis of the small-world phenomenon

In order to judge whether this network is a small-world network or not, the network characteristics were analyzed as follows:

(1) Clustering analysis

By using UCINET 6.0 to deal with the sample data, through “network → cohesion → clustering coefficient”, the results are shown in the Table 69.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall graph clustering coefficient</td>
<td>0.244</td>
</tr>
<tr>
<td>Weighted Overall graph clustering coefficient</td>
<td>0.118</td>
</tr>
</tbody>
</table>

Hence, the clustering coefficient of this network was 0.244.
(2) Characteristic path length analysis

By using UCINET 6.0 to deal with the sample data, through “network → cohesion → Geodesic distances (old)”, the results are shown in the Table 70 and the Table 71.

Table 70. Part 1 of characteristic path length analysis
(The table is made by the author.)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average distance (among reachable pairs)</td>
<td>2.986</td>
</tr>
<tr>
<td>Distance-based cohesion (&quot;Compactness&quot;)</td>
<td>0.068</td>
</tr>
<tr>
<td>(range 0 to 1; larger values indicate greater cohesiveness)</td>
<td></td>
</tr>
<tr>
<td>Distance-weighted fragmentation (&quot;Breadth&quot;)</td>
<td>0.932</td>
</tr>
</tbody>
</table>

Table 70. Part 2 of characteristic path length analysis
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequencies of Geodesic Distances</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Frequency</td>
<td>Proportion</td>
</tr>
<tr>
<td>1</td>
<td>4323.000</td>
</tr>
<tr>
<td>2</td>
<td>42954.000</td>
</tr>
<tr>
<td>3</td>
<td>102226.000</td>
</tr>
<tr>
<td>4</td>
<td>41835.000</td>
</tr>
<tr>
<td>5</td>
<td>3460.000</td>
</tr>
<tr>
<td>6</td>
<td>51.000</td>
</tr>
</tbody>
</table>

From the Table 71, the distance of “1” occurred 4323 times and the distance of “2” occurred 42954 times. Meanwhile, the distance of “3” occurred 102226 times. It indicates that the distances which are not greater than 3 took up about 78.47% and that the distances of the vast majority of nodes were not more than 3.
From the Table 70, it can be seen that the average distance was 2.096. It means that in this community, every two members could be connected through less than 3 members in average.

Meanwhile, according to the Table 70, the characteristic path length L was 2.986.

(3) Analysis of Density

By using UCINET 6.0 to deal with the sample data, through “network → Cohesion → Density → Density Overall”, the results are shown in the Table 72.

Table 71. Analysis of Density
(The table is made by the author.)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg Value</td>
<td>Total</td>
<td>Std Dev</td>
<td>Avg Wtd Degree</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>The data</td>
<td>0.005</td>
<td>5599</td>
<td>0.099</td>
</tr>
</tbody>
</table>

From the Table 72, the network density D was 0.005 and the standard deviation was 0.099.

Overall, 0.005 was a relatively small density, which shows that the entire network was very sparse and that the connections between member are not very close. In general, the close groups cooperate more with others, and the information is flowed easier inside such groups. Whereas, the alienated groups have information barriers, little emotional support and low degree of collaboration (X. Chen, Zeng, & Xing, 2007).

(4) The Clustering analysis and Characteristic path length analysis for the sociometric random graph

In order to judge one network is a small-world network or not, the data of this network needed to be compared with a sociometric random network. Hence, the data of a random network was calculated.
By using UCINET 6.0, through “data → random → sociometric”, a network matrix for 1024 nodes was built up. Meanwhile, the degree of every node was designed to be 150. The result of this new matrix was named “sociometric random graph”.

The results of clustering analysis and Characteristic path length analysis are shown in the Table 73, Table 74 and the Table 75.

Table 72. Clustering analysis for the sociometric random graph
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Overall graph clustering coefficient</th>
<th>0.146</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted Overall graph clustering coefficient</td>
<td>0.146</td>
</tr>
</tbody>
</table>

Table 73. Part 1 of characteristic path length analysis for the sociometric random graph
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Average distance (among reachable pairs)</th>
<th>1.853</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance-based cohesion (&quot;Compactness&quot;) (range 0 to 1; larger values indicate greater cohesiveness)</td>
<td>0.573</td>
</tr>
<tr>
<td>Distance-weighted fragmentation (&quot;Breadth&quot;)</td>
<td>0.427</td>
</tr>
</tbody>
</table>

Table 74. Part 2 of characteristic path length analysis for the sociometric random graph
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Frequencies of Geodesic Distances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>153600.000</td>
</tr>
<tr>
<td>Proportion</td>
</tr>
<tr>
<td>0.147</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>893952.000</td>
</tr>
<tr>
<td>Proportion</td>
</tr>
<tr>
<td>0.853</td>
</tr>
</tbody>
</table>
From the Table 73 and 74, it is shown that the clustering coefficient of this random network \( C_{\text{random}} \) was 0.146 and that the characteristic path length \( L_{\text{random}} \) was 1.853.

(5) Summary of the analyses above
The summary of the analyses above is listed in the Table 76.

Table 75. Summary of the analyses above
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Nodes</th>
<th>Relationships</th>
<th>( C ) (clustering coefficient)</th>
<th>( C_{\text{random}} )</th>
<th>Density</th>
<th>( L ) (characteristic path length)</th>
<th>( L_{\text{random}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1024</td>
<td>5599</td>
<td>0.244</td>
<td>0.146</td>
<td>0.005</td>
<td>2.986</td>
<td>1.853</td>
</tr>
</tbody>
</table>

From the Table 76, it is shown that this network had 1024 nodes and 5599 relationships. The clustering coefficient was 0.244 and the density of this network was 0.005. Meanwhile, the characteristic path length was 2.986. Furthermore, the clustering coefficient for a completely random network was 0.146 and the characteristic path length for this network was 1.853.

Consequently, the summary of these analyses is provided as follows:

- Since the density of this network was only 0.005, it was a loose network and the interaction between the members was low. Their viscosity was also low. This data verifies the result of section 7.2 that the relationships among most members were connected through weak ties.
- Because \( C >> C_{\text{random}} \) and \( L >> L_{\text{random}} \), this network was a small-world network. It means that the information inside this
network could be spread very rapidly. Furthermore, because L was less than 3, it means that the posted information could be spread to the whole network within three members. Namely, this virtual community accelerated the eWOM flow, when compared to the offline cases.

Consequently, this community had the features of the small-world phenomenon. Namely, it was a network inside which the information was flowing smoothly.

7.4. Analyses of centrality

7.4.1. Analysis of Degree centrality

By using UCINET 6.0 to deal with the sample data, through “network → Centrality and power → Degree (old), the results are shown in the Table 77 and the Table 78.

Table 76. Part 1 of Degree centrality
(The table is made by the author.)
(Limited by the space, only the information of first 40 members is shown)

<table>
<thead>
<tr>
<th>Number</th>
<th>ID</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OutDegree</td>
<td>InDegree</td>
<td>NrmOutDeg</td>
<td>NrmInDeg</td>
</tr>
<tr>
<td>150</td>
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### Table 77. Part 2 of Degree centrality
(The table is made by the author.)

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<th>NrmInDeg</th>
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**DESCRIPTIVE STATISTICS**

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</table>

Network Centralization (Outdegree) = 0.681%
Network Centralization (Indegree) = 2.149%
The results are divided into two parts.

In the first part, namely in the Table 77, the analysis of every member is shown. The first column in the table indicates the original number of the members and the second column indicates the ID of the members. The third column is the Outdegree of the members and the fourth column is the InDegree of them. The fifth column is the NrmOutDeg, which represents the standard value of the OutDegree and the sixth column is the NrmInDeg, which represents the standard value of the InDegree. Here, the InDegree centrality represents the number of the replies received by the posters from the repliers, and the OutDegree centrality represents the number of the repliers sent by a specific node to others.

In the second part, namely in the Table 78, the descriptions of the overall network are shown, including the mean, standard deviation, sum, minimum, maximum and others. It is indicated that the mean of OutDegree was 5.468, the same as mean of InDegree. The minimum of the amount of replies was 0, and the maximum of the replies was 96. The minimum number of replies received by members was 0 and the maximum of the number of that was 291.

Because the minimum of OutDegree and of InDegree were all equal to 0, indicating the isolated nodes existed. These isolated nodes were also shown in the Figure 34. The standard deviation of OutDegree was 10.432, much smaller than the standard deviation of InDegree. It indicates that the values of OutDegree was not so different from the mean of it and the values of InDegree was comparatively different from the mean of InDegree. It also indicates that the numbers of the posts were even, but the numbers of received replies were uneven. Namely, there were some posts which received more pieces of comments than other posts.

Also, the network centralization of OutDegree was 0.681% and the network centralization of InDegree was 2.149%. These two values were all low, so this network was not formed around the core nodes.
7.4.2. Analyses of the OutDegree and of the InDegree

The more specific analyses of the OutDegree and of the InDegree are listed as follows:

(1) Analysis of the OutDegree

By using SPSS 23, the data of Frequency statistics is shown in the Table 79.

Table 78. Analysis of the OutDegree
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Out-Degree</th>
<th>Frequency</th>
<th>Percent-age</th>
<th>cumulative percentages</th>
<th>Out-Degree</th>
<th>Frequency</th>
<th>Percent-age</th>
<th>cumulative percentages</th>
</tr>
</thead>
<tbody>
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From the Table 79, it is shown that the percentage of the OutDegree equal to 0 was 2.9% and thus 2.9% of members did not reply to others. The percentage of the OutDegree equal to 0 was 2.9%. The percentage of the OutDegree larger than 0 and less than 8 was 81.3%. And the percentages of the OutDegree larger than 7 was 15.8%.

Hence, some of these members were active to send out posts and a small part of them were extremely active. It also indicates the great heterogeneity of the community.

(2) Analysis of the InDegree

By using SPSS 23, the data of Frequency statistics is shown in the Table 80.

Table 80. Analysis of the InDegree
(The table is made by the author.)
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</tbody>
</table>

239
As it is shown in the Table 80, the number of the members whose InDegree was 0 took up 80.2%. It means that these 80.2% of the total members posted nothing in this week. Meanwhile, the percentages of members larger than 0 and smaller than 9 was 7.6%.

Hence, inside this community, only a small number of them were active and most members were not. It also indicates the great heterogeneity of the community.

### 7.4.3. Clustering analysis of the OutDegree and of the InDegree

By using SPSS 23 to have a clustering analysis of the InDegree and OutDegree of the members, the results are shown in the Table 81 and the Table 82.

Table 79. Part 1 of clustering analysis of the OutDegree and of the InDegree

(The table is made by the author.)

<table>
<thead>
<tr>
<th>clustering analysis</th>
<th>clustering</th>
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</thead>
<tbody>
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<td>InDegree</td>
<td>27.93</td>
</tr>
<tr>
<td>OutDegr</td>
<td>66.2872</td>
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</table>
Table 80. Part 2 of clustering analysis of the OutDegree and of the InDegree

(The table is made by the author.)

<table>
<thead>
<tr>
<th>Number of nodes in every cluster</th>
<th></th>
<th></th>
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</thead>
<tbody>
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<td>clustering</td>
<td>1</td>
<td>15.000</td>
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<tr>
<td></td>
<td>2</td>
<td>29.000</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>976.000</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>3.000</td>
</tr>
<tr>
<td>effective</td>
<td></td>
<td>1024.000</td>
</tr>
<tr>
<td>missing</td>
<td></td>
<td>.000</td>
</tr>
</tbody>
</table>

Through the clustering analysis, the members were divided into 5 categories.

The first one included 15 members. They had high values of OutDegree, but their InDegree were not comparatively high. The InDegree centrality represents the number of the replies received by the posters from the repliers, and the OutDegree centrality represents the number of the repliers sent by a specific node to others. Hence, these 15 members always replied others, but they did not reply so many replies.

The second one included 29 members. They had high values of InDegree and of OutDegree. Hence, these 29 members always replied other and got many replies. Their relationships with some other members were comparatively strong.

The third one included 976 members, which took up 95% of the total members. These members had low values of InDegree and of OutDegree. Hence, they did not reply many posts and they received a few replies. These members were lacking of the interaction with others.
The fourth one included only 1 member. Compared to all other members, this member had the highest values of InDegree and of OutDegree. Hence, this member replied a lot and receives the most replies.

The fifth one included 3 members. They had relatively high values of InDegree and their values of OutDegree were also high. Hence, these 3 members replied many members and receives the comparatively high number of replies.


7.4.4. Analysis of Betweenness centrality

By using UCINET 6.0 to deal with the sample data, through “network → Centrality and power → Freeman Betweenness → Node Betweenness, the results are shown in the Table 83 and the Table 84.
<table>
<thead>
<tr>
<th>Number</th>
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<th>2</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>Betweenness</td>
<td>nBetweenness</td>
</tr>
<tr>
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<td>苏大大大大大</td>
<td>154350.547</td>
<td>14.763</td>
</tr>
<tr>
<td>23</td>
<td>康康砣</td>
<td>121755.336</td>
<td>11.646</td>
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<tr>
<td>128</td>
<td>跟屁虫</td>
<td>87438.781</td>
<td>8.363</td>
</tr>
<tr>
<td>20</td>
<td>临去秋波</td>
<td>85143.242</td>
<td>8.144</td>
</tr>
<tr>
<td>188</td>
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</tr>
<tr>
<td>164</td>
<td>dark_darky</td>
<td>57067.199</td>
<td>5.458</td>
</tr>
<tr>
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</tr>
<tr>
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<tr>
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<td>4.39</td>
</tr>
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<td>40839.59</td>
<td>3.906</td>
</tr>
<tr>
<td>150</td>
<td>蔡大婶</td>
<td>40815.316</td>
<td>3.904</td>
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<tr>
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<td>3.748</td>
</tr>
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<td>38835.934</td>
<td>3.715</td>
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<tr>
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<td>沐小言</td>
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<tr>
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<td>25658.162</td>
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<td>2.086</td>
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<td>soga</td>
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<td>微微筱</td>
<td>20668.924</td>
<td>1.977</td>
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</table>
Table 82. Part 2 of analysis of Betweenness centrality
(The table is made by the author.)

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<td>Mean</td>
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<td>Sum</td>
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</tr>
<tr>
<td>4</td>
<td>Variance</td>
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<td>5</td>
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<td>100116332544.000</td>
</tr>
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<td>6</td>
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</tr>
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<td>7</td>
<td>Euc Norm</td>
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<td>0.000</td>
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<tr>
<td>10</td>
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</table>

Network Centralization Index = 14.55%
The results are divided into two parts.

In the first part, namely in the Table 83, the analysis of every member is shown. The first column in the table indicates the original number of the members and the second column indicates the ID of the members. The third column is the value of Betweenness of the members and the fourth column is the nBetweenness value of them. From the table, it can be seen that the top one was the member called “苏大大大大大”. The Betweenness value of this member was 154350.547. Because the Betweenness is used to describe the cases that one node is in the shortcut of many other pairs of nodes, it means that this member was on the shortcut to many nodes inside the network. Also, this member usually serves as an intermediary member and many information was flowed to others through this member. Hence, this member has a very important position inside the network.

Meanwhile, there were many members who had the Betweenness being 0 (the data is not shown in this table). It is because that these members were in the position of hanging out, namely they just had relationships with one member inside the communities. They were not in the shortcut of any two members and thus their Betweenness is being 0.

In the second part, namely in the Table 84, the descriptions of the overall network were shown, including the mean, standard deviation, sum, minimum, maximum and others. It is indicated that the mean of Betweenness value was 2343.563 and the standard deviation was 9606.121. The maximum was 154350.547 and the minimum is 0. Meanwhile, the Network Centralization Index was 14.55% and it means that the centralization trend of this community was not obvious. This conclusion is in correspondence with that in the section 7.4.1.
7.4.5. Analysis of Closeness centrality

By using UCINET 6.0 to deal with the sample data, through “network → Centrality and power → Closeness(old)”, the results are shown in the Table 85 and the Table 86.

Table 83. Part 1 of analysis of Closeness centrality

(Limited by the space, only the information of first 40 members is shown)

(The table is made by the author.)

<table>
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<tr>
<th>Number</th>
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<th>1 InFarness</th>
<th>2 OutFarness</th>
<th>3 InCloseness</th>
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<td>2556</td>
<td>18.222</td>
<td>40.023</td>
</tr>
<tr>
<td>93</td>
<td>大小眼</td>
<td>5621</td>
<td>2567</td>
<td>18.2</td>
<td>39.852</td>
</tr>
<tr>
<td>114</td>
<td>小小樱桃</td>
<td>5629</td>
<td>2578</td>
<td>18.174</td>
<td>39.682</td>
</tr>
</tbody>
</table>
Table 84. Part 2 of analysis of Closeness centrality
(The table is made by the author.)

<table>
<thead>
<tr>
<th>Statistics</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>InFarness</td>
<td>OutFarness</td>
<td>InCloseness</td>
<td>OutCloseness</td>
</tr>
<tr>
<td>Minimum</td>
<td>5252</td>
<td>2195</td>
<td>12.917</td>
<td>0.098</td>
</tr>
<tr>
<td>Average</td>
<td>6432.565</td>
<td>6432.565</td>
<td>15.977</td>
<td>30.748</td>
</tr>
<tr>
<td>Maximum</td>
<td>7920</td>
<td>1047552</td>
<td>19.478</td>
<td>46.606</td>
</tr>
<tr>
<td>Sum</td>
<td>6586947</td>
<td>6586947</td>
<td>16360.161</td>
<td>31486.094</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>433.994</td>
<td>56436.598</td>
<td>1.091</td>
<td>4.422</td>
</tr>
<tr>
<td>Variance</td>
<td>188350.906</td>
<td>318508928</td>
<td>1.19</td>
<td>19.556</td>
</tr>
<tr>
<td>SSQ</td>
<td>42563837952</td>
<td>3902543872</td>
<td>262600.125</td>
<td>988164.313</td>
</tr>
<tr>
<td>MCSSQ</td>
<td>192871328</td>
<td>615314227</td>
<td>1218.429</td>
<td>20025.615</td>
</tr>
<tr>
<td>Euclidean Norm</td>
<td>206310.063</td>
<td>1817664</td>
<td>512.445</td>
<td>994.065</td>
</tr>
<tr>
<td>Observations</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
<td>1024</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The results were divided into two parts.
In the first part, namely in the Table 85, the analysis of every member was shown. The first column in the table indicates the original number of the members and the second column indicates the ID of the members. The third column is the InFarness of the members and the fourth column
is the OutFarness of them. The InFarness represents the sum of the distance from this node to the information receivers and the OutFarness represents the sum of the distance from the information senders to this node. From the table, the member called “苏大大大大大” had the shortest distance to other members. It means that this member might be in contact with most of the members of the network or be able to contact the other members of the network at a very short distance. It also can be seen that this member has the minimal control when they want to get information from other members.

In the second part, namely in the Table 86, the descriptions of the overall network are shown, including the mean, standard deviation, sum, minimum, maximum and others. It is indicated that for InFarness, the mean was 6432.565 and the Standard Deviation was 433.994. Meanwhile, the maximum for it was 7920 and the minimum for it was 5252. For OutFarness, the mean was 6432.565 and the Standard Deviation was 56436.598. Meanwhile, the maximum for it was 1047552 and the minimum for it was 2195.

Because the average value of OutFarness was 6432.565, and the OutFarness values of the first 40 members were smaller than 2600, it means that these members could be in contact with most of the members of the network or be able to contact the other members of the network at a very short distance. This distance was shorter than the average distance.

7.5. Analysis of the structure holes

By using UCINET 6.0 to deal with the sample data, through “network → Ego networks → structural holes”, the results are shown in the Table 87.

Table 85. Analysis of structure holes
(The table is made by the author.)  
(Limited by the space, only the information of first 10 members is shown)

<table>
<thead>
<tr>
<th>No.</th>
<th>ID</th>
<th>Structural Hole Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Degree</td>
</tr>
<tr>
<td>1</td>
<td>满天都是馨馨</td>
<td>17.00</td>
</tr>
<tr>
<td>2</td>
<td>倩倩砣</td>
<td>88.00</td>
</tr>
<tr>
<td>3</td>
<td>den gya_wen</td>
<td>64.00</td>
</tr>
<tr>
<td>4</td>
<td>老傅</td>
<td>9.00</td>
</tr>
<tr>
<td>5</td>
<td>teroyo</td>
<td>4.00</td>
</tr>
<tr>
<td>6</td>
<td>lovejamt</td>
<td>15.00</td>
</tr>
<tr>
<td>7</td>
<td>xixihaha86</td>
<td>5.00</td>
</tr>
<tr>
<td>8</td>
<td>细</td>
<td>8.00</td>
</tr>
</tbody>
</table>
From the Table 87, the analysis of every members was shown. The first column in the table indicates the original number of the members and the second column indicates the ID of the members. From the third column, there are some structural hole measures. The most important and the second important values are the EffSize and Constraint. The EffSize represents the nonredundant contacts of a node and it measures the effective size of ego's network. The higher the EffSize is, the more nonredundant contacts does the node have. Meanwhile, the Constraint measures the extent to which the node’s network limits his or her time and energy. The lower the Constraint is, the more open the network will be and it would be more possible to have structural holes.

The data in the Table 87 indicates that there were some large gaps in the EffSize value of these 10 members, let alone all the members. For example, the EffSize value of the node called “倩倩砣” was 82.611 times as much as that of the node called “chy901” or “zcx”. On the other hand, the Table 87 also indicates that there were some large gaps in the Constraint value of these 10 members, let alone all the members. For example, the Constraint values of the nodes called “chy901” or “zcx” were nearly 20 times as much as that of the node called “倩倩砣” or “zcx”.
7.6. Identification of the online opinion leaders

7.6.1. Analysis of the indicators’ data

The section 7.4 and 7.5 provided the analyses related to the indicators of opinion leaders. Also, from the section 7.4.3, the result of the clustering analysis of the OutDegree and of the InDegree has shown that 34 members may be the opinion leaders. Hence, the indicators of these 34 members were listed in the Table 88 and the possibility of their being opinion leaders are going to be discussed.

Table 86. Analysis of the indicators’ data
(The table is made by the author.)

<table>
<thead>
<tr>
<th>No.</th>
<th>ID</th>
<th>InDegree</th>
<th>OutDegree</th>
<th>EffSize</th>
<th>Constraint</th>
<th>Betweenness</th>
<th>InFarness</th>
<th>OutFarness</th>
</tr>
</thead>
<tbody>
<tr>
<td>380</td>
<td>苏大大大大大</td>
<td>291</td>
<td>48</td>
<td>161.9</td>
<td>21</td>
<td>0.032</td>
<td>154350</td>
<td>.547</td>
</tr>
<tr>
<td>23</td>
<td>康康砣</td>
<td>189</td>
<td>33</td>
<td>117.5</td>
<td>42</td>
<td>0.037</td>
<td>121755</td>
<td>.336</td>
</tr>
<tr>
<td>128</td>
<td>跟屁虫</td>
<td>161</td>
<td>67</td>
<td>110.2</td>
<td>11</td>
<td>0.045</td>
<td>87438.781</td>
<td>5285</td>
</tr>
<tr>
<td>20</td>
<td>临去秋波</td>
<td>143</td>
<td>36</td>
<td>125.1</td>
<td>76</td>
<td>0.032</td>
<td>85143.242</td>
<td>5538</td>
</tr>
<tr>
<td>56</td>
<td>败家的甘小姐妞</td>
<td>128</td>
<td>22</td>
<td>67.74</td>
<td>5</td>
<td>0.077</td>
<td>38835.934</td>
<td>5614</td>
</tr>
<tr>
<td>2</td>
<td>倩倩砣</td>
<td>121</td>
<td>57</td>
<td>82.61</td>
<td>1</td>
<td>0.054</td>
<td>45835.426</td>
<td>5429</td>
</tr>
<tr>
<td>113</td>
<td>小小樱桃</td>
<td>114</td>
<td>33</td>
<td>73.07</td>
<td>9</td>
<td>0.057</td>
<td>5541</td>
<td>2488</td>
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<tr>
<td>225</td>
<td>miss 柚子</td>
<td>109</td>
<td>23</td>
<td>73.29</td>
<td>5</td>
<td>0.064</td>
<td>47165.516</td>
<td>5566</td>
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<tr>
<td>267</td>
<td>白将军</td>
<td>102</td>
<td>36</td>
<td>71.42</td>
<td>0.067</td>
<td>39184.133</td>
<td>5511</td>
<td>2425</td>
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<tr>
<td>77</td>
<td>潇湘猫</td>
<td>99</td>
<td>34</td>
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<td>51276.117</td>
<td>5572</td>
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<tr>
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<td>90</td>
<td>34</td>
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<td>68944.75</td>
<td>5507</td>
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<td>41</td>
<td>莫小喵</td>
<td>87</td>
<td>15</td>
<td>66.75</td>
<td>0.05</td>
<td>49169.605</td>
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<tr>
<td>150</td>
<td>蔡大婶</td>
<td>81</td>
<td>96</td>
<td>74.51</td>
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<td>40815.316</td>
<td>5298</td>
<td>2251</td>
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<tr>
<td>152</td>
<td>沐小言</td>
<td>79</td>
<td>96</td>
<td>64.98</td>
<td>0.069</td>
<td>34886.75</td>
<td>5349</td>
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<td>18</td>
<td>铃铛小亚</td>
<td>75</td>
<td>63</td>
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<td>0.077</td>
<td>25664.84</td>
<td>5462</td>
<td>2411</td>
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<td>92</td>
<td>雅笛</td>
<td>73</td>
<td>38</td>
<td>55.72</td>
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<td>30097.926</td>
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<td>50</td>
<td>42.76</td>
<td>0.095</td>
<td>15683.476</td>
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</tr>
<tr>
<td>175</td>
<td>泡泡不是彩色的</td>
<td>71</td>
<td>72</td>
<td>58.28</td>
<td>0.071</td>
<td>20294.611</td>
<td>5462</td>
<td>2402</td>
</tr>
<tr>
<td>3</td>
<td>dengya_wen</td>
<td>71</td>
<td>48</td>
<td>58.93</td>
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<td>28336.488</td>
<td>5499</td>
<td>2441</td>
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<tr>
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<td>夏沫冬至</td>
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<td>58</td>
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<td>15418.374</td>
<td>5435</td>
<td>2380</td>
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<td>32.76</td>
<td>0.129</td>
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<tr>
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<td>五五呀</td>
<td>62</td>
<td>24</td>
<td>46.42</td>
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<td>16388.652</td>
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<tr>
<td>400</td>
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<td>60</td>
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<td>40839.59</td>
<td>5597</td>
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<tr>
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<td>59</td>
<td>24</td>
<td>48.05</td>
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<td>42.15</td>
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<td>十八大姨妈</td>
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<td>19</td>
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<td>晶晶suger</td>
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<td>29.63</td>
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<td>13</td>
<td>35.52</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

(*The Table 83 lists the information of Betweenness of first 40 members. The table 85 lists the information of both InFarness and OutFarness of first 40 members. If the 34 members’ ID were not shown in the Table 83, their Betweenness are not reported in the Table 88. Similarly, if the 34 members’ ID were not shown in the Table 85, their InFarness and OutFarness are not reported in the Table 88.)

From the data above, it shows that:

- If the values of InDegree were arranged from large to small:
  
The numbers for top 10 highest members were: “380”, “23”, “128”, “20”, “56”, “2”, “113”, “225”, “267”, “77”. Namely, they were “苏大大大
大大的“康康砣”，“跟屁虫”，“临去秋波”，“败家的甘小妞妞”，“倩倩砣”，“小小樱桃”，“miss 柚子”，“白将军”，and “潇湘猫猫”. Then the numbers for the following ten members were: “188”, “41”, “150”, “152”, “18”, “92”, “13”, “175”, “3”, “162”.

- If the values of OutDegree were arranged from large to small:
  The numbers for top 10 highest members were: “150”, “152”, “175”, “128”, “18”, “162”, “2”, “13”, “380”, “3”. Namely, they were “蔡大婶”，“沐小言”，“泡泡不是彩色的”，“跟屁虫”，“铃铛小亚”，“夏沫冬至”，“倩倩砣”，“yyyyyyyyyyyy”，“苏大大大大大”，and “dengya_wen”. Then the numbers for the following ten members were: “44”, “38”, “36”, “36”, “34”, “34”, “34”, “33”, “33”, “24”.

- If the values of EffSize were arranged from large to small:
  The numbers for top 10 highest members were: “380”, “20”, “23”, “128”, “2”, “188”, “150”, “225”, “113”, “77”. Namely, they were “苏大大大大大”，“临去秋波”，“康康砣”，“跟屁虫”，“倩倩砣”，“芳芳”，“蔡大婶”，“miss 柚子”，“小小樱桃”，and “潇湘猫猫”. Then the numbers for the following ten members were: “267”, “56”, “41”, “152”, “3”, “175”, “400”, “92”, “18”, “114”.

- If the values of Constraint were arranged from small to large:
  The numbers for top 10 smallest members were: “380”, “20”, “23”, “188”, “128”, “41”, “2”, “77”, “150”, “113”. Namely, they were “苏大大大大大”，“临去秋波”，“康康砣”，“芳芳”，“跟屁虫”，“莫小喵”，“倩倩砣”，“潇湘猫猫”，“蔡大婶”，“小小樱桃”. Then the numbers for the following ten members were: “52”, “225”, “267”, “400”, “152”, “175”, “420”, “92”, “56”, “18”.

- If the values of Betweenness were arranged from large to small.
  The numbers for top 10 largest members were: “380”, “23”, “128”, “20”, “188”, “77”, “41”, “225”, “2”, “400”. Namely, they were “苏大大大大大”，“康康砣”，“跟屁虫”，“临去秋波”，“芳芳”，“潇湘猫猫”，“莫小喵”，“miss 柚子”，“倩倩砣”，“木槿花微眠”. Then the numbers for the following ten members were: “150”, “267”, “56”, “152”, “92”, “3”, “18”, “114”, “52”, “175”.

- If the values of InFarness were arranged from small to large.
The numbers for top 10 smallest members were: “380”, “128”, “150”, “23”, “152”, “162”, “175”, “18”, “13”, and “3”. Namely, they were “苏大大大大大”, “苏大大大大大”, “跟屁虫”, “蔡大婶”, “康康砣”, “沐小言”, “夏沫冬至”, “泡泡不是彩色的”, “铃铛小亚”, “yyyyyyyyyy”, and “dengya_wen”. Then the numbers for the following ten members were: “2”, “188”, “267”, “20”, “113”, “225”, “77”, “270”, “400”, “56”.

If the values of OutFarness were arranged from small to large.

The numbers for top 10 smallest members were: “380”, “150”, “128”, “152”, “23”, “2”, “162”, “175”, “18”, “13”. Namely, they were “苏大大大大大”, “蔡大婶”, “跟屁虫”, “沐小言”, “康康砣”, “倩倩砣”, “夏沫冬至”, “泡泡不是彩色的”, “铃铛小亚”, “yyyyyyyyyy”. Then the numbers for the following ten members were: “267”, “20”, “3”, “188”, “113”, “77”, “225”, “400”, “270”, “56”.

7.6.2. Identification

From the data above, the opinion leaders and the potential opinion leaders inside this community could all be identified.

(1) Opinion leaders
This community had 18 opinion leaders. Nodes with numbers of “380”, “23”, “128”, “20”, “56”, “2”, “225”, “267”, “77”, “188”, “150”, “152”, “18”, “13”, “175”, “3”, “162” and “400” could be considered as the opinion leaders of this community.


They have highest values of InDegree, OutDegree, EffSize, Betweenness and lowest values of Constraint, InFarness and OutFarness.

(2) Potential opinion leaders
This community had 5 potential opinion leaders. Nodes with numbers of “113”, “41”, “92”, “420” and “114” had the potential to be the opinion leaders.

They were “小小樱桃”, “莫小喵”, “雅笛”, “五五呀” and “安南妈”. From the table, further information could be analyzed for these members:

Firstly, the Betweenness value of “小小樱桃” was blank in the Table 88. It means that the Betweenness value of this member was not belonging to the top 40 of the whole network. Thus, this member needed to increase the Betweenness value.

Secondly, the InFarness and OutFarness values of “莫小喵”, “雅笛”, “五五呀” and “安南妈” were all blank. It means that the InFarness and OutFarness values of these member were not belonging to the top 40 of the whole network. Thus, these members needed to enhance the InFarness and OutFarness values.

These members had enough high value of other indicators, and they had potentials to be opinion leaders.

(Notably, the standards of judging these potential opinion leaders are subjective and depends on the researcher. For example, with a less strict standard, inside these 34 members, besides the 18 opinion leaders, all other 16 members can be considered as the potential opinion leaders.)

7.7. Influences of opinion leaders on eWOM dissemination

In order to investigate the influence of opinion leaders on eWOM communication, the identified opinion leaders were deleted and the data of the new network were analyzed and compared with the original one. The relevant data was shown in the Table 89.

Table 87. Analysis of network with and without opinion leaders
(The table is made by the author.)
<table>
<thead>
<tr>
<th>No.</th>
<th>Attributes</th>
<th>Original data</th>
<th>Data for the network in which opinion leaders are deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Network density</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td>2</td>
<td>Average distance</td>
<td>2.986</td>
<td>3.664</td>
</tr>
<tr>
<td>3</td>
<td>Overall graph clustering coefficient</td>
<td>0.244</td>
<td>0.065</td>
</tr>
<tr>
<td>4</td>
<td>Network Centralization (Outdegree)</td>
<td>0.681%</td>
<td>1.612%</td>
</tr>
<tr>
<td>5</td>
<td>Network Centralization (Indegree)</td>
<td>2.149%</td>
<td>1.612%</td>
</tr>
</tbody>
</table>

From the table above, it can be seen that after deleting 18 opinion leaders:

- The density of this network reduced by 20% from 0.005 to 0.004. The network density represents the ratio of the actual connections inside the network to the potential connections. Hence, the reduced density indicates that the spread scale of WOM information inside this community was narrowed and the speed of it was also negatively affected.

- The average distance increased to 3.664 and increased by 22.7%. In the original network, every two members can connect with each other through less than 3 members in average. However, without the opinion leaders in the community, they needed to get through more than 3 members. Hence, the speed of information flow inside this community had been negatively affected.

- The Overall graph clustering coefficient decreased from 0.244 to 0.065. The overall graph clustering coefficient measures the degree to which the nodes inside the network tend to cluster together. Hence, the nodes were dispersing greatly.

- The Network Centralization (Outdegree) increased to 1.612% and the network Centralization (Indegree) decreased to 1.612%. It means that without the opinion leaders in the community, the positional
advantages were distributed equally, because the value of Network Centralization (Outdegree) was the same as that of Network Centralization (Indegree). It means that the members with the advantages of positions, namely the opinion leaders, were disappeared.

From the analysis above, it can be concluded that opinion leaders affect the speed and scale of the information flow. Furthermore, because of the opinion leaders serving as the bridges for connecting other members, the members were not so dispersing. Without the opinion leaders, the flow of information was interrupted.

7.8. Results

The results obtained through the analyses above are listed as follows.  
1) For section 7.1, about the relationship matrix and the social diagram:
   ● A 1024*1024 matrix was obtained.
   ● This network was relatively large. Some members were at the central positions and some are at the edge position. Also, there were 15 isolated nodes.

2) For section 7.2, about the analysis of tie strength:
   ● In this thesis, the members who interacted with others less than 3 times are considered to have weak ties and the ones with more than 3 times are considered to have strong ties with others. Hence, only 2.29% of the community members were strongly connected with others and a vast majority of these members had weak ties. Consequently, the tie strength of the members in this community was mainly weak.

3) For section 7.3, about the analysis of the small-world phenomenon:
   ● Since the density of this network was only 0.005, it was a loose network and the interaction between the members was low. Their
viscosity was also low. This data verifies the result of section 7.2 that
the relationships among most members were connected through
weak ties.

- This network was a small-world network. It means that the
information inside this network could be spread very rapidly.
Meanwhile, because L was 2.096, less than 3, it means that the
posted information could be spread to the whole network within
three members. Namely, this virtual community accelerated the
eWOM flow, when compared to the offline cases.

4) For section 7.4.1, about the analysis of Degree centrality:
- Because the minimum of OutDegree and of InDegree were all equal
to 0, indicating the existence of isolated nodes, which are also shown
in the Figure 33.
- It also indicates that the numbers of the posts were even, but the
numbers of received replies were uneven. Namely, there were some
posts which received more pieces of comments than other posts.
- Also, the network centralization of OutDegree was 0.681% and the
network centralization of InDegree was 2.149%. These two values
were all low, so this network was not formed around the core nodes.

5) For section 7.4.2, about the analyses of the OutDegree and of the
InDegree:
- For the data of sending out posts, some of these members were
active to send out posts and a small part of them were extremely
active.
- For the data of replying to posts, only a small number of them were
active and most members were not.
- Inside this community, only a small number of them were active and
most members were not. It also indicates the great heterogeneity of
the community.

6) For section 7.4.3, about the clustering analysis of the OutDegree and
of the InDegree:
• 34 members may be the opinion leaders. They interacted more with others and were comparatively active. Their tie strength with others were higher than others.

7) For section 7.4.4, about the analysis of Betweenness centrality:
• The centralization trend of this community was not obvious. This conclusion is in correspondence with that in the section 7.4.1.

8) For section 7.4.5, about the analysis of Closeness centrality
• Because the average value of OutFarness was 6432.565, and the OutFarness values of the first 40 members were smaller than 2600, it means that these members could be in contact with most of the members of the network or be able to contact the other members of the network at a very short distance. This distance was shorter than the average distance.

9) For section 7.5, about the analysis of the structure holes:
• The data in the Table 87 indicates that there were some large gaps in the EffSize value of these 10 members, let alone all the members.
• The Table 87 also indicates that there were some large gaps in the Constraint value of these 10 members, let alone all the members.

10) For section 7.6, about the identification of opinion leaders:
• This community had 18 opinion leaders. Nodes with numbers of “380”, “23”, “128”, “20”, “56”, “2”, “225”, “267”, “77”, “188”, “150”, “152”, “18”, “13”, “175”, “3”, “162” and “400” could be considered as the opinion leaders of this community. Namely, their ID are “苏大大大大大”，“康康砣”，“跟屁虫”，“临去秋波”，“败家的甘小姐妞”，“倩倩砣”，“miss 柚子”，“白将军”，“潇湘猫猫”，“芳芳”，“蔡大婶”，“沐小言”，“铃铛小亚”，“yyyyyyyyyyyy”，“泡泡不是彩色的”，“dengya_wen”，“夏沫冬至” and “木槿花微眠”.
• This community had 5 potential opinion leaders. Nodes with
numbers of “113”, “41”, “92”, “420” and “114” had the potential to be the opinion leaders. Namely, their ID are “小小樱桃”，“莫小喵”，“雅笛”，“五五呀” and “安南妈”.

11) For section 7.7, about the influences of opinion leaders on eWOM dissemination

- It can be concluded that opinion leaders affect the speed and scale of the information flow. Furthermore, because of the opinion leaders serving as the bridges for connecting other members, the members were not so dispersing. Without the opinion leaders, the flow of information was interrupted.

### 7.9. Discussion for Part 2

In this part, SNA is used for answering three small questions, including: 1) How to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly? 2) What are the characteristics of such virtual communities of consumption? 3) How do the opinion leaders affect the eWOM dissemination?

The analysis above can be concluded as follows:

(1) Using SNA was able to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

According to the section 7.6, 18 opinion leaders and 5 potential opinion leaders in this virtual community were identified. For the analyses above, these 18 individuals meet with the characteristics of opinion leaders and other 5 individuals also meet with the characteristics of potential opinion leaders.

Firstly, from the section 7.4.3, the average value of both Indegree and Outdegree were 5.468. From the Table 88, the Indegree values of these
opinion leaders were all larger than 60 and their Outdegree values were bigger than 17. Meanwhile, the Indegree values of these opinion leaders were all larger than 59 and their Outdegree values were bigger than 15. That is, these individuals have actively sent out posts and replied to others.

Secondly, from the section 7.4.4, it indicates that the average value of Betweenness was 2343. From the Table 88, it can be concluded that all the Betweenness values of opinion leaders were higher than 15000. The Betweenness centrality can be used to show the control degree of the node towards the overall resources inside the network. If a node has a high value of it, it indicates that this node is in the shortcut of many other pair nodes. Namely, the high Betweenness values of the identified opinion leaders in this study have strong control to the resource flow.

Thirdly, from the section 7.4.5, it indicates that the average of InFarness and of OutFarness were 6432.565. From the Table 88, the InFarness and OutFarness values of these opinion leaders were similar to the minimum values of InFarness and of OutFarness. Because the higher the Closeness centrality is, the easier for the node to transmit and get information and the less likely will this node be controlled by other nodes. Namely, the values of these opinion leaders indicate that they are easier to send out and receive information and less likely to be controlled by others.

Fourthly, from the section 7.5 and the Table 88, it indicates the EffSize values of these opinion leaders were comparatively large and their Constraint values were comparatively small. Because the higher the EffSize and the lower the Constraint are, more likely the node has structure holes. Namely, these opinion leaders had comparatively many structure holes and they connected many individuals who otherwise were separate. Meanwhile, they controlled the information flow.

Consequently, the identified opinion leaders meet with the features of opinion leaders and SNA can be used in identifying the opinion leaders in the virtual communities of consumption.

(2) Compared to the speed of traditional WOM dissemination, the
spread of eWOM flow in the virtual communities of consumption was faster.

According to section 7.3, in terms of the overall network structure, the virtual community of consumption exhibited the typical small world characteristics and the data shows that inside this network, the eWOM could be spread within less than 3 members in average.

However, in the traditional cases, the “six-degree separation theory” indicates that everyone can be connected within six individuals. Obviously, the speed of spreading information online is much faster than spreading it offline. Because of the openness of the Internet, members can leave messages and communicate with the individuals whoever they prefer and thus accelerate the information flow inside the virtual community.

(3) The relationships inside the virtual community of consumption were mainly based on weak ties and thus enabled the eWOM information to be spread within a variety of heterogenous groups.

According to section 7.2 and 7.3, the relationships among the members inside virtual community of consumption were mainly weak ties. (In this thesis, the members who interacted with others less than 3 times are considered to have weak ties and the ones with more than 3 times are considered to have strong ties with others.)

Furthermore, according to section 7.4.2, this community had great heterogeneity. A lot of members sent out posts but did not reply to any posts. Only a small part of members was very active to send out or reply to posts. Also, some members did not send out or reply to any posts. This result is in line with the conclusion from Granovetter (1973), who pointed out that individuals connected by weak ties are more heterogeneous.

(4) The opinion leaders affected the speed and scale of the dissemination of eWOM information greatly; meanwhile, they served as the bridges for connecting the members inside the virtual communities in which most of the members were having weak ties, and had strong ties with
other members.

According to the section 7.5.4, the opinion leaders affect the speed and scale of the information flow. Without the opinion leaders, the flow of information was interrupted and the members became dispersing.

This result confirmed that the opinion leaders accelerated the flow of eWOM information by affecting its speed and scale, were taking the central positions and having many structure holes, and served as the bridge for linking other members.

According to the section 7.3, the eWOM flow has already become faster in the virtual communities of consumption, compared to offline cases. With the opinion leaders, the eWOM dissemination has been further accelerated.

Moreover, from the section 7.4.3, it can be concluded that these opinion leaders had strong ties with others.

(5) The over density of the virtual community was very low and if the companies wanted to promote a certain product or service, related strategies and actions were necessary.

According to the section 7.3, the network density was 0.005. Since the density was the indicator for the general level of connectedness of the graph, the value of 0.005 was very low and means that this network was sparse.

Previous researches on utilizing SNA to identifying online opinion leaders reveal that the density for a virtual community of knowledge was 0.64 (L. Wang & Ma, 2009) and that the density for the college student groups was 0.0068 (Luo & Xi, 2012). Hence, the result for the virtual community of consumption is different from the density of the virtual community of knowledge, but is similar to the density of the college student groups.

To be more specific, for the research of L. Wang and Ma (2009), the samples were 18 college students who chose the same course and Wang served as the teacher of that course. These students and the teacher had relationships in the real world and their teacher-student relationships in the real world reinforced their online relationships. Hence, the density of
this virtual community of knowledge was high.

Obviously, for the virtual communities of consumption, the opinion leaders serve as the individuals who provide advice and recommendation and the members act as the individuals who are looking for information and the potential consumers. Meanwhile, because of the anonymity of Internet, it is impossible for the opinion leaders to cultivate relationship with every member. Even if the opinion leaders are willing to show their personal information, it can hardly be assured that every member is willing to do so.

On the contrary, the opinion leaders and members in the virtual community of knowledge act as the teachers, and the members act as the students. Meanwhile, they may have relationships offline, as in the L. Wang and Ma (2009)’s research.

Hence, the density of virtual communities of consumption can hardly be compared with that of the virtual communities of knowledge.

Furthermore, the low density of this research is in accordance with the Luo and Xi (2012), although their research focused on the offline WOM network. The low density of this research also confirmed the conclusion of Luo and Xi (2012) that the close WOM/eWOM network can hardly be formed by the members themselves. If the companies want to promote their products or services, they need to utilize some strategies.

On the other hand, for the research of Luo and Xi (2012), their sample was from the students in a college and these students had been asked for filling in questionnaire. The questionnaire was for investigating the eWOM network for mobile and the further data analysis was for identifying the offline opinion leaders inside these 282 respondents. The low value of density indicates that in the offline community, the close WOM network could hardly be formed by the individuals themselves and if the companies wanted to promote their products, they needed to intervene and take actions to promote their products.

Consequently, if the enterprises expect to realize the positive eWOM marketing, they cannot rely entirely on the spontaneous formation of the information dissemination network. They need to take corresponding means to build eWOM communication network, to
promote the spread of eWOM information and to improve network connectivity. For example, they can utilize the opinion leaders to stimulate the silent members, which take up most percentages of all the members.

Chapter 8. Conclusion

This chapter provides the final conclusion of this thesis, and it is divided into 6 sections. The section 8.1 provides the summary of Chapter 1 to 7 and the section 8.2 outlines the conclusions for this thesis. The section 8.3 and 8.4 explain the theoretical and the practical implications respectively. The section 8.5 is about the major theoretical contributions and the final section is about the limitations and future research.

8.1. Summary of Chapter 1 to 7

The purpose of this thesis is to investigate the influence of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption. In this thesis, two research questions were pointed out, including:

1) How to explain the mechanism of how opinion leaders affect the purchase intentions of the consumers in the virtual communities of consumption?

2) How to identify opinion leaders in the virtual communities of consumption in which they cannot be identified directly?

The summary of Chapter 1 to 7 is shown as follows.

Chapter 1: Introduction

Chapter 1 provided the introduction of this thesis. Firstly, the
background was introduced that nowadays, with the popularity of eWOM, consumers begin to search and share information online before making purchase, and opinion leaders becomes popular, especially in the virtual communities of consumption. Based on this background, this thesis pointed out the two research questions and emphasized that the focus of this study is the opinion leaders. Then, the theoretical implications, practical implications, key concepts, methodology and outline of this thesis were explained.

Part 1: The influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption

Part 1 of this thesis included Chapter 2, 3 and 4.

Chapter 2. Literature Review

Chapter 2 provided the literature review for the Part 1 and explained the main concepts. Firstly, the basic definitions, influences and differences of WOM and eWOM were introduced. Secondly, the definitions, characteristics, types, identification approaches of offline and online opinion leaders were explained. Thirdly, for virtual communities, the definitions, the differences towards the offline communities, the formation and evolvement, the classification, the value and the contents related to the members were illustrated. Fourthly, the definitions of consumer behavior and of their purchase intentions and the models related to consumer behavior were outlined. In particular, the applications of TAM and IAM on the consumers’ purchase intentions were collected and analyzed. Finally, further the focuses of these applications were summarized and the possible future research directions were pointed out.

Chapter 3. The model

Chapter 3 provided the model for this thesis. On one hand, for designing this model, four small questions were pointed out and answered. These questions included 1) for this study, which traditional models of consumer behavior will be more suitable? 2) whether the original IAM can be used for this study? 3) how did other researchers adjust IAM for eWOM study? 4) based on IAM, how to design the model for this study? As the answers for these four questions, the model for
this thesis chose IAM as the basic model, and added some factors related to opinion leaders and consumers to the basic model. The factors of opinion leaders included the message quality, source credibility and tie strength. And the factors of consumers included trust towards the site, recommendation consistency and confirmation with prior belief. Furthermore, besides the perceived usefulness of information, the intermediary functions of perceived risk and message credibility were testified.

After designing the model, the related hypotheses were pointed out and the related variables were defined and explained.

**Chapter 4. Empirical analyses**

Chapter 4 provided the empirical analyses of Part 1. This chapter included 4 sections. In the section 1, the questionnaire was designed by designing the measurements of the variables, setting China as the sample, explaining the specific method. Then a small group of discussion was held for purifying the Chinese version of the questionnaire. Subsequently, in order to testify the reliability and validity of the questionnaire, the questionnaire was pretested by 128 pieces of answers and two inappropriate questions were deleted. Finally, the formal questionnaire was obtained and 347 pieces of answers was obtained through the data collection.

Section 2 provided the descriptive statistical analysis to the answers. Firstly, the basic information of the respondents based on the part 3 of the questionnaire and their online activities and choices based on the part 1 of the questionnaire were analyzed respectively. Then the data of the part 2 of the questionnaire was analyzed and these analyses included the validity analysis, the reliability analysis, the discriminant validity analysis and the confirmatory factor analysis. Finally, the hypotheses and the functions of intermediary factors were testified.

In the section 3, the explanations of the testified hypotheses were provided. Except that the influence from trust towards the site on message credibility and the influence from recommendation consistency on message credibility failed to show significant influences, other hypotheses were all supported. Meanwhile, besides the perceived
usefulness of information, the intermediary functions of the perceived risk and of the message credibility were all confirmed.

Section 4 provided the discussion of the empirical analyses.

**Part 2. Identifying the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.**

Part 2 of this thesis included Chapter 5, 6 and 7.

**Chapter 5. Literature Review**

Chapter 5 provided the main concepts for Part 2. This chapter began with the literature review on the approaches for identifying opinion leaders and concluded three main approaches, including the user attributes analysis, the text mining analysis and the network structure analysis. Although there are many approaches for identifying the online opinion leaders, few research is for identifying opinion leaders in the virtual communities of consumption, let alone in the virtual communities of consumption in which they cannot be identified directly. Based on this literature review, this chapter pointed out that Social Network Analysis (SNA), an approach belonging to the network structure analysis, was widely used to identify the opinion leaders in the social networks and was applicable to identify opinion leaders in the virtual communities of consumption. Furthermore, because of the unique advantages of SNA, three small questions could be answered. These questions included: 1) How to identify the opinion leaders in such virtual communities of consumption? 2) What are the characteristics of such virtual communities of consumption? 3) How do the opinion leaders affect the eWOM dissemination? Hence, Part 2 chose to utilize SNA. Finally, the basic introduction, basic principles and the related theories of SNA, and the indicators of opinion leaders were introduced.

**Chapter 6. Design of the Research**

Chapter 6 was about the design of the research. Firstly, this chapter introduced the selected sample in China, called Changsha Tong. Secondly, the research approach and research variables were introduced. Finally, it was explained that the posts in Changsha Tong in one week was selected as the data sources and that the snowball sampling was selected as the sampling method.
Chapter 7. Data Analyses

Chapter 7 provided the data analysis for Part 2 and included 7 sections. The first section provided the data analysis for the overall network. The section 7.2 was about the analysis of tie strength and found out that most tie strength in this virtual community is weak ties. The section 7.3 was about the analysis of the small-word phenomenon and found out that this community had the characteristics of small world. The section 7.4 was the analyses of degree centrality and the section 7.5 was the analysis of the structure holes. These two sections were for providing basic information for the identification of opinion leaders in the section 7.6. Then, the section 7.7 analyzed the influence of these opinion leaders on eWOM communication and the section 7.8 outlined the results for the analyses above. Finally, section 7.9 provided the discussion for Part 2.

8.2. Conclusions for this thesis

This thesis was divided into two parts.

In part 1, this thesis firstly pointed out the research question that the mechanism of opinion leaders towards the consumers’ purchase intention in the virtual communities of consumption was still unclear. In order to investigate the influences of opinion leaders on the purchase intentions of consumers, the relevant theories and models on the consumer behavior needed to be discussed. Previous researches show that the typical models for explaining the consumer behavior might be applicable to this study. And based on the comparison of TAM and IAM, this study chose IAM as the basic model. After reviewing several related researches, this study designed the final model for investigating the influential factors of opinion leaders from the perspective of information adoption process of consumers. Then, this study explained the hypotheses and the measurement scale resulted from the literature review, purified the questionnaire and testified it through pretest by
selecting Chinese as the research objects. After gathering the data through sending out the questionnaire, SEM was used for testifying the model.

Through the empirical analysis, 13 hypotheses in this model were accepted and two were rejected. Namely, this model was confirmed to be able to explain the mechanism of how opinion leaders affect the purchase intentions of consumers in the virtual communities of consumption. The main conclusions of part 1 are listed as follows:

(1) From the side of opinion leaders, the results confirmed that the influential factors of opinion leaders include the message quality, the source credibility and the tie strength. To be more specific, the results indicate that message quality (MQ) had significant influences on both perceived usefulness of information (PU) and message credibility (MC), that source credibility (SC) had significant influences on both PU and MC and that tie strength (TS) had significant influence on MC. However, the result failed to show the significant influence of recommendation consistency (RC) on MC.

(2) From the side of consumers in the virtual communities of consumption who are affected by the opinion leaders, their trust towards the site and confirmation with prior belief were confirmed to affect their final purchase intentions. To be more specific, the results indicate that trust towards the site (T) had a negative influence on perceived risk (PR), but the hypothesis about the influence of T on message credibility (MC) was not supported. Furthermore, the results also indicate that confirmation with prior belief (C) had a significant influence on message credibility (MC), that perceived risk (PR) had significantly negative influences on both PU and information adoption (IA), that MC had significant influences on both PU and information adoption (IA), that PU had a significant influence on IA and that IA has a significant influence on PU.

(3) From the side of mediators which all related to the perceptions of
consumers, were found to be affected by the opinion leaders and the new environment. The results confirm the influences of perceived risk and message credibility, besides the perceived usefulness of information. To be more specific, the results indicate that message credibility (MC) affected information adoption (IA) directly and affects IA through perceived usefulness of information (PU) indirectly and that perceived risk (PR) affected IA directly and affects IA through PU indirectly.

In part 2, this thesis firstly pointed out the question about How to identify the opinion leaders in such virtual communities of consumption in which they cannot be identified directly. In order to answer this question, the literature review of approaches for identifying opinion leaders were provided and it is found that few researchers had used it to identify opinion leaders in the virtual communities of consumption, let alone in the virtual communities of consumption in which they cannot be identified directly. Hence, in order to fill in this research gap, this study needed to choose an approach to have an empirical study. A discussion on these approaches was made and SNA was chosen. Considering its unique advantages, the empirical study in the Part 2 could analyze and answer three small questions, including 1) How to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly? 2) What are the characteristics of such virtual communities of consumption? 3) How do the opinion leaders affect the eWOM dissemination?

For the empirical study, this study randomly chose a virtual community of consumption in China and analyzed the collected data. The analyses include the analyses of the network structure of the virtual community, the analyses of the identifying the opinion leaders and the analysis of their influences towards the eWOM dissemination.

Through the empirical analysis, the main conclusions of part 2 are listed as follow:

(1) Using SNA were able to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.
According to the section 7.6, 18 opinion leaders and 5 potential opinion leaders in this virtual community were identified. For the analyses above, these 18 individuals meet with the characteristics of opinion leaders and other 5 individuals also meet with the characteristics of potential opinion leaders.

Firstly, from the section 7.4.3 and the Table 87, the Indegree and Outdegree values of these opinion leaders indicate that they have actively sent out posts and replied to others. Secondly, from the section 7.4.4 and the Table 87, the Betweenness values of these opinion leaders indicate that they have strong control to the resource flow. Thirdly, from the section 7.4.5 and the Table 87, the InFarness and OutFarness values of these opinion leaders indicate that they are easier to send out and receive information and less likely to be controlled by others. Fourthly, from the section 7.5 and the Table 87, the EffSize and Constraint values of these opinion leaders indicate that they have comparatively many structure holes and they connected many individuals who otherwise were separate. Meanwhile, they controlled the information flow.

Consequently, the identified opinion leaders meet with the features of opinion leaders and SNA can be used in identifying the opinion leaders in the virtual communities of consumption.

(2) In terms of the overall network structure, the virtual community of consumption exhibited typical small world characteristics. Namely, the eWOM flow was accelerated, compared to the offline cases. Inside this network, the eWOM could be spread within less than 3 members in average. The speed of spreading information online was much faster than spreading it offline.

(3) The relationships among the members inside virtual community of consumption were mainly weak ties and the members had a degree of heterogeneity. The weak ties inside the network contributed greatly to the widely spread of various information and ideas and enabled the information to
be spread to different groups inside the community.

(4) Opinion leaders were very active in this community and they affected speed and scope of the eWOM flow greatly; meanwhile, they served as the bridges for connecting the members inside the virtual communities in which most of the members were having weak ties. These opinion leaders were very active. The comparison of the data with or without them indicates that without the opinion leaders, the network structure would become loose, and the speed and scope of the information flow were negatively affected. Furthermore, without them, the members would become disperse.

(5) However, it is also found that the over density of this community was comparatively small. It means that the connections between the members were not too close to some extent and the information flow was not very smooth. Hence, if marketers want to promote their products or services, the information exchange and the interpersonal interaction needed to be strengthened for the stable connections and the information flow.

8.3. The theoretical implications

For part 1, a comprehensive model which investigates the influential factors of opinion leaders towards consumers in the virtual communities was developed, based on IAM. The theoretical implications of this model are listed as following.

1) The Part 1 builds up an integrated model based on IAM to investigate the influential factors of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption. This model provides new perspectives to the researches related to consumer behavior and to IAM.
2) This model investigated and confirmed the influential factors of opinion leaders within the virtual community from the perspective of the information adoption process of consumers and emphasized not only the original features including message quality and source credibility, but also the tie strength between opinion leaders with the consumers. The result can deepen the understandings of opinion leaders and further enrich the relevant researches of them.

3) This model confirmed the influences of relevant factors on the purchase intentions of consumers, and these factors included trust towards the site, message quality, source credibility, tie strength, recommendation consistency, confirmation with prior belief, perceived risk, perceived usefulness of information, message credibility, and information adoption. Meanwhile, besides the perceived usefulness of information, the intermediary functions of perceived risk and message credibility have been confirmed. Hence, this mode provides a wider understanding on the purchase intention of consumers in the virtual communities of consumption.

4) This model investigated and confirmed the negative influence of perceived risk. In the online context, the inhibiting influence of consumers’ perceptions of the uncertainty and adverse consequences from e-commerce need to be underscored. Hence, this model enriches the understanding on the researches about perceived risk.

For part 2, the SNA was used to identify the opinion leaders in a virtual community of consumption in which they cannot be identified directly and meanwhile, the network structure of the virtual community and the influence of opinion leaders towards eWOM dissemination were shown. The theoretical implications of this model are listed as following.

1) This study provided an empirical study about using SNA to identify
opinion leaders in the virtual communities of consumption in which they cannot be identified directly, thus filled in the research gap that few research is about identifying opinion leaders in such virtual communities of consumption. Hence, the result provides implications for future study on identifying opinion leaders in the virtual communities of consumption.

2) By utilizing SNA, the structure of the virtual community of consumption was analyzed. The ties strength of the members and the eWOM flow in the virtual community were investigated. The results enable the researchers to better understand the relationships and information flow in the virtual communities of consumption.

3) By utilizing SNA, the situations of the eWOM dissemination inside the virtual communities of consumption with or without the opinion leaders were compared. The result confirmed that opinion leaders affected the speed and scale of eWOM dissemination greatly and affected the connection among the members. Hence, this result enriches the researchers’ understanding on the influence of opinion leaders towards eWOM flow.

8.4. The practical implications

With the e-commerce being developed quickly, various virtual communities of consumption appear. In such kinds of virtual communities, a great number of potential members gather, discuss about topics related to online shopping and gradually become consumers. With numerous information, individuals can hardly judge all of them, so they begin to rely on the opinion leaders. These opinion leaders are able to affect the information adoption and purchase intentions of those consumers and further affect some potential consumers through both informational and interpersonal influences.
Under this situation, the empirical results in this thesis provide some practical implications for virtual communities of consumption, for companies and marketers, and for opinion leaders themselves.

8.4.1 For virtual communities of consumption

The virtual community of consumption can be considered as a unique e-commerce model and it also face with the issues of development and competition. In order to develop, the virtual communities of consumption need to attract the Internet users and increase their loyalty at first. The more members one virtual community gather, the more people will join. However, the time and energy of every netizen is limited and they cannot allocate their time and attention evenly into each virtual community. Hence, the virtual community needs to attract the members to spend more time and energy into the community. The more others spending time and energy, the more competitive will the virtual community be.

However, joining in the community does not mean that these individuals will actively participate in the activities of the virtual community, and the virtual community without the participation of members will lose its vitality. Hence, the in-depth study in this thesis will help the organizer of the virtual communities of consumption to learn about how to effectively stimulate, manage and control members so as to enhance the popularity and vitality of virtual communities.

1) The organizers of virtual communities of consumption need to take actions to improve their services and managements for encouraging the users to increase their trust towards the website.

According to the conclusions from Part 1, members’ trust towards the site can reduce their perceived risk and finally affects their purchase intentions. Hence, it is essential for virtual communities to take actions to increase the members’ trust towards the site.
On one hand, the organizers can filter or delete some inappropriate or fake eWOM information by terms of the technology support or management system support. On the other hand, they can provide some special treatments to the influential eWOM information, like giving noticeable emphases on the information on the website. Such kinds of actions will improve the authority and reliability of the virtual communities. By doing so, the consumers’ trust towards the site can be increased to some degree.

2) The organizers of virtual communities of consumption need to pay attention to and to utilize the influences of opinion leaders.

   According to the conclusions for Part 1, the opinion leaders affect the information adoption and purchase intentions of consumers greatly.

   According to the conclusions from Part 2, opinion leaders are very active and they affect speed and scope of the eWOM communication greatly. Meanwhile, without them, the network will become loose.

   Hence, the organizers need to pay attention to these opinion leaders. At the micro level, utilizing the influence of opinion leaders is conducive to control the information flow and to guide the communication behavior of other members inside the virtual community to some degree. At the macro level, utilizing the influences and intermediary functions of opinion leaders are helpful to mobilize various resources and to connect the heterogeneous groups in the virtual communities. Moreover, utilizing opinion can develop the stickiness and loyalty of members.

   After paying attention to the opinion leaders, the organizers of virtual communities of consumption need to make a full use of these opinion leaders. For example, the organizers can set up “opinion leader recommendation zone”. By gathering the opinion leaders together, it will be easier for the members to notice and follow these opinion leaders. And the opinion leaders are easier to cultivate relationships with the followers and affect them. In particular, this approach will be more effective in the virtual communities of consumption which do not show the attributes of users, such as the number of followers, and make it difficult for other members to find out opinion leaders.
3) The organizers of virtual communities of consumption can use SNA to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

According to the empirical study in the Part 2, the SNA can be used to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

Hence, if the virtual communities do not show the attributes of opinion leaders, the organizers can utilize SNA to identify opinion leaders and further utilize them.

4) The organizers of virtual communities of consumption need to pay attention to the tie strength among members.

According to the conclusions from Part 1, tie strength between opinion leaders and members affects the purchase intention of consumers. Furthermore, according to the conclusions from Part 2, the tie strength in the virtual communities are mainly weak ties.

Hence, the organizers need to take some approaches to promote the interaction of members and enhance their tie strength. If the members refuse to interact with others, it will lead to a decrease in the overall activity and the value of the community as a whole, adversely affecting the long-term development of the community. So, the organizers need to actively stimulate the users. For example, the virtual community can hold regular events or give gifts to members.

8.4.2. For companies and marketers

1) The companies and marketers can use SNA to identify the opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

According to the empirical study in the Part 2, the SNA can be used to identify the opinion leaders in the virtual communities of consumption in
which they cannot be identified directly.

Hence, in the virtual communities of consumption in which the opinion leaders cannot be identified directly, the companies and marketers can utilize SNA to identify the opinion leaders for the marketing strategies or for cultivating them.

2) The companies and marketers can utilize the virtual communities of consumption to accelerate the eWOM communication.

According to the conclusions from Part 2, the virtual community of consumption exhibits typical small world characteristics and accelerates the eWOM flow, compared to the offline cases. Meanwhile, because the over density of the virtual community is comparatively low, the companies and marketers need to take actions for promoting their products or services.

On one hand, because the eWOM flow is faster online than offline, the companies and marketers need to pay attention to the online communication for promoting their products and services.

On the other hand, because the members in the virtual communities of consumption are not too close and the information flow is not very smooth, when the companies and marketers want to promote their items, they need to take some actions for attracting the members and stimulating their interaction. For example, they can provide some gifts for encourage members to reply the posts.

3) The companies and marketers need to utilize the online opinion leaders in the virtual communities of consumption.

According to the conclusions from Part 1, the opinion leaders affect the information adoption of consumers and further affect their purchase intentions. Furthermore, according to the conclusions from Part 2, the opinion leaders affect the speed and scale of eWOM flow.

On one hand, the opinion leaders affect the purchase intentions of consumers in the virtual communities of consumption by affecting their information adoption process. So, the companies and marketers should cooperate with opinion leaders and utilize their influential factors to
promote the products or services. Firstly, because the message quality of opinion leaders affects the purchase intentions, the companies and marketers can provide detailed and high-quality messages to the opinion leaders. Secondly, because the source credibility of opinion leaders affects the purchase intentions, the companies and marketers can choose to cooperate with the opinion leaders who are more credible and persuasive. Thirdly, because the tie strength between the opinion leaders and others affects the purchase intentions, the companies and marketers can utilize opinion leaders to let the individuals who have strong tie with the opinion leaders notice the product. These homogeneous individuals may be more likely to purchase the product or service, because they have similar interests or focuses with the opinion leaders. Meanwhile, the opinion leaders can utilize their weak tie to let the information be flow to a wider scale.

On the other hand, the companies and marketers need to utilize the influences of opinion leaders towards the scale and speed of the eWOM dissemination. By doing so, the product or service can be known by more people in a shorter time.

Hence, the companies and marketers should cooperate with opinion leaders for benefits.

8.4.3. For cultivating opinion leaders

Besides the informational influences and the interpersonal influences of opinion leaders, they can also attract many new members to the virtual communities because of their personal characteristics or their unique resources. Nowadays, there are many virtual communities setting up the “opinion leader recommendation zone” to attract consumers. If the virtual communities and sellers have their own influential opinion leaders, a large number of consumers will be attracted to follow.

Considering the significant role of opinion leaders, the organizers of
the virtual communities of consumption, the companies and marketers need to be good at not only identifying opinion leaders, but also cultivating their own opinion leaders. Hence, it is essential to cultivate opinion leaders. Meanwhile, there are many opinion leaders who want to cultivate themselves to be more influential and to attract more followers.

According to the conclusions from Part 1, three factors of opinion leaders, including the message quality, the source quality and the tie strength, affect the purchase intentions of consumers in the virtual communities of consumption.

Hence, the approaches to cultivate opinion leaders can be considered from the following aspects.

1) Opinion leaders can be cultivated from their credibility.

The empirical results show that the credibility of opinion leaders has a significant influence on consumers. When judging the credibility of opinion leaders, consumers will think about the expertise, which is related to the products or services, including information on the brands, information of the advantages and disadvantages, the using approaches and others. Hence, when cultivating the credibility opinion leaders, helping them to accumulate related information and using experiences is a good approach. For example, the companies can provide advice or professional knowledge training to the selected opinion leaders through seminars. By doing so, these opinion leaders will have a deepened understanding towards the certain products or services. By being more professional, the opinion leaders will become more credible.

2) Opinion leaders can be cultivated from the quality of the message which they convey.

The empirical results in Part 1 show that the quality of the message which the opinion leader sent out has a significant influence on consumers. The quality of the message can be judged from its contents, format, accuracy, ease of use, timeliness and others. Hence, in order to spreading message with high quality, the format and contents need to be
emphasized. For example, photos which can display the details of the products need be added so as to make the message more attracting. Meanwhile, small videos can be used to display the products, including its application approaches, effects and others. Consequently, when cultivating opinion leaders, it is essential to help them to increase the quality of the message by adding more details.

3) Opinion leaders can be cultivated from the tie strength between them and the consumers.

The empirical results in Part 1 show that the tie strength has a significant influence on consumers. Obviously, their tie strength can be shown from their interaction frequency and their chatting contents. For example, opinion leaders’ speed for replying questions, the quality of the replies, the attitude and the response rates play a significant role in determining their tie strength. Hence, when cultivating opinion leaders, it is essential to remind them of actively interacting with their followers and sharing their using experiences. For example, the opinion leaders can choose a time period especially for answering the questions from the followers.

Furthermore, from the analyses in Part 2, it can be also concluded that always interacting with others are crucial for the opinion leaders.

8.5. Major theoretical contributions

The aim of this thesis is to investigate the influence from opinion leaders towards the consumers in the virtual communities of consumption. Two questions were investigated and answered. These questions include: 1) How to explain the mechanism of how opinion leaders affect the purchase intentions of the consumers in the virtual communities of consumption? 2) How to identify opinion leaders in the virtual communities of consumption in which they cannot be identified directly?
For answering these questions, two parts of empirical studies are made. In Part 1 of this thesis, the first question was investigated and in Part 2, the second question was answered.

The major contributions of this thesis are listed as follows.

1) Part 1 of this thesis provided an integrated and unique model for explaining the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption from the perspective of information adoption process of consumers.

![Theoretical Model](image)

**Figure 33. The theoretical model for this thesis**  
(The figure is made by the author)

For the first research question, this part began with a literature review on the related concepts. Since the influence of opinion leaders towards consumers were aimed at being investigated, the theories on consumer behavior were studied. Prior researches on the typical models for explaining consumer behavior indicated that IAM was suitable for this research. Namely, in the new model, the opinion leaders were supposed
to affect the purchase intentions of consumers in the virtual communities of consumption by affecting their information adoption process. However, the explanatory power of IAM was limited, because that it only focuses on the information perspective and that the virtual community of consumption was a new environment, which results in other possible factors.

Hence, based on the original model of IAM, some new factors related to opinion leaders and to consumers are added to the extended model. Then, in the extended model, the factors related to opinion leaders included the source credibility, message quality and tie strength. The factors related to consumers include the trust towards the site, recommendation consistency, confirmation with prior belief. Furthermore, besides the perceived usefulness of information, two supposed mediators, including perceived risk, message credibility were added.

After the empirical analysis, Part 1 confirmed that:

- From the side of opinion leaders, the influential factors of opinion leaders include source credibility, message quality and tie strength.
- From the side of consumers, their trust towards the site and the confirmation with prior belief are found to be influential. On one hand, the consumers are inside the new environment, namely the virtual communities of consumption, so their trust towards the site is influential. On the other hand, after receiving the eWOM information, whether it is confirmed with prior belief of the consumers is also influential to their purchase intention.
- From the side of mediators, beside the perceived usefulness of information, the perceived risk and the message credibility are found to be influential.

By developing an integrated model and by confirming the influential factors of opinion leaders, this model provides new perspectives to the researches related to opinion leaders, especially the researches related to the influential factors of opinion leaders and the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption.
2) Part 1 of this thesis extended the original IAM uniquely and confirmed its applicability in studying the influences of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption.

As the literature review in the Part 1 indicates that although IAM was developed to explain the information adoption of individuals, it had been applied under different situations with different but additional factors and different subjects.

In order to investigate the mechanism of opinion leaders towards the purchase intentions of consumers in the virtual communities of consumption, the Part 1 of this thesis extended the IAM innovatively. The unique parts of the new model include:

- The original IAM has been adapted to study the eWOM information adoption behavior of individuals (C.-W. Chen et al., 2011; C. M. Cheung et al., 2008; M. Y. Cheung et al., 2009) and to study the purchase intentions of consumers (Alfina et al., 2014; Erkan & Evans, 2016; Gunawan & Huarng, 2015). The Part 1 has had an empirical study on adapting the original IAM to study the mechanism of how opinion leaders affect the purchase intention of individuals in the certain situation from the perspective of information adoption. Namely, the focus of the new model is opinion leader.

- The original IAM is critiqued for only focusing on the information perspective. For the research question in the Part 1, the new model in this study focuses on the perspectives of both opinion leaders and consumers. The relevant variables were added and testified.

- The original IAM only study the mediator called perceived usefulness. However, prior researches have confirmed that only one intermediator is not enough. Hence, the model in this study added two new mediators for increasing its explanatory power.

- The model in this study has utilized the IM in a new environment, namely the virtual communities of consumption.

Hence, the unique model in this study and the empirical study contribute to the IAM-related research. Meanwhile, new ideas and
possibility related to IAM for the researches in the future are provided.

3) Part 1 of this thesis confirmed the influences of two supposed mediators in the extended model, including the perceived risk and message credibility.

In the extended model, besides the perceived usefulness of information, the perceived risk and message credibility were added and their intermediary functions were investigated. The empirical analysis confirmed that the perceived risk had negative influences on the information adoption directly and through perceived usefulness of information indirectly, and that the message credibility affected the information directly and through perceived usefulness of information indirectly.

The results about the intermediary function of message credibility in the virtual communities of consumption is in line with the research of (C.-W. Chen et al., 2011). C.-W. Chen et al. (2011) confirmed the function of message credibility as a mediator when studying the eWOM information adoption in the online communities.

On the other hand, the result that the perceived risk serves as a mediator in the virtual communities of consumption is in line with the research of Tseng and Wang (2016). Tseng and Wang (2016) confirmed the intermediary function of perceived risk when studying the travel website. The result of this thesis confirms the influence of perceived risk in the virtual communities of consumption and serves as a supplement to the researches related to perceived risk.

Consequently, the confirmation of the intermediary functions of these two factors enriches the researches related to the IAM, and also deepens the understandings of researchers on the message credibility and perceived risk.

4) Part 2 of this thesis provided one of the first empirical study on using SNA for identifying the online opinion leaders in the virtual communities of consumption in which they cannot be identified directly.

In order to find out the appropriate approach for identifying the
online opinion leaders in the virtual communities of consumption, Part 2 began with the literature review on the approaches about how to identify opinion leaders. Although there are many approaches for identifying opinion leaders, few research is about identifying online opinion leaders in the virtual communities of consumption, let alone in the virtual communities of consumption in which they cannot be identified directly.

In order to fill in this research gap, for this study, considering the unique advantages of SNA, it was chosen. Then, the measurements of central position and of structure holes were selected as the indicators of opinion leadership. Finally, the opinion leaders were identified.

Hence, the result of this part serves as a supplement to the researches related to utilizing SNA for identifying online opinion leaders.

5) The results of both Part 1 and Part 2 provide a unique investigation for and confirm the influences of the opinion leaders in the virtual communities of consumption from both the perspective of the information adoption process of consumers and from the perspective of social science.

The research of Kozinets et al. (2010), as introduced in the Chapter 1, has confirmed the influences of opinion leaders towards the eWOM dissemination in the online communities by indicating that opinion leaders usually spread the eWOM information to the consumers (as shown in the Figure 37).

![Figure 34. The Linear Marketer Influence Model](image-url)
However, the mechanism of how opinion leaders affect the purchase intention of consumers is still unclear. Meanwhile, when facing with the virtual communities of consumption in which the opinion leaders cannot be identified directly, it becomes a question for the marketers to identify the opinion leaders. Furthermore, the specific influence of opinion leaders towards the eWOM dissemination is not explained.

Through the empirical studies, the results serve as a supplement to the research of Kozinets et al. (2010) in four perspectives:

- The results in the Part 1 investigated and confirmed the influential factors of opinion leaders in the certain situation.
- The results in the Part 1 provided a model for explaining the mechanism of how opinion leaders affect the purchase intention of consumers in the virtual communities.
- The results in the Part 2 provided a useful approach to identify the online opinion leaders in the virtual communities of consumption in which they cannot be identified directly.
- The results in the Part 2 analyzed and figured out the specific influences of opinion leaders towards the eWOM flow in such virtual communities of consumption.

In this study, the Part 1 focuses on answering the question about the mechanism of how opinion leaders affect the purchase intention of consumers in the virtual communities from the perspective of the information adoption process of consumers. For this purpose, this part built up an extended model based on IAM and used SEM to testify the theoretical model. As a result, the Part 1 confirmed the influential factors of opinion leaders, including the message quality, source credibility and tie strength, towards the purchase intentions of consumers in the virtual communities of consumption. Meanwhile, the mechanism of how opinion leaders affect the purchase intention of consumers in the virtual communities is investigated and confirmed.

On the other hand, the Part 2 focuses on identifying the opinion leaders in the virtual communities in which they cannot be identified
directly from the perspective of social science. The empirical study in the Part 2 provides a useful approach for marketers to identify online opinion leaders in such kind of virtual communities. Obviously, this approach can also be used for identifying the opinion leaders in which they can be identified directly. In addition, because of the unique advantage of SNA, the influence of opinion leaders towards the eWOM dissemination in such virtual communities from the perspective of social science was also investigated. As a result, the Part 2 confirmed that the opinion leaders affect the scale and speed of the eWOM dissemination in the virtual communities of consumption.

Consequently, the results on the influences of opinion leaders obtained from Part 1 and Part 2 will enrich the researchers’ understandings towards the opinion leaders in the virtual communities of consumption.

8.6. Limitations and future research

This thesis consists of two parts and provides two empirical studies for answering two research questions:

1) How to explain the mechanism of how opinion leaders affect the purchase intentions of the consumers in the virtual communities of consumption?

2) How to identify opinion leaders in the virtual communities of consumption in which they cannot be identified directly?

Although the author collected and analyzed the relevant researches and had the empirical analyses, the limited time, limited resources, limited research abilities and others lead to the limitations of this thesis. These limitations will provide the directions for future researches.
8.6.1. Limitations for Part 1

The limitations for Part 1 are listed as follows.

(1) Limitations caused by the sample
- Because of the number of the respondents.
  For the questionnaire, 347 pieces of valid answer were accepted. The validity and credibility of the conclusion may be untenable because of the inadequate number of answers.
- Because of the choice of country.
  Chinese were selected because the situation in China was representative. However, because of the cultural reasons and other reasons, the situations in different countries may not be exactly the same and the conclusions of this part may not be able to be explain the situations in other countries.
- Because of the respondents.
  The respondents with bachelor degree or higher took up 80.98% of the whole respondents for the questionnaire. However, according to the 39th China Internet Network Development State Report, until the December of 2016, the Chinese with bachelor degree or higher only took up 11.5% of all the Chinese. Furthermore, about the data of income, respondents with the income of 3000-yuan or lower took up 25.64% of the whole respondents for the questionnaire. However, according to the 39th China Internet Network Development State Report, until the December of 2016, Chinese with the income of 3000-yuan or lower took up 60.2% of all the Chinese. Hence, the data indicates that most of the respondents for this questionnaire had high degree of education and have comparatively high income. One of the possible reasons may be that Chinese with higher degree of education are more likely to understand the importance of this questionnaire and are more willing to finish this questionnaire. Hence, these respondents may be highly possible to lead to the volunteer bias. The volunteer bias is the bias which is appeared because the sample only consists of respondents who are actually willing to answer the questionnaire (Richardson, 1985). Such
kind of bias will limit the generalization of the results to the public.

Hence, the respondents for this questionnaire may not be enough for representing Chinese.

(2) Limitations caused by the research method.

- Because of the approach of sending out questionnaire through Internet.

  This research chose to send out the questionnaire through Internet and the respondents could answer the questionnaire anonymously. Compared with sending out the questionnaire face to face and asking the respondents to leave some personal information, this approach may not be so reliable.

- Because of asking the respondents to recall their experiences.

  This research chose to ask the respondents to recall their latest experiences before answering the questionnaire. Although this approach makes it possible to investigate the respondents’ specific feelings towards the latest experiences, the memory recession or something else may give rise to the mistaken details and the respondents may give out different answers.

(3) Limitations caused by the investigated factors.

Based on the literature review, Part 1 chose some influential factors of opinion leaders and of consumers. The result of the empirical analysis shows that the (Explained Variance) $R^2$ between information adoption and purchase intention was only 33.3%. This result indicates that the information adoption could only explain for the 33.3% of the purchase intention. Hence, this result also indicates that there are still some factors which affect the purchase intention are not investigated through this model, leading to the limited explanatory ability of this model.
8.6.2. Limitations for Part 2

The limitations for Part 2 are listed as follows.

(1) Limitations caused by the sample

- Because of the selected virtual community of consumption.
  
  This part selected one virtual community of consumption randomly as a research target and had an empirical analysis on the data from this virtual community. However, whether this virtual community can represent all other virtual communities of consumption is still a question. Hence, the results based on this virtual community may be not enough to explain the whole situation of virtual communities of consumption.

- Because of the choice of country.
  
  This part also selected China as research sample because it was representative. However, because of the behavior, cultural and other reasons, different countries may exhibit different features and the results of China may be inadequate to explain all the situations in other countries.

- Because of the time period of data.
  
  This thesis only had an empirical study on the virtual community for one week. However, in the long time, some members may build up relationships with others who they never connect before or the silent members in the sample may become active later, thus may lead to some different empirical results. Also, the changes in the opinion leadership in the long time were not investigated in the study. Hence, the explanatory ability of the result may be limited.

(2) Limitations caused by the research method

- The measures for identifying online opinion leaders
  
  On one hand, the indicators of opinion leaders used in this study, including the indicators of central positions and of structure holes positions, were actually subjective. For the three mainly used approaches, including user attributes analysis, text mining analysis and network structure analysis, the standards of identifying opinion leaders
are decided by the researchers. Hence, no matter what kind of approach is used for identifying opinion leaders, the identified opinion leaders depends on the standard which the research chooses and the research aims which the research want to study (M. Liu et al., 2014). Obviously, for SNA, different measures will lead to different nodes being identified. Consequently, with different standards and indicators, the results of the identified opinion leaders may be different. Considering this point, the results of Part 2 may be limited.

On the other hand, the process of judging the opinion leaders and potential opinion leaders in the section 7.6 is also very subjective. The section 7.4.3 indicates that 34 members may be opinion leaders and the 18 identified opinion leaders here are most influential in this network. The 5 members who were judge as potential opinion leaders can be considered as more influential than the 11 members left in this 34-member-group. The standard for judging the potential opinion leaders are very subjective. For example, a different research may consider that besides 18 opinion leaders, others are all potential opinion leaders. Considering this point, the results of Part 2 may be limited.

The SNA itself

As for this approach itself, there are two main limitations. Firstly, SNA neglects the contents of the messages which posters or repliers left. Secondly, the premise of the overall network research is to determine the boundaries of the overall network, so as to investigate all the relationships that exist. However, the different boundary may lead to different results. For example, the results of the data in one month may be different from that in two months.

8.6.3. Future research

With the rapid development of Internet, the popularity of opinion leaders and virtual communities of consumption and the limitations in this thesis, there are still many questions left to be researched in the
future.

(1) Directions for future research based on Part 1

- Future research can improve the samples.
  The limitations for Part 1 have pointed out that because of the number of respondents, the choice of country and the respondents’ personal characteristics, the explanatory power of the results of Part 1 may be limited. Hence, future research can increase the explanatory power by improving the problems related to the sample for the questionnaire.

- Future research can improve the research method.
  The limitations for Part 1 have indicated that the approach of sending out questionnaire through Internet and the approach of asking the respondents to recall their experiences may affect the final results negatively. Hence, future research can improve the research method for getting a better result from the empirical analysis.

- Future researches can consider the influences from other consumers.
  The Part 1 of this thesis investigated the influences of opinion leaders towards consumers. However, as it is explained in Chapter 1, Kozinets et al. (2010) have pointed out three models for explaining the eWOM communication in the online communities and one of the model, called The Network Co-Production Model (as shown in the Figure 38), emphasizes the influences between consumers.
When Internet users are interacting in the online communities, they are affected not only from opinion leaders but also from other individuals. Namely, the interpersonal influence not only occurs between opinion leaders to followers, but also appears among followers. Also, because the pattern of consumer behavior is changing from AIDMA to AISAS, consumers become more willing to search and share information and will affect others.

Hence, whether the influences from other individuals will affect the influences from opinion leaders or not is a question which needs to be investigated in the future. With a better understanding of such kind of interpersonal influence, the researchers may be able to learn more on opinion leaders.

- Future researches can investigate more factors for increasing the explanatory ability of the model.

The explained variable ($R^2$) between IA and PI indicates that there are still some unknown factors which also affect the purchase intention of consumers. For example, the interpersonal influence discussed above many affect the consumers greatly. To be more specific, if a product was popular among the peer individuals, the consumer may be more likely to buy one. In addition, although this study also examined the role of mediating variables, but it did not examine the moderator, which may affect the final conclusions greatly. The future research can add some moderators. For example, some demographic characteristics, such as different gender and age, education, can be used as the moderators.

- Future researches can further investigate the influences of opinion leaders based on the specific fields which these opinion leaders are focusing on, such as fashion field.

The question 7 in the Part 1 of the questionnaire asked about the most suitable commodity type to purchase online. The results showed that the percentages for commodity related to fashion, technology,
culture and lifestyle were about 32%, 23%, 30% and 15% respectively. It means that when the consumers are looking for information online, they have their preferences towards the categories. Meanwhile, this result indicated that the field of fashion and of culture was the most popular ones. Hence, the opinion leaders in different fields may be facing with different groups of potential consumers and the influential factors of these opinion leaders may be different. Facing with different products, the purchase intentions of consumers may be formed through different process and need to be further investigated. Hence, future research can further compare the influences from opinion leaders in different field towards the consumers and can also utilize the fashion field for further study.

Future research can further separate the patterns of consumer behavior.

In general, the cognitive consumption and impulsive consumption are affected greatly by opinion leaders and in the different situations, the influences from the opinion leaders and from the information are different. However, such kinds of differences in the behavior patterns were not investigated in this research. Hence, in order to make the results of the research more practical, the future research can separate the consumer behavior patterns for deepen research. For example, the influences of opinion leaders towards the patterns of cognitive consumption and impulsive consumption can be further investigated.

Future research can test the model in other social media or platforms.

This research only focuses on the opinion leaders in the virtual communities of consumption, but the conceptual model may be also useful for other social media. Future research could test the applicability of this model to other platforms.

(2) Directions for future research based on Part 2

Future research can improve the samples.

The limitations for Part 2 have pointed out that because of the selected virtual community of consumption, the choice of country and
the time period of data, the explanatory power of the results of Part 2 may be limited. When studying the social network, collecting a huge number of complex data is difficult, so many researchers choose to use a small sample (Wasserman & Faust, 1994). However, utilizing the small sample will inhibit the researchers from finding and summarizing the complex patterns. Hence, future research can increase the explanatory power by investigating more virtual communities, choosing other counties and collecting the data in the long-time period.

- Future research can choose some efficient approaches to collect data.

For this empirical study, the snowball sampling was used for collecting data. This method can be used for collecting the data in the short time. However, only utilizing snowball sampling can hardly collect some complex data or the data in the long-time period, such as in one year. Hence, future research can choose other better approaches for collecting data. For example, the researchers can design some algorithms for collecting data.

- Future research can use other indicators or other methods for the identification of opinion leaders.

Part 2 utilized the indicators of the central position and of the structure hole position for identifying the online opinion leaders. However, the different indicators may lead to different results and the choice of indicators is very subjective, as explained in the section 5.2.4. Hence, future research can choose other indicators to measure the central and influential actors, namely the opinion leaders, in the networks.

On the other hand, considering the limitation of SNA, other approaches can be integrated to the original SNA for a better result.

- Future research can further study the subdivided parts of the virtual communities of consumption for investigating the opinion leaders.

The empirical studies of Part 2 are based on the shopping part of the virtual community of consumption and did not subdivide the shopping part. However, in the shopping part, consumers usually have different concerns, such as fashions, culture, parenting and so on. The opinion
leaders may be influential in one subdivided part, rather than in all these topics. Hence, future research can investigate some subdivided parts and identify the opinion leaders in these subdivided fields. Furthermore, the researchers can make some comparison among these opinion leaders.

- Future research can undertake a longitudinal study to understand the phenomenon of opinion leaders in the virtual communities of consumption over time.

As the time pass, the changes in the virtual communities of consumption will appear. The members may build up relationships with other individuals who they did not know before. The opinion leadership may change in a longer time period. Hence, Future research should undertake a longitudinal study to further investigate the opinion leaders and their followers in the virtual communities of consumption.
Appendices

English version of the questionnaire

Dear Mr. /Miss.

Hello! Thank you so much for your sparing time to finish this questionnaire! The purpose of this questionnaire is to analyze the influential factors of opinion leaders towards your purchasing intentions in the virtual communities of consumption.

(Note 1: The virtual community of consumption refers to online communities in which consumers participate and interact with others on the topics related to products, services, shopping experiences and so on.)

(Note 2: The opinion leaders refer to individuals who have a certain number of followers and who can affect others by convey information. They can also be called “Daren” or “Banzhu” or other in Chinese.)

This research adopts an anonymous way, and the information you provided is only for academic purposes. Please answer it with feeling relieved. The answers will not be judged as right or wrong. Please express your true feelings and thoughts. Your enthusiastic participation will contribute to the completion of this study. Thank you so much!

Tohoku University, Economic department

Part 1 online activities and choices

1. The main shopping approach which you use is:
   1) mainly shopping in the offline stores
   2) mainly shopping in the online stores
   3) sometimes shopping offline, and sometimes shopping online. It depends on the commodity type.

2. The commodity type (including products and services) which you
consider it as the most suitable one to purchase online is:
1) commodity related to fashion (such as clothing, cosmetics, etc.)
2) commodity related to technology (such as electronic products, high-tech products, etc.)
3) Commodity related to culture (such as books, movies, dramas, etc.)
4) Commodity related to lifestyle (such as food, household goods, daily necessities, etc.)

3. Will you search for commodity information online before purchasing it?
1) usually
2) sometimes
3) occasionally

4. If you are going to search commodity information, the information is mainly from:
1) word-of-mouth
2) recommendations from opinion leaders
3) recommendations from friends
4) brand advertisements
5) others

5. Among the virtual communities of consumption which you visited before, the most frequent one is:

6. In these virtual communities of consumption, have you got experiences of finding commodity information because of the recommendations of opinion leaders?
1) usually
2) sometimes
3) occasionally
4) never

7. What kind of opinion leaders will you usually pay attention to or will you be willing to pay attention to?
1) commodity related to fashion (such as clothing, cosmetics, etc.)
2) commodity related to technology (such as electronic products, high-tech products, etc.)
3) commodity related to culture (such as books, movies, dramas, etc.)
4) commodity related to lifestyle (such as food, household goods, daily necessities, etc.)
5) never

8. When you are browse webpage, will be you interested in commodity labeled with “some opinion leaders recommend”.
1) certainly
2) maybe
3) never
4) never pay attention to that

Part 2. Opinion leader and purchase intention

Please notice: Please recall the last experience of you paying attention to the recommendations from the opinion leader in the virtual communities of consumption and answer the following questions. (“1” represents completely disagree; “2” represents disagree; “3” represents a little disagree; “4” represents “so so”; “5” represents “a little agree”; “6” represents “agree”; “7” represents “completely agree”.)
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trust towards the site in which opinion leaders are</strong></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>This website itself is trustworthy.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>T2</td>
<td>I think that the information in this website is credible.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>T3</td>
<td>I think that the information in this website is professional.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td><strong>Message quality about the commodity</strong></td>
<td></td>
</tr>
<tr>
<td>MQ1</td>
<td>The message from this opinion leader is highly relevant to the product itself.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>MQ2</td>
<td>The message from this opinion leader has timeliness.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>MQ3</td>
<td>The message from this opinion leader convey correct information.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>MQ4</td>
<td>The message from this opinion leader is comprehensive.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td><strong>Source credibility (namely the credibility of opinion leader)</strong></td>
<td></td>
</tr>
<tr>
<td>SC1</td>
<td>The opinion leader who provided this message is knowledgeable on this topic.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>SC2</td>
<td>The opinion leader who provided this message appeared to be an expert on this topic.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>SC3</td>
<td>The opinion leader who provided this message is credible.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td><strong>Tie strength (with the opinion leader)</strong></td>
<td></td>
</tr>
<tr>
<td>TS1</td>
<td>I have a close relationship with this opinion leader.</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>TS2</td>
<td>I am willing to support this opinion</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>TS3</strong></td>
<td>I am willing to spend time in communicating with the opinion leader.</td>
</tr>
<tr>
<td><strong>Recommendation consistency</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RC1</strong></td>
<td>The information provided by this opinion leader is consistent with information from other opinion leaders.</td>
</tr>
<tr>
<td><strong>RC2</strong></td>
<td>The information provided by this opinion leader is similar to information from other opinion leaders.</td>
</tr>
<tr>
<td><strong>RC3</strong></td>
<td>The opinion leader providing this information has consistent or similar interests as other opinion leaders on the same topic.</td>
</tr>
<tr>
<td><strong>Confirmation with prior belief</strong></td>
<td></td>
</tr>
<tr>
<td><strong>C1</strong></td>
<td>The information provided by this opinion leader supports my impression of the product or service.</td>
</tr>
<tr>
<td><strong>C2</strong></td>
<td>The information provided by this opinion leader reinforces the information I have got about this product or service before.</td>
</tr>
<tr>
<td><strong>C3</strong></td>
<td>The information provided by this opinion leader contradicts to what I have already known about this product or service before.</td>
</tr>
<tr>
<td><strong>Perceived risk</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PR1</strong></td>
<td>I think that the risk of purchasing a product through this site is small.</td>
</tr>
<tr>
<td>PR2</td>
<td>I think that the potential for loss of purchasing a product through this site is high.</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PR3</td>
<td>I think that the potential for profit of purchasing a product through this site is high.</td>
</tr>
<tr>
<td>PR4</td>
<td>I think that a good transaction can probably be done through this site.</td>
</tr>
</tbody>
</table>

Perceived usefulness of information

<table>
<thead>
<tr>
<th>PU1</th>
<th>I think that the information from this opinion leader is valuable.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU2</td>
<td>I think that the information from this opinion leader is helpful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>PU3</td>
<td>I think that the information from this opinion leader can increase my understanding of the product or service.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Message credibility

<table>
<thead>
<tr>
<th>MC1</th>
<th>I think that the information from this opinion leader is factual.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC2</td>
<td>I think that the information from this opinion leader is accurate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>MC3</td>
<td>I think that the information from this opinion leader is credible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Information adoption

<table>
<thead>
<tr>
<th>IA1</th>
<th>I agree with the action suggested in the information from this opinion leader.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA2</td>
<td>I pay close attention to the information from this opinion leader and follow his or her suggestion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>IA3</td>
<td>The information from this opinion leader motivates me to take action.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------</td>
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<td>---</td>
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<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>IA4</td>
<td>The information from this opinion leader enhances my effectiveness in making purchase decision.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Purchase intention</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI1</td>
<td>It is very likely that I will purchase the product recommended by this opinion leader.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>PI2</td>
<td>I will purchase the product recommended by this opinion leader next time when I need such kind of product.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>PI3</td>
<td>I will definitely try the product recommended by this opinion leader.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

**Part 3 personal information**

1. Your gender:  1) male  2) female
2. Your age:
   1) below 18 years old
   2) 18-29 years old
   3) 30-39 years old
   4) older than 40 years old

3. Your education level:
   1) high school or below
   2) technical college
   3) bachelor degree
4) master degree or higher

4. Your career:
1) students
2) government-related staff
3) companies managers
4) general staff in companies
5) professionals
6) business service staff
7) freelance
8) retired
9) unemployed/laid-off

5. Your average monthly income:
1) below 1500 yuan
2) 1501-3000 yuan
3) 3001-5000 yuan
4) 5001-10000 yuan
5) more than 10000

6. How long have you used Internet:
1) within 1 year
2) 1-2 years
3) 2-3 years
4) 3-4 years
5) 4-5 years
6) more than 5 years

7. How long have you purchased commodity online:
1) within 1 year
2) 1-2 years
3) 2-3 years
4) 3-4 years
5) 4-5 years
6) more than 5 years.

8. Hong long have you searched commodity information online:
   1) less than 1 year
   2) 1-2 years
   3) 2-3 years
   4) 3-4 years
   5) 4-5 years
   6) more than 5 years

9. How much times are you shopping online per month:
   1) less than once
   2) 1-3 times
   3) 4-6 times
   4) more than 7 times

10. How long have you spent in the webpage every time in average:
    1) less than 10 minutes
    2) 10-20 minutes
    3) 20-30 minutes
    4) 30 minutes - 1 hour
    5) more than 1 hour

11. The frequency of your visiting this webpage:
    1) once per week
    2) twice per week
    3) three times per week
    4) four times per week
    5) more than four times per week

12. The total money which you have spent online per month:
    1) 100 yuan or less than 100 yuan
    2) 101-200 yuan
    3) 201-300 yuan
4) 301-500 yuan
5) 501-1000 yuan
6) 1001-2000 yuan
7) more than 2001 yuan
尊敬的先生/女士：
您好！非常感谢您百忙之中抽空来填写此调查问卷！本次问卷的目的是分析消费类虚拟社区中的意见领袖对您的购物意愿的影响。
（注 1：消费类虚拟社区是指主要有消费者参与形成，以商品/服务、购物经历等消费话题为主要互动内容的互联网社区。）
（注 2：此处的意见领袖是指具有一定粉丝量，能够影响到别人的人。他们也被称作“达人”或“版主”等。）
本研究采用匿名的方式，您所提供的信息仅供学术研究之用，决不另作他用，请您安心回答。答案无对错之分，只希望您能够表达自己的真实意见和想法。您的热心参与将有助于本研究的顺利完成，在此向您致以衷心的感谢！

日本东北大学经济学研究科

第一部分：在线活动和选择
1. 您现在主要选择的购物方式是：
   1）主要网下实体店购买
   2）主要网上购买
   3）部分网下实体店购买，部分网上购买，依据商品类型而决定

2. 您认为适合网上购物的商品类别（包括产品和服务）：（单选）
   1）时尚类（如服装、护肤化妆品等）
   2）科技类（如电子商品、高科技商品等）
   3）文化类（如书籍、电影、电视等）
   4）生活类（如食品、家居用品、日用品等）

3. 您在购物前是否会在网上搜寻商品信息：
   1）经常
2）有时
3）偶尔

4. 您如果从网上搜寻商品信息，信息主要来自于：
1）大众口碑
2）达人推荐
3）朋友推荐
4）品牌广告
5）其他

5）在您访问过的消费类虚拟社区中，您访问次数最多的一个是：（单选）
1）淘宝社区、 2）当当社区 3）豆瓣网 4）聚美优品社区 5）美丽说 6）马蜂窝 6）我爱购物网 蘑菇街 8）闺蜜网 9）手机之家 10）中关村在线论坛 11）爱卡汽车社区 12）电玩巴士 13）电脑之家 14）零食控美食社区 15）网易手机论坛 16）新浪化妆品论坛 17）下厨房

6. 在这样的消费类虚拟社区中，您是否有通过达人推荐从而发现商品信息的经验：
1）经常
2）有时
3）偶尔
4）从不

7. 您平时比较关注或者愿意关注哪方面的意见领袖
1）时尚类（如服装、护肤化妆品等）
2）科技类（如电子产品、高科技商品等）
3）文化类（如书籍、电影、电视等）
4）生活类（如食品、家居用品、日用品等） 5）从不

8. 当您浏览网络店铺的商品时，是否会对写有“某某达人”推荐类商品
感兴趣：
1）一定会
2）可能会
3）不会
4）没留意过

第二部分：意见领袖与购买意愿
请注意：请回忆起你最近一次关注消费类虚拟社区上的意见领袖（即达人）的一条推荐信息的经历后，回答下面的问题。（“1”代表完全不同意；“2”代表不同意；“3”代表有点不同意；“4”代表一般；“5”代表有点同意；“6”代表同意；“7”代表完全同意。）

第二部分：意见领袖与购买意愿

<table>
<thead>
<tr>
<th>对意见领袖所在的网站的信任</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 该网站本身是值得信任的。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>T2 我认为在该网站上出现的信息是真实可信的。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>T3 我认为在该网站上出现的信息是专业的。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

关于某商品的信息的质量

<table>
<thead>
<tr>
<th>关于某商品的信息的质量</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQ1 这位意见领袖的这条推荐信息与商品本身相关。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>MQ2 这位意见领袖的这条推荐信息具有时效性。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>MQ3 这位意见领袖的这条推荐信息传递了正确的消息。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>MQ4 这位意见领袖的这条推荐信息是全面的。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>来源可靠性（即提供该条信息的这位意见领袖的可靠性）</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC1</td>
<td>这位意见领袖在相关领域里是有见识的。</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC2</td>
<td>这位意见领袖在相关领域里似乎是专家。</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC3</td>
<td>这位意见领袖是可靠的。</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 关系强度（与这位意见领袖的关系的强度） | 1 2 3 4 5 6 7 |
| TS1 | 我跟这位意见领袖关系密切。 |
| TS2 | 我愿意支持这位意见领袖，如果需要的话。 |
| TS3 | 我愿意花时间跟这位意见领袖交流。 |

| 推荐一致性 | 1 2 3 4 5 6 7 |
| RC1 | 这位意见领袖的这条推荐信息跟其他意见领袖的推荐信息一致。 |
| RC2 | 这位意见领袖的这条推荐信息跟其他意见领袖推荐的信息相似。 |
| RC3 | 这位意见领袖在该领域内与其他意见领袖的兴趣是一致的或相似的。 |

| 先前信念的确认 | 1 2 3 4 5 6 7 |
| C1 | 这位意见领袖的这条推荐信息符合我原先对商品的印象。 |
| C2 | 这位意见领袖的这条推荐信息强化了我已经知道了关于某商品的信息。 |
| C3 | 这位意见领袖的这条推荐信息与我之前知道的信息冲突。 |

| 感知风险 |  |
| PR1 | 我认为在该网站做出购买决定所承担的风险很小。 | 1 2 3 4 5 6 7 |
| PR2 | 我认为在该网站做出购买决定所可能遭受的损失很小。 | 1 2 3 4 5 6 7 |
| PR3 | 我认为在该网站做出购买决定所可能获得的收益很大。 | 1 2 3 4 5 6 7 |
| PR4 | 我认为在该网站可能可以完成一笔好的交易。 | 1 2 3 4 5 6 7 |
| PU1 | 我认为这位意见领袖的这条推荐信息是有价值的。 | 1 2 3 4 5 6 7 |
| PU2 | 我认为这位意见领袖的这条推荐信息对我是有帮助的。 | 1 2 3 4 5 6 7 |
| PU3 | 我认为这位意见领袖的这条推荐信息可以加深我对商品的了解。 | 1 2 3 4 5 6 7 |
| MC1 | 我认为这位意见领袖的这条推荐信息是贴近事实的。 | 1 2 3 4 5 6 7 |
| MC2 | 我认为这位意见领袖的这条推荐信息是正确的。 | 1 2 3 4 5 6 7 |
| MC3 | 我认为这位意见领袖的这条推荐信息是可靠的。 | 1 2 3 4 5 6 7 |
| IA1 | 我赞同这位意见领袖的这条推荐信息。 | 1 2 3 4 5 6 7 |
| IA2 | 我会密切注意这位意见领袖的这条推荐信息，并会听从对方的建议做出购买决策。 | 1 2 3 4 5 6 7 |
| IA3 | 这位意见领袖的这条推荐信息能够促使我做出购买决策。 | 1 2 3 4 5 6 7 |
| IA4 | 这位意见领袖的这条推荐信息提 | 1 2 3 4 5 6 7 |
高了我做决策的效率。

购买意图

<table>
<thead>
<tr>
<th>PI1</th>
<th>我很可能会购买这位意见领袖推荐的商品。</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI2</td>
<td>下次当我需要这样的商品时，我会购买这位意见领袖推荐的这一款商品。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>PI3</td>
<td>我一定会尝试这位意见领袖推荐的这一款商品。</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

第三部分：个人基本信息
1. 您的性别：
   1）男
   2）女

2. 您的年龄：
   1）18岁以下
   2）18-29岁
   3）30-39岁
   4）40岁以上

3. 您的受教育程度：
   1）高中及以下
   2）中专/大专
   3）大学本科
   4）硕士研究生及以上

4. 您的职业：
   1）学生
2）党政机关事业单位人员
3）企业/公司管理人员
4）企业/公司一般职员
5）专业技术人员
6）商业服务业职工
7）个体户/自由职业者
8）退休人员
9）无业/下岗/失业

5. 您的平均月收入:
1）1500 元及以下
2）1501-3000 元
3）3001-5000 元
4）5001-10000 元
5）10000 元以上

6. 您接触网络的时间:
1）1 年以内
2）1-2 年
3）2-3 年
4）3-4 年
5）4-5 年
6）5 年以上

7. 您网购的时间:
1）1 年以内
2）1-2 年
3）2-3 年
4）3-4 年
5）4-5 年
6）5 年以上
8. 您通过网络进行口碑搜寻的时间:
1) 不到 1 年
2) 1-2 年
3) 2-3 年
4) 3-4 年
5) 4-5 年
6) 5 年以上

9. 您平均每月网购次数:
1) 小于 1 次
2) 1-3 次
3) 4-6 次
4) 7 次以上

10. 您平均每次访问该网站的时间:
1) 小于 10 分钟
2) 10-20 分钟
3) 20-30 分钟
4) 30 分钟-1 小时
5) 1 小时以上

11. 您浏览该网站信息的频率:
1) 每周一次
2) 每周两次
3) 每周 3 次
4) 每周 4 次
5) 每周 4 次以上

12. 您平均每个月网购的金额:
1) 100 元及以下
2) 101-200 元
3) 201-300 元
4）301-500 元
5）501-1000 元
6）1001-2000 元
7）2001 元以上
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