

# UNDERSTANDING THE IMPACT OF INTERNET MEDIA ON PATIENT-CLINICIAN TRUST: MODEL DEVELOPMENT AND RESEARCH DESIGN

*Research-in-Progress*

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## **Abstract**

*Patient-clinician trust is one of the major concerns regarding the relationship between the public and the healthcare industry. The development of Internet technology, especially Web 2.0 applications, provides us with a greater ability to exchange information and provide feedback. To describe and measure the impact of ICT-based new media on patient-clinician trust, this paper develops a theoretical model that builds on previous literature in both the healthcare and IS research areas. The paper also aims to explain the differing impacts of online reports (Web 1.0) and online comments (Web 2.0), along with the differing impacts of positive and negative comments. Expected contributions and an agenda for future empirical experiment are also discussed in the paper.*

**Keywords:** patient-clinician trust, Internet media, word-of-mouth, healthcare, Web 2.0

## **Introduction**

China currently faces many challenges as it changes from an isolated, centrally-managed economy to an open market in the global economy (Martinsons 2005). Within this context, healthcare reform has attracted much attention from both academics and practitioners. As the relationship between the healthcare industry and patients has become like the relationship between a business and its customers in the wake of healthcare reform, patients' mistrust of clinicians has become a major concern regarding the relationship between the public and the healthcare industry. Previous studies into the trust between clinicians and patients showed that the relationship was affected by many factors, including the competitive relationship between healthcare resources (Mechanic and Schlesinger 1996; Emanuel and Dubler 1998), the care and empathy from the clinician during the treatment process, the protection and respect of the patient's privacy (Thom and Campbell 1997), the perceived trustworthiness of the clinician, and the communication between the clinician and the patient (Mechanic 1998). However, when we examine recent, important healthcare events, we find that the mass media are making an important difference (Andressen et al. 2006). The rapidly expanding Internet, websites, BBS, blogs, microblogs and other Internet media forms are playing a more and more important role in information transactions throughout society (Flanagin and Metzger 2001; Gable 2006). Because new Internet media types are both broad and interactive, it is possible for them to draw public attention and generate word of mouth, further affecting public trust in the healthcare system.

One such example was a recent event in which a young Chinese singer died after cosmetic surgery. After this accident, the hospital first tried to hide the information. It received no attention until an informal report about the incident appeared on the Internet and a few of the singer's friends further explored and published information about the event on the Internet. Then related information was re-published on microblogs, which drew the government's attention. Finally, the Ministry of Health of the People's Republic of China took charge of the incident. Afterwards, due to the severity of this event, the government took a series of actions to regulate the cosmetic industry, but the public still expressed serious doubts about cosmetic surgery and related fields because of the irresponsible actions of the hospital. From this brief review of the event, we can see that Internet media and the online users played an important role in generating public attention and exposing the truth.

Web 2.0 provides a solid base and diverse means for multilateral online interactions. By using Web 2.0, people may obtain information not only from Internet media but also from user comments, which indicate public opinion (Wang and Wei 2006). These comments function as an online form of word-of-mouth, and they affect the public's perception. Past studies about word-of-mouth have tended to focus on E-Commerce, and they have found that word-of-mouth usually influences consumers' decisions and preferences about purchasing certain goods. These studies have shown that people tend to buy goods with greater quantities of comments posted in online shopping forums (Alanah and Deepak 2007). As a means of virtual transaction, E-Commerce requires a relatively high level of trust between each participant (Jones et al. 2000). There are many factors affecting trust in the field of E-Commerce, such as the quantity and quality of the information, the complexity and usability of the information, and the reputation, competitive advantage, and sensitivity of the content provider. These many factors determine whether a consumer chooses to trust an online merchant. Though has intrinsic differences in its ultimate goals, trust in patient-clinician relationships resembles trust in E-Commerce in many practical ways. In both two behavior patterns, trust results from the judgment of massive quantities of information and, ultimately, affects the behavior of the consumer or patient. Therefore, in this paper, we introduce the concept word-of-mouth to explain how reports in online media and the related comments affect the trust between clinicians and patients. In the other sections of this paper, we will briefly review related research and provide our theoretical model and hypotheses. The research design and expected contributions will also be discussed.

## **Related Literature**

### ***Patient-clinician Trust Research***

Trust is a kind of anticipation of others' behavior (Mayer et al. 1995). It can also be described as a kind of voluntary desire to do something or accept certain possibilities without having total control over the situation (Baier 1986). In medical systems, the specific definition of trust is the anticipation of how the healthcare system will function and how the clinicians will behave throughout the treatment process (Anderson and Derick 1990; Thom and Campbell 1997). Many scholars focus on the measurement of the trust between patients and clinicians. The theoretical work primarily focuses on the construction of a conceptual framework. Such work indicates that patient-clinician trust can be measured by the relationship between clinicians and patients, the sympathy of the clinician toward the patient, the patient's understanding of the situation due to the clinicians' efforts (Thom and Campbell 1997), and the clinician's level of credibility.

Some empirical studies mainly focus on developing specific methods based on a conceptual framework to measure trust in a special field. Kao et al. (1998) measured trust in the patient-clinician payment relationship in this way. Hall et al. (2001) adopted additional elements to measure overall levels of patient-clinician trust, such as whether there were disputes between patients and clinicians, whether patients change their opinions of clinicians, and whether the patients follow the clinicians' advice for treatment. Those studies also have developed their own questionnaires that aim to measure patients' trust in the healthcare system.

Recent research has paid more attention to the factors outside the patient-clinician relationship. The media is a powerful force in shaping public opinion outside of the healthcare system. The information offered in media reports includes facts and reporter's opinions about certain issues. When these types of facts accumulate, they provide a solid basis for the formation of certain judgments about a particular issue. When these reports reach the public, they give weight to the issue and sway public opinion. Because of the healthcare system's special features, including its high levels of professionalism and relative isolation, the media is even more influential here.

With the rapid development of ICTs, no one can deny the new media's power to influence patients' trust in the healthcare systems (Avery 2009; Radford 1996). However, research on how Internet media and online word-of-mouth influence patient-clinician trust is still scarce.

### ***E-Commerce Trust Research***

The studies of E-Commerce are related to several other fields, such as MIS, psychology, sociology, and marketing. Various theories, such as theory of reasoned action (TRA), theory of planned behavior (TPB), technology-acceptance model (TAM), transaction-cost economics, Belief-inoculation theory theory, and trust-transmit theory have been adopted in E-Commerce research (Zhu 2004).

Previous studies on determinants can be divided into two categories: the first are concerned with the factors that affect trust in the context of E-Commerce, and the second consider how these factors take effect. There are many factors related to consumers' trust of E-Commerce. Elements related to websites are the most frequently studied. These include the website's features, the quality and quantity of information, customer satisfaction, and the usefulness and sensitivity of the information. There are also certain trust factors related to online shopping. Factors related to the safety and privacy of online shopping are very important, and personal experiences of and familiarity with online shopping also matter.

Word-of-mouth is defined as noncommercial public communication about commodities (Chungtae et al. 2006), and it is considered to be a factor that influences public trust in E-Commerce. Word-of-mouth is usually generated in loose or intensive social networks, and the material value of goods that provide entertainment usually brings more positive word-of-mouth (Wu 2009). The advertisements on Facebook are actually aiming to provide a basis for the generation of word-of mouth (Zhang 2009). The effectiveness of word-of-mouth is related to customer acceptance toward the products or services. A study

conducted by Wang et al. (2006) shows that both negative and positive evaluations affect people's judgment about a certain commodity; however, negative comments appear to have a more powerful influence (Cheung et al. 2008).

There is no doubt that there are already many interesting and valuable studies about trust in E-Commerce. From a broader perspective, E-Commerce is a form of relationship between the commodity or service provider and the consumer. This study focuses on analyzing trust in the narrow field of E-Commerce in order to strengthen the explanatory power of existing E-Commerce trust theories.

### ***Internet Media and Word-of-Mouth Research***

Introduced in April 2003, Web 2.0 is a term used to describe various novel changes occurring on the Internet. To some extent, Web 2.0 is technically different from web 1.0, but the key differences are associated with the use of Web 2.0 technologies in social networks and multi-directional communication platforms (Cormode and Krishnamurthy 2008). In this way, Web 2.0 provides the possibility for online interaction. Reports published on Internet media platforms and the user comments under the reports are actually two different mechanisms affecting readers. The reports are authoritative information issued from the website, and they primarily provide the basis for communication and interaction. While the comments generate word-of-mouth, word-of-mouth is first and foremost considered to be a kind of marketing tool (Chao et al. 2009).

On the one hand, word-of-mouth can be considered as a result of information exchange, so it can be measured as a result variable (Brown et al. 2005). On the other hand, it can be considered as a determinant of consumers' purchasing decisions and their evaluation of the product afterwards. In this context, word-of-mouth updates to online word-of-mouth are defined as comments posted on the Internet by consumers about certain products without commercial purposes. These evaluations will be transmitted via the Internet to other people as well (Park et al. 2009). Recent studies have found that online word-of-mouth generated in bulletin board systems influenced audience ratings of television programs (Kozinets 1999). Word-of-mouth generated within the professional virtual community regarding wedding design apparently affects consumer choices (Nelson and Otnes 2005). Schindler and other scholars carried out several deep interviews and summarized the mechanisms in which online word-of-mouth affects consumers' decision-making processes. Online word-of-mouth not only provides information about the benefits of certain purchasing behavior, but it can also help consumers compare different choices and provide evaluation criteria.

Summaries of online word-of-mouth show that the influence of word-of-mouth on consumers' behaviors and judgments is widely recognized, and the specific factors and mechanisms have been thoroughly studied. Because healthcare services are actually a kind of commodity, patient-clinician trust involves a kind of psychological recognition of the healthcare care system and because the behavior model of patients resembles that of consumers, we conclude that online word-of-mouth may also be used to analyze how the reports and comments on online media websites affect patient-clinician trust.

Though the ultimate purposes of healthcare services and business are different, on a practical level, these two areas have much in common and function with similar mechanisms. Trust is a very important part of these mechanisms. Present studies of trust in these two areas draw upon similar findings from many fields, such as psychology, sociology and communication. Although trust between patients and clinicians is measured differently from consumer trust in E-Commerce, determinants for both can be categorized in two ways: 1) the quality of the health system or business objective and 2) the quality of information exchange. The second part is, in fact, more flexible than the first. According to studies in the field of E-Commerce, trust is influenced by word-of-mouth in the media to a great extent. Taking the similarity of trust in the healthcare system and that in E-Commerce into consideration, applying studies of word-of-mouth to the study of patient-clinician relationships is both meaningful and practical. Doing so will contribute to developing and deepening the mechanisms of trust in the healthcare field.

## Theoretical Framework

As mentioned above, on the one hand, studies of the influence of Internet media highlight the Internet's influence in the healthcare industry, and that, on the other hand, studies of the factors that influence patient-clinician trust show that Internet media is an apparent influencing factor. As a patient-clinician relationship is already recognized, further study is both necessary and possible. An empirical study of tumor patients shows that Internet media apparently influence the perceptions and behaviors of tumor patients (Chen and Siu 2001). Telephone surveys of the American public reflect that the release of information via Internet media outlets has positive effects on the patient-clinician relationship (Murray et al. 2003). The influence of Internet media on the patient-clinician relationship is widely recognized among both scholars and the healthcare system. Clinicians have already attempted to improve patient-clinician trust using Internet media (McMullan 2006). Due to the interactive features of Internet media, their influence is not limited to the reports themselves, but rather the user comments also affect the readers (Sisask et al. 2005). This study focuses on both social and scientific reports published by Internet media (Nelson 2005), along with the subsequent online public comments (Kahn and Kellner 2004). The influencing mechanisms can be categorized as either direct influence or indirect influence (Darmanin 1999), and the results of the influence can be characterized as positive, negative or neutral (Apollonio and Malone 2009).

Patient-clinician trust is a broad concept (Bachinger et al. 2009). In this study, we focus on the patients' trust regarding the healthcare system; personal trust between clinicians and patients is not included in this analysis. In previous studies about trust, trust is categorized in many ways. We adopt a relatively simple but effective categorization here: high trust versus low trust (Lee and Lin 2008).

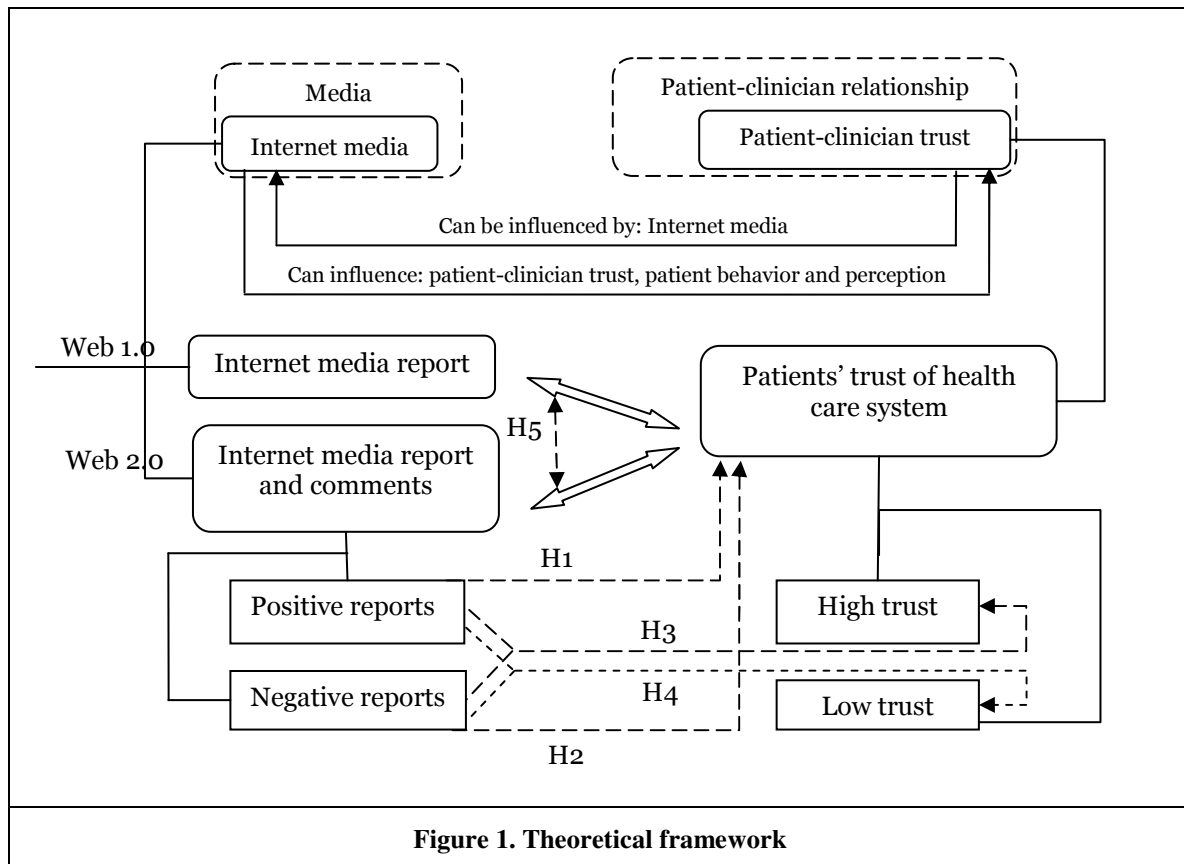


Figure 1. Theoretical framework

A related question is whether the relationship between Internet media and patient-clinician trust also exists in narrower categories. A further question is whether and how positive reports and comments function differently than negative reports and comments. These are the fundamental questions that will

be addressed in this paper. Figure 1 shows the theoretical framework. We employ both academic and practical knowledge to clearly define and categorize positive and negative reports and comments.

This study's theoretical approach draws upon previous studies' results. This study's methodology is to grade specific materials and then categorize the materials based on their grades. A problem that may exist here is that there are two types of influencing factors—reports and comments—and the categorization process will be difficult if these two factors send different kinds of messages. This methodological question has not been addressed in the previous literature, which is why this study grades materials through a pre-experiment. Grading can reflect integrated information, which is exactly what we need. The categories of high trust and low trust were defined based on the previous theoretical study results, and questionnaires are used in this study to measure and categorize the levels of trust.

Compared to Web 1.0, the main difference in the Web 2.0 environment is the improvement in the quality of interactions. In this study, Web 2.0 content comprises both Internet reports and user comments. The question is whether this change will influence patient-clinician trust, and we have designed related parts of the experiment to answer this question.

The two main elements discussed here are Internet media and patient-clinician trust, and they are studied within the range of two larger fields: the media and patient-clinician relationships. From previous studies, we learned that patient-clinician trust can be influenced by Internet media and that Internet media has an influence on patient-clinician trust, patient behavior and patient perceptions. These findings support the primary hypothesis in this study.

After refining the two main elements based on our study's purposes, we focused on Internet media reports, public comments on the Internet media, and patients' trust of the healthcare system as a factor in patient-clinician trust. We found that it is appropriate to discuss these elements within the context of both web 1.0 and Web 2.0. The differences between these two contexts expand and enrich our study.

To test the relationship between Internet content and patient-clinician trust more precisely, we characterized Internet reports and comments as either positive or negative, and we categorized patients' trust in the healthcare system as either high trust or low trust. Based on the theoretical framework, five hypotheses are posited:

*H1: Positive Internet media reports and comments have no significant influence on patient-clinician trust.*

*H2: Negative Internet media reports and comments have a significant influence on patient-clinician trust.*

*H3: High-trust patients have a higher possibility of being influenced by positive Internet reports and comments than low-trust patients.*

*H4: Low-trust patients have a higher possibility of being influenced by negative Internet reports and comments than high-trust patients.*

*H5: In the Web 2.0 context, the combination of reports and comments makes Internet media a more significant influence than in a Web 1.0 context, in which online real-time interaction is not possible.*

## **Methodology**

In the study of trust, the experimental method is not frequently used; however, in recent years, it has gained more acceptance. Avner and Louis (2009) used the experimental method to study the relationship between trust, interaction and contact and to determine the cause-and-effect relationship between elements. They found that improving communication can raise trust and that contact does not necessarily improve trust. Kyprilidis and Gallagher (2003) conducted experiments on the Internet and came to the conclusion that Internet interaction affects the levels of alcohol abuse among students. These examples indicate that the experimental method is feasible in an Internet environment. From the previous literature, we can see that the experimental method is possible to utilize in this study, and it is very helpful in understanding the causal relationship between factors. At the same time, we are cautious about the limitations inherent to our experiments.

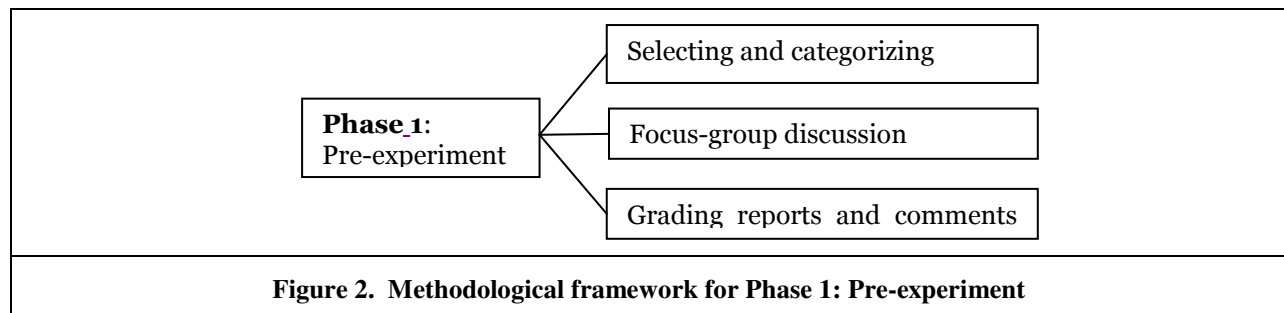
In this study, the principles of the experiments are as follows: the process should be clear and operable, the data should be comprehensive, the experiment should be reliable and effective, and the risks should be controllable. The process of analysis extracts further data. The inherent risks and uncertainty are accounted for in the experimental design, and the analysis aims to mitigate any experimental design flaws that may exist.

The experiment as a whole consists of the pre-experiment and a three-step main experiment, as indicated in figure 2.

### ***Pre-experiment***

The pre-experiment has two purposes: 1) to modify the existing hypothesis and 2) to prepare for the main experiment. This process includes the following steps. First, several pre-experiment participants will be selected, and information for the main experiment will be collected. Then, the participants will be divided into several groups, and each one will have a focus-group discussion about the influence of Internet media on patients' trust in the health care system. The information collected here will be helpful in designing the questionnaire.

After the focus-group discussions, materials for the main experiment will be distributed to the pre-experiment participants, and these materials will be scored and categorized as positive or negative. The materials will consist of two parts, the first being Internet media reports that may related to the patient-clinician relationship, and the second being the public comments under these reports. Both of these parts will be scored by the focus groups using similar scoring techniques. The scoring scale will range from extremely negative to extremely positive. Each report will receive one score, and the comments after each report will each receive a score. Both scores will be added together to result in a total score for each piece of material. If the number of online comments for each report is greater than one, the scores for the two parts will be weighted and totaled in order to keep a proper balance between the report and the comments. During this process, the materials not designated as clearly positive or negative will be removed from the selection pool.



**Figure 2. Methodological framework for Phase 1: Pre-experiment**

### ***Main experiment***

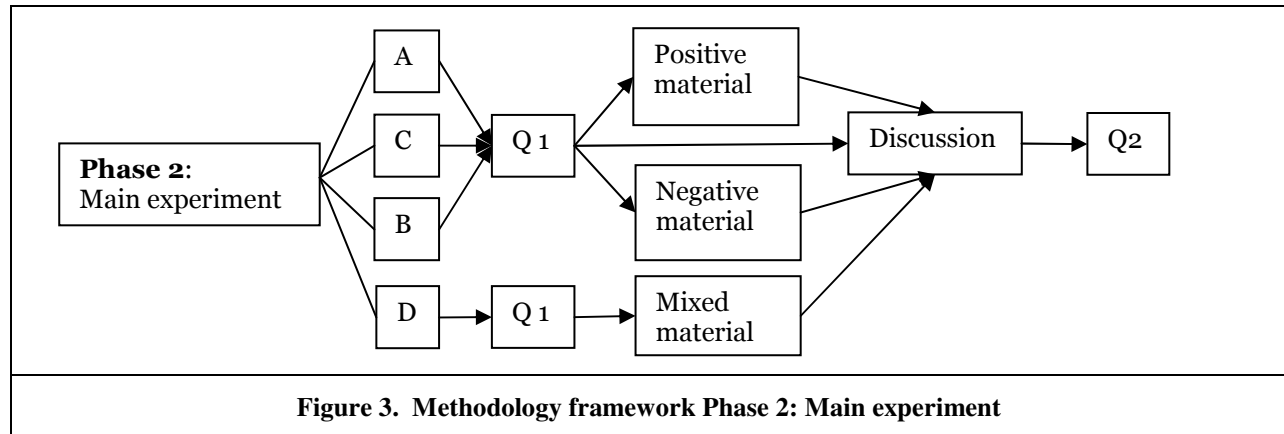
A group of people approximately five times larger than the number of pre-experiment participants will be selected and randomly divided into four groups: A, B, C, D. The number of the participants will be determined based on past related studies.

This experiment will be designed to have three steps:

*Step 1:* Questionnaire 1 (shown as Q1 in Figure 3) is distributed to participants in all four groups. Then every participant is given the same amount of time to answer the questionnaire. All of the questionnaires are collected once completed. Questionnaire 1 is primarily concerned with measuring the participants' trust and sensitivity toward Internet media and the healthcare system.

*Step 2:* Positive Internet reports and comments are shown to group A, while negative Internet reports and comments are shown to group B. Group D views Internet reports without comments, while group C views no material. Each group reads the material (or looks at no material) for the same amount of time and then

discusses it for several minutes. The exact amount of time given is based on the quality and quantity of the materials.



*Step 3:* Questionnaire 2 (shown as Q1 in Figure 3) is distributed to groups A, B, and C, and every participant is given the same amount of time to answer the questionnaire. Then all of the questionnaires are collected after completion. Questionnaire 2 is designed to measure the participants' trust of the healthcare system and to collect the participants' demographic data.

### Data Analysis

In this experimental design, Questionnaires 1 and 2 are different, and thus, it is not inappropriate to use the same group of participants to conduct the comparison. Therefore, group C is used here as a control group.

We consider this comparison to be reasonable for three reasons: first, the demographic differences between groups A, B, C, and D are not sufficiently significant to affect the effectiveness of the comparison. The hypotheses can be verified in SPSS. Second, the distribution of the participants' trust and sensitivity toward Internet media in groups A, B, C, and D are not different enough to affect the effectiveness of the comparison. This hypothesis can also be verified in SPSS. The final reason is that the four groups are statistically similar and, thus, that the comparison is effective.

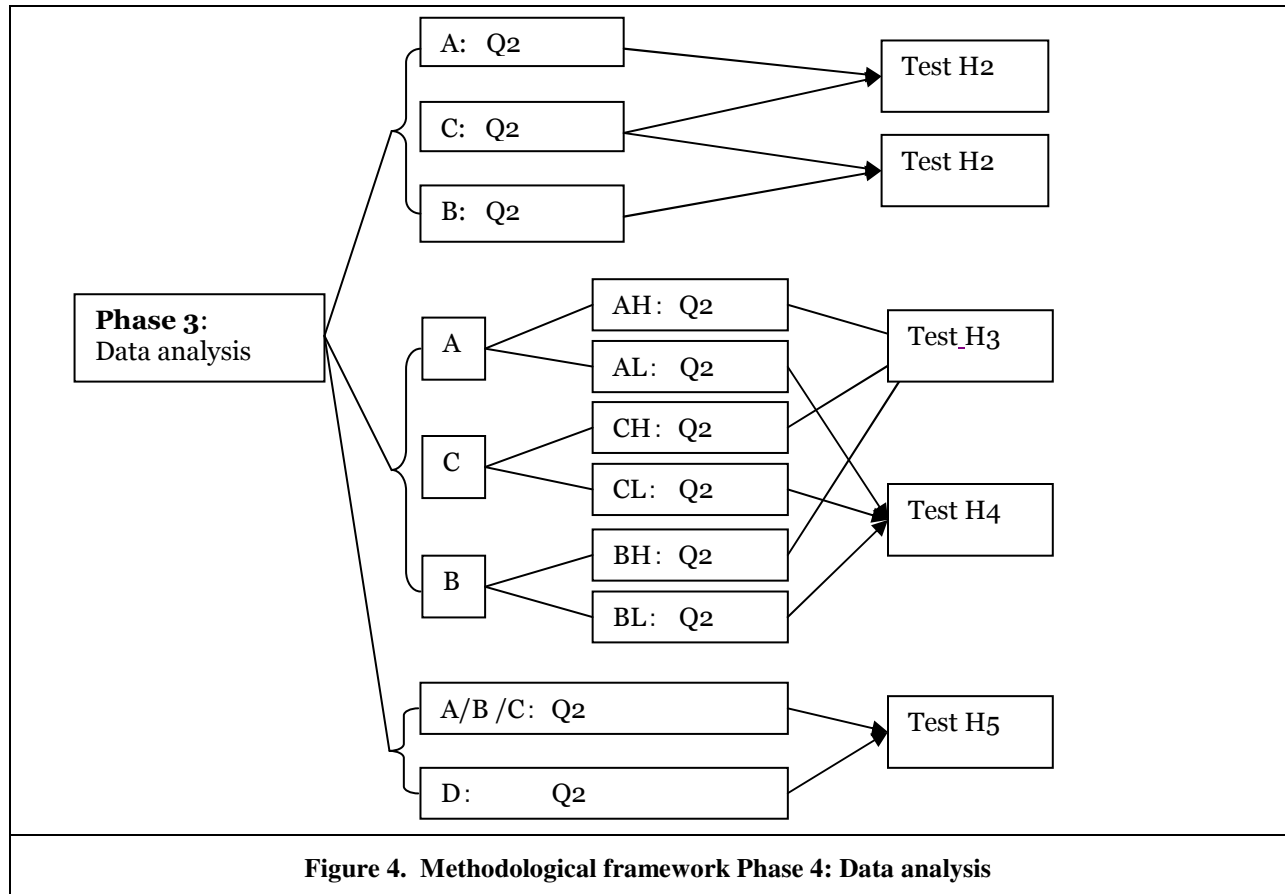
### Expected Contributions and Limitations

This study's findings are expected to contribute both academically and practically. In a practical aspect, this study provides additional evidence that online media have the power to influence patient-clinician relationships. This study also suggests ways in which the media might affect these patient-clinician relationships. There are already many hospitals attempting to adopt Web 2.0 Internet technologies to improve service quality and the relationships between patients and doctors.

There are thousands of hospitals registered in the three main microblog platforms, Sina Microblog, Sohu Microblog and Tencent Microblog. Many of these hospitals are already using microblog platforms effectively to communicate and advertise their services. For example, Chaoyang Hospital is a 3A-level hospital in Beijing that adopted microblogs in 2011. The hospital has an institutional blog, and the managers and renowned doctors all received individual microblogs. Microblogs serve not only to facilitate communication within hospital system but also to provide quick and effective interactions between the hospital and patients. During the Super Bacteria event in Beijing Anzhen Hospital, for example, when rumors about the existence of super bacteria in Anzhen Hospital caused panic among patients, the hospital management published a clear and persuasive announcement in its institutional microblog to combat rumors and restore patients' trust in the hospital. In this way, the hospital reversed its worsening patient-clinician relationship. There are many other examples of the positive effects of microblogs on patient-clinician relationships; however, the total mechanism is not yet mature, and additional hospitals



are waiting to see whether they wish to implement similar strategies. Thus, this study regarding the function and utility of online reports and comments helps hospitals to weigh the advantages and disadvantages of using Web 2.0 technologies. In this way, better choices may be made according to different hospitals' situations.



In an academic respect, this research takes place at the intersection of Internet media and patient-clinician trust, and it aims to make contributions to both of these fields. The contribution of Internet media research is primarily to expand upon earlier studies' findings and to strengthen the explanatory power of these theories. The study's contribution toward understanding patient-clinician trust is mainly in exploring the ways in which Internet media reports and comments influence patients' trust, especially in the Web 2.0 context, when real-time online interactions are possible. This study's experimental design aims to expand the methods of study method between these two domains, clarifying the causal relationship between various factors.

This study's limitations are primarily its research design and the categorization of factors based on previous literature. Whether these categories are suitable for this study is not yet clear, and better categories may yet be discovered. In addition to its theoretical contributions, this study also contributes to practical fields. This study will provide not only theoretical evidence but also inspiration for how to use Internet media to improve patient-clinician trust.

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