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THE INFLUENCE OF
INFORMATION-SEEKING
STRATEGIES ON UNCERTAINTY IN
ELECTRONIC COMMERCE

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NOVEMBER 2009
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The Influence of Information-seeking Strategies on Uncertainty in Electronic Commerce
網上交易中信息搜尋策略對交易不確定性之影響

Submitted to
Department of Information Systems
信息系統學系
in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy
哲學博士學位

by

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November 2009
二零零九年十一月
Acknowledgement

First, I will give my thanks to my supervisor, Dr. SIA Choon Ling. He gave me many valuable suggestions and helps during the topic selection, writing and amendment of this thesis. He is so kind and with full of patience to help me improve my research, without his supervision, I cannot successfully finish this thesis. I also want to thank my co-supervisor from University of Science and Technology of China, Prof. Chen Huaping, he also gave me strong supports and encouragements during my whole Ph.D research process. The advices from my two supervisors will benefit me in my whole life.

Thanks to my panel members, Prof. WEI Kwok Kee, Prof. LIANG Ting Peng, Prof. TEO Hock Hai, Prof. XU Weixuan and Prof. HUA Zhongsheng. They gave me a lot of insightful and valuable comments on this thesis. Thanks to Dr. TAN Chuan Hoo, for his kindly encouragements and guidances.

Also, I would like to thank my classmates and friends, Miss SHI Yani, Miss YANG Jinbi, Miss WANG Nan, Mr SUN Yongqiang, they also gave me many helps during my research career.

Finally, special thanks to my parent, my girl friend, for their encouragements, and their love.
Abstract

Online consumer behavior is inherently uncertain given that consumers cannot completely predict the consequences of online transactions. Although uncertainty has been widely considered as one of the primary barriers to online transactions, past research in online commerce has focused predominantly on trust building, but has not adequately examine this important pre-trust-building stage: acquiring information and thereby reducing uncertainty about online sellers, they only view it as a contingent conditional variable or a background mediator without sufficiently investigating its origin during the online transaction process. This research will therefore investigate the antecedents of uncertainty. It aims to help researchers and practitioners comprehend the function of transaction uncertainty more deeply in electronic commerce (EC).

This research explores the effectiveness of the information acquired from four groups of information-seeking strategies (passive, active, extractive, and interactive), categorized by the Uncertainty Reduction Theory (URT) and the Computer-mediated Communication (CMC) Information-seeking Strategies Model (ISSM). This is applied to online consumers’ perception of uncertainty when initially transacting with an unknown online store in an online marketplace in China. Also, two most prominent contextual factors will be integrated, namely, information consistency and seller reputation, originating from Kelly’s Attribution Theory (KAT), to explore their direct influences, as well as their interactive effects with information from different information-seeking strategies on the perception of transaction uncertainty.

An online survey is used to collect data from the three most prestigious online store marketplaces in Mainland China. The statistical results strongly support the theoretical
model and specify the exact influence of the information from different groups of information-seeking strategies on online consumers’ transaction uncertainty perception in different kinds of contextual conditions. The probable reasons for the supported and rejected hypotheses are discussed, and theoretical and practical implications will be proposed. We believe the findings of this research would be instructive for EC and IS researchers to further understand the internal mechanism of transaction uncertainty. In addition, it could inform practitioners of IS and EC to adopt valid and effective measures to help the potential consumers reduce their perception of transaction uncertainty in online consumer-to-consumer (C2C) transaction processes.
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Chapter 1 – Introduction

1.1 Research Motivation

The continued growth of electronic commerce (EC) has made it be a popular research topic. During the initial stage of an online transaction with an unknown online store, consumers have an inherently high level of uncertainty perception towards transacting at the store since the consequence of the transaction cannot be perfectly predicted (Ba et al. 2002; 2003; Pavlou et al. 2007). A high level of transaction uncertainty perception raises online consumers’ risk perception, which indicates consumers’ subjective perception of suffering (Chiles et al. 1996), thus restraining their online purchase intention (Pavlou 2003). As previous studies” (Gefen 2000; Ramirez et al. 2002; Tidwell et al. 2002) description, to reduce the high uncertainty perception, a fundamental activity consumers would engage in is to seek required transaction information (e.g. product information, seller information, etc) from various information sources or cues, which helps them conquer their anxiety on information asymmetry originating from the spatial and temporal separation between sellers and consumers. This enhances their confidence in perfectly predicting the consequence of the transaction, thus resulting in consumers finally making their transaction decision (Ba et al. 2003; Hunter et al. 2004).

This information-seeking behavior can take a more significant role in online consumer-to-consumer (C2C) transactions. This is because in C2C transactions, consumers and sellers are commonly both unknown individuals; therefore, consumers perceive a rather high level of uncertainty compared with transactions with a reputed online sale company (e.g., business-to-consumer (B2C) transactions in which online consumers transact with a well-known online store). Thus, it is natural to presume that
consumers would depend more on the information-seeking and gathering process in a C2C transaction. By evaluating the obtained information (Hu et al. 2004; Jones et al. 2008), online consumers can have clearer knowledge about transaction-related issues, thus obtaining more confidence in predicting the future behavior of the online sellers. This finally reduces the high uncertainty level regarding the unknown seller during the online transaction process.

Thus, this research will adopt the online C2C online transaction as the research context, and to investigate how the online consumers’ information-seeking behaviors can affect their perception of transaction uncertainty.

1.2 Research Objective

Theoretically, uncertainty reduction and the associated information-seeking behaviors have been viewed as critical factors in the process of relationship development between individuals (e.g., Berger et al. 1982). The Uncertainty Reduction Theory (URT) (Berger et al. 1975) categorized people’s information-seeking behaviors from various information sources or cues into three mutually exclusive groups of information-seeking strategies in traditional face-to-face (FtF) communication context, namely, passive information-seeking strategies (PAIS), active information-seeking strategies (AIS), and interactive information-seeking strategies (IIS). PAIS refers to the acquisition of information about a target through unobtrusive observation without affecting the target’s behavior. AIS involves acquiring information from other individuals actively but without direct interaction with the target. IIS requires information seekers to directly and obtrusively exchange information with the target to elicit the desired information.
Obviously, there are many different characteristics between real world and Internet communication, and as a result, people may act differently in different communication contexts. For example, in the real world, people could use verbal communication and nonverbal affiliative expressions to interact with others in order to reduce their perception of uncertainty. They could seek information from other people who might be familiar with the target person to obtain more information. Furthermore, they could depend on the communication environment, the intimacy level of the content, the normal reciprocity rate, their liking and similarity level with the counterpart, and others in order to form their perception of uncertainty (Berger et al. 1975).

Whereas, in computer-mediated communication (CMC) environments, it eliminates or severely reduces many cues available in the real world to address uncertainty (Ramirez et al. 2002), such as, in CMC, verbal communication and nonverbal affiliative expressions are difficult to carry out, both sides of the communication lack key contextual information, and they cannot interact in various situational contexts. Altogether, in CMC, because of restricted communication contexts with the target and the mitigation of extra-interactional observations, people cannot use many traditional cues to form impressions, develop relationships, and reduce their high level of uncertainty at the initial interaction stage.

However, these limitations and restrictions do not mean CMC could not significantly influence the communicators’ perception of uncertainty, as some research indicates, the relationship development process between individuals not only includes FtF interaction in the physical world, but also includes communication through the Internet (Wathen et al. 2002). As Ramirez et al. (2002) point out, CMC environments can offer alternative mechanisms to acquire information about targets, which help information seekers form
their cognition. Examples include online information seekers browsing various Web sites, using e-mail, search engines, and instant messengers (IMs) to obtain the required information. Ramirez et al. (2002) further propose a CMC information-seeking strategies model (ISSM) that improves the URT categorization of information-seeking strategies with necessary adaptations based on the novel attributes of the Internet, they further add a unique group of information-seeking strategies that is only available on CMC into the information-seeking categorization, named extractive information-seeking strategies (EIS). EIS is the unique information strategies available only in CMC, which utilizes the aggregation and storage function of Internet technologies based on the social information provided by various Internet users.

In conclusion, Ramirez et al. (2002) categorize people’s online information-seeking behaviors into four groups of strategies, and they consider these four groups of information-seeking strategies are mutually exclusive and can represent all online information-seeking behaviors executed by the online information seekers.

To be specific in the context of C2C online transaction, the online consumers can easily adopt all of the four information-seeking strategies since the Internet has provided them with numerous information sources or cues to seek transaction information. And according to a series of interviews with 35 online consumers made by us previously, most of them acknowledge that during the C2C online transaction process, they will try to seek and collect transaction information from various information sources or cues, instead of only viewing the seller-provided information, to help them reduce their high uncertainty perception at the initial stage of the transaction process, and thus finally make their purchase decision. However, extant IS and EC research has not adequately addressed how the information from different sources or cues is utilized by consumers,
it is still unclear how the information from different information sources or cues, by utilizing different information-seeking strategies, can affect online consumers’ transaction uncertainty perception. Thus, research identifying the exact effects of information from different sources or cues on online consumers’ transaction uncertainty perception is significant.

Grounded in the theoretical framework proposed by URT and ISSM, this research seeks to uncover how the information from these four seeking strategies can affect online consumers’ perception of uncertainty, when initially transacting with an unknown seller in an online marketplace in China. Specifically, we explore whether the transaction information from each, or some combinations of the four seeking strategies could effectively alleviate consumer uncertainty perception. This could have important implications for the design of online stores’ websites, particularly in deciding what kinds of information sources to harness for such websites, to effectively manage consumers’ uncertainty.

Additionally, online consumers are probably face different contextual conditions embarking on an online transaction. It is likely that under different contextual conditions, the acquired information from various sources or cues might have different effects on the consumers’ perception. As confirmed by KAT and numerous other studies, seller reputation and information consistency are the two most crucial contextual factors to affect the online consumers’ perception of the acquired information during the transaction process (Cheung et al. 2009; Eagley et al. 1978; Hovland et al. 1951; Kelley 1967; 1971; 1973; Wathen et al. 2002; Zhang et al. 2003). These studies state that if information is consistent with others, or the seller is known to be highly reputable, then positive information about it would be more persuasive. This
facilitates consumers’ reaction that “this is likely to be true” and thus can reduce their perception of uncertainty. However, until now, there have been relatively little IS and EC studies have explored the different effects of different kinds of information (acquired through various information-seeking strategies) on online consumers’ uncertainty perception under these different contextual conditions. To fill this gap, we will investigate these issues in this study.

KAT further proposes that information consistency and seller reputation can jointly affect online information seekers’ perception on the acquired transaction information. This theory states that persons’ causal attribution process might not depend monotonously and separately on seller reputation or information consistency; instead, they may also rely on both contextual factors when evaluating the acquired information and the final decision-making process. Therefore, these two contextual factors might jointly exert an interactive impact on the online consumers. Consequently, it should be interesting to investigate these two contextual factors’ joint moderating effects on the causal relationship between acquired transaction information (from various seeking strategies) and the uncertainty perception. This research thus will do some additional test to identify if the contextual factors could jointly affect online consumers’ perception on the acquired information (three-way interactions). This could help to generate insights on the conditions under which the impacts of the information from four information-seeking strategies to reduce uncertainty can be altered.

In conclusion, this study will initially explore the direct effects of information from different information-seeking strategies, as well as the direct effects of the two contextual factors, information consistency and seller reputation, on online consumers’ perception of transaction uncertainty when initially transacting with an unknown online
store in an online marketplace in China. It will be followed by an investigation of the two contextual factors’ respective moderating effects (two-way interaction) between acquired information from different strategies and uncertainty perception in the second research model. Finally, the possibility of the three-way interactions will be tested.

This study has both theoretical and practical contributions. It is one of the first investigations in the IS and EC domains that applies the four groups of information-seeking strategies categorized by URT and ISSM to investigate how the transaction information acquired from these groups of strategies can affect the online consumers’ perception of transaction uncertainty in the C2C transaction process, this study also integrates the two most important contextual factors proposed by KAT, to investigate their direct effects, and the interactive effects with the information, on this uncertainty perception. We empirically identified which contextual factors can significantly affect consumers’ uncertainty, as well as which contextual factors have two- or three-way interactions with information from the four groups of information-seeking strategies that affect uncertainty perception. This research also has significant practical implications for practitioners. EC and IS practitioners can refer to the findings to obtain a deeper understanding of the factors that significantly affect the cognitive process of online consumers in different contextual conditions, and then to make informed decisions as well as corresponding improvements.

1.3 Thesis Structure

This thesis is structured as follows: Chapter 1: Explain the motivation for this research, interpret why we explore online consumers’ uncertainty, and propose the research questions. Chapter 2: Describe general knowledge on EC and the difference between
EC and the traditional transaction mode; and introduce C2C online transaction and the current C2C transaction situation in China. Previous literature on online transactions is also included in this chapter. Chapter 3: Describe the overall theoretical foundation for the study. Chapter 4: Propose the theoretical model and hypotheses. Chapter 5: Present the methodology. Chapter 6: Report the analyses and the statistical results. Chapter 7: Discuss the research findings and limitations, and propose future research fields. Chapter 8: Conclude the study with an interpretation of the theoretical and practical implications of the result.
Chapter 2 – EC and C2C EC in China

2.1 General Description of EC

EC refers to business transactions conducted electronically using computers and a communication network. EC transactions are divided as follows (Turban et al. 1999): consumer-to-consumer (C2C), business-to-business (B2B), business-to-consumer (B2C), consumer-to-business (C2B), nonbusiness EC (use of the Internet by nonbusiness organizations such as academic institutions or government agencies to reduce expenses or improve services), and intrabusiness EC.

2.2 The Difference between Online and Traditional Transaction Modes

In the traditional transaction mode, if consumers want to buy products or services, they could go to physical stores to directly observe and experience the product or service personally. After consultation and negotiation, if both sides are satisfied with the transaction, the consumers pay for the product/service, then the sellers make an instant delivery, with the payment and delivery confirmed by both sides synchronously at the same physical location, thus completing the transaction. In addition, the two transactions should also agree on the disposal of post-sale service and the solution to possible disputes.

In online transactions, because of physical distance, the transaction cannot be processed in the same way as in the traditional mode; it needs to be conducted through the Internet. If consumers want to buy products/services online, they cannot personally experience them because of the decentralization of the physical location; they can only seek
information through cues that Internet technologies provide (Gefen 2000; Hosmer 1995; Rousseau et al. 1998), which is a significant difference as compared to the traditional transaction process.

Another significant difference is the mode of monetary payment and delivery of goods, as both transaction sides cannot process them synchronously and directly online. Commonly, in online transactions, after both sides agree on a transaction, the consumer will remit or transfer the money into the sellers” account, and the sellers will deliver the goods to the consumer’s address. However, with this asynchronous money payment and goods delivery process, both sides may encounter transaction fraud owing to physical location decentralization. For example, online consumers might confirm payment by sending fake money orders. However, it is more common that online consumers are defrauded (Pavlou et al. 2005); for instance, online sellers might refuse to deliver the promised goods, or deliver defective or fake goods after receiving the money.

Generally, for online transactions, because of the separation of the physical location, online consumers do not have access to live information through the Internet, and thus they have a higher level of transaction uncertainty perception as compared to that in the traditional transaction process. Furthermore, the separation of payment and delivery in online transactions due to space and time decentralization further expands online consumers” transaction uncertainty perception since it is more difficult for them to predict the result of the transaction problems in terms of the verification and the availability of information. Thus, it is important to investigate this issue as transaction uncertainty is a primary barrier to online transactions (Pavlou et al. 2007).

2.3 C2C Online Transactions in China
Currently, C2C online transaction is the most popular EC type in China, as it constitutes 92.3% of the country’s EC gross transaction amount. According to iResearch’s report, in the past five years, China’s C2C electronic market has been growing rapidly. The number of C2C online consumers has reached 55 million, and the gross business volume of the C2C electronic market has exceeded RMB51.8 billion in 2007, compared with in 2002 there were only 8.43 million consumers and RMB0.9 billion gross business volume; it is expected that the gross transaction amount will further soar to RMB101.4 billion in 2008 (iResearch, 2008). Thus, C2C online transaction has been touted as the main engine for growth in EC for the next few years.

Also, as the iResearch report states, most Chinese C2C transactions are processed through the online store marketplaces. An online store marketplace is a community of consumers and sellers who transacts under the aegis of a virtual intermediary who provides the institutional infrastructure with the aid of Internet technologies (Gefen et al. 2006). The Web site functions as an electronic transaction market; it allows sellers to freely open their own online stores on the Web site, and online consumers to transact with those online sellers directly. The administrators of the online store marketplace are third-party intermediary agencies who provide the necessary processes that support impartial transactions among online sellers and consumers.

Nowadays in China, many companies have established online store marketplaces to encourage individuals to set up their own online stores on a particular Web site, such as Alibaba, Tencent, eBay, and so on. Currently, www.taobao.com (Alibaba), www.paipai.com (Tencent), and www.eachnet.com (eBay) are the three most famous online store marketplaces, with a reported cumulative one million online stores held by individual sellers. Their sites have daily visits of more than 10 million, and these three
marketplaces have almost taken the entire market share of the Chinese C2C electronic market (iResearch, 2008).

2.4 Taobao and Its Transaction Process

As seen in Figure 1, among all online store marketplaces in China, Taobao has a staggering leadership position with 83.6% of all C2C transactions China (iResearch, 2008) and the marketplace’s Web site design and transaction process are the current standard in China’s C2C transaction marketplaces.

![Figure 1 The Share of the Mainland China’s C2C EC Marketplace 2007](image)

Note: the volume of business of Mainland China’s C2C EC marketplace is 51.8 Billion in 2007. @2008 iResearch Inc. (www.iresearch.com.cn)

Taobao was founded on May 10, 2003 by Alibaba to cater to C2C electronic transactions. It has successfully attracted more than 66 million registered members and is the largest and most active online store marketplace in Mainland China. According to Taobao’s official statement, the marketplace provides completely free services to its
sellers and consumers, thus the company does not currently generate any revenue due to its free services; its financial support is provided by its holding company, Alibaba. Its aim is to attract as many members as possible in order to enlarge its market share and reach critical mass.

Various useful and effective techniques are used in the Taobao Web site to avoid potential transaction problems and verify the efficiency and success of each transaction. Strict precautions are observed to avoid transaction risks on both sellers and consumers in the hope of reducing both sides’ high uncertainty perception during the online transaction process. This is especially true for online consumers since they are more vulnerable in online transactions due to the lack of transaction information.

Upon registration, Taobao requires real-name authentication; both buyers and sellers need to provide their real and complete official personal information, which will be verified by Taobao employees. After passing the authentication process, the account holder could begin monetary transactions. Taobao will also evaluate the credit rank of the account based on transaction information, such as the transaction frequency, number of successful transactions, and other people’s evaluation. Since Taobao accounts are directly associated with registered members’ official personal information, thus it prevents the account holders from using one account to defraud others, and then abandoning the account, only to use a new account without any fraud records to transact. Thus, Taobao could successfully differentiate between credible traders and swindlers, and give very limited chances for swindlers to cheat on the marketplace again.

Taobao also provides an inter-mediator payment system to guarantee the rights and interests of both sellers and consumers, which is called Alipay. Alipay uses a multi-step
process beginning with consumers deciding to buy goods. First, consumers transfer money from their bank account into their Alipay account, then they transfer the money to Alipay. Alipay notifies the seller to deliver the goods to the consumer, who then notifies Alipay if the goods received are acceptable. Finally, Alipay transfers the money to the seller’s Alipay account.

The inter-mediator payment system avoids many potential transaction risks. If consumers do not receive the goods, or if the promised quality is not met, they can request Alipay not to release the money. On the other hand, if the sellers send the right goods with the promised quality, but the consumer does not confirm receipt, they could still get the due payment by providing Alipay with persuasive evidence, such as the list of goods and the invoice of express delivery. Alipay is a significant third-party escrow service on Taobao, and it plays a key role during the transaction process.

The operation process of Taobao is widely accepted among other online store marketplaces; its transaction process is considered to be the standard in C2C online transactions in Mainland China. The transaction process of Taobao is shown in Figure 2. However, Taobao and other C2C online store marketplaces have not completely solved potential problems during the online transaction process, such as online consumers’ inherent high level of transaction uncertainty perception when initially transacting with an unknown seller (Ba et al. 2003; Gefen et al. 2006). Thus, additional investigation on this subject can provide EC practitioners additional insights.
2.5 Past Research on Online Transactions

Past research on EC has always focused on identifying the factors that might influence online consumers’ perception of trust and their final purchase intention or behaviors (Antony et al. 2006; Ba et al. 2002; Gefen et al. 2003a; 2006; Jarvenpaa et al. 2000; Jiang et al. 2004; 2007; Kim et al. 2003; Lee et al. 2001; McKnight et al. 2002; 2003-2004; Pavlou et al. 2004). These studies confirm that consumers’ perceived trust on online sellers positively influences their transaction intention or final transaction behavior, and conclude that five groups of crucial factors could affect consumers’ trust perception. These factors are the (1) characteristics of the sellers such as perceived
reputation and perceived trustworthiness (including competence, benevolence, integrity, and predictability) of the sellers; (2) characteristics of the stores such as the pattern of the transaction service they provide, perceived usefulness, ease of use, enjoyment of usage, and perceived quality of the online stores’ Web site, and the type of goods sold (such as price and diagnostics); (3) characteristics of the consumers such as their natural propensity to trust, their attitude towards past online transaction experience, and their ability and motivation; (4) third parties’ recognition of the online store; and (5) characteristics of online transaction marketplaces, such as the regulatory effectiveness and fraud rate of online transaction marketplaces.

2.6 The Importance of Uncertainty in Online Transactions

An increasing number of researchers have acknowledged that focusing only on factors that influence online consumers’ trust perception during the online transaction process is insufficient, as recent research shows that trust is not the only key predictor to determine consumers’ final transaction behavior (Gefen et al. 2006; Grabner-Krauter et al. 2003). These studies state that trust is not the unconditional antecedent predictor of online transaction or behavior; trust could only exert significant influences in certain uncertain situations (Gefen et al. 2006; Grabner-Krauter et al. 2003; Mayer et al. 1995). Grabner-Krauter and Kaluscha (2003) declare that across disciplines, there is consensus that trust only exists in uncertain and risky conditions; trust would not be needed if actions could be undertaken with complete certainty and no risk. Gefen and Pavlou (2006) further find that in online marketplaces, where the transaction uncertainty level is extremely high, consumers would be reluctant to buy from unknown sellers regardless of their trust perception. In contrast, in low uncertainty online marketplaces, there is a lesser need to rely on trust since online consumers would not worry about
sellers’ fraudulent actions. Thus, in these two conditions, trust could not be a
determinant of transaction intention; trust could only significantly influence online
consumers’ purchase intention in online marketplaces when they perceive a moderate to
high level of uncertainty.

Furthermore, previous studies also show that online consumers’ perception of
transaction uncertainty can directly affect their purchase intention. Chiles and
McMackin (1996) state that a high level of uncertainty perception raises online
consumers’ risk perception, which indicates their subjective perception of suffering; this
in turn finally restrains their online purchase intention (Pavlou 2003). Pavlou et al.
(2007) confirm this negative effect from online consumers’ perception of transaction
uncertainty on their purchase intention using empirical data. Thus, uncertainty should be
an essential factor that could affect the cognition of online consumers. However, even if
uncertainty is widely recognized as one of the primary barriers during online transaction
processes in various studies, few have actually embarked on investigating its nature
using empirical data. Thus, research to identify the antecedent factors that could
facilitate the reduction of online consumers’ uncertainty perception is significant.

According to previous studies (Gefen 2000; Ramirez et al. 2002; Tidwell et al. 2002), in
order to reduce the high uncertainty perception at the initial stage of an online
transaction with an unknown store, a fundamental activity consumers engage in is to
seek required transaction information from various information sources or cues, which
helps them conquer their anxiety about information asymmetry originating from the
spatial and temporal separation between sellers and consumers. This enhances their
confidence to perfectly predict the consequence of the transaction and finally make their
transaction decision (Ba et al. 2003). However, little extant studies have explored how
the information originating from various sources or cues would affect online consumers’ uncertainty perception by empirical data; thus, this issue will be further explored in the current study.
Chapter 3 – Uncertainty and Theories of Uncertainty

3.1 Definition of Uncertainty

Based on early work in psychology (Downey et al. 1975; Garner 1962; Miller et al. 1949; Shannon et al. 1949; Tushman et al. 1978), uncertainty means the absence of information. Galbraith (1977) defines uncertainty as “the difference between the amount of information required to perform the task and the amount of information already possessed by the person.” Pfeffer and Salancik (1978) consider uncertainty as the degree to which the future states of the environment cannot be accurately anticipated or predicted due to imperfect information. Uncertainty exists when the framework for resolving a task is available, but there is lack of information to process it (Dennis et al. 1999); as information increases, uncertainty decreases. Therefore, to reduce uncertainty, questions must be asked, and additional information should be acquired to learn the answers. The important assumption underlying uncertainty is that people works in environments where questions can be asked and answers can be obtained. The new information then reduces the uncertainty. Although classical theories suggest that more information acquired reduces the perceived uncertainty level (Bavelas 1950; Becker et al. 1969; Berger et al. 1975; Daft et al. 1981; Shannon et al. 1949), more recent research contends that the quality of information is also a strong predictor of uncertainty reduction (Berger 1987; Friedrich et al. 1996; Nicolaou et al. 2006). Thus, both the quantity and quality of the information processed should be associated with the perception of uncertainty.

In online transactions, uncertainty refers to the extent to which the outcome of the transaction cannot be accurately predicted due to imperfect information (Ba et al. 2002).
Thus, more and high-quality transaction information would significantly affect consumers’ uncertainty perception.

3.2 Theories and Conceptual Models on Uncertainty

Although CMC studies on uncertainty perception have not been widely developed (Pavlou et al. 2007; Tidwell et al. 2002), some theories and conceptual models that focus on uncertainty reduction by implementing different behavioral strategies have been proposed. Through these approaches, people could perceive interpersonal impressions and mark their evaluations. URT (Berger et al. 1975) and CMC ISSM (Ramirez et al. 2002), are two famous heuristic approaches for the impression formation and initial relational development of interpersonal interactions.

3.2.1 Uncertainty Reduction Theory

URT (Berger et al. 1975) provides a theoretical perspective for dealing with the initial entry stage of interpersonal interaction under FtF physical conditions. It posits that the initial interactions between different parties typically involve high levels of uncertainty, which can be reduced by high amounts of verbal communication, nonverbal affiliative expressiveness, information-seeking behavior, intimacy, reciprocity, liking, and by perceived similarities between the interacting parties. It uses seven axioms to describe these relationships.

AXIOM 1: Given the high level of uncertainty present at the onset of the entry phase, as the amount of verbal communication between strangers increase, the level of uncertainty for each interactant in the relationship will decrease. As uncertainty is further reduced, the amount of verbal communication will increase.
AXIOM 2: As nonverbal affiliative expressiveness increases, uncertainty levels will decrease in an initial interaction situation. In addition, decreases in uncertainty level will cause increases in nonverbal affiliative expressiveness.

AXIOM 3: High levels of uncertainty cause increases in information-seeking behavior. As uncertainty levels decline, information-seeking behavior decreases.

AXIOM 4: High levels of uncertainty in a relationship cause decreases in the intimacy level of communication content. Low levels of uncertainty produce high levels of intimacy.

AXIOM 5: High levels of uncertainty produce high rates of reciprocity. Low levels of uncertainty produce low reciprocity rates.

AXIOM 6: Similarities between persons reduce uncertainty, while dissimilarities produce increases in uncertainty.

AXIOM 7: Increases in uncertainty level produce decreases in liking; decreases in uncertainty level produce increases in liking.

According to URT, the core element of reducing uncertainty is the exchange, search, and collection of information, which allow one to predict other people’s attitudes and behaviors (Daft et al. 1986; Tidwell et al. 2002); other factors are contingent with this information-seeking process. Using obtained information, people could create impressions-mental models that help them make sense of people and situations (Srull et al. 1989). The key point of this theory is that the more information one gets about the counterparts, the less uncertainty they have.
3.2.2 Information-seeking Strategies in Uncertainty Reduction Theory

Furthermore, URT predicts that individuals use three major groups of information-seeking strategies, which are mutually exclusive, namely, passive, active, and interactive information-seeking strategies, to acquire information and reduce uncertainty. Berger (1979) and Berger et al. (1976) also identify different kinds of sub-information-seeking strategies under the three major groups of strategies.

3.2.2.1 Passive Information-seeking Strategies

PAIS means acquiring information about a target through unobtrusive observation without affecting the target’s behavior. Berger (1979) further divides PAIS into three sub-strategies. The first is reactivity search which is expressed through unobtrusive observation of a target in a situation in which the target interacts with or reacts to others. The second sub-strategy is social comparison; it is demonstrated as observing the target as he/she interacts with others who are known to the observer, and then drawing comparisons based on the level of similarity of the target to others. The third sub-strategy is disinhibition searches or deviation testing (Berger et al. 1976). This sub-strategy tries to identify the target’s candid behavior by watching him/her in informal situations where his/her inhibitions are less impacted by social norms and rules.

3.2.2.2 Active Information-seeking Strategies

AIS is different from PAIS; it involves acquiring information from other individuals but without direct interaction with the target, AIS requires information seekers adopt proactive efforts to collect information about the target (Berger 1979). Since there is no
confrontation with the target, these strategies are still considered as indirect information-seeking methods. Berger et al. (1976) and Berger (1979) identify two active information strategies. The first is to ask third parties who might be familiar with the target; the second is environmental restructuring which entails creating a set of circumstances, then unobtrusively observing the target in these environments or viewing the effect of manipulation. These strategies include indirect knowledge acquisition by communicating with known third-party information sources.

3.2.2.3 Interactive Information-seeking Strategies

The third information-seeking strategy proposed by Berger et al. (1976) and Berger (1979) is IIS, which requires information seekers to directly and obtrusively exchange information with the target during which different tactics are enacted to elicit the desired information. Berger et al. (1976) and Berger (1979) identify three interactive sub-strategies: Deception detection involves identifying falsifications, distortions, or omissions of information; verbal interrogation refers to asking questions; while in self-disclosure, a person knowingly communicates to the target private information about him/herself that is not publicly known (Worthy et al. 1969), it is bound by the norm of reciprocity: self-disclosure begets disclosure from the target person, thus its utility as an information-seeking behavior. Berger and Kellermann (1983) recognize the fourth sub-strategy, which is attempting to relax the target as a means to obtain information. In IIS, information seekers could take the active position; they could influence the type of information solicited by altering their own behaviors based on the available feedback from the target (Ramirez et al. 2002).

3.2.3 Computer-mediated Communication Information-seeking Strategies Model
An unstated boundary condition of URT is that it limits the interaction in physical FtF conditions. Douglas (1990) argues that tests of URT in FtF conversation necessarily involve seeing others before speaking and potentially gleaning information from physical appearances and other nonverbal indicators. Thus, the FtF boundary is an anachronism for URT. Tidwell and Walther (2002) argue that the dynamics of URT that manifest themselves in CMC settings might not be the same as those in FtF settings. They believe that although most CMC environments eliminate or severely reduce the nonverbal and contextual information available to form impressions, develop relationships, and reduce perceived uncertainty, variations in CMC and other technological developments open alternative means for gathering information not present in traditional FtF contexts. Thus, those information-seeking strategies adopted in FtF contexts might be still available in CMC conditions with modified formats (Ramirez et al. 2002; Tidwell et al. 2002). Furthermore, these variations and other technological developments in CMC highlight the need to incorporate more information-seeking strategies and mechanisms into current theorizing. Thus, Ramirez, et al. (2002) improve the categorization of the information-seeking strategies of URT based on the development of unique CMC technologies to fit the online communication context. Specifically, they added a new information-seeking strategy, EIS, into the categorization. They believe such four groups of information-seeking strategies are mutually exclusive and can cover all online information seekers’ information-seeking behaviors.

3.2.3.1 Passive Information-seeking Strategies in CMC

Although the availability of PAIS might be more limited in CMC settings as compared to FtF because passive strategies might require public settings rather than private ones,
they may still be fulfilled in online interactions. As Tidwell and Walther (2002) state, PAIS in CMC might be confined to unusual contexts such as Usenet groups, Multi-User Dungeons/Object Oriented (MUDs or MOOs), and mailing lists; the most common form of CMC is e-mail. Although it might be difficult to imagine passive observation in one-to-one e-mail contexts, it might occur in the case of being “carbon copied (CC)” on an ongoing stream of messages between other parties. Bonito (1998) states the decision by interlocutors to enlarge the audience for their exchange by using the “CC” function is an increasingly used feature of CMC that places the newly added recipients in the passive observer role. Messages that are sent as “BCC” (blind carbon copy) or unbeknownst to the authors are forwarded to others, can provide additional passive observational opportunities akin to eavesdropping in a conversation. Passive observation is even more common in online communication forums, which are designed for group interactions. In this situation, passive information-seeking may take the form of reading messages posted to a central location (e.g., a distribution list), reviewing “buddy profiles” commonly available in instant messaging, or lurking (logging in but not participating) in real-time chat spaces from AOL chat rooms to multiuser games and social spaces (Utz 2000).

In sum, previous research concludes that new developments in communication technology can shift the traditional PAIS into new forms or tactics, which rely on the affordances of these technologies (Burgoon et al. 2002).

3.2.3.2 Active Information-seeking Strategies in CMC

Similar to passive strategies, AIS might also be more difficult to deploy in CMC than in FtF, as it requires certain resources that might be less available online. Specifically,
CMC relationships offer a more limited network of common acquaintances than in FtF associations in the case of asking third parties for information (Parks et al. 1996), and environmental restructuring requires advanced planning and the involvement of third parties. However, these strategies still might be adaptable to ongoing CMC environments (Tidwell et al. 2002).

In CMC, AIS could take the form of acquiring information through e-mail exchanges or chats with others who are familiar with the target; conceivably, this might include acquiring messages composed by a target passed on by some public, known third-party sources. Such as, active information seekers can obtain required information from virtual groups in some virtual communities, since these virtual groups are organized based on certain interests and hobbies, commonly, the members in these groups would have the same interests and hobbies (for instance, some of these virtual groups focus on digital cameras), thus, people can easily obtain the required information from these interest-oriented virtual group members. Another commonly used AIS in CMC is to seek information from professional gateway Web sites devoted to certain topics; by this way, beyond getting information from some Internet friends in CMC, people could further obtain data from third-party Web sites.

These new forms of AIS rely on the variations in CMC and the employment of socio-technical mechanisms (Burgoon et al. 2002). Through these approaches, online information seekers might reduce, to some extent, their perception of the lack of shared social networks among online acquaintances.

3.2.3.3 Interactive Information-seeking Strategies in CMC
As Tidwell and Walther (2002) state, all the interactive strategies suggested by Berger and his colleagues could be utilized in CMC. Tidwell and Walther (2002) further express that because of the restrictions in communication cues in CMC contexts, the easily amendable nature of these strategies to CMC might intensify their use in such a context. Tidwell and Walther (2002) believe one sub-strategy, namely, deception detections, might tend to be considered unreliable in CMC unless target individuals contradict either themselves or known facts, thus making this sub-strategy less likely to be employed.

Others, such as verbal interrogation (i.e., question asking) and self-disclosure, are most available in CMC as uncertainty reduction strategies. Questions and disclosures are both readily deployed in CMC because personal questions could easily be posed in online environments, and self-disclosures might also be effective in CMC settings and operate in patterns similar to FtF. They not only provide impression-bearing information, but the process of disclosing creates a demand so that the recipient feels obligated to respond in kind, typically generating return disclosures from the target individual (Jourard 1971).

Results from the work of Tidwell and Walther (2002) show that people use a greater proportion of self-disclosures and interrogations in CMC than in FtF first encounters. The relationship between the frequency of these kinds of remarks and partners’ ratings of one another’s communication effectiveness is significantly greater in CMC than in FtF. The personal questions employed by CMC communicators connote greater depth than those by FtF counterparts. Pratt et al. (1999) further point out that the use of interrogative tactics in CMC appears to follow a similar pattern to that proposed by theories of traditional relationship development. Altogether, these studies believe that
compared with the FtF context, CMC contexts limit many visual and verbal cues; however, people still show high willingness to adopt IIS.

3.2.3.4 Extractive Information-seeking Strategies in CMC

Ramirez et al. (2002) state that variations in CMC and other technological developments not only open up alternative means for gathering information by PAIS, AIS, and IIS, but also offer new approaches for information-seeking that could not be integrated into any of the three traditional strategies. They label these new approaches as EIS, which are supported by the development of non-interactive Internet technologies and are unique to CMC and new media. These new strategies have already received attention in other academic fields (Cline et al. 2001) but have not been fully investigated in the IS and EC domains. To our knowledge, until now, little published IS and EC studies have embarked on systematically and empirically exploring the effectiveness and effects of these approaches using field data.

According to the description of Ramirez, et al. (2002) on EIS, we summarize people can use two kinds of sub-strategies on EIS. First, information seekers can use search engines to discover information available on the Internet about the target. We can further fractionize the search engines currently available online based on their constructive formation. The first kind of search engine is a keyword-oriented formation engine, which allows information seekers to input the key words according to their need, which results in related information sequenced by the related degrees of the inputted key words via their embedded arithmetic; many famous search engines, such as www.google.com and www.baidu.com, are examples of this kind of search engine. The second kind is option oriented, which gives information seekers choice menus and
generate result information based on the information seekers’ choices; many online marketplaces and product evaluation Web sites have adopted this kind of search engine and embedded it into their Web sites, such as www.taobao.com, www.eachnet.com, and www.pconline.com.cn. It should be noted that there is a current trend to incorporate these two formats together into one search engine in order to allow information seekers to seek their required information more conveniently and flexibly. For example, www.google.com allows users to first set restrictions based on provided choice menus in the Advanced Search, Preferences, and Language Tools, according to their needs. www.pconline.com.cn also settles the keywords inputting blank. Therefore, it is difficult to conclude that all search engines are only strictly based on one formation. The current study focuses on the two main divisions based on their main functions without losing universality. Based on these search engines, information seekers could then obtain the information they require.

The second sub-strategy is to use electronic list postings, Usenet news group messages, or archives, which draw upon a vast storehouse of comments towards the target written by a large number of unknown online users. These postings could reflect the statements enacted in social settings; in many cases, the information is made without the target’s suspecting that it would be stored for years and would be available for public consumption. This kind of information may offer particularly valuable insights to information seekers because such information commonly originates from various common Internet users’ opinions and suggestions without direct association of interest. Furthermore, such information could be collected covertly and is beyond the target’s control.
Although Ramirez et al. (2002) did not clearly propose the definition of EIS, with our careful understanding on the description and further thinking on its connotation, we infer that EIS refers to the information-seeking strategies that use the aggregation and storage function of Internet technologies based on the social information provided by various Internet users. This means that with EIS, no matter information seekers use search engines or discussion forums, those Internet techniques just act as an intermediary and provide the information seekers a platform to obtain the information they need, instead of providing information by themselves directly. This is a distinct characteristic of EIS information which differs from AIS information in that the third-party sources directly propose their own viewpoints to information seekers. Thus, EIS represents a unique manifestation of information-seeking that is unavailable in physical communication.

3.2.4 Contextual Factors’ Interaction Influences on Uncertainty

Both URT and ISSM have emphasized the significant effects of information from different information-seeking strategies on perceived uncertainty reduction. However, solely exploring the information obtained from different information-seeking strategies cannot fully interpret online consumers’ cognition of uncertainty. Realistically, online information seekers might obtain information in different contextual conditions; thus, contextual or situational factors might also exert powerful influences on online information seekers’ cognition, and this viewpoint is theoretically supported by KAT.

KAT focuses on the important effects of contextual factors during people’s cognitive process. This theory discusses how people make causal inferences and what they do with the information they obtain, it proposes that people processes information
differently depending on several contextual factors. This theory is developed within the field of social psychology primarily as a means to deal with questions of social- and self-perception within the psychological epistemology. As a general conception of the way people thinks about and analyzes cause-effect information, this theory is suitable in coping with any of the fields of psychology concerned with perception, judgment, and thinking (Kelley 1973).

KAT deals with the cases distinguishable in terms of the information available to the attributors. It states that the obtained information co-varies with other existent contextual factors. According to this theory, an individual who reflects on the cause of a certain event and forms a perception may take into account information about distinctiveness over entities, consensus across persons, and consistency over time or modality. Generally, KAT illustrates distinctiveness indicates the degree to which the actor performs different behaviors with different attribute objects; the consensus expresses the degree to which other actors perform the same behavior with the same object; the consistency is the degree to which the actor performs the same behavior toward an object on different occasions (including different time or modality). The attributors use some or all of these factors, separately or jointly with the obtained information, to form their cognition.

The subjective validity of all of these criteria in Kelley’s formulation is familiar in previous literature and in real life. Many studies conclude that confidence in one’s judgment (Cheung et al. 2009; Zhang et al. 2003) depends on the agreement of a larger number of others (consensus), and this tends to increase adherence to one’s judgment. On the other hand, the disagreement of others tends to increase uncertainty and the likelihood of change (Hare 1962). Distinctiveness and consistency also have a
significant influence on people’s confidence in their judgment. Specifically, for
distinctiveness, the more obvious the differences between the entities, the more
dissimilar the judgments attributors would make. If there are no or very few distinctions
among entities, the attributors would then have more confidence to make similar
evaluations (Eagley et al. 1978). For consistency, actors that decrease the variance of
consistency help attributors cultivate confidence in their judgment (Irwin et al. 1956).
These three criteria of validity suggest a means to index people’s perception of
information regarding any portion of the external world (Kelley 1973). This framework
provides a foundation to systematically analyze information recipients’ evaluation of
how they would make causal inferences about the information from information
providers and form their own perception and cognition.

KAT also points that this variance model is undoubtedly idealized. In some situations,
attributors might lack some criteria to make their judgment; even if those criteria are
available, the attributors might not feel that all the influential factors equally affect the
influence of perception and cognition; certain factors might be the main causes in some
situations; thus, they might make a causal inference not equally based on all the criteria
proposed in the model. Instead, in forming their perception and evaluations, they would
use some selected criteria they think is valid.

Thus, based on the theoretical background discussed above, we will integrate the
categorization of the four-group information-seeking strategies from URT and ISSM,
with the contextual factors proposed by KAT, to construct the research models. We will
investigate how these factors can individually or jointly affect online consumers’
perception of uncertainty during C2C online transaction processes. The theoretical
models and hypotheses of this research are discussed in the next chapter.
Chapter 4 – Research Model and Hypotheses

4.1 Information-seeking Strategies in C2C E-commerce

Based on URT and ISSM, information from all of the four information-seeking strategies is theoretically proposed to affect the perceived uncertainty of the communicators, and thus we will bring this information-seeking categorization into online C2C EC, in this research, we hypothesize the transaction information from all of these four information-seeking strategies will significantly affect online consumers’ perception of transaction uncertainty.

PAIS is one basic group of information-seeking strategies adopted by online consumers in C2C transaction. When online consumers want to buy something from an unknown online seller, a preliminary action they will conduct is to browse the homepages of the target online store, then to find the information that might be required in that transaction. This information may include the product information posted by the seller, which can help online consumers to gain a deeper understanding of the attributes of the concerned products. Online consumers could also evaluate the attributes of the seller depending on the profiles available on the store Web site. Besides, consumers can also browse on the frequently asked questions (FAQs) section to better understand how the store handles sales or delivery, etc. These information-seeking methods are examples of reactivity search. Furthermore, online consumers also can use the social comparison sub-strategy when planning to transact with an unknown online seller, such as by browsing message boards on that store’s homepage to watch the seller’s responses to other online consumers’ inquiries.
Altogether, through passively browsing the homepage of the online store, potential consumers can obtain various transaction information from the sellers, such as information about the product, about the seller, and about the store, etc. Since such kind of information is provided by the sellers, thus, online consumers may think its neutrality is low; also, without direct interacting with the sellers, online consumers only can review the existent information posted on the online stores’ Web sites, and they totally cannot manipulate the content of the information, thus, it is possible that the information acquired through this groups of strategies may not cover all issues the online consumers concerned, which may reduce the relevance of the information (Teo et al. 2003). But some previous research still conceives that online consumers will utilize such kind of information to form their perception and judgment (Chakraborty et al. 2002; Pavlou et al. 2007). Thus, based on the theory of URT and ISSM, we hypothesize, although PAIS information is a kind of “indirect information” which may avoid direct communication with the online sellers, it still can significantly reduce the information recipients’ uncertainty perception in many conditions, thus in this research, we predict the more PAIS information obtained, the more uncertainty reduction online consumers would perceive.

H1. The more transaction information is obtained from PAIS, the more uncertainty reduction online consumers will perceive.

In the C2C transaction process, the online AIS might also take significant roles. In case online consumers intend to process transactions with an online seller in an online store marketplace, besides passively browsing the homepages of the online store, they can also actively seek required transaction information from other third-party information sources (Shaffer et al. 2002; Thakor 1982). For instance, they can join in some
interest-oriented virtual discussion groups, which are organized based on certain interest (Taobao buyers’ group, digital camera group, etc, can be the examples of such interest-oriented virtual groups). Employing AIS, they can seek other group members’ opinions about a certain product or seller. In fact, these groups have already become a popular online communication style for online information seekers currently (Dholakia et al. 2004; McKenna et al. 1998). Besides, consumers can also visit some related famous third-party evaluation websites or comprehensive gateway websites they previously knew to get more third-party comments or evaluation reports on the issues of concern.

Since AIS information is acquired through various third-parties, online consumers may conceive its neutrality is relatively high. AIS may take both high interactivity level by directly communicating with some third-party individuals, and low interactivity level by reading the postings writing by them, or browsing the evaluation reports from some third-party websites, thus, online consumers only can control the content of the information in certain conditions (when directly communicating with the third-party individuals). Because such kind of information is obtained from some third-party persons/organizations, and it is possible those persons/organizations may not possess all transaction related information, thus, AIS information sometimes may not be very relevant to the current transaction. Previous research has already confirmed such a kind of third-party information can significantly reduce the consumers’ uncertainty perception, and the effect may even be stronger than the seller (producer) provided information (Weathers et al. 2007). Thus, in this study, we predict, with more AIS information acquired from various third-party sources, online consumers’ uncertainty perception would be reduced correspondingly.
H2. *The more transaction information is obtained from AIS, the more uncertainty reduction online consumers will perceive.*

The Internet has also provided technological support for EIS for online information seekers so that they can search for required information. Specifically, in C2C transactions in online store marketplaces with an unknown seller, potential consumers can easily adopt EIS by using the “search” tools such as search engines or websites (e.g. Google.com, Baidu.com, etc) to acquire required transaction information (Bilal 2000; 2001; 2002; Spink 2002). Without search engines, consumers can still conveniently browse online consumer discussion forums (utilizing electronic list postings IT technologies) to find consumer comments about a certain product or seller, thus obtaining more comprehensive information (Bickart et al. 2001; Pitta et al. 2005). Commonly, these discussion forums draw on a vast storehouse of comments written by various online users.

Altogether, with the help of the powerful aggregation and storage ability of Internet technologies, online consumers could obtain a more socialized and far-ranging information from various third-party information sources, compared with utilizing AIS, thus, we conceive this kind of information can be regarded as a kind of public social opinion, consequently, online consumers may think it should be very neutral. EIS takes a relatively high interactivity level, it allows online consumers to interact with the search engines, or electronic list postings, by inputing their searching, or listing commands to find required transaction information; although online consumers cannot alter the content of EIS information, but they do can manipulate to obtain much information with various modified characteristics through this groups of information-seeking strategies by selecting various commands to interact with these IT
systems (Szuprowicz 1995), thus, such information takes a relatively high relevance. Therefore, we predict EIS should be an important source of information to affect the consumers’ uncertainty perception.

H3. The more transaction information is obtained from EIS, the more uncertainty reduction online consumers will perceive.

IIS can be easily utilized in CMC. In a C2C transaction, online consumers can directly contact the sellers through IMs to acquire required transaction information synchronously; for example, Taobao Wangwang is a special IM created for the communications between Taobao sellers and consumers. Through IMs, consumers and sellers can have synchronous communication, thus the consumers can directly acquire transaction information from the sellers. Aside from synchronous communication methods, consumers could also choose asynchronous interactive communication methods in case the seller is unavailable online at a specific time. They could post their inquiries on the message board of the online store Web site, or send an e-mail to the seller and wait for a reply.

Similar with PAIS information, online consumers may conceive the neutrality of IIS information is low since such kind of information is provided by the sellers; the significant differences between PAIS and IIS information is the interactivity level: compared with PAIS information, IIS information takes a high level of interactivity because online consumers are required to directly communicate with the sellers, thus, they can conveniently manipulate the content of the information by simply inquiring the sellers on different issues they concerned during the transaction process, and in most cases, the online sellers can give them accurate answers, consequently, such kind of
information should take a very high relevance level. Besides, IIS information is beyond the scope limitation of existent information posted on the online stores’ Web sites. Previous research conjectures that IIS in the CMC context tends to be unreliable because some social influence cues, such as individuals’ noverbal signs, which are often used to help online information seekers detect deception, are difficult to observe (Donath 1999). However, additional research has concluded that communication through Internet technologies could still exert a strong social influence on both sides of the communication (Davis et al. 1989). For examples, the social presence awareness, a critical cue differentiating CMC and FtF communication (Short et al. 1976; Sia et al. 2002), has been empirically established in various IIS communicating IT tools, such as e-mail (Gefen et al. 2003b), IM tools (Kumar et al. 2002; Rossade et al. 2005), and message boards (Cyr et al. 2007), has been empirically confirmed by various studies. Thus, we believe that information obtained through interactive strategies should take a significant role in shaping online consumers’ uncertainty perception.

H4. The more transaction information is obtained from IIS, the more uncertainty reduction online consumers will perceive.

In sum, the developments of CMC technologies may weaken communicators’ reliance on traditional modes of information acquisition and shift passive, active, and interactive information-seeking strategies into new forms or tactics that rely on the affordances of the CMC technologies provided (Burgoon et al. 2002). These technologies may also offer alternative modes of information-seeking strategies that could not be simply categorized into traditional approaches (Ramirez et al. 2002). It would shift information seekers’ search information from the social network to the socio-technical, electronic network. Thus, based on URT and CMC ISSM, we hypothesize that more transaction
information from the four information-seeking strategies would significantly reduce online consumers’ perception of transaction uncertainty. For the different characteristics of the four groups of transaction information, we briefly conclude in Table 1.

<table>
<thead>
<tr>
<th>Source</th>
<th>PAIS Information</th>
<th>AIS Information</th>
<th>EIS Information</th>
<th>IIS Information</th>
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</thead>
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<td>Third-parties</td>
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<td>Seller</td>
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<td></td>
<td></td>
<td>(Individual opinion)</td>
<td>(Public opinion)</td>
<td></td>
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<td>Relatively High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Manipulation</td>
<td>Low</td>
<td>Low-High</td>
<td>Relatively High</td>
<td>High</td>
</tr>
<tr>
<td>Relevance</td>
<td>Medium</td>
<td>Medium</td>
<td>Relatively High</td>
<td>High</td>
</tr>
</tbody>
</table>

Table 1 The Characteristics of the Four Groups of Information

In the context of this study, online store marketplaces have set a series of regulations to avoid fraudulent information and behavior, thus ensuring the quality of information and facilitating the success of the transaction in the marketplace. Besides, we assume that consumers will not pay attention to low-quality information and may only adopt high-quality information to help them make transaction decisions; thus in this research, we do not consider information quality, but mainly focus on the influence of the information quantity obtained from these four information-seeking strategies on online consumers’ uncertainty perception. In conclusion, according to the theories, we hypothesize that the more transaction information obtained from these four groups of information-seeking strategies, then the higher uncertainty reduction online consumers will perceive (Please see the model in Figure 3).
4.2 Contextual Factors’’Interactive Influences on Uncertainty

In online C2C transactions, when consumers plan to process transaction with an unknown online seller, inspecting only the effects of information from different information-seeking strategies cannot comprehensively interpret online consumers’ cognition of uncertainty. Realistically, online consumers would probably obtain transaction information in different contextual conditions instead of always in a monotonous condition. Thus, contextual or situational factors might also exert powerful influences on online consumers’ cognition. Within the C2C transaction context, we identified two contextual factors found to be the most important in influencing information judgments: information consistency (Cheung et al. 2009; Zhang et al. 2003)
and seller reputation (Eagley et al. 1978; Hovland et al. 1951; Wathen et al. 2002). Seller reputation is derived from the distinctiveness concept of KAT, whereas information consistency is rooted in the consistency (in information from same person) and consensus (in information from different persons) concepts. As an initial research, we focus on the consumers’ general consistency perception based on all information they have obtained. The following two sections elaborate on the effects of these two contextual factors on consumers’ uncertainty perception.

4.2.1 Information Consistency

Information consistency is defined by Barry et al. (Barry 1993; 1994; Barry et al. 1998) as information from one source that is consistent with that from other sources (called source agreement). Zhang and Watts (2003) indicate that information consistency refers to the extent that the information a person possesses is consistent with one another.

In C2C transaction, consumers can conveniently utilize any or even all four information-seeking strategies, which could sometimes lead to inconsistencies in the information acquired through two or more information-seeking strategies. When utilizing different information-seeking strategies, online consumers acquire information from different information sources or cues. Online consumers can browse the Web site of the online store to acquire PAIS information; can obtain AIS or EIS information by searching in various third-party information sources, or utilize IIS to directly communicate with the seller to acquire information. It is likely that information from one source might contradict that from other sources since different information providers might have different attitudes about one subject. Comparing the information consistency level of the acquired information from these different sources takes the
same meaning with the KAT criteria “information consensus across persons.” Even if the information is provided by the same source, it might still not be completely consistent if it is acquired through different cues. For instance, in the interviews in the pilot test, a few online consumers declared that information posted on online store Web sites by the seller (PAIS cue) contradicts their live words (IIS cue) when using IM to communicate with them. This case should fit the KAT criteria “information consistency over time or modality.” Thus, the construct, information consistency in this research is rooted in the consistency (information from the same source) and consensus (information from different sources) concepts from KAT, it indicates online consumers’ general perception of the information consistency level from all of the information-seeking strategies.

In this study, this general information consistency perception is used to further test how it could influence online consumers’ perceived uncertainty. Many previous studies state that information consistency could directly influence information recipients’ cognition (Cheung et al. 2009; Zhang et al. 2003). Barry and Schamber (1998) propose that information consistency could be a key criterion employed by information recipients in making judgments or decisions on the obtained information. They believe that consistent information would help information receivers to verify the authenticity of the information, and thus reduce their perceived uncertainty. Zhang and Watts (2003) purport that the high level of consistent information from different sources would persuade information recipients to feel that “this is likely to be true” and thus reduce their perception of uncertainty level on the issue. This finding has also been confirmed by the study of Cheung et al. (2009). According to these studies as well as KAT, we hypothesize that in C2C transactions, the perception of a high information consistency level will enhance online consumers’ confidence in accurately predicting the outcome.
of the transaction, As a result, this will directly reduce online consumers” transaction uncertainty perception. Also, high information consistency can lead online consumers believe the authenticity of the acquired information from various seeking strategies and thus increase the effects of the information on online consumers” uncertainty perception. Conversely, if the obtained information is inconsistent with that from other strategies, the favorable impact on online consumers” uncertainty perception will be attenuated. Thus, we hypothesize:

H5. The higher the information consistency level from the four information-seeking strategies, the more uncertainty reduction online consumers will perceive.

H5a. The higher the information consistency level, the greater the information from PAIS reduces uncertainty.

H5b. The higher the information consistency level, the greater the information from AIS reduces uncertainty.

H5c. The higher the information consistency level, the greater the information from EIS reduces uncertainty.

H5d. The higher the information consistency level, the greater the information from IIS reduces uncertainty.

4.2.2 Seller Reputation

Another significant contextual factor is the attributes of the target seller on the transaction. As the description of the criterion “distinctiveness over entities” in KAT, the attributes of the entities would shape the information recipients’ perception and
judgment of the entities. Thus, the attributes of the seller should also be a pivotal factor that affects online consumers’ perception of uncertainty when initially process transaction with an unknown online seller in an online marketplace.

Hovland et al. (1951) point out that reputation, attractiveness, physical appearance, familiarity, power, and others are attributes of the information provider that could have an impact on the information seekers’ cognition. However, in CMC, where textual messages are exchanged, some attributes, such as attractiveness and the physical appearance of the information provider, are difficult to assess because the nature of the virtual communication may not permit the availability of such cues. Thus, the more salient cues of the information providers may be their reputation, which is awarded by site administrators based on the general evaluation of Web site users.

In the online transaction context, the online seller reputation’s is defined as the extent to which consumers believe the seller is honest and is concerned about its customers (Doney et al. 1997). In most online marketplaces, online sellers’ reputation system is used to convey their level of credibility and honesty. Commonly, the online seller’s reputation is conferred by the administrator of the marketplaces based on its previous transaction records and previous online consumers’ evaluations. All the information on reputation is shown along with the online seller’s profile. Thus, potential consumers are able to perceive how credible the seller is based on its reputation.

This study will examine how an online seller’s reputation could affect consumers’ perceived uncertainty. Previous studies indicate that individual reputation in the offline world determines the effectiveness of a communication. People tend to believe information from highly reputed sources and more readily accept the information. If the
source has a low reputation, receivers are less likely to accept that information (Eagley et al. 1978; Grewal et al. 1994). Although online sellers’ reputation in this study is only a “virtual credential” awarded by the administrators of certain online marketplaces, previous studies (Antony et al. 2006; Ba et al. 2002; Jarvenpaa et al. 2000; Lee et al. 2001; McKnight et al. 2002) have already proven that such “virtual credentials” still have a similar effect online as it does in the real world. Some research states that a high online seller’s reputation could induce online consumers to form a positive attitude on the seller and help overcome the perception of transaction uncertainty. This is because high seller reputation would lead consumers to believe that the seller would not violate the transaction contract, thus achieving a satisfactory transaction consequence (McKnight et al. 2002; Wathen et al. 2002). In addition, other studies declare that online consumers perceive that the transaction information acquired from highly reputed sources is more reliable and thus would have a stronger effect on online consumers’ uncertainty perception (Cheung et al. 2009; Zhang et al. 2003).

In this study, we will also follow the findings of these previous literatures as well as KAT and to hypothesize that online seller reputation would significantly influence online consumers’ perception of uncertainty when initially contacting with an unknown online seller in an online marketplace. First, we hypothesize that a seller with higher reputation would direct let online consumers perceive a lower transaction uncertainty. We also predict that online consumers would perceive that the transaction information acquired from a higher reputed seller would be more persuasive than that provided by lower reputation sellers, thus would have a stronger effect on online consumers’ uncertainty perception. It should be noted that only PAIS and IIS information is provided by online sellers; AIS and EIS information is provided by third-party information sources. Thus, we hypothesize that seller reputation only could moderate
the causal relationship between PAIS, or IIS information and transaction uncertainty perception: when such information is provided by a highly reputed seller, its effect on uncertainty reduction will be increased, and if it is provided by a lower reputation seller, its effects will be attenuated; we do not propose any similar hypotheses for AIS and EIS because the information originates from third-party sources, we predict there would be no two-way interactive effects between seller reputation and information from AIS and EIS on uncertainty. Thus,

H6. The higher the seller reputation, the more uncertainty reduction online consumers will perceive.

H6a. The higher the seller reputation, the greater the information from PAIS reduces uncertainty.

H6b. There will be no interactive effects of seller reputation and information from AIS on perceived uncertainty.

H6c. There will be no interactive effects of seller reputation and information from EIS on perceived uncertainty.

H6d. The higher the seller reputation, the greater the information from IIS reduces uncertainty.

These two contextual factors’ moderating effects on the causal relationship between the transaction information from the four groups of information-seeking strategies and the perception of uncertainty are illustrated in Figure 4.
4.3 Investigation on the Potential Three-way Interactions

As KAT states, people’s causal attribution process on the acquired information might not so monotonously depend on seller reputation or information consistency separately. Instead, it may also rely on both of these two contextual factors in evaluating the acquired information in their decision-making process. These two contextual factors might jointly exert an interactive impact on attributors.
Although previous studies on IS and EC have not investigated the joint impact of information consistency and seller reputation on the casual relationship between information and uncertainty, KAT suggests the possibility that these two contextual factors might jointly affect online information seekers’ perception on the acquired information, this theory states: studying multivariate configurations of these factors may offer more useful and complete explanations on information recipients’ cognitive process. This is realistically true since online consumers frequently face these complex environmental situations in daily online transactions experiences. Thus, this research will conduct some additional tests to detect if there are some three-way interactions among the two contextual factors and the acquired transaction information.

4.4 Control Variables

Other variables which are confirmed to significantly influence online consumers’ perception during the transaction process might also potentially affect online consumers’ perception of uncertainty. Theoretically, these have not been integrated in the current research model, but will be treated as control variables in this research. They are as follows: (1) the regulatory effectiveness of online transaction marketplaces (RE), (2) online consumers’ previous attitude towards online transaction (PA), (3) online consumers’ involvement level (IN), (4) the price of the product online consumers are concerned with (PR), and (5) the diagnostic level of the product online consumers are concerned with (DI).
Chapter 5 – Research Methodology

The research model was tested using the online survey method, as this permits the gathering of field information from persons who use online marketplaces in their daily lives, thereby enhancing the realism of the research. We first adapted and developed the instrument for the constructs in this research, then carried out a pilot survey with interviews before proceeding to the main study.

5.1 Operationalization of the Constructs

The constructs in this study were operationalized by adopting validated instruments from previous research if possible. Some constructs without ready-made validated instruments were developed following Moore and Benbasat’s (1991) method. The items on seller reputation were adopted from the work of Doney and Cannon (1997). Four items on information consistency were adopted from the work of Cheung et al. (2009). There were no standard instruments on information from the passive, active, extractive, and interactive information strategies, as well as the dependent variable—transaction uncertainty perception. Thus, we developed the corresponding items for each of these constructs following the instrument design steps recommended by Moore and Benbasat (1991) were developed.

5.1.1 Item Creation

The purpose of this step was to create pools of items for each construct and to ensure the content validity of the items in each construct. First, we reviewed the relevant literature in IS, MS, and Psychology to acquire the existing instruments of each construct in different research contexts. The items applicable only in particular
situations without generalizability were culled. To ensure all dimensions of the construct been covered in the new items, we carefully reviewed the definition and the expatiations of the construct in the original papers. If needed, new items were created strictly based on the definition and expatiations of the constructs. By these ways, multiple candidate items for passive, active, extractive, and interactive information strategies, as well as uncertainty, were produced.

5.1.2 Scale Development

The purpose of this step was twofold: first, to assess the construct validity of the various scales being developed; and second, to identify those particular items that are still perceived as ambiguous. Besides the items created by us, items from construct seller reputation and information consistency were also included in the pool to ensure construct validity. Then the card sorting procedures following the instructions of Moore and Benbasat (1991) were applied.

5.1.2.1 First Round Card Sorting

For the first round card sorting, a 3×5-inch index card for each item was prepared, and then the cards were shuffled into random order for presentation to four judges. Each judge was required to sort the cards into a few categories independently and then label the categories of items. Cohen’s Kappa (Cohen 1960) and the item placement ratio were used to assess the reliability of the result of this sorting by the judges. Commonly, Cohen’s Kappa is used to assess the level of agreement across all pairs of judges. It is suggested that the acceptable scores of Cohen’s Kappa should be greater than 0.65. The item placement ratio is used to measure both the reliability of the classification scheme and the validity of the items developed in this research. There are no established
guidelines to determine acceptable levels of placement, but higher item placement ratio scores indicate higher reliability and validity. In addition, the matrix provided could be used to highlight any potential problem areas. Tables 2 and 3 demonstrate the results of Cohen’s Kappa and the item placement ratio.

<table>
<thead>
<tr>
<th>First round</th>
<th>Rater and 2</th>
<th>1</th>
<th>Rater and 3</th>
<th>1</th>
<th>Rater and 4</th>
<th>1</th>
<th>Rater and 3</th>
<th>2</th>
<th>Rater and 4</th>
<th>2</th>
<th>Rater and 4</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw agreement</td>
<td>0.958</td>
<td>1.00</td>
<td>0.917</td>
<td>0.958</td>
<td>0.958</td>
<td>0.917</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohen’s Kappa</td>
<td>0.952</td>
<td>1.00</td>
<td>0.904</td>
<td>0.952</td>
<td>0.952</td>
<td>0.904</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Inter-Judge Agreements of Round 1

<table>
<thead>
<tr>
<th>Actual Categories</th>
<th>PAI</th>
<th>AIS</th>
<th>EIS</th>
<th>HIS</th>
<th>UNT</th>
<th>REP</th>
<th>CON</th>
<th>Other</th>
<th>Total</th>
<th>TGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Categories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIS</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>AIS</td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>EIS</td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>HIS</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>UNT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
<td></td>
<td></td>
<td>3</td>
<td>20</td>
<td>85%</td>
</tr>
<tr>
<td>REP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>CON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td>100%</td>
</tr>
<tr>
<td>Total Item Placements: 96</td>
<td>Hits: 93</td>
<td>Overall Hit Ratio: 96.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Item Placement Ratio of Round 1

As shown in Tables 2 and 3, the raw agreement, the scores of Cohen’s Kappa, and the overall item placement ratio are high. Furthermore, we checked the labels the judges tagged on each category; they were very similar with the definitions or the expatiations of the original constructs. Thus, this carding process can be continued into the next stage. One item in the construct “transaction uncertainty” confused more than one judge;
it was deemed an ambiguous item and was therefore dropped from the item pool before conducting next round card sorting.

5.1.2.2 Second Round Card Sorting

Although a good result was collected in the first round of card sorting, to further confirm the items’ reliability and validity, a second round of card sorting was conducted. In this round, four new judges were invited to sort the items, and the difference between first round and this round was, we restricted the number of the categories and labeled each category with a construct name and a simple explanation in this round instead of allowing them to sort randomly. To avoid the judges from being forced to put items into a particular category, an extra “N/A” category option was provided. The sorting results of this round are shown in Tables 4 and 5.

<table>
<thead>
<tr>
<th>Second round</th>
<th>Rater 1 and 2</th>
<th>Rater 1 and 3</th>
<th>Rater 1 and 4</th>
<th>Rater 2 and 3</th>
<th>Rater 2 and 4</th>
<th>Rater 3 and 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw agreement</td>
<td>0.956</td>
<td>0.870</td>
<td>0.956</td>
<td>0.913</td>
<td>1.000</td>
<td>0.913</td>
</tr>
<tr>
<td>Cohen’s Kappa</td>
<td>0.950</td>
<td>0.851</td>
<td>0.950</td>
<td>0.900</td>
<td>1.000</td>
<td>0.900</td>
</tr>
</tbody>
</table>

Table 4 Inter-Judge Agreements of Round 2

<table>
<thead>
<tr>
<th>Actual Categories</th>
<th>PAI</th>
<th>AIS</th>
<th>EIS</th>
<th>IIS</th>
<th>UNT</th>
<th>REP</th>
<th>CON</th>
<th>N/A</th>
<th>Total</th>
<th>TGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Categories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIS</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>AIS</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>EIS</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>IIS</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>UNT</td>
<td>15</td>
<td></td>
<td></td>
<td>1</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>93.8%</td>
<td></td>
</tr>
<tr>
<td>REP</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>CON</td>
<td>14</td>
<td>2</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>87.5%</td>
<td></td>
</tr>
</tbody>
</table>

Total Item Placements: 92 Hits: 89 Overall Hit Ratio: 96.7%
Table 5 Item Placement Ratio of Round 2

In the second round, the results still demonstrated good reliability and validity; thus, another round of card sorting is unnecessary as a high enough confidence level was obtained from the developed construct items. Although the results of both rounds of card sorting were satisfactory, the eight judges in both rounds were questioned about their opinions and suggestions, and some wording changes were applied according to their suggestions.

5.2 Pilot Test

Since the study will be conducted in Mainland China, firstly the English version of the instruments were translated in simplified Chinese by us, and then three PhD students from Mainland China who had studied English for more than 12 years were invited to verify the translation. Disagreements in wording and meaning were resolved through meetings and discussions. To ensure that the respondents could distinguish the four information-seeking strategies easily, brief descriptions were presented in the online survey. Then a small-scale pilot study was conducted to filter and reconfirm the instruments using field data. The seven-point Likert-type scale for the instruments anchored from “strongly disagree” (1), to “neutral” (4), to “strongly agree” (7) was used, which is the most popular scale employed in current IS research. Thirty-five respondents with experiences on C2C online transactions or have experiences in interacting with these online marketplaces (although without any real online transaction record) from three popular Chinese online marketplaces (www.taobao.com, www.paipai.com, and www.eachnet.com) were invited to complete the online questionnaire.
After completing the questionnaire, an online interview was carried out. First, questions about the constructs and items in the questionnaire were posited to help point out potential deficiencies, such as if the four information-seeking strategies can easily be distinguished; if the explanation of proper nouns was easy to understand; if the number of questions was suitable; and if the respondents encountered any difficulties in understanding the wording of the questions, etc. We were especially concerned about the potential for information overload, which might vitiate the effectiveness of the information on uncertainty perception. However, all respondents replied that they would not torture themselves to seek extraneous information during online purchasing, but simply obtain sufficient information to help them with the purchase decision. Thus, we believe information overload should not be a confounding factor in the study. Regarding the issue of information quality, all respondents admitted they would only adopt the relevant high quality information from various information sources or cues and simply ignore low quality ones, which confirms our prediction that the most interesting topic in the field online transaction process is how information quality affects consumers’ cognition. In addition, the respondents were encouraged to provide comments and suggestions on any issue that might be relevant to the questionnaire. We also provided our e-mail addresses to the interviewees to allow future contacts if any suggestions arisen later.

Generally, the results of the pilot survey data showed good construct reliability and validity. Some changes in the questionnaire were made according to the comments and suggestions of the participants in this pilot test. For example, in the instructions, the wording and format were corrected, and the number of questions was reduced. In the questionnaire of the pilot test, the following questions were included: (1) perceptions on the information quality from different information-seeking strategies with detailed
quality dimensions, (2) perceptions on the reputation of different information sources, and (3) perceptions on the information consistency level from different information sources as well as from the online sellers in different cues (PAIS and IIS), respectively. Most participants complained that these questions confused them because they exceeded their thought boundary. Thus, it was difficult to provide accurate answers. Therefore, we removed questions referring to the three subjects, and retained the following: (1) few general questions on information quality from different information-seeking strategies, (2) only the online seller’s reputation, and (3) only the general perception on the information consistency level. With these amendments, we believed it was appropriate to proceed to the main data collection.

5.3 Data Collection

5.3.1 Introduction of the Online Questionnaire Content

The online questionnaire was finalized in view of the instrument development and pilot test process. There are two sections in the final format. The first section includes an explanation of our general research purpose (to investigate online consumers” information-seeking behaviors and how the information from different seeking methods would influence their judgment). Specific terms used in the questionnaire were defined, and RMB20 was allotted for each participant. A consent form was included to protect the respondents’ private information.

The second part of the survey included questions on the constructs. The respondents were asked to answer based on their experience and perception of their most recent initial interaction with one unknown online store in one of the three identified famous online marketplaces in China (www.taobao.com, www.paipai.com, or
www.eachnet.com), whether or not the transaction was a success. To obtain valid data, the respondents were encouraged to spend a few minutes remembering their experience with the online store in order to recall their exact perception of the transaction before answering the questions. They were required to provide the exact hyperlink of the online store, which allowed us to inspect the online store retrospectively. Then questions and brief descriptions about the independent variable, information from PAIS, AIS, EIS, and IIS; and questions about the contextual variable, information consistency and seller reputation; as well as the dependent variable, perception of transaction uncertainty, were then asked. Questions about the control variables, the general perceived information quality from the four information-seeking strategies, regulatory effectiveness, past attitude, involvement level, product price, and diagnosis level were also included in this section. Finally, the respondents were asked to complete personal demographic information for statistical purposes. The English questionnaire is shown in Appendix 1, and the Chinese questionnaire is shown in Appendix 2.

5.3.2 Sample Demographics Statistics

The members of the three online marketplaces were invited to participate via two routes, first we sent out email to those random selected members in the three online marketplaces, invitation letter with hyperlink of the online questionnaire were included in the email thus the members who received the email could directly access the survey by simply clicking the hyperlink. Besides, we also put up the same invitation letter on some discussion forums relevant to C2C transactions, thus those Internet users who had experience on C2C transactions and interested in our investigation might notice our letter and go to fill in our questionnaire. The duration of this data collection was about 3 weeks.
Finally, 310 responses were received. We then scrutinized these data carefully. The samples answered in less than 10 minutes and those with the same scores on most of the questions were removed from the data set. This resulted in 245 eligible samples for statistic analysis. Among these samples, most of them utilized various information-seeking strategies (more than 84% claimed to have utilized all of the four strategies, and more than 93% claimed to have utilized at least three of the four strategies) to seek required information, this confirms that in a C2C online transaction process, online consumers do will utilize various information-seeking strategies to seek information from various information sources or cues, which validates our research model. Only 6 respondents referred to their transaction experience in www.paipai.com, while only 2 referred to www.eachnet.com. The numbers align with the iResearch’s (2008) report that www.taobao.com is a virtual monopoly in the C2C online marketplace in Mainland China.

Furthermore, interviews with some participants showed that although they were registered members in the three identified online marketplaces, they preferred to purchase from www.taobao.com. In addition, even if the invitation letters were received from www.paipai.com or www.eachnet.com, many of the respondents still preferred to use their transaction experience in www.taobao.com for the survey because their most recent transaction took place on said Web site. Therefore, it is reasonable to assume that our data can generally represent the current share of C2C customer proportion of online marketplaces in Mainland China without serious sample bias.

Especially, we have compared the demographic characteristics of the 8 samples with other samples from taobao.com, and we did not find any significant differences between them, which indicated the 8 samples” cognition style might also similar with other
samples from www.taobao.com. Thus, we believe our sample can represent the whole online C2C consumers’ behavior and perception in Mainland China.

Finally, to ensure that the respondents used the initial transaction experiences with the online sellers to fill in this questionnaire, we retraced the hyperlinks of the online store that the respondents indicated. By checking their transaction record, we confirmed that all of the respondents had no previous transaction experience with their specified online stores, which ensured that the respondents did not know about the online stores and have no previous interaction with the sellers.

Table 6 provides a summary of the overall sample demographics. The demographic characteristics of the respondents in this study were compared with the general demographic characteristics of the entire Chinese online consumers as reported by iResearch (2008). No significant differences were found (iResearch reports that 69.1% online consumers are younger than 30 years old, and 70% of them take bachelor degree or above); thus, we believe that the sample distribution is sound, and potential bias on the demographic characteristics of the participants is not a serious problem in this research.
<table>
<thead>
<tr>
<th>Demographics</th>
<th>Number (N=245)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Past experience of online transaction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little</td>
<td>22</td>
<td>9.0%</td>
</tr>
<tr>
<td>Neutral</td>
<td>138</td>
<td>56.3%</td>
</tr>
<tr>
<td>Rich</td>
<td>85</td>
<td>34.7%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>111</td>
<td>45.3%</td>
</tr>
<tr>
<td>Female</td>
<td>134</td>
<td>54.7%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>106</td>
<td>43.3%</td>
</tr>
<tr>
<td>25-29</td>
<td>111</td>
<td>45.3%</td>
</tr>
<tr>
<td>&gt;29</td>
<td>28</td>
<td>11.4%</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below</td>
<td>47</td>
<td>19.2%</td>
</tr>
<tr>
<td>Bachelor</td>
<td>93</td>
<td>38.0%</td>
</tr>
<tr>
<td>Above</td>
<td>105</td>
<td>42.8%</td>
</tr>
<tr>
<td><strong>Internet experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>49</td>
<td>20.0%</td>
</tr>
<tr>
<td>5-8</td>
<td>120</td>
<td>49.0%</td>
</tr>
<tr>
<td>&gt;8</td>
<td>76</td>
<td>31.0%</td>
</tr>
</tbody>
</table>

Table 6 Sample Demographics
6.1 Measurement Model

The measurement model was tested by examining the internal consistency of the constructs (convergent validity), the discriminant validity, and the reliability of individual items. Due to reliability problems, one item from seller reputation was dropped in the analysis.

Convergent validity (internal consistency) is used to judge the extent to which each measurement item is related with its corresponding theoretical construct and is consistent with other items of the construct. High convergent validity scores indicate a low level of variable errors and a high degree of internal consistency. These can be tested by the following: (1) composite reliability (internal consistency of each item), (2) Cronbach's Alpha, (3) loading and cross-loading of each construct, and (4) average variance extracted (AVE) of each construct. Fornell and Larcker (1981) recommend the value of composite reliability (internal consistency of each item) to be equal to or above 0.80, and a Cronbach's Alpha above 0.70 to be the acceptable reliability of the instruments. In Table 7, which includes the descriptive and internal consistency of all constructs in the research model, all of the constructs' composite reliability and the Cronbach's Alpha exceed the corresponding threshold criterion values. The value of AVE in each construct is above 0.6, which is higher than the threshold value of 0.5. In Table 8, the factor loadings and cross-loadings for all constructs are shown, all the loadings of each construct are higher than 0.7, and all cross-loadings are much lower than their loadings. Generally, the constructs exhibit sufficient internal consistency and confirm that convergent validity will not be a problem in this study.
<table>
<thead>
<tr>
<th>Construct Items</th>
<th>No. of Items</th>
<th>Means</th>
<th>Standard Deviation</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
<th>Average variance extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAIS</td>
<td>3</td>
<td>5.336</td>
<td>1.050</td>
<td>0.770</td>
<td>0.863</td>
<td>0.678</td>
</tr>
<tr>
<td>AIS</td>
<td>3</td>
<td>4.358</td>
<td>1.823</td>
<td>0.942</td>
<td>0.963</td>
<td>0.896</td>
</tr>
<tr>
<td>EIS</td>
<td>3</td>
<td>4.426</td>
<td>1.903</td>
<td>0.939</td>
<td>0.961</td>
<td>0.891</td>
</tr>
<tr>
<td>IIS</td>
<td>3</td>
<td>5.335</td>
<td>1.545</td>
<td>0.941</td>
<td>0.963</td>
<td>0.896</td>
</tr>
<tr>
<td>Information consistency (CON)</td>
<td>4</td>
<td>4.672</td>
<td>1.065</td>
<td>0.822</td>
<td>0.884</td>
<td>0.656</td>
</tr>
<tr>
<td>Seller reputation (REP)</td>
<td>2</td>
<td>5.384</td>
<td>1.125</td>
<td>0.913</td>
<td>0.959</td>
<td>0.921</td>
</tr>
<tr>
<td>Uncertainty (UNT)</td>
<td>4</td>
<td>3.728</td>
<td>1.342</td>
<td>0.887</td>
<td>0.922</td>
<td>0.749</td>
</tr>
</tbody>
</table>

Table 7 Descriptive Results and Internal Consistency of the Constructs

<table>
<thead>
<tr>
<th>Construct Items</th>
<th>PAIS</th>
<th>AIS</th>
<th>EIS</th>
<th>IIS</th>
<th>UNT</th>
<th>CON</th>
<th>REP</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAIS1</td>
<td>0.7676</td>
<td>0.0423</td>
<td>0.0563</td>
<td>0.1464</td>
<td>-0.0911</td>
<td>0.1149</td>
<td>0.1306</td>
</tr>
<tr>
<td>PAIS2</td>
<td>0.8327</td>
<td>0.0612</td>
<td>-0.0137</td>
<td>0.1562</td>
<td>-0.1676</td>
<td>0.2179</td>
<td>0.2597</td>
</tr>
<tr>
<td>PAIS3</td>
<td>0.8661</td>
<td>0.2023</td>
<td>0.1369</td>
<td>0.1318</td>
<td>-0.1827</td>
<td>0.1496</td>
<td>0.2437</td>
</tr>
<tr>
<td>AIS1</td>
<td>0.1258</td>
<td>0.9597</td>
<td>0.2409</td>
<td>-0.0236</td>
<td>-0.1286</td>
<td>0.0446</td>
<td>0.0527</td>
</tr>
<tr>
<td>AIS2</td>
<td>0.1347</td>
<td>0.9503</td>
<td>0.2227</td>
<td>-0.0391</td>
<td>-0.097</td>
<td>0.0477</td>
<td>0.0449</td>
</tr>
<tr>
<td>AIS3</td>
<td>0.1362</td>
<td>0.9289</td>
<td>0.2704</td>
<td>-0.0307</td>
<td>-0.0968</td>
<td>0.0353</td>
<td>0.0944</td>
</tr>
<tr>
<td>EIS1</td>
<td>0.0548</td>
<td>0.2186</td>
<td>0.9469</td>
<td>-0.1161</td>
<td>-0.1318</td>
<td>0.2181</td>
<td>0.0544</td>
</tr>
<tr>
<td>EIS2</td>
<td>0.1017</td>
<td>0.2616</td>
<td>0.9498</td>
<td>-0.1388</td>
<td>-0.0934</td>
<td>0.0246</td>
<td>0.0056</td>
</tr>
<tr>
<td>EIS3</td>
<td>0.0653</td>
<td>0.2588</td>
<td>0.935</td>
<td>-0.1277</td>
<td>-0.1002</td>
<td>0.005</td>
<td>0.0044</td>
</tr>
<tr>
<td>IIS1</td>
<td>0.2</td>
<td>-0.0163</td>
<td>-0.1421</td>
<td>0.936</td>
<td>-0.3075</td>
<td>0.2961</td>
<td>0.3073</td>
</tr>
<tr>
<td>IIS2</td>
<td>0.1785</td>
<td>-0.019</td>
<td>-0.128</td>
<td>0.9562</td>
<td>-0.3651</td>
<td>0.316</td>
<td>0.3661</td>
</tr>
<tr>
<td>IIS3</td>
<td>0.1183</td>
<td>-0.0539</td>
<td>-0.112</td>
<td>0.948</td>
<td>-0.362</td>
<td>0.2562</td>
<td>0.3623</td>
</tr>
<tr>
<td>UNT1</td>
<td>-0.1092</td>
<td>-0.0077</td>
<td>-0.1032</td>
<td>-0.2687</td>
<td>0.8034</td>
<td>-0.4513</td>
<td>-0.2218</td>
</tr>
<tr>
<td>UNT2</td>
<td>-0.1694</td>
<td>-0.1077</td>
<td>-0.1187</td>
<td>-0.3143</td>
<td>0.9058</td>
<td>-0.5114</td>
<td>-0.3515</td>
</tr>
<tr>
<td>UNT3</td>
<td>-0.1982</td>
<td>-0.1605</td>
<td>-0.0913</td>
<td>-0.3416</td>
<td>0.8851</td>
<td>-0.414</td>
<td>-0.3613</td>
</tr>
<tr>
<td>UNT4</td>
<td>-0.1768</td>
<td>-0.118</td>
<td>-0.0926</td>
<td>-0.3422</td>
<td>0.863</td>
<td>-0.4127</td>
<td>-0.2793</td>
</tr>
<tr>
<td>CON1</td>
<td>0.1867</td>
<td>0.0858</td>
<td>0.0558</td>
<td>0.247</td>
<td>-0.4054</td>
<td>0.8373</td>
<td>0.458</td>
</tr>
<tr>
<td>CON2</td>
<td>0.2182</td>
<td>0.0323</td>
<td>0.0208</td>
<td>0.2341</td>
<td>-0.3792</td>
<td>0.8113</td>
<td>0.453</td>
</tr>
<tr>
<td>CON3</td>
<td>0.0934</td>
<td>-0.0203</td>
<td>-0.0287</td>
<td>0.2463</td>
<td>-0.4886</td>
<td>0.861</td>
<td>0.3085</td>
</tr>
<tr>
<td>CON4</td>
<td>0.1759</td>
<td>0.0608</td>
<td>0.0215</td>
<td>0.263</td>
<td>-0.3918</td>
<td>0.7225</td>
<td>0.3518</td>
</tr>
<tr>
<td>REP1</td>
<td>0.2763</td>
<td>0.0364</td>
<td>0.011</td>
<td>0.3525</td>
<td>-0.3462</td>
<td>0.4514</td>
<td>0.9613</td>
</tr>
<tr>
<td>REP2</td>
<td>0.2448</td>
<td>0.0922</td>
<td>0.0404</td>
<td>0.3512</td>
<td>-0.3321</td>
<td>0.4669</td>
<td>0.9579</td>
</tr>
</tbody>
</table>

Table 8 Factor Loadings and Cross-loadings for all Constructs
Discriminant validity indicates the extent to which the items of a construct are distinct from those of other constructs. According to Fornell and Larcker (1981), discriminant validity is acceptable when the square root of every AVE of each construct is larger than any correlation among any pair of the constructs (the AVE shared between the construct and its indicators is larger than the AVE shared between the construct and other constructs). Table 9 shows that all values of the square root of AVE are above 0.70 and are larger than all other cross-correlations. This indicates that the variance explained by the respective construct is larger than the measurement error variance (Fornell et al. 1982).

<table>
<thead>
<tr>
<th></th>
<th>PAIS</th>
<th>AIS</th>
<th>EIS</th>
<th>IIS</th>
<th>CON</th>
<th>REP</th>
<th>UNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAIS</td>
<td>0.823</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIS</td>
<td>0.139</td>
<td></td>
<td>0.947</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIS</td>
<td>0.076</td>
<td>0.258</td>
<td>0.944</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIS</td>
<td>0.173</td>
<td>-0.032</td>
<td>-0.134</td>
<td>0.947</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON</td>
<td>0.202</td>
<td>0.045</td>
<td>0.018</td>
<td>0.305</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REP</td>
<td>0.272</td>
<td>0.066</td>
<td>0.026</td>
<td>0.367</td>
<td>0.478</td>
<td>0.96</td>
<td></td>
</tr>
<tr>
<td>UNT</td>
<td>-0.19</td>
<td>-0.116</td>
<td>-0.118</td>
<td>-0.366</td>
<td>-0.518</td>
<td>-0.354</td>
<td>0.865</td>
</tr>
</tbody>
</table>

Table 9 Square Root of AVE and Cross-Correlations

Multicollinearity indicates the extent to which an independent variable varies with other independent variables. Excessively high multicollinearity challenges the statistical assumption that independent variables are truly independent of one another. Both tolerance and Variance Inflation Factor (VIF, the reciprocal of the tolerance) are statistical tests used to determine the problem of multicollinearity. A lower tolerance or higher VIF indicates a higher risk of multicollinearity; as tolerance decreases or VIF increases, the variance of the regression coefficient would also increase, which would cause an unstable estimate. The tolerance values of all independent variables are larger than 0.1, and a VIF lower than 10 suggests the absence of the multicollinearity problem.
As shown in Table 10, all tolerance values are larger than 0.6, and the VIF values are lower than 2.0, which indicate the absence of a multicollinearity problem in this study.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Tolerance</th>
<th>Variance Inflation Factor (VIF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAIS</td>
<td>0.897</td>
<td>1.115</td>
</tr>
<tr>
<td>AIS</td>
<td>0.917</td>
<td>1.090</td>
</tr>
<tr>
<td>EIS</td>
<td>0.911</td>
<td>1.098</td>
</tr>
<tr>
<td>IIS</td>
<td>0.816</td>
<td>1.225</td>
</tr>
<tr>
<td>CON</td>
<td>0.747</td>
<td>1.338</td>
</tr>
<tr>
<td>REP</td>
<td>0.692</td>
<td>1.445</td>
</tr>
</tbody>
</table>

Table 10 Collinearity Statistics of the Constructs

Furthermore, Harman’s single factor test was applied to examine if there is common method bias present in this study. The result of the principal components factor analysis reveals that the first factor does not account for a majority of the variance (31.94%), and no single factor emerges from the factor analysis (Podsakoff et al. 2003). This indicates that the common method bias is not a major issue in the data.

6.2 Structural Model Analyses

SPSS 13.0 was used for the structural model analyses, and all data were standardized proceeding with the data analyses. The main effect hypotheses proposed in the research model (including H1 to H6) were tested. This was followed by testing the moderating effects (two-way interactions) of information consistency and seller reputation on the causal relationship between transaction information from the four groups of information-seeking strategies and uncertainty perception (including H5a to H5d and H6a to H6d). Finally, The additional test for the three-way interaction were tested.
6.2.1 Main Effects Test

In the research model, we hypothesize that the transaction information acquired from the four information-seeking strategies, PAIS, AIS, EIS, and IIS, as well as the information consistency level and seller reputation will positively reduce online consumers’ perception of transaction uncertainty. To test these effects, the dependent variables were regressed onto the independent variable. In addition, the control variables, including the regulatory effectiveness, previous attitude toward online transaction, involvement level, price, and the diagnostic level of the product, were also included in the model.

As shown in Figure 5, the results of the full model are significant, as is consistent with our prediction, with F=14.227 and P<0.001; the adjust $R^2$ is 40.2%. This indicates that the model could explain 40.2% of the variance of the perceived uncertainty reduction. Three of the six hypotheses on the main effects (H3, H4, and H5) are supported, whereas H1, H2, and H6 are rejected in the Linear Regression Test. Specifically, H3 is significant at p<0.05 level with a negative coefficient with uncertainty, H4 is significant at p<0.001 level with a negative coefficient with uncertainty, and H5 is significant at p<0.001 level with a negative coefficient with uncertainty. In addition, two of the five control variables, involvement level and product price, are significant at p<0.05 level, and both take positive coefficients with uncertainty. Two other control variables, regulatory effectiveness and past attitude towards online transaction, are found to be marginally significant at p<0.1 level with both negative coefficients on the transaction uncertainty. The results, including independent variables and control variables, are shown in Table 1.
Figure 5 The Results of Main Effects Test
Coefficients(a)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>PAIS</td>
<td>.011</td>
<td>.069</td>
<td>.009</td>
<td>.164</td>
</tr>
<tr>
<td>AIS</td>
<td>-.048</td>
<td>.039</td>
<td>-.065</td>
<td>-1.225</td>
</tr>
<tr>
<td>EIS</td>
<td>-.078</td>
<td>.038</td>
<td>-.111</td>
<td>-2.043</td>
</tr>
<tr>
<td>IIS</td>
<td>-.191</td>
<td>.050</td>
<td>-.220</td>
<td>-3.812</td>
</tr>
<tr>
<td>CON</td>
<td>-.405</td>
<td>.081</td>
<td>-.322</td>
<td>-5.028</td>
</tr>
<tr>
<td>REP</td>
<td>-.011</td>
<td>.080</td>
<td>-.009</td>
<td>-.141</td>
</tr>
<tr>
<td>RE</td>
<td>-.154</td>
<td>.079</td>
<td>-.125</td>
<td>-1.943</td>
</tr>
<tr>
<td>PA</td>
<td>-.154</td>
<td>.086</td>
<td>-.113</td>
<td>-1.776</td>
</tr>
<tr>
<td>IN</td>
<td>.179</td>
<td>.077</td>
<td>.139</td>
<td>2.330</td>
</tr>
<tr>
<td>PR</td>
<td>.121</td>
<td>.060</td>
<td>.112</td>
<td>2.018</td>
</tr>
<tr>
<td>DI</td>
<td>-.103</td>
<td>.063</td>
<td>-.095</td>
<td>-1.631</td>
</tr>
</tbody>
</table>

a  Dependent Variable: UNT

Table 11 The Results of Main Effects Test (Linear Regression)

In order to confirm that the findings are mainly due to the quantity rather than quality of the information, we ran an additional linear regression test. The test included the information quality factors of the four strategies into the full model; the results demonstrated that all of information quality’s influences were insignificant at p>0.5, and the significances of H1 to H6 was similar so. This suggests that information quality is not a confounding factor in this research and demonstrated that in our research context, the most significant issue should be information quantity.

6.2.2 Test of Information Consistency’ Interactive Influences on Uncertainty

As described in H5a to H5d and H6a to H6d, we predict the information consistency level and seller reputation will moderate the causal relationship between the information from the four information-seeking strategies and the online consumers’ perception of uncertainty. We hypothesize that the higher the information consistency level, the greater the information from those information-seeking strategies reduces transaction uncertainty; the higher the seller reputation, the greater the information from PAIS or
IIS reduces transaction uncertainty. To test these two-way interactive effects, moderated multiple-regression models were built, and product terms were built by multiplying the information from the four information-seeking strategies and information consistency or seller reputation individually. To avoid the confounding influences between the two moderating variables that could affect each other in the model (additional three-way interaction analyses is shown below), these two moderating variables were analyzed separately.

The results indicate that information consistency level could only moderate the causal relationship between IIS information and online consumers’ perception of transaction uncertainty, with a negative coefficient and with a significance level of p<0.05; all other moderating effects are insignificant, and thus H5d is supported, while H5a, H5b, and H5c are rejected. The score of F change is 2.003, and the score of $R^2$ change is 0.02 in the model with information consistency’s moderating effects. The results of these two-way interaction tests are demonstrated in Figure 6 and Table 12.
Figure 6 The Results of Information Consistency” Interactive Effects
### Coefficients(a)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>PAIS</td>
<td>.034</td>
<td>.055</td>
<td>.034</td>
<td>.616</td>
</tr>
<tr>
<td>AIS</td>
<td>-.049</td>
<td>.054</td>
<td>-.049</td>
<td>-.909</td>
</tr>
<tr>
<td>EIS</td>
<td>-.127</td>
<td>.055</td>
<td>-.127</td>
<td>-2.304</td>
</tr>
<tr>
<td>IIS</td>
<td>-.243</td>
<td>.059</td>
<td>-.243</td>
<td>-4.143</td>
</tr>
<tr>
<td>CON</td>
<td>-.323</td>
<td>.065</td>
<td>-.323</td>
<td>-4.967</td>
</tr>
<tr>
<td>REP</td>
<td>.006</td>
<td>.067</td>
<td>.006</td>
<td>.092</td>
</tr>
<tr>
<td>RE</td>
<td>-.137</td>
<td>.064</td>
<td>-.137</td>
<td>-2.131</td>
</tr>
<tr>
<td>PA</td>
<td>-.101</td>
<td>.064</td>
<td>-.101</td>
<td>-1.575</td>
</tr>
<tr>
<td>IN</td>
<td>.134</td>
<td>.060</td>
<td>.134</td>
<td>2.233</td>
</tr>
<tr>
<td>PR</td>
<td>.131</td>
<td>.056</td>
<td>.131</td>
<td>2.350</td>
</tr>
<tr>
<td>DI</td>
<td>-.108</td>
<td>.059</td>
<td>-.108</td>
<td>-1.827</td>
</tr>
<tr>
<td>PAIS*CON</td>
<td>-.035</td>
<td>.049</td>
<td>-.037</td>
<td>-.712</td>
</tr>
<tr>
<td>AIS*CON</td>
<td>-.021</td>
<td>.051</td>
<td>-.023</td>
<td>-.413</td>
</tr>
<tr>
<td>EIS*CON</td>
<td>.048</td>
<td>.049</td>
<td>.054</td>
<td>.983</td>
</tr>
<tr>
<td>IIS*CON</td>
<td>-.127</td>
<td>.052</td>
<td>-.129</td>
<td>-2.445</td>
</tr>
</tbody>
</table>

a  Dependent Variable: UNT

Table 12 The Results of Information Consistency’’ Interactive Effects

To more deeply and clearly understand these moderating effects, the Simple Slopes Test recommended by Cohen and Cohen (1983) and Aiken and West (1991) was used. This method is designed to interpret the interaction effects of two continuous predictor variables. By this way, one could interpret the significance level of the causal relationships between the independent variable and the dependent variable under high or low levels of the moderator. To illustrate and test the significant interaction effects, separate regression lines were computed, plotted, and tested with one standard deviation below the mean on the moderating variables and one standard deviation above their mean. The results are shown in Table 13 and Figure 7.
The results show that under low information consistency level, more information from IIS could not significantly reduce online consumers’ perception of uncertainty; however, under a high information consistency level, more information from IIS could significantly reduce uncertainty with \( p<0.001 \).

### 6.2.3 Test of Seller Reputation’ Interactive Influences on Uncertainty
For seller reputation, the results indicate that it could only moderate the causal relationship between IIS information and online consumers’ perception of uncertainty, with a negative coefficient and with a significance level of $p<0.01$, while all other moderating effects are insignificant. Thus, H6b, H6c, and H6d are supported whereas H6a is rejected. The score of $F$ change is 3.966, and the score of $R^2$ change is 0.039 in the model with the seller reputation’s moderating effects. The results of these two-way interaction tests are demonstrated in Figure 8 and Table 14.

![Figure 8 The Results of Seller Reputation’’s Interactive Effects](image)
Table 14 The Results of Seller Reputation" Interactive Effects

To more deeply and clearly understand these moderating effects, the Simple Slopes Test recommended by Cohen and Cohen (1983) and Aiken and West (1991) was used again. The results are shown in Table 15 and Figure 9.

Table 15 The Moderating Effects of Seller Reputation on IIS information
The results show that under low seller reputation, more information from IIS could not significantly reduce online consumers’ perception of uncertainty. Under high seller reputation, more information from IIS could significantly reduce uncertainty with p<0.001 level.

6.2.4 Additional Test on the Influence of Seller Reputation

To further investigate the effect of seller reputation on uncertainty, we conducted an additional Simple Slopes Test and drew the picture of the two-way interaction about IIS information and seller reputation on uncertainty from another angle. Specifically, we portrayed the moderating effects of IIS information on seller reputation, the results are shown in Table 16 and Figure 10.
As shown in the results, if online consumers obtain little IIS information from online sellers, sellers’ higher reputation will marginally significantly enhance online consumers’ perception of uncertainty with \( p < 0.1 \) as compared to lower seller reputation. When online consumers obtain comprehensive IIS information from online sellers, sellers’ higher reputation can significantly reduce uncertainty with \( p < 0.05 \) as compared to lower seller reputation.

Table 16 The Moderating Effects of IIS information on Seller Reputation

<table>
<thead>
<tr>
<th>Seller Reputation</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>With Low IIS Information</td>
<td>.159</td>
<td>.087</td>
<td>.159</td>
<td>1.820</td>
</tr>
<tr>
<td>With High IIS Information</td>
<td>-.202</td>
<td>.088</td>
<td>-.202</td>
<td>-2.294</td>
</tr>
</tbody>
</table>

\( a \) Dependent Variable: UNT

Figure 10 The Moderating Effects of IIS information on Seller Reputation
6.2.5 Additional Test on the Influence of Control Variables

According to the results of the main effect test, we found two of the five control variables (online consumers’ involvement level and the price of the product) could significantly affect our research model, in order to clearly clarify these two control variables’ effect on our research model, we conducted some additional tests to further explore if they have any interactive effect with the transaction information to affect online consumers’ uncertainty perception.

Similarly with the test on the two contextual factors’ interactive effects on uncertainty, the moderated multiple-regression model was built and analysed. For online consumers’ involvement level, the results indicate that it could moderate the effects of IIS information on online consumers’ perception of transaction uncertainty with a negative coefficient and with a significance level of p<0.05; all other moderating effects are insignificant. The score of F change is 1.804, and the score of $R^2$ change is 0.018. For the price of the product, the results indicate that it could moderate the effects of IIS information on online consumers’ perception of transaction uncertainty with a positive coefficient and with a significance level of p<0.05; all other moderating effects are insignificant. The score of F change is 2.963, and the score of $R^2$ change is 0.029. The results of these two-way interaction tests are demonstrated in Table 17.
### Coefficients(a)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>Online consumers’ involvement level (IN)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIS*IN</td>
<td>-0.033</td>
<td>.050</td>
<td>-.035</td>
<td>-0.665</td>
</tr>
<tr>
<td>AIS*IN</td>
<td>.023</td>
<td>.055</td>
<td>.024</td>
<td>0.417</td>
</tr>
<tr>
<td>EIS*IN</td>
<td>-0.052</td>
<td>.055</td>
<td>-.055</td>
<td>-0.942</td>
</tr>
<tr>
<td>IIS*IN</td>
<td>-1.128</td>
<td>.052</td>
<td>-.130</td>
<td>-2.451</td>
</tr>
<tr>
<td>Price of the product (PR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAIS*PR</td>
<td>.054</td>
<td>.053</td>
<td>.055</td>
<td>1.009</td>
</tr>
<tr>
<td>AIS*PR</td>
<td>-0.052</td>
<td>.057</td>
<td>-.052</td>
<td>-.904</td>
</tr>
<tr>
<td>EIS*PR</td>
<td>.000</td>
<td>.060</td>
<td>.000</td>
<td>.004</td>
</tr>
<tr>
<td>IIS*PR</td>
<td>.135</td>
<td>.055</td>
<td>.139</td>
<td>2.469</td>
</tr>
</tbody>
</table>

a Dependent Variable: UNT

Table 17 The Results of Control Variables’ Interactive Effects

6.2.6 Additional Test on the Potential Three-way Interaction

According to the results of the two-way interaction, we found that information consistency, or seller reputation only could moderate the causal relationship between IIS information and transaction uncertainty, both of them could not seperately moderate the causal relationship between information from other three groups of strategies and the uncertainty perception. It is possible that these two contextual factors may not have any impact to change such information’s effect on transaction uncertainty; but another possibility is that they only can jointly affect the online consumers’ perception on such information thus let the results of the two-way interaction test insignificance.

KAT suggests the possibility that the contextual factors could jointly affect online information seekers’ perception on the acquired information. This could help to generate insights on the conditions under which the impacts of the information from four information-seeking strategies to reduce uncertainty can be altered.
To test the possibility of the potential three-way interactions, the significance test of slope differences for three-way interactions in moderated multiple regression analysis proposed by Cohen and Cohen (1983), Aiken and West (1991), and Dawson and Richter (2006) was adopted. Again, to avoid the confounding interactive influences among the variables as well as the produced terms, which could impact the target three-way interaction effects in the study, we separately analyzed the independent variables with the moderating variables, as well as the produced two-way and three-way interaction predictor variables. Following their algorithmic procedure, we first regressed the independent and moderating variables, then all the pairs of the produced two-way interaction predictor variables were added to the regression, finally, the produced three-way interaction predictor variables were included; according to the algorithm, only when the three-way interactions are significant in the regression equation can the interaction be meaningful and interpretable.

As shown in Tables 18, 19, 20, and 21, the produced three-way interaction predictor variable AIS*CON*REP is significant at p<0.01 level with a positive coefficient, the score of F change is 7.041, and the score of R² change is 0.02. The EIS*CON*REP is significant at p<0.001 level with a positive coefficient, the score of F change is 14.241, and the score of R² change is 0.039. These results indicate that information consistency and seller reputation do can jointly affect online consumers’ perception on the AIS and EIS information.
Table 18 The Result of Three-way Interaction (PAIS information, REP and CON)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>PAIS</td>
<td>-.094</td>
<td>.067</td>
<td>-.094</td>
<td>-1.410</td>
</tr>
<tr>
<td>CON</td>
<td>-.405</td>
<td>.064</td>
<td>-.405</td>
<td>-6.283</td>
</tr>
<tr>
<td>REP</td>
<td>-.169</td>
<td>.066</td>
<td>-.169</td>
<td>-2.561</td>
</tr>
<tr>
<td>PAIS*CON</td>
<td>.021</td>
<td>.069</td>
<td>.022</td>
<td>.305</td>
</tr>
<tr>
<td>PAIS*REP</td>
<td>-.078</td>
<td>.065</td>
<td>-.086</td>
<td>-1.187</td>
</tr>
<tr>
<td>CON*REP</td>
<td>-.082</td>
<td>.055</td>
<td>-.086</td>
<td>-1.479</td>
</tr>
<tr>
<td>PAIS<em>CON</em>REP</td>
<td>.050</td>
<td>.048</td>
<td>.073</td>
<td>1.046</td>
</tr>
</tbody>
</table>

a  Dependent Variable: UNT

Table 19 The Result of Three-way Interaction (AIS information, REP and CON)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>AIS</td>
<td>-.159</td>
<td>.060</td>
<td>-.159</td>
<td>-2.636</td>
</tr>
<tr>
<td>CON</td>
<td>-.448</td>
<td>.064</td>
<td>-.448</td>
<td>-6.975</td>
</tr>
<tr>
<td>REP</td>
<td>-.145</td>
<td>.064</td>
<td>-.145</td>
<td>-2.280</td>
</tr>
<tr>
<td>AIS*CON</td>
<td>-.003</td>
<td>.061</td>
<td>-.003</td>
<td>-.041</td>
</tr>
<tr>
<td>AIS*REP</td>
<td>-.016</td>
<td>.062</td>
<td>-.016</td>
<td>-.258</td>
</tr>
<tr>
<td>CON*REP</td>
<td>-.118</td>
<td>.054</td>
<td>-.123</td>
<td>-2.172</td>
</tr>
<tr>
<td>AIS<em>CON</em>REP</td>
<td>.141</td>
<td>.053</td>
<td>.170</td>
<td>2.654</td>
</tr>
</tbody>
</table>

a  Dependent Variable: UNT

Table 20 The Result of Three-way Interaction (EIS information, REP and CON)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>EIS</td>
<td>-.237</td>
<td>.063</td>
<td>-.237</td>
<td>-3.754</td>
</tr>
<tr>
<td>CON</td>
<td>-.397</td>
<td>.064</td>
<td>-.398</td>
<td>-6.210</td>
</tr>
<tr>
<td>REP</td>
<td>-.184</td>
<td>.063</td>
<td>-.184</td>
<td>-2.911</td>
</tr>
<tr>
<td>EIS*CON</td>
<td>-.001</td>
<td>.059</td>
<td>-.001</td>
<td>-.023</td>
</tr>
<tr>
<td>EIS*REP</td>
<td>.087</td>
<td>.065</td>
<td>.089</td>
<td>1.336</td>
</tr>
<tr>
<td>CON*REP</td>
<td>-.173</td>
<td>.055</td>
<td>-.181</td>
<td>-3.141</td>
</tr>
<tr>
<td>EIS<em>CON</em>REP</td>
<td>.192</td>
<td>.051</td>
<td>.247</td>
<td>3.774</td>
</tr>
</tbody>
</table>

a  Dependent Variable: UNT
Table 21 The Result of Three-way Interaction (IIS information, REP and CON)

Since we found AIS*CON*REP and EIS*CON*REP are significant, we thus further tested the internal mechanism of the three-way interactions on AIS and EIS information.

Three-way Interaction on AIS Information

To analyze the internal mechanism of the significant three-way interaction, the Simple Slopes Test of Cohen and Cohen (1983) and Aiken and West (1991) was adopted. By this way, the significance level of the causal relationships between the independent variable and the dependent variable under different combination levels of the two moderators could be interpreted. Separate regression lines were computed, plotted, and tested with one standard deviation below the mean on the moderating variables and one standard deviation above the mean of them. Second, we adopted the algorithm of Dawson and Richter (2006) to test the slope differences for statistical significance among each pair of the casual relationships” slopes based on different combination levels of the two moderating variables. The formulas and the development process of these formulas are described in Appendix 3. The results of the three-way interaction effects on AIS are shown in Figure 11 and Tables 22 and 23.
Figure 11 The Three-way Interaction (AIS Information)

<table>
<thead>
<tr>
<th>Coefficients(a)</th>
<th>AIS</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(4) CON Low</td>
<td></td>
<td>.001</td>
<td>.093</td>
<td>.001</td>
<td>.007</td>
</tr>
<tr>
<td>REP Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.995</td>
</tr>
<tr>
<td>(3) CON Low</td>
<td></td>
<td>-.313</td>
<td>.130</td>
<td>-.313</td>
<td>-2.415</td>
</tr>
<tr>
<td>REP High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) CON High</td>
<td></td>
<td>-.286</td>
<td>.157</td>
<td>-.286</td>
<td>-1.820</td>
</tr>
<tr>
<td>REP Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) CON High</td>
<td></td>
<td>-.036</td>
<td>.078</td>
<td>-.036</td>
<td>-.465</td>
</tr>
<tr>
<td>REP High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a  Dependent Variable: UNT

Table 22 The Internal Mechanism of AIS information, REP and CON
Table 23 The Comparison Test of AIS information’s Effect on Uncertainty

<table>
<thead>
<tr>
<th>Pair of slopes on AIS</th>
<th>t-value for slope difference</th>
<th>p-value for slope difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) and (2)</td>
<td>1.418</td>
<td>0.158</td>
</tr>
<tr>
<td>(1) and (3)</td>
<td>2.026</td>
<td>0.044</td>
</tr>
<tr>
<td>(1) and (4)</td>
<td>-0.302</td>
<td>0.763</td>
</tr>
<tr>
<td>(2) and (3)</td>
<td>0.126</td>
<td>0.900</td>
</tr>
<tr>
<td>(2) and (4)</td>
<td>-1.532</td>
<td>0.127</td>
</tr>
<tr>
<td>(3) and (4)</td>
<td>-2.048</td>
<td>0.042</td>
</tr>
</tbody>
</table>

As shown in the results, under low information consistency level and low seller reputation condition, or under high information consistency level and high seller reputation condition, more information from AIS cannot significantly reduce online consumers’ perception of transaction uncertainty. On the other hand, under high information consistency level and low seller reputation condition, more information from AIS can marginally reduce transaction uncertainty perception with a negative coefficient and a significance level set at p<0.1. Under low information consistency level and high seller reputation condition, more information from AIS can significantly reduce uncertainty with a negative coefficient and a significance level set at p<0.05 leve. We also further compare the differences of each pairs of the lines in Figure 11, as shown in Table 23, under high seller reputation condition, the slope difference between high and low information consistency level is significant at p<0.05 level; under low seller reputation condition, the slope difference between higher and low information consistency level is insignificant; under high information consistency level, the slope difference between high and low seller reputation condition is insignificant; and under low information consistency level, the slope difference between high and low seller reputation condition is significant at the p<0.05 level. The results of these comparison tests clearly exhibit the significance of the slope discrepancies under each pairs of contrastive contextual (“information consistency” × “seller reputation”) conditions.
Three-way Interaction on EIS Information

With the same arithmetic as in AIS*CON*REP, we analyzed the internal mechanism of the three-way interaction on EIS*CON*REP. The results of the three-way interaction effects on EIS are shown in Figure 12 and Tables 24 and 25.

![Figure 12 The Three-way Interaction (EIS Information)](image)

<table>
<thead>
<tr>
<th>Coefficients(a)</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(4) CON Low REP Low</td>
<td>-.131</td>
<td>.088</td>
<td>-.131</td>
<td>-1.494</td>
</tr>
<tr>
<td>(3) CON Low REP High</td>
<td>-.340</td>
<td>.112</td>
<td>-.340</td>
<td>-3.040</td>
</tr>
<tr>
<td>(2) CON High REP Low</td>
<td>-.517</td>
<td>.177</td>
<td>-.517</td>
<td>-2.929</td>
</tr>
<tr>
<td>(1) CON High REP High</td>
<td>.040</td>
<td>.075</td>
<td>.040</td>
<td>.535</td>
</tr>
</tbody>
</table>

Dependent Variable: UNT

Table 24 The Internal Mechanism of EIS information, REP and CON
### Table 25 The Comparison Test of EIS information’s Effect on Uncertainty

<table>
<thead>
<tr>
<th>Pair of slopes on EIS</th>
<th>t-value for slope difference</th>
<th>p-value for slope difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) and (2)</td>
<td>2.913</td>
<td>0.004</td>
</tr>
<tr>
<td>(1) and (3)</td>
<td>3.063</td>
<td>0.002</td>
</tr>
<tr>
<td>(1) and (4)</td>
<td>1.463</td>
<td>0.145</td>
</tr>
<tr>
<td>(2) and (3)</td>
<td>-0.809</td>
<td>0.420</td>
</tr>
<tr>
<td>(2) and (4)</td>
<td>-2.130</td>
<td>0.034</td>
</tr>
<tr>
<td>(3) and (4)</td>
<td>-1.556</td>
<td>0.121</td>
</tr>
</tbody>
</table>

Similar results are obtained in the three-way interaction on EIS information, under low information consistency level and low seller reputation condition, or under high information consistency level and high seller reputation condition, more information from EIS cannot significantly reduce online consumers’ perception of uncertainty.

Under high information consistency level and low seller reputation condition, or under low information consistency level and high seller reputation condition, more information from EIS can significantly reduce uncertainty with a negative coefficient and the significance level set at p<0.01 level. Similar with the case in AIS information, we also further compare the differences of each pairs of the lines in Figure 12, Table 25 shows that under the high seller reputation condition, the slope difference between the high and low information consistency level is significant at p<0.01 level; under low seller reputation condition, the slope difference between the high and low information consistency level is significant at p<0.05 level; under high information consistency level, the slope difference between the high and low seller reputation condition is significant at p<0.01 level; finally, under low information consistency level, the slope difference between high and low seller reputation condition is insignificant. The results of these comparison tests clearly exhibit the significance of the slope discrepancies under each pairs of contrastive contextual (“information consistency” × “seller reputation”) conditions.
6.2.7 Additional Test on the Uncertainty’s Effect on Purchase Intention

Finally, in order to confirm the crucial roles of transaction uncertainty perception during the online purchase process, we further test its effect on the online consumers’ purchase intention, the results substantiate this significant causal relationship, it is significant at p<0.001 level with a negative coefficient, the score of F change is 28.397, and the score of R² is 0.105.

For concluding this chapter, we summarized the overall results of all the hypotheses in Appendix 4. In the next chapter, we will discuss the findings of these analyse results.
Chapter 7 – Discussion

This study focuses on investigation of the effects of the obtained information from various information-seeking strategies on online consumers’ perceived transaction uncertainty, which is believed to significantly influence online consumers’ transaction decision by many scholars (Benbasat et al. 2008; Gefen et al. 2006; Grabner-Kräuter et al. 2003; Pavlou et al. 2007). We adopted the classification of information-seeking strategies proposed by URT and ISSM to examine how online consumers in C2C transaction could be affected by the transaction information acquired from the four groups of information-seeking strategies when initially transacting with an unknown seller in an online marketplace in China. We further incorporated the two most important contextual variables of information consistency and seller reputation, which were extracted from KAT, into the research model to investigate their effects on the uncertainty perception.

The independent variables proposed in the theoretical structural model explain over 40% of the variances on perceived transaction uncertainty of the online consumers. The significant interactive effects among these variables provide more additional variances to further interpret the causal inferences made by online consumers on transaction uncertainty. These results thus provide empirical evidence on the validity and explanatory ability of the theoretical models. In addition, they contribute to the research of EC and IS by remediaging the existing problems in these domains, which are proposed in the beginning of this study, and advances our field of vision when developing further studies. Discussions based on the findings of this research are presented.
7.1 Discussion on PAIS Information

PAIS is one of the preliminary information-seeking strategies adopted by online consumers. In online C2C transactions, its typical style is to browse the homepages of the target online store (operated by an online seller). Commonly, obtaining the needed transaction information from the Web site of the store, and thus to evaluate the quality of the product or the attributes of the seller is necessary and inevitable. URT and ISSM suggest that the information obtained from PAIS could significantly reduce Internet users’ uncertainty perception, and thus we hypothesize that in online C2C EC, acquiring more PAIS information could significantly reduce online consumers’ perception of transaction uncertainty.

Surprisingly, the statistical results show that PAIS information cannot significantly affect online consumers’ perception of uncertainty in the C2C transaction context. In addition, information consistency or seller reputation cannot moderate the causal relationship between PAIS information and transaction uncertainty perception. Furthermore, PAIS information has no significant three-way interaction with information consistency and seller reputation on the uncertainty perception. This means that in any contextual situation used in this study, PAIS information does not have a significant effect on online consumers’ uncertainty perception, which indicates that PAIS as categorized by URT and ISSM is not the crucial information-seeking strategies that affect online consumers’ uncertainty perception, it also reveals that the online consumers may not be easily affected by the seller-provided information without direct contacting with the sellers.
With checking the original data, we find that only 36 of the participants reported that they obtained insufficient information from PAIS (their reporting scores on PAIS information are less than or equal to the neutral score 4). This indicates the popularity of PAIS in online transaction processes since most online consumers prefer to utilize PAIS to acquire transaction information. Thus, we conjecture, with the availability of multiple information-seeking strategies to obtain information, online consumers may treat PAIS information as the hygiene information in their transaction process. Online consumers might still need it, but it is not sufficient to reduce uncertainty. Thus, consumers may need more information from other information-seeking strategies to confirm with PAIS information, thus reducing their transaction uncertainty. This might be the reason why PAIS information cannot solely significantly reduce online consumers’ uncertainty perception.

7.2 Discussion on AIS Information

In online C2C transactions, online consumers can conveniently obtain AIS information from various third-party information sources. Since AIS information originates from third-party sources that might not have an affiliation with both consumers and sellers, AIS information should be more neutral and thus can be rather persuasive to affect online consumers’ attitude. Therefore, we hypothesize that AIS information can significantly affect online consumers’ perception of transaction uncertainty.

According to the analyses results, AIS information cannot directly influence online consumers’ transaction uncertainty perception in C2C EC. In addition, information consistency or seller reputation cannot separately moderate the causal relationship between AIS information and transaction uncertainty, but it has a significant three-way
interaction effect on the uncertainty perception when interacting with information consistency and seller reputation jointly. This indicates that AIS information’s effect on online consumers’ transaction uncertainty perception is conditionally instead of unconditionally. It conditionally confirms the significance of AIS information in C2C transactions process, it also confirms the KAT’s statement that there will be some interactions among the contextual factors and the acquired information on the information recipients’ uncertainty perception.

We further clarify under which conditions AIS information can affect transaction uncertainty perception. It was seen that when both information consistency and seller reputation are high, or both are low, there is no significant effect between AIS information and uncertainty perception. It is possible that under a high information consistency level and high seller reputation condition, the main effects of these contextual factors have already sharply reduced consumers’ uncertainty into a low level; thus, much third-party information is not necessary; and we guess under a low information consistency level and low seller reputation condition, online consumers will perceive that they are settled in a high uncertainty condition; thus let more third-party information worthless. The results also show when online consumers are under a high information consistency and low seller reputation condition, or under low information consistency and high seller reputation condition, in both conditions, the causal relationships between AIS information and transaction uncertainty are statistically significant. These findings suggest that with such kind of third-party information (obtained through AIS), which are presumably more neutral compared to seller-provided information, seller reputation and consistency amongst different sources have less impact on it to affect the consumers’ uncertainty perception.
7.3 Discussion on EIS Information

Since EIS information originates from the various common Internet users’ evaluations and suggestions, even the third-party inter-media which collect and store the information cannot control or change the content of the information; thus, EIS information should possess more authenticity without the possibility of fraud by third-party publishers. Therefore, it might have a strong persuasive effect on the online consumers’ transaction uncertainty perception.

The analyses results show that EIS information can directly influence online consumers’ uncertainty perception, which confirms EIS’ crucial role in C2C transactions. It indicates EIS information, as a different kind of third-party information compared with AIS information, can take a stronger effect on online consumers’ uncertainty perception during online transaction that AIS information. In addition, information consistency level or seller reputation cannot moderate the causal relationship between EIS information and perceived uncertainty separately, but it has a significant three-way interaction effect on uncertainty perception when interacting with both of the two contextual factors, such an interactive effect is similar with the case of AIS information. Altogether, we find EIS information not only can directly affect consumers’ uncertainty, furthermore, in some contextual conditions, the causal relationship will even be stronger.

We also present the conditions in which EIS information could affect uncertainty perception. The result is almost the same with the case in AIS but taking a more significant level. The results demonstrate that when both information consistency and seller reputation are under a high level or both are under a low level; there will be no
significant effect between EIS information and uncertainty. When online consumers are under a high information consistency and low seller reputation, or under a low information consistency and high seller reputation condition, in both conditions, the causal relationships between EIS information and uncertainty are statistically significant, and the significance level in both conditions are stronger than their counterparts in AIS information.

From these results, we observe, since both of AIS and EIS information originate from third-party information sources, thus, they take some similar attributes, their interactive effect with the two contextual factors on online consumers’ uncertainty perception is uniform; but EIS information takes a stronger significant level than AIS information on corresponding conditions, the plausible explanation might be: contrast with AIS information, EIS information is a kind of social information which represents the public opinion on a certain issue, and China is a country with collectivism-orientation culture, thus, Chinese consumers may be more willing to accept such a public opinion, thus EIS information can be more significant to affect online consumers’ uncertainty perception; also, another possible reason might be, compared with AIS information, EIS information is more difficult to control by any person or organization since it originates from various Internet users, thus, the online consumers may conceive it to be more authentic.

7.4 Discussion on IIS Information

Online consumers can directly contact the sellers to obtain required transaction information through IIS. Previous research (Davis et al. 1989; Rossade et al. 2005) has emphasized that Internet users will perceive social presence awareness through IIS tools,
thus, IIS information should contain a certain kind of social presence perception, which indicates more meanings beyond the content of the information itself; with this, we conceive IIS information can have a significant effect on online consumers’ perception of uncertainty.

The analyses results reveal that IIS information has a significant influence on online consumers’ transaction uncertainty perception, which confirms IIS’ crucial role in C2C transactions; it reveals that the online consumers will be more affected by the information acquired through the direct communication with the sellers. Furthermore, the information consistency level or seller reputation can significantly moderate the causal relationship between IIS information and perceived uncertainty separately. Specifically, if the online consumers perceive IIS information, obtained by interacting directly with the seller, to be consistent with information from other strategies, it will help consumers to substantially reduce their uncertainty perception. Similarly, IIS information provided by a highly reputable seller will more significantly affect consumers’ uncertainty, compared to a lower reputation seller.

However, IIS information has no significant three-way interaction effects on uncertainty with information consistency and seller reputation. We conjecture this insignificance is due to online consumers’ processing of IIS information. Understanding of either information consistency or seller reputation could help them make their evaluation. Regardless of seller reputations, high information consistency level will always let they feel that IIS information can obviously reduce their perceived uncertainty. In addition, regardless of information consistency, high seller reputation will always let they feel IIS information can obviously reduce their transaction uncertainty. This interactive effect is dissimilar with the case of the third-party information (AIS and EIS) in which online
consumers use both contextual factors to make their judgment on the acquired transaction information.

7.5 Discussion on Contextual Factors

As proposed by KAT and confirmed by previous empirical studies (Barry et al. 1998; Cheung et al. 2009; Zhang et al. 2003), the consistency level of the obtained information would not only directly shift consumers’ attitude on the transaction but could also affect their attitude on the acquired transaction information. This study also tested these issues; with the analyse results, we confirm previous studies’ findings and discover that information consistency can directly affect online consumers’ perception of transaction uncertainty. In addition, it could also influence their attitude on the acquired information; especially, the results show that information consistency cannot impact the effects of information from all information-seeking strategies; instead, it could only impact the effects of information from some groups of information-seeking strategies, such as IIS information (two-way interaction), as well as AIS and EIS information (three-way interaction). These interactive effects are discussed in previous sections. It confirms the crucial role of information consistency in C2C online transaction processes.

However, for seller reputation, we find it cannot directly affect online consumers’ perception of uncertainty. With additional analyses, we discover that under different IIS information conditions, the seller reputation has dissimilar effects on uncertainty. When online consumers obtain little IIS information, the high seller reputation even can marginally increase their transaction uncertainty perception, only when they obtain comprehensive IIS information, then the high seller reputation can decrease their
uncertainty perception. This result is surprising and contradicts with previous literature (e.g., Antony et al. 2006; Ba et al. 2002; Jarvenpaa et al. 2000), which consistently confirms that high seller reputation would help consumers to form a positive attitude towards the seller, thus could significantly reduce online consumers’ uncertainty perception. One plausible reason might be that previous studies were set in the West world as compared to the current study that was set in China. Thus, people with different cultural backgrounds might use different thinking styles to make judgments (Sia et al. 2009). Obviously, the differences between Chinese and Western culture are significant; thus, Chinese culture might be a possible reason for the difference. In addition, China’s C2C EC has had a shorter history (began in 1998 and thrived in 2003 with the foundation of www.taobao.com) as compared with that of Western countries. Thus, Chinese online consumers might perceive the regulations, techniques, and environment of online transactions have not been cultivated perfectly yet thus vitiate the seller reputation’s effect. Further research is strongly recommended to compare different cultures, or between mature and immature online transaction environments, to understand how these factors can shape persons’ cognition of uncertainty.

Furthermore, one more possible reason for this phenomenon (high seller reputation can enhance uncertainty perception when consumers obtain little IIS information condition) may be due to the reputation fraudulent actions occurred on various Chinese online store marketplaces, the fraudulent actions have already been reported by some famous traditional media in China, such as, Guangzhou Daily; as well as various popular gateway websites, e.g., www.163.com, www.sina.com.cn, etc. (Please refer to appendix 5 to see one example about the reports of the seller reputation fraudulent actions occurred in Chinese online store marketplaces). Thus, without direct communication (especially in the cases that the online consumers have tried to directly contact with the
seller but got no feedback), the Chinese online consumers may cline to consider the online seller’s high reputation is inveracious thus it may even raise their anxiety on the potential transaction uncertainty. Only when online consumers have personally contacted with the sellers and obtained much valuable IIS information, then they may believe the authenticity of the high reputation, and thus under this condition, high seller reputation can significantly reduce online consumers” transaction uncertainty perception.

7.6 Summary of Discussion

In conclusion, we confirm that the transaction information acquired from three groups of the four online consumers’ information-seeking strategies can significantly influence online consumers” perception of uncertainty in the C2C EC context in China. Specifically, we find that only EIS and IIS information can directly influence online consumers” transaction uncertainty perception; the two contextual factors, information consistency and seller reputation, can only moderate the causal relationship between IIS information and uncertainty separately; these two contextual factors have a strong three-way interaction with AIS and EIS information on uncertainty. Furthermore, we also discover AIS, EIS, and IIS information”s accurate effectiveness on uncertainty under various contextual conditions. Besides, we also tested the two contextual factors” direct effects on online consumers” perception of uncertainty. The limitations of this study and suggestions for future research will be discussed in the following section.

7.7 Limitation and Future Research
Several limitations of this study need to be recognized. First, as shown in the results, the main model could only explain more than 40% of the variance of the dependent variable. Although the interaction effects among the independent and moderating variables also contribute more variances for the model, we suspect that there might still be some other important factors, which could affect online consumers’ perceived uncertainty but are not included in this theoretical model. Thus, future research is encouraged to explore more significant factors to further supplement and reinforce our theoretical model.

Second, as an initial research on transaction uncertainty based on the influences of different information-seeking strategies, we propose a comprehensive model instead of emphasize a few factors for the in-depth study. The result was a general perception of information consistency level in the survey, which might not clearly distinguish the effects of information consistency in different cases; such as, if information inconsistency originates from PAIS and AIS has the same effect as the inconsistency origins from PAIS and EIS, and so on. As an initial study, this research validates the strong effect of information consistency on online consumers. Further studies can involve various information consistency/inconsistency conditions with an accurate experimental design based on different contextual cases and to investigate the internal effects of different kinds of information consistency/inconsistency conditions on online consumers’ cognition; this can provide clearer information about the inter-mechanism of information consistency’s effects on transaction uncertainty perception.

Third, as PAIS information does not appear to significantly affect online consumers’ uncertainty perception in this study, its role in online transaction is still unclear. We speculate that PAIS information might be the hygiene information in online transaction: online consumers might still need it, but it is not sufficient to reduce uncertainty;
consumers may need more information from other information-seeking strategies to obtain further confirmation. Further research is suggested to address this issue and investigate the actual role of PAIS information in the online transaction process.

Fourth, the study used a sample based only in Mainland China; thus, it is necessary to exercise caution to avoid over-generalizing its findings. Future research is strongly recommended to adopt this theoretical model on other countries, especially in cultures that are dissimilar to China, the comparison of the results can shed light on how different cultures could shape persons’ cognition of uncertainty.

Finally, due to the attributes of the context of this research, the study focused only on how the quantity of information obtained from different groups of information-seeking strategies could exert significant influence on online consumers’ perception of uncertainty. The findings of this research confirm the significance of the information quantity in online transaction. However, we believe that information quality is likewise a significant topic that requires further exploration in the IS and EC domains. Thus, further research is strongly recommended to separately test the different effects of information quantity and quality on uncertainty thus providing us an accurate picture on this issue.
Chapter 8 – Implications and Conclusion

This research applied URT and ISSM’s information-seeking strategies categorization and integrated with KAT to develop an integrative research model to investigate how online consumers’ perceived transaction uncertainty could be affected by the information from various seeking strategies as well as the two contextual factors. We believe that the findings of this research could provide both theoretical implications for future researchers in the IS and EC domains, as well as practical implications for the practitioners of IS and EC.

8.1 Theoretical Implications

This study investigates the nature of perceived transaction uncertainty reduction in online C2C EC; thus, it has several important contributions and implications to theory development in IS and EC. According to our knowledge, this is one of the first studies in the IS and EC domains that empirically tests the influences of information from different information-seeking strategies on uncertainty. In addition, this is the initial investigation on the interactive effects of information from various information-seeking strategies and the key contextual factors proposed by KAT on online consumer’s transaction uncertainty perception with empirical data. Specifically, we investigated not only information consistency and seller reputation’s separate moderating effects on the causal relationship between information from the four groups of seeking strategies and the transaction uncertainty perception (two-way interaction); we also examined these two contextual factors’ joint moderating effects on such causal relationships (three-way interaction). The significant results of the causal relationship between the independent variables and the dependent variable, as well as the significant results of the interactive
effects among the independent variables and the moderating variables on the dependent variable confirm the validity of the theoretical model. These findings confirm the crucial roles of the information from various information-seeking strategies proposed by URT and ISSM, as well as the moderating effects of the contextual factors proposed by KAT in the context of online C2C transactions.

Specifically, the statistic results of this research show a series of findings concerning with the effects of the transaction information from the four groups of seeking strategies on online consumers’ transaction uncertainty perception: (1) information only acquired from two of the four seeking strategies (EIS and IIS) can directly affect the online consumers’ transaction uncertainty perception. (2) only IIS information can have two-way interactive effects with information consistency and seller reputation separately to affect online consumers’ transaction uncertainty perception. (3) only the two kinds of third-party information (AIS and EIS information) can have significant three-way interactive effects with the two contextual variables jointly to affect the transaction uncertainty perception. (4) PAIS information does not significantly affect online consumers’ perception of uncertainty in any condition in this research.

These findings reveal that not any kind of information (obtained from different information-seeking strategies) can significantly affect online consumers’ uncertainty perception, thus only partially support the URT and ISSM’s declaration on the effect of information from various information-seeking strategies. These findings also reveal that transaction information from each of these four group of information-seeking strategies has distinct affecting pattern on online consumers’ transaction uncertainty perception, compared with the information from other three groups of seeking strategies; therefore,
these findings enrich URT and ISSM theory by reifying the exact role of each group of information-seeking strategies on the uncertainty perception in our research context.

The interactive effects among the two contextual factors and the information from various information-seeking strategies on online consumers’ uncertainty perception confirm the KAT’s co-variation declaration, these findings clarify that different kinds of information can have different interactions with these two contextual factors to affect online consumers’ uncertainty perception, this further confirm the KAT’s declaration that these co-variations are selectively. Especially, we find with third-party information (obtained through AIS and EIS), which are presumably more neutral compared to seller-provided information, seller reputation and consistency amongst different sources have less impact on uncertainty reduction. Conversely, for seller provided information (obtained through IIS), higher seller reputation could compensate for lack of information consistency amongst different sources, or highly consistent opinions amongst different sources could compensate for low seller reputation, to effectively reduce uncertainty perceptions.

Thus, this research not only uncovers the information-seeking strategies that could effectively reduce uncertainty perceptions amongst consumers, it also highlight the need to consider other contextual factors that could alter the way consumers reduce their uncertainty towards online sellers and their products.

The statistic results also show some findings concerning with the direct effects of the two crucial contextual factors proposed by KAT: (5) Only information consistency directly influences uncertainty perception, but seller reputation does not. (6) Seller reputation can significantly reduce online consumers’ transaction uncertainty perception
when the consumers obtain comprehensive IIS information, and it can marginally
enhance the uncertainty when consumers obtain little IIS information. These findings
reveal the significant effects of these two contextual factors on online consumer’s
transaction uncertainty perception, these findings are not completely consistent with
previous research which was conducted in western countries, this indicates Chinese
online consumers have a distinct cognitive style which is differ from the westerners.

Since this study is the first empirical research on different information-seeking
strategies under the online C2C transaction context in Mainland China, these findings
could be the foundation or reference for future research,. Further investigations would
be needed to re-validate or generalize the results.

8.2 Practical Implications

This study also has several implications for the practitioners of EC and IS, especially for
those C2C undertakers. Understanding how online consumers perceive reducing their
uncertainty is important for the survival and development of online stores because a low
level of uncertainty (high uncertainty reduction) would help online consumers more
accurately predict the outcome of their transaction, thus increasing their confidence to
complete the transaction. The research exhibits a picture of how different
information-seeking strategies could reduce online consumers” uncertainty perception.
We also present two contextual factors” direct influences, as well as their interactive
effects with information from different strategies, which could provide important
insights for online sellers and other relevant C2C EC stakeholders.

First, according to the findings of this research, comprehensive PAIS information,
whether unconditional or in any of the contextual conditions proposed by the study,
does not relax online consumers” uncertainty anxiety. Thus, online sellers should not emphasize too much on providing transaction information on their online store Web sites. By randomly browsing many online stores’ Web sites on www.taobao.com, we notice that most online sellers always focus on providing exhaustive information, expecting that this will help consumers understand more about their store, retail products, and others, thus reducing online consumers’ uncertainty perception. According to the research findings, however, such endeavor would not be very productive. Online sellers may need to pay more attention to facilitating consumers’ acquisitions of other kinds of information from other information-seeking strategies.

Based on the research findings, although more AIS information would not reduce consumers’ uncertainty unconditionally, but in some conditions, such as, in high consistency and low reputation, or low consistency and high reputation conditions, it could reduce consumers” uncertainty sharply. For EIS information, obtaining more information could not only unconditionally reduce consumers” uncertainty; it could even more significantly reduce consumers” uncertainty perception in specific conditions (the same as AIS information). IIS information could significantly reduce consumers” uncertainty perception unconditionally. Furthermore, when consumers are under high consistency or high reputation condition, the effect would even be stronger. Thus, online sellers could adopt effective measures to help consumers obtain comprehensive AIS, EIS, and IIS information more conveniently. For example, they could cooperate with related famous evaluation websites, or online consumer discussion forums, by affiliating the hyperlinks of their Web sites on their online store Web site to help consumers obtain more AIS and EIS information more expediently. In addition, they could also provides instructions to consumers on how to obtain comprehensive EIS information related to their business from some search engine by elaborating the
detailed steps of the search process. Besides, online sellers, or marketplaces administrators, could organize correlative interest-oriented virtual groups on their online store Web sites, thus allowing online consumers obtain AIS information from other group members more conveniently. Furthermore, online marketplaces could incorporate communication tools that facilitate direct interaction between sellers and consumers. Online sellers may also try to be available online or accessible as much as possible to give relevant clarifications or timely information to consumers, instead of in a perfunctory fashion, to help them obtain more IIS information.

As information consistency could directly affect and interact with information from different information-seeking strategies to affect consumers’ perceived uncertainty, online sellers on their part need to pay attention to the information they offered. First, they need to confirm that the information provided on different occasions should be consistent. For example, PAIS information published on the Web site of the online store needs to be consistent with the IIS information provided via IM or message boards. In addition, sellers should refer to the relevant information offered by other third-party information sources before publishing their own information, so as to ensure that their published information be consistent with various information sources. When faced with ineluctable information inconsistency cases, such as, wrong information provided by third-party sources, or the information provided by various third-party sources is inconsistent, sellers can supply additional explanations on the inconsistencies, thus helping their consumers more clearly understand the inconsistent issues, thus to form a positive cognition, and reduce their uncertainty perception.

For seller reputation, since it has interactive effects with information on uncertainty, thus it is also important in this study; it corroborates previous research’s conclusion that
improving online seller reputation is important. However, we take a cautious worry on the effects of seller reputation since the study’s findings show that it does not directly affect uncertainty, which contradicts with much previous research, such as, the results of this study find a higher seller reputation can induce a higher uncertainty perception when under a low IIS information condition, this might provide hints that seller reputation might be a weak impact factor to reduce online consumers’ transaction uncertainty perception in the context of China’s C2C EC environment. This might originate from the fraudulent online reputation of China, which is confirmed by the respondents in the pilot test via the interviews (more than 10 of the participants in the interviews indicate they are unsure if the high seller reputation rank indicated is really authentic or not). Furthermore, reputation fraud in many famous Chinese online marketplaces is reported by well-known gateway Web sites such as www.sina.com, www.sohu.com, and www.163.com. Because of fraudulent behavior, online consumers in China do not directly use seller reputation as an uncertainty indicator; instead, they prefer to jointly consider online seller reputation with other contextual factors, which then can ease their anxiety on reputation fraud and thus help them form their evaluation on uncertainty. The results of this study could therefore warn practitioners of online transactions in Mainland China. It warns administrators to pay more attention to their marketplace and to try to reduce or avoid the possibility of reputation cheating; online sellers also need to reject fraudulent behaviors consciously because it will harm the credit mechanism between sellers and consumers, which can in turn destroy the establishment of a sound C2C online transaction environment.
In addition, the research findings suggest that EC technicians should improve the design of their embedded search engines and the format of the consumer discussion forums. Examples include improving the search tools and making it advanced by re-categorizing the option framework based on users’ utilization frequency, by this way to improve consumers’ search efficiency. Another is by improving the sort functionality of consumer discussion forums in order to let consumers list/find information according to various criteria such as sorting information based on the target product. These strategies can help online consumers obtain the required information more conveniently.

8.3 Conclusion

This research provided a theoretical model that adopted the information-seeking strategies categorized by URT and ISSM, and integrated it with two contextual factors proposed by KAT in order to examine how online consumers could reduce their perception of uncertainty when initially interacting with an unknown online store in an online marketplace in China. It is an initial exploratory research that attempts to identify the effects of information from different seeking strategies, as well as their interactive effects with the contextual factors on online consumers’ perception of uncertainty. An online survey is used to collect data from the three most prestigious online store marketplaces in China. The analyzing results validate the applicability of our theoretical model, and reveal the different effects of information from the four information-seeking strategies, namely, PAIS, AIS, EIS, and IIS. It also addresses two contextual factors, information consistency and seller reputation’s direct influences, and their interactive influences with the information-seeking strategies on online consumers’ perception of transaction uncertainty reduction. The theoretical and practical implications have been discussed to show the significance of this study. Overall, we believe that the findings of
this research could give instructional theoretical implications to relevant researchers and business suggestions to relevant practitioners.
References


Jourard, S.M. The Transparent Self (Rev. Ed.) Van Nostrand Rheinhold, New York,
Pavlou, P.A. "Consumer Acceptance of Electronic Commerce: Integrating Trust and
Shaffer, G., and Zettelmeyer, F. "When Good News About Your Rival Is Good for You: The Effect of Third-Party Information on the Division of Channel Profits,"


Appendix 1

Survey-Online Information-seeking Strategies in C2C Transaction

Please fill in this questionnaire based on your feeling about the most recent transaction experience (no matter finally you buy some products or not) with a first-time visiting online seller (not the emporium sponsored by those platforms) from one of the 3 online store marketplaces (www.taobao.com, www.paipai.com or www.eachnet.com). You are encouraged take 3 minutes to retrace the website of the online vender, and to recall how you seek transaction information and what kind of information you obtained (Transaction information indicates the information which might more or less, directly or indirectly influence your purchase decision in this transaction; it may include information about product, about seller and about online store, et al) in that experience, and then to fill in the following questions.

Please remain the exact hyperlink of the online seller’s website you concern:

Section One: About different information-seeking strategies you used

1. Information-seeking strategy---Passive (acquiring information about a target through unobtrusive and observation without affecting the target)

I obtained much transaction information by browsing the online store website
I understood many transaction related issues through browsing the website of the online store
I knew much about this transaction by browsing the online store website

2. Information-seeking strategy---Active (actively acquiring information from third-party sources but without direct interaction with the target, the information should
be provided by the target sources instead of others publishing information on the website of the „third-party source”

I obtained much transaction information from third-party information sources
I understood many transaction related issues from third-party information sources
I knew much about this transaction by seeking information from third-party sources

3. Information-seeking strategy---Extractive (Acquiring information through some IT functions such as search engine or many pieces of target information listed on one website drawing upon a vast storehouse of comments)

I got much transaction information by using extractive IT tools to seek information
I understood many transaction related issues by utilizing extractive IT tools to seek information
I knew much about this transaction by utilizing extractive IT tools to seek information

4. Information-seeking strategy---Interactive (acquiring information by direct contacting with the target)

I got much transaction information by directly communicating with the seller
I understood many transaction related issues by directly contacting with the seller
I knew much about this transaction by directly contacting with the seller

5. Information quality questions

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**Section two: Your feeling on entire information-seeking process**

1. **Uncertainty**

(Note: Uncertainty refers to the perceived risk due to lack or absence of information, the degree to which the future states of the environment cannot be accurately anticipated or predicted due to imperfect information)

It is difficult for me to predict the future behavior of the online vendor due to limited transaction information I have.

I am not sure if the online vendor will fulfill his/her transaction obligation because I do not have enough transaction information.

It is very hard to predict the transaction outcomes due to lack of transaction information.

It is difficult to make an informed transaction performance prediction because I have not obtained necessary transaction information.

2. **Information consistency**

The various information I got was consistent.

The various information I got did not match or agree.

The various information I got was too inconsistent to use.
The various information I got matched or agreed

3. Seller reputation

According to the record of the store, this vendor is known to be dependable
According to the record of the store, this vendor has a bad reputation in the market.
According to the record of the store, this vendor has a good reputation.

4. Involvement level

When I transact with the online store, I pay______amount of attention
When I transact with the online store, I pay______degree of concentration
When I transact with the online store, I pay______degree of focus
When I transact with the online store, I pay______level of effort

5. Experience/search product (Diagnostics)

I could fully evaluate the product qualities prior to purchase.
I could fully evaluate the product functionality prior to purchase.
I could fully evaluate the product ergonomics prior to purchase.
The product features are hard to judge prior to purchase.
The quality of this product can be adequately evaluated before purchase.

6. The regulatory effectiveness of the online transaction marketplaces

The online store marketplace has enough legal and technological safeguards to make me feel comfortable using it to transact personal business.
I feel assured that legal and technological structures on the online store marketplace provided by governmental, professional and regulatory frameworks to adequately protect me from problems.
I feel confident that encryption and other technological advances on the online store marketplace make it safe for me to do business there.
In general, the online store marketplace is now a robust and safe environment in which to transact business.
7. Price

For me, this product is expensive.
I think this is a high price product.

8. Attitude toward past transaction

In general, I have a positive online purchase experience in the past
In general, I think most of the online sellers have provided us good service.
In general, the online sellers have done rather well.

Section three: Demographic statistics

1. Past experience of E-Commerce

<table>
<thead>
<tr>
<th></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></td>
<td>Very Lack</td>
<td>Lack</td>
<td>A Little Lack</td>
<td>Neutral</td>
<td>A little Abundant</td>
<td>Abundant</td>
<td>Very Abundant</td>
</tr>
</tbody>
</table>

2. Gender
3. Age
4. Education level
5. Internet experience
大家好：

我们是香港城市大学信息系统学系的研究人员，我们目前正在进行一个关于网上购物消费者寻找信息策略的研究。我们真诚地邀请您参与填写我们的问卷调查。填写完成问卷大约需要20分钟，每位认真填写完成问卷的参与者将会获得20元人民币，酬劳我们将通过支付宝，财付通或安付通支付。每位参与者只能填写一次问卷，重复支付宝帐号我们将不会再次支付。

所有收集的数据只仅仅用于统计分析，我们会绝对保密每位受访者的资料。所有问题答案都是没有对错的，您只需要按照自己的真实经历和感受填写即可。学术是严谨的，为了提高学术研究的质量，希望大家能够认真填写，真实有效的研究成果更能帮助我们建立起更完善的网上购物系统。我们对您的支持表示衷心的感谢。

LUO Chuan
香港城市大学信息系统学系

如果你有任何问题，意见或者建议，请联系

问卷网址: http://www.questionpro.com/akira/TakeSurvey;jsessionid=eaagyv-vfh07bS

请按“继续”按钮开始回答问卷
问卷中大多数问题答案是从1=“非常不同意”到7=“非常同意”。带有*号的问题为必填问题，如不填写则不能提交。

名词解释：
购物所需信息：指在该次购物中能够或多或少，直接或间接地影响你做出购买决定的信息，包括产品信息，卖家信息以及网店信息等等。
网上购物平台：指支持个体卖家开设网店的网站，如淘宝，拍拍和易趣。

请你根据你最近一次和淘宝，拍拍或者易趣这三个购物平台之一上的某个陌生的个体卖家的网店接触的经历（无论是否购买，只要去该网店的网页浏览了信息即可。请注意是个体卖家，不要用与该购物平台上的商城的接触经历来填写本问卷）来回答下列问题。回答问卷前希望你首先用3分钟时间，返回到该卖家的网店去回忆你当时搜寻购物所需信息的方式，以及你获得了什么样的信息。

然后，请留下该网店的具体网址：

第一部分：关于你所采用的不同的信息搜寻策略

一. 信息搜寻策略－被动搜寻（仅仅只是通过浏览目标网店的网页来获取信息）

（1）通过浏览该网店的网页获得了很多该次购物所需的（如关于产品，或卖家，或网店）信息 *
（2）通过浏览网店的网页减少了我此次购物中的疑问（如关于产品，或卖家，或网店的疑问） *
（3）浏览网店的网页获得的信息让我了解了很多与此次购物相关的（如关于产品，或卖家，或网店）事情 *

二. 信息搜寻策略－主动搜寻（主动从其他一些第三方来源撰写的信息当中搜寻和获取信息，但未与网店卖家直接联系。第三方信息来源指除该网店卖家以外的其他任何信息来源；第三方来源提供的信息是指由该第三方网站自己提供的信息而不包括其他网络使用者在该网站上提供的信息，如评测网站提供的信息即为评测网站自己提供的信息而不是其他的网络用户在该网站上的评论）

在该次接触中如果你完全没有使用第三方信息来源来搜寻信息，则在下列问题中选择非常不同意1

（1）通过一些第三方信息来源提供的信息当中获得了很多该次购物所需的（如关于产品，或卖家，或网店）信息 *
（2）通过在一些第三方信息来源提供的信息当中寻找信息我减少了购物中的疑问...
（如关于产品，或卖家，或网店的疑问） *
（3）一些第三方信息来源提供的信息让我了解了很多与此次购物相关的（如关于产品，或卖家，或网店）事情 *

三．信息搜寻策略－抽取搜寻（通过搜索引擎或含有大量网络用户评论的网站来搜寻和获取信息）。搜索引擎包括专业的搜索引擎网站（如baidu, google等），也包括一般网站的搜索功能（如淘宝网上的搜索或者高级搜索功能）。

在该次接触中如果你完全没有使用搜索引擎，并且完全没有通过含有大量网络用户评论的网站来搜寻信息，则在下列问题中选择非常不同意

（1）我通过使用搜索引擎或通过含有大量网络用户评论的网站而获得了很多该次购物所需的（如关于产品，或卖家，或网店）信息 *
（2）我使用搜索引擎或通过含有大量网络用户评论的网站获得的信息，减少了我购物中的疑问（如关于产品，或卖家，或网店的疑问） *
（3）通过使用搜索引擎或通过含有大量网络用户评论的网站我了解了很多与此次购物相关的（如关于产品，或卖家，或网店）事情 *

四．信息搜寻策略－交互搜寻（通过与目标网店卖家直接联系来获取信息）

在该次接触中如果你完全没有使用通过与卖家直接联系来搜寻信息，则在下列问题中选择非常不同意

（1）我通过与卖家直接联系获得了很多该次购物所需的（如关于产品，或卖家，或网店）信息 *
（2）通过与卖家直接联系获得的信息减少了我此次购物中的疑问（如关于产品，或卖家，或网店的疑问） *
（3）通过与卖家直接联系获得的信息让我了解了很多与此次购物相关的（如关于产品，或卖家，或网店）事情 *

五．个人对信息的感受
请根据你个人真实感受填入1, 2, 3, 4, 5, 6, 7中的一个数值（数值指示见下表，所有空格都必须填入，只有填1－7方为有效数据）。

<table>
<thead>
<tr>
<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>非常低</td>
<td>低</td>
<td>有些低</td>
<td>一般</td>
<td>有些高</td>
<td>高</td>
<td>非常高</td>
</tr>
</tbody>
</table>

在该次接触中，从不同信息搜寻策略（即问卷前面部分问题所涉及的那些策略）所获得的信息，我的感受程度：
第二部分：关于你的整个信息搜寻过程

请根据你对在该次接触的整个信息搜寻过程中获得的全部信息的感受来填写下列问题

1. 交易不确定性（指由于缺乏信息而感知到的风险；由于获得的信息的不完善，因此很难对于在某环境下对某事情未来的发展状态做出准确的预测）

（1）由于获得的购物所需信息有限所以我很难预测网店卖家下一步的行为 *
（2）由于没有得到足够的关于该次购物的信息所以我不确定卖家是否会履行他关于交易的承诺 *
（3）由于有关购物的信息缺乏所以很难预测该次购物的最终结果如何 *
（4）因为我没有得到充分的购物所需信息因此我很难对关于该次购物结果好坏情况作出预测和判断 *

2. 信息的一致性
（1）在这次信息搜寻过程中，我从不同的来源获得的各种信息是一致的 *
（2）在这次信息搜寻过程中，我从不同的来源获得的各种信息是相符和匹配的 *
（3）在这次信息搜寻过程中，我从不同的来源获得的各种信息是不相符的 *
（4）在这次信息搜寻过程中，我从不同的来源获得的各种信息非常不一致所以无用 *

3. 网店（卖家）的名誉
（1）根据网店记录，该卖家是可靠的 *
（2）根据网店记录，该卖家有很好的名声 *
（3）根据网店记录，该卖家在市场上名誉很差 *

4. 参与程度
5. 产品类型
（1）在购买获得产品以前我能完全地评估出该产品的品质
（2）在购买获得产品以前我能完全地评估出该产品的功能
（3）在购买获得产品以前我能完全地评估出该产品的功效
（4）该产品的质量可以在购买获取以前充分地被评估出来
（5）在购买获取该产品以前该产品的特性是很难评估出来的

6. 网上购物平台购物规则的有效性
（1）网店所在的购物平台有足够的法律和技术安全措施，因此我感觉在该购物平台上购物是很适合的
（2）我感觉在政府、行业协会和规章框架下，网店所在的购物平台的法律和技术结构可以完全地保障我的权益
（3）我对该网店所在的购物平台的加密技术和其他技术优势很有信心，我认为他们能确保我的交易安全
（4）总的来说，该购物平台是一个非常安全的购物环境

7. 所关注产品价格
（1）对我来说，该产品是很贵的
（2）我认为该产品属于昂贵产品类

8. 对过去网上购物经历的态度
（1）总的来说，我对过去的网上购物经历持肯定态度
（2）总的来说，我认为大多数的网店的卖家都会给顾客提供良好的服务
（3）总的来说，网店的卖家都做的很不错

第三部分：个人信息统计

1. 我过去的网上购物经历(选其一) *

<table>
<thead>
<tr>
<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>非常缺乏</td>
<td>缺乏</td>
<td>有些缺乏</td>
<td>一般</td>
<td>有些丰富</td>
<td>丰富</td>
<td>非常丰富</td>
</tr>
</tbody>
</table>

2. 你的性别 *

3. 你的年龄 *

4. 受教育程度 *

5. 你的网龄 *
最后，请输入你的帐号（只需填入一个），20元人民币将会在你成功提交问卷后10日内存入你的帐号。

<table>
<thead>
<tr>
<th>支付宝帐号</th>
<th>财付通帐号</th>
<th>安付通帐号</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

问卷结束，谢谢你的参与。请按“结束”按钮提交问卷。
Appendix 3

The Development of a Significance Test for Slope Differences
(Dawson and Richter, 2006)

Independent Variable: X; Dependent Variable: Y; Moderating variables: Z and W.

Step 1: Calculate generic formulas for simple slopes of the relation between X and Y at high and low levels of Z and W (Aiken & West, 1991).

The generic form of the three-way interaction regression equation can be represented as follows:

\[ Y = b_0 + b_1X + b_2Z + b_3W + b_4XZ + b_5XW + b_6ZW + e. \]

A typical plot of a three-way interaction would consist of four lines. Each of these lines would show the (estimated) relation between X and Y under one of four conditions: (a) Z high, W high; (b) Z high, W low; (c) Z low, W high; and (d) Z low, W low. Normally, the high and low values of Z and W are taken to be one standard deviation above and below the mean values of the variables (Aiken & West, 1991). To leave this as general as possible, however, we refer to high and low values of Z and W as ZH, ZL, WH, and WL, respectively. The lines are described by the regression equation given above, with substitution of parameter estimates for b0 to b7 and of ZH, ZL, WH, and WL for Z and W as appropriate. The regression equation can be rewritten as

\[ Y = (b_0 + b_1Z + b_3W + b_4ZW) + (b_1 + b_2Z + b_5W + b_6ZW)X + e. \]

The part of this equation in the first set of parentheses represents the intercept on a graph of Y against X; the part in the second set of parentheses represents the gradient, or
slope, of the line. Therefore, the slopes of the four lines can be represented by

\[ b_1 + b_2 Z_H + b_3 W_H + b_4 Z_H W_H. \]  
(1)

\[ b_1 + b_2 Z_H + b_3 W_L + b_4 Z_H W_L. \]  
(2)

\[ b_1 + b_2 Z_L + b_3 W_H + b_4 Z_L W_H. \]  
(3)

and

\[ b_1 + b_2 Z_L + b_3 W_L + b_4 Z_L W_L. \]  
(4)

Step 2: Calculate difference between any two pairs of slopes (\( \Delta \text{slope} \)).

In total, there are six pairs of slopes that may potentially be of interest for testing between. These fall into two categories: Slopes between which only one variable changes (e.g., Equations 1 and 2; \( W \) changes between high and low, but \( Z \) remains high in both cases), and slopes for which both variables change (e.g., Equations 1 and 4; both \( Z \) and \( W \) change from high to low). The difference between each pair of slopes is shown following:

*Formulas for Differences Among All Six Pairs of Slopes*

<table>
<thead>
<tr>
<th>Slopes</th>
<th>Difference</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>( b_5 (W_H - W_L) + b_7 Z_H (W_H - W_L) )</td>
<td>a</td>
</tr>
<tr>
<td>1 and 3</td>
<td>( b_4 (Z_H - Z_L) + b_7 W_H (Z_H - Z_L) )</td>
<td>b</td>
</tr>
<tr>
<td>2 and 4</td>
<td>( b_4 (Z_H - Z_L) + b_7 W_L (Z_H - Z_L) )</td>
<td>c</td>
</tr>
<tr>
<td>3 and 4</td>
<td>( b_5 (W_H - W_L) + b_2 Z_L (W_H - W_L) )</td>
<td>d</td>
</tr>
<tr>
<td>1 and 4</td>
<td>( b_4 (Z_H - Z_L) + b_4 (W_H - W_L) + b_5 (Z_H W_H - Z_L W_L) )</td>
<td>e</td>
</tr>
<tr>
<td>2 and 3</td>
<td>( b_4 (Z_H - Z_L) + b_4 (W_L - W_H) + b_4 (Z_H W_L - Z_L W_L) )</td>
<td>f</td>
</tr>
</tbody>
</table>

Although these formulas appear somewhat complicated, if simple values of \( Z \) and \( W \) are substituted, they reduce considerably. For instance, if both variables have been standardized (i.e., centered with mean 0 and standard deviation 1) before the interaction terms are calculated and the regression performed and if the lines have been plotted for values of \( Z \) and \( W \) that are one standard deviation above and below the mean (i.e., \( Z_H = WH = 1, \) and \( Z_L = WL = 1 \)), Difference a in Table 1 would reduce to \( 2(b_5 + b_7) \), and Difference e would reduce to \( 2(b_4 + b_5) \). Although we recommend that such standardization take place, we continue to describe the general situation and proceed to describe the simplification achieved by the use of standardized variables.
Step 3: Calculate standard error (SE \( \triangle \) slope) of the difference of pairs of slopes.

To determine whether a difference in slopes is significant, it is necessary to compare the difference with its standard error. It can be shown that the standard errors of the slope differences are given by the formulas in following:

### Standard Errors of Differences Between All Six Pairs of Slopes and Associated Test Statistics

<table>
<thead>
<tr>
<th>Slopes</th>
<th>Variable</th>
<th>Standard error (difference)</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 1 and 2</td>
<td>General</td>
<td>((W_{12} - W_{13}) \sqrt{s_{r12} + Z_{12}^2 s_{r13} + 2Z_{12} Z_{13} s_{r123}})</td>
<td>(t = \frac{b_2 + b_3 Z_{12}}{\sqrt{s_{r12} + Z_{12}^2 s_{r13} + 2Z_{12} Z_{13} s_{r123}}} \neq 0)</td>
</tr>
<tr>
<td>b. 1 and 3</td>
<td>General</td>
<td>((Z_{13} - Z_{12}) \sqrt{s_{r13} + W_{13}^2 s_{r12} + 2W_{13} s_{r123}})</td>
<td>(t = \frac{b_2 + b_3}{\sqrt{s_{r13} + W_{13}^2 s_{r12} + 2W_{13} s_{r123}}} \neq 0)</td>
</tr>
<tr>
<td>c. 2 and 4</td>
<td>General</td>
<td>((Z_{12} - Z_{13}) \sqrt{s_{r12} + W_{12}^2 s_{r13} + 2W_{12} s_{r123}})</td>
<td>(t = \frac{b_2 + b_3}{\sqrt{s_{r12} + W_{12}^2 s_{r13} + 2W_{12} s_{r123}}} \neq 0)</td>
</tr>
<tr>
<td>d. 3 and 4</td>
<td>General</td>
<td>((W_{12} - W_{13}) \sqrt{s_{r13} + Z_{12}^2 s_{r12} + 2Z_{12} s_{r123}})</td>
<td>(t = \frac{b_2 + b_3}{\sqrt{s_{r13} + Z_{12}^2 s_{r12} + 2Z_{12} s_{r123}}} \neq 0)</td>
</tr>
<tr>
<td>e. 1 and 4</td>
<td>General</td>
<td>(\left[\frac{Z_{12} - Z_{13}}{s_{r12}} + (W_{12} - W_{13})^2 s_{r13} + (Z_{12} - Z_{13}) Z_{13} W_{12} - W_{13} W_{12} s_{r123}\right])</td>
<td>(t = \frac{b_2 + b_3}{\sqrt{s_{r12} + s_{r13} + 2s_{r123}}} \neq 0)</td>
</tr>
<tr>
<td>f. 1 and 2</td>
<td>General</td>
<td>(\left[\frac{Z_{13} - Z_{12}}{s_{r13}} + (W_{13} - W_{12})^2 s_{r12} + (Z_{13} - Z_{12}) W_{13} - W_{12} W_{13} s_{r123}\right])</td>
<td>(t = \frac{b_2 + b_3}{\sqrt{s_{r13} + s_{r12} + 2s_{r123}}} \neq 0)</td>
</tr>
</tbody>
</table>

The formulas rely on the variances and covariances of the regression estimates b4, b5, and b7; in keeping with Aiken and West’s (1991) notation, we refer to the variance of regression estimate b4 as s44 and the covariance of estimates b4 and b5 as s45. Note that the formulas for the cases in which variables are standardized are far simpler than the general formulas.
Step 4: Test whether the ratio of the difference between pairs of slopes and its standard error ($\Delta\text{slope} / \text{SE}_{\Delta\text{slope}}$) differs significantly from zero.

The difference between two slopes itself represents a relation between Y and X (for a certain change in at least one of Z and W) and, as such, is similar to a slope in its own right. Therefore the ratio $(\text{slope})/(\text{standard error} [\text{slope}])$ has, under the assumption that the slopes are equal, at distribution with $(n-k-1)$ degrees of freedom, where $n$ is the sample size and $k$ is the total number of predictors in the regression equation (including all the interaction terms). Thus, to test the significance of Slope Difference, it is necessary to test the hypothesis:

$$t = \frac{(\Delta)}{\text{SE}_{\Delta}} = \frac{b_5(W_{H} - W_{L}) + b_2Z_{a}(W_{H} - W_{L})}{(W_{H} - W_{L})\sqrt{\text{S}_{15} + Z_{a}^{2}\text{S}_{77} + 2Z_{a}\text{S}_{57}}}$$

$$= \frac{b_5 + b_2Z_{a}}{\sqrt{\text{S}_{15} + Z_{a}^{2}\text{S}_{77} + 2Z_{a}\text{S}_{57}}} \neq 0,$$

Where $t$ follows a t distribution with $(n-k-1)$ degrees of freedom (this is a generalization of the two-way interaction slopes test proposed by Aiken & West, 1991). Equivalent test formulas for the other slope differences, including the forms for standardized variables, are given above.
Appendix 4

The Conclusion of the Hypotheses Result

H1. The more transaction information is obtained from PAIS, the more uncertainty reduction online consumers will perceive.  **Rejected**

H2. The more transaction information is obtained from AIS, the more uncertainty reduction online consumers will perceive.  **Rejected**

H3. The more transaction information is obtained from EIS, the more uncertainty reduction online consumers will perceive.  **Supported**

H4. The more transaction information is obtained from IIS, the more uncertainty reduction online consumers will perceive.  **Supported**

H5. The higher the information consistency level from the four information-seeking strategies, the more uncertainty reduction online consumers will perceive. **Supported**

H5a. The higher the information consistency level, the greater the information from PAIS reduces uncertainty.  **Rejected**

H5b. The higher the information consistency level, the greater the information from AIS reduces uncertainty.  **Rejected**

H5c. The higher the information consistency level, the greater the information from EIS reduces uncertainty.  **Rejected**

H5d. The higher the information consistency level, the greater the information from IIS reduces uncertainty.  **Supported**

H6. The higher the seller reputation, the more uncertainty reduction online consumers will perceive.  **Rejected**

H6a. The higher the seller reputation, the greater the information from PAIS reduces uncertainty.  **Rejected**

H6b. There will be no interactive effects of seller reputation and information from AIS on perceived uncertainty.  **Supported**

H6c. There will be no interactive effects of seller reputation and information from EIS on perceived uncertainty.  **Supported**
H6d. The higher the seller reputation, the greater the information from IIS reduces uncertainty. Supported
Appendix 5

Report of the Seller Reputation Fraudulent Actions Occurred in Chinese Online Store Marketplaces

Hyperlink: [http://tech.163.com/08/1209/06/4SMUKP3G000915BF.html](http://tech.163.com/08/1209/06/4SMUKP3G000915BF.html)

淘宝宝网信誉被炒卖 250 元可买“一钻”

2008-12-09 06:07:40 来源: 广州日报(广州) 网友评论 91 条 进入论坛

网店的信誉度是网购买家消费的重要参考依据，不过现在，网购买家们也要注意了，本是信誉标志的“钻”、“皇冠”却可以通过不诚信的虚假交易方式直接购买。日前本报记者就在市区的瀛洲生态公园大门附近看到了公开张贴的淘宝信誉售卖广告，“一钻”的信誉售价仅为 250 元。

**网上虚假交易买信誉**

本报记者连续多日扮成淘宝店主与多位信用刷家联系，他们的价位基本一致，“一钻”的信誉售价都在 250 元左右。一位信用刷家乐为人师，还仔细向记者讲述了一套“淘宝刷信用教程”，其核心就是通过虚假交易，虚构的买家给予好评而获得信用。操作流程就是刷家手中有一批散布各地的兼职工作人员，淘宝店主确定要享受信用刷家的“刷信用”服务，双方约定后，由刷家组织这些兼职者上该网店进行一次交易，通过支付宝付钱，但实际上并不要求卖家寄出实物，一般次日卖家就返还同等金额的费用；再过一段时间，假装这次虚假交易成功，买家收到货品且货真价实，于是上网店发表好评。此类虚假交易要刷到一颗钻石的信用度，一般需要三四天的时间来制造 251 笔虚假交易，之后用一个月的时间慢慢发表好评，一个月后好评达到 251 条后，客户自然升到钻石级信用度。达到这个等级后，刷家会要求网店店主支付约好的酬金，一般来说由于担心网上实力庞大刷家的报复，单个买家都会准时支付酬劳。

**刷信用很难被发现**

“刷信用”是否很容易被淘宝网站或者买家发现？”当记者向这些信用刷家工作人员表达类似的担忧时，他们都会强调自己散布各地的庞大网络。一个刷家甚至宣称他们共有 3000 个“买家”，分布在全国不同的城市，因此决不会出现同一个“买家”反复现身，或者不同的“买家”出现在同一个 IP 地址上的“不专业”行为。
昨天下午本报记者致电淘宝网公关部有关负责人，他表示目前倒卖信用者还是极少数。他说目前淘宝已经有一套完整方案来监控“刷信用”行为：首先是预防机制。通过机器排查，可将交易有明显异常波动的卖家过滤出来，并将他们归入“黑箱子”；其次是处罚机制，一旦发现有“刷信用”的卖家，淘宝根据情节轻重程度，处以关店、封号等不同处罚。