HOW DO EXPECTATIONS SHAPE CONSUMER SATISFACTION? AN EMPIRICAL STUDY ON KNOWLEDGE PRODUCTS

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ABSTRACT

This study aims to gain a better understanding of how the expectation-confirmation process shapes consumers' satisfaction with products in the emerging online knowledge industry. Like other experience products, the benefits that a consumer can gain from a knowledge product are greatly associated with the consumer's initial expectations. To capture consumers' attitudes towards knowledge products both before and after usage, this study conducts an innovative online survey in order to explore both the direct and indirect effects of pre-usage expectations on consumers' satisfaction. Four hundred valid responses were collected, and the proposed hypotheses were empirically verified through structural equation modeling. The results indicate that both direct and indirect paths of expectation positively impact satisfaction, although the latter has a stronger influence. In addition, product price positively moderates the relationship between expectation and confirmation. The findings extend expectation-confirmation theory by introducing perceived risk and product price as constructs, and they contribute to the literature by providing empirical evidence of the effect of pre-usage expectations on consumers' satisfaction. This study can help knowledge product providers and third-party platforms better understand how consumer satisfaction forms and, subsequently, enhance long-term customer relationships.

Keywords: Expectation-confirmation theory; Online knowledge products; Consumer satisfaction

1. Introduction

In recent decades, people have become accustomed to sharing and exchanging knowledge for free within online Q&A communities or on knowledge-sharing platforms (e.g., Yahoo Answers, Stack Overflow, and Quora). However,

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free access to information and knowledge via the Internet may lead to information overload, and it is becoming increasingly difficult and costly for users to efficiently obtain high-quality information and knowledge online. After years of cultivation, online knowledge-sharing platforms have attracted not only a large number of knowledge providers but also potential knowledge consumers who yearn for high-quality knowledge and are willing to pay for it. Consequently, an innovative business model (i.e., *pay for knowledge*) has enjoyed tremendous growth, especially in China, since 2016. Several leading knowledge-sharing platforms (e.g., Zhihu, Himalayas, and ZaiHangYiDian) have actively explored possible avenues for knowledge trading and launched a variety of knowledge products. By 2018, the knowledge sharing industry in China was estimated to be 8.67 billion RMB (approximately 1.22 billion USD) [Zppeng 2019], and it is expected to reach 23.5 billion RMB (approximately 3.3 billion USD) in 2020 [iResearch 2018]. Popular knowledge products and services include paid subscriptions, one-on-one online/offline consultants, paid Q&A, and real-time broadcasts and interactions.

Although the size of knowledge sharing market is increasingly large, most knowledge sharing platforms are faced with the risk of financial distress due to the low repurchase rate [Zu 2018]. As consumer satisfaction can positively influence companies in several ways, such as enhancing long-term customer relationships [Cronin et al. 2000; Kim et al. 2009] and forming continuous use intentions [Bhattacherjee 2001; Lin et al. 2012], which lead to repurchase behavior [Kim et al. 2009], understanding how to generate consumer satisfaction for online knowledge products is crucial for effective promotion and sustainable development of the emerging field of knowledge sharing. In the literature, expectation-confirmation theory (ECT) [Bhattacherjee 2001; Oliver 1977; 1980] provides a theoretical lens to explain how satisfaction forms through the expectation-confirmation process. Traditionally, ECT has been regarded as the dominant paradigm for investigating consumer satisfaction across a wide variety of products and services [Bhattacherjee & Premkumar 2004; Fan & Suh 2014; Hsu & Lin 2015; Kim et al. 2009; Lin et al. 2017].

However, as online knowledge products are part of an emerging business model, to the best of the authors' knowledge, few studies have applied ECT to explain how consumer satisfaction forms towards these products. Additionally, their distinct characteristics (including perishability, high customizability, and time sensitivity) make it challenging to apply the traditional ECT framework for several reasons. First, a knowledge product is an emerging experience product that introduces new perceived risks. Consumers are required to pay to access knowledge online. They cannot physically examine (e.g., touch and feel) before purchasing, even a picture of a knowledge product is not available. It introduces product uncertainty due to the information asymmetry between knowledge providers and consumers. The uncertainty leads to perceived risk which has consistently been identified as a major concern in the context of online knowledge products. In addition, perceived risk is highly associated with expended money/effort. Therefore, the roles of perceived risk and product price in consumer satisfaction need to be further investigated. Second, initial expectations play a relatively important role in consumer satisfaction in this context. However, it is challenging to accurately evaluate consumers' (pre-purchase) expectations. The benefits that a consumer can gain from knowledge products are largely consumer-specific; consumers with diverse educational backgrounds and life/work experiences may interpret the same piece of information or knowledge in different ways, and therefore its perceived usefulness and benefits will vary. As argued by Bhattacherjee [2001], consumers' expectations may change as they gain experience with the system or product, and therefore, initial expectation and perceived performance must be captured at two different points in time (i.e., before and after usage, respectively). This study aims to meet this demand, capturing consumers' pre-purchase expectations and perceived performance in the context of online knowledge products.

ECT posits that consumers' satisfaction is jointly determined by their pre-usage expectations and perceived performance after using a product or service. That is, pre-usage expectations can influence consumer satisfaction through either directly or indirectly. The latter method involves comparison of initial expectations and perceived performance after usage (termed "confirmation" in the literature). Due to the difficulty of conducting longitudinal studies, a post-acceptance model (PAM) was proposed by Bhattacherjee [2001] to explain the relationship between post-usage expectation, confirmation, and satisfaction. The initial expectation was replaced with the post-usage expectation (also called "perceived usefulness") to examine the effect of expectations on satisfaction. Since then, rather than separately measuring initial expectation and perceived performance, most recent ECT studies in the information systems (IS) discipline (e.g., [Hsu & Lin 2015; Kim et al. 2009; Lankton & McKnight 2012; Lin et al. 2012; Lin et al. 2017; Wu 2013]) have omitted expectations from the proposed model and instead employed a direct method of measuring confirmation. However, such direct measurement may cause methodological problems [Venkatesh & Goyal 2010], such as ambiguous results, oversimplification of the joint effects of expectation and perceived performance [Edwards & Parry 1993; Edwards & Van Harrison 1993], substantial recall bias [Ross 1989; Staples et al. 2002], and lack of clarity regarding the absolute levels and influence directions of expectation and perceived performance [Edwards & Parry 1993; Venkatesh & Goyal 2010].

A study performed to better understand the mechanism by which satisfaction is formed in relation to knowledge products would not only fill the current research gap caused by oversimplified measurement of the individual effect of expectation but also provide practical implications for developing effective strategies to enhance consumers' satisfaction. Thus, this study seeks to answer the following key research questions: (1) How do pre-usage expectations influence consumer satisfaction in the context of online knowledge products? (2) What is the role of product price in the path by which pre-usage expectations enhance perceived confirmation with online knowledge products? To achieve the research objectives, a theoretical model was developed to explore the relationship between expectation, confirmation, and satisfaction and a two-stage online survey was conducted to verify the model hypotheses.

The rest of the paper is organized as follows. Section 2 introduces the theoretical background of knowledge products and reviews related work on ECT and halo effects. Section 3 proposes the research model and develops research hypotheses. Section 4 presents the design of the online survey, including the research settings, the process by which the survey was conducted, and the variable constructions. Section 5 presents and discusses the results. The study concludes with Section 6, which summarizes the major findings and highlights theoretical and practical contributions.

2. Theoretical Background

2.1. Online Knowledge Products

The literature on online knowledge products can be classified into two categories: knowledge contribution and knowledge purchasing. Traditional knowledge-sharing (e.g., Q&A) platforms provide an open and free environment in which users can exchange knowledge. Therefore, extant studies on these platforms primarily focus on investigating the factors that influence users' knowledge contribution behaviors (e.g., [Jin et al. 2015; Lou et al. 2013; Song & Phang 2016; Yan et al. 2016]). To obtain profits and encourage users to contribute more and better knowledge, the platforms enable knowledge providers to monetize their knowledge by charging consumers. This business model has attracted massive attention. While they share some of the general characteristics of online transactions, knowledge products also have several distinct characteristics, which will influence consumers' purchase behaviors. Interest in exploring consumers' purchase intentions/behaviors in this context is increasing (e.g., [Cai et al. 2018; Jin et al. 2019; Zhao et al. 2018]).

Regarding knowledge contribution behaviors, different theories have been employed to explain contribution motivations, including social role theory [Chai et al. 2011], social cognitive theory [Chen & Hung 2010; Wasko & Faraj 2005], social exchange theory [Chen & Hung 2010; Pi et al. 2013; Yan et al. 2016], social capital theory [Chai et al. 2011; Chang & Chuang 2011; Wasko & Faraj 2005], and social technology perspectives [Chai & Kim 2012; Wasko & Faraj 2005]. There are two categories of online knowledge contribution motivations: intrinsic and extrinsic motivations. The former mainly concern the intrinsic factors of knowledge providers, including their sense of self-worth [Pi et al. 2013], self-efficacy [Chen & Hung 2010; Li et al. 2016], perceived enjoyment gained from helping others [Wasko & Faraj 2005], and altruistic intentions (i.e., helping others without expecting anything in return) [Chang & Chuang 2011]. Extrinsic motivations emphasize the external incentives that knowledge providers may receive by contributing knowledge, including an improved social reputation [Chang & Chuang 2011; Pi et al. 2013; Wasko & Faraj 2005], mutual benefits [Chai et al. 2011; Chen & Hung 2010], virtual currency [Hung et al. 2011], financial incentives [Kuang et al. 2019], and new connections [Chai et al. 2011]. These prior studies demonstrate that both intrinsic and extrinsic motivations can jointly influence users' knowledge contribution behaviors, although their effects may vary across different research contexts.

While extensive effort has been devoted to examining knowledge contribution behaviors, research on knowledge purchase behaviors is still nascent. Zhao et al. [2018] investigated the factors that help to build trust between knowledge providers and consumers and that drive consumers' payment decisions on a paid Q&A platform from the perspective of knowledge providers' characteristics (e.g., ability, benevolence, and integrity) and reputation. They also examined how price moderates the relationship between trust and payment decisions. Cai et al. [2018] proposed a two-phase model to identify different factors that influence the daily sales of knowledge products at different stages (i.e., before and after live broadcasting). Also, Jin et al. [2019] built a structural model to examine the effects of seller-related, product-related, and platform-related factors on consumer demand for online knowledge products.

Consequently, research on consumers' knowledge purchase intentions and behaviors is still limited. In particular, research analyzing and explaining consumers' attitudes towards online knowledge products throughout the entire purchase process from an expectation perspective is scarce. Accurate measurement of consumers' feelings before (e.g., perceived risk and expectation) and after a purchase (e.g., confirmation and satisfaction) and examination of their effects would be beneficial to explain the varied effects of the same factors reported in different contexts. In practice, this also helps to enhance consumers' satisfaction and boost the development of the pay-for-knowledge business model.

2.2. Expectation-Confirmation Theory

Expectation-confirmation theory (ECT) was originally proposed by Oliver [1977; 1980], and it has been widely employed to reveal the relationship between expectation, satisfaction, and post-purchase behaviors (e.g., continuance intention, repurchase, customer royalty) in diverse contexts [Hong et al. 2017; Kim et al. 2009; Sun et al. 2016]. The causal flow of the ECT is as follows: 1) customers form an initial belief or expectation of a product or service prior to purchase via exposure to the available information; 2) after a period of exploring and using a product/service, customers develop ex-post perceptions of its performance; 3) a cognitive comparison between initial expectations and perceived performance is conducted and the level of confirmation is determined; 4) a positive correlation in the perceived level of confirmation and expectation positively affects customer satisfaction, which is a key determinant of repurchase intentions. In other words, if a product or service outperforms the initial expectation, satisfied customers are more likely to form a repurchase intention. If a product or service falls short of expectations, dissatisfied users will form a negative attitude towards repurchase.

Table 1: Summary of recent ECT studies

Author (year)	Context	Post-purchase behaviors	Modified Variables	Main results
Hsu & Lin [2015]	e-commerce	Purchase intention regarding paid mobile apps	Perceived value of multiple dimensions: performance, value for money, emotional factors, and social factors	PV, SAT → purchase intention
Lin et al. [2017]	Social networking sites (SNS)	Continuance intention to use SNS	SNS constructs: perceived privacy risk, perceived enjoyment, perceived reputation, community identification	PU, SAT, SNS-related PV → CI and effects moderated by gender
Fan & Suh [2014]	Information technology (IT)	Intention to switch from incumbent IT to disruptive IT	Confirmation (incumbent IT), expectation (disruptive IT), financial switching cost, procedural switching cost	EXP (disruptive IT), SAT (incumbent IT), switching cost → switching intention
Wu [2013]	e-commerce	Complaint intention	Trust, perceived usefulness, justice (distributive justice, procedural justice, international justice)	Justice, CF, PU, trust → SAT; SAT → complaint intention
Joo et al. [2017]	Education	Continuance intention to use digital textbooks	Perceived enjoyment, PU	PU, perceived enjoyment, SAT → CI
Kim et al. [2009]	e-commerce	e-loyalty	Trust, perceived performance	CF, EXP, Trust → SAT; SF → e-loyalty
Bhattacherjee & Premkumar [2004]	IT usage	Subsequent IT usage behavior	Modified beliefs, modified attributes	Modified beliefs, modified attributes → modified IT usage intention
Valvi & West [2013]	e-commerce	e-loyalty	Perceived value, price, and trust	Perceived value→ SAT; E-trust → eloyalty

Note: PV: perceived value, PU: perceived usefulness, SAT: satisfaction, CI: continuance intention, EXP: expectation, CF: confirmation

ECT facilitates examination of the motivations of post-purchase behaviors by introducing new perceptual variables and/or combining other theoretical models. A summary of recent ECT studies is provided in Table 1. Extant studies show that, within the framework of ECT, expectation can influence satisfaction in two ways: (1) directly, in accordance with adaptation level theory [Helson 1964], which posits that expectation positively affects customer

satisfaction because it forms the baseline for customers to evaluate products, or (2) indirectly through confirmation. The level of confirmation is determined by the customer's initial expectation and post-usage perceived performance. Due to the coexistence of direct and indirect effects, the relationship between customer expectation and satisfaction becomes complicated, producing inconsistent results. For example, Szajna & Scamell [1993] employed cognitive dissonance theory [Festinger 1957] to demonstrate that customer satisfaction assimilates affect expectation (i.e., the direct effect), while the work of Bhattacherjee [2001] verified the indirect effect of expectation through confirmation.

As shown in Table 1, the level of confirmation in ECT can be measured using two approaches. First, the majority of studies employ a single value to estimate the level of confirmation, but this approach makes it difficult to distinguish between the effects of consumers' pre-usage expectation and perceived performance. Second, a few studies (e.g., [Brown et al. 2012; Venkatesh & Goyal 2010]) measure customer expectation and perceived performance separately, which allows for more accurate identification of the level of confirmation by calculating the difference between expectation and perceived performance. In addition, the direct effect of pre-usage expectation on customer satisfaction is replaced with post-usage expectation (which is represented as perceived usefulness and/or perceived values), and the effect of pre-usage expectation on satisfaction is mainly discussed in terms of the level of confirmation. Most extant ECT studies contribute to theory by proposing new variables of perceived usefulness and/or values within diverse application contexts. However, there still exists a research gap regarding the relationship between pre-usage expectation and satisfaction, especially in the context of online knowledge products.

2.3. Halo Effect

Since the halo effect was introduced in the 20th century, it has received considerable attention in the fields of psychology, marketing, and management [Asch 1940; Beckwith et al. 1978; Dillon et al. 1984; Jacobs & Kozlowski 1985; Klein & Dawar 2004; Leuthesser et al. 1995; Nisbett & Wilson 1977]. It has been widely applied to investigate rating quality, particularly in performance evaluations, consumer decision making, and marketing. For example, Santhanam & Hartono [2003] employed the halo effect to explain the phenomenon in which companies with a previous record of superior financial performance have higher-rated IT capabilities than companies with prior poor financial performance, even they actually have the same capabilities.

The halo effect can be divided into two broad effects: the inter-dimensional similarity halo and the general impression halo [Boatwright et al. 2008]. The former makes an individual prone to rating an object similarly across different dimensions and blurring the differences between dimensions or attributes, leading to attribute ratings that covary more than they would otherwise [Kohli et al. 2005]. In this case, the halo effect can be defined as one's tendency to use apparent attributes (i.e., visual aesthetics) to deduce non-evident features (i.e., usability) [Minge & Thuring 2018]. For instance, Kurosu & Kashimura [1995] conducted an experiment involving an ATM interface and found positive correlations between perceived aesthetics before use and perceived usability after use; in other words, due to the halo effect, aesthetic features were presumed to influence the pragmatic qualities of the ATM. Tractinsky et al. [2000] later extended the work of Kurosu & Kashimura [1995], summarizing the relationship between visual aesthetics and usability with the phrase "beautiful is usable."

The general impression halo occurs when an individual's overall impression or evaluation guides his or her assessment of all aspects of performance [Boatwright et al. 2008]. For instance, when consumers have an offline experience with a multi-channel retailer, they may develop an impression (a positive or negative halo) of the retailer, which will have a powerful influence on their interpretation of the information about the performance of a product provided by the retailer online. When the online information is consistent with the retailer's positive offline brand image, consumers will interpret the online information in a more positive manner and thus forming a more positive online brand image and expectations (e.g., lower perceived risk). In turn, this may lead to a positive behavioral response (e.g., loyalty intention) [Kwon & Lennon 2009].

The literature identifies reputation (e.g., the Internet celebrity economy and branding effect), physical attractiveness or visual aesthetics, service policy (e.g., free returns or a free trial), and other factors as possible sources of the halo effect. For example, Smith et al. [2010] showed that more renowned brand names have a positive halo due to their reputation, which allows them to charge premium prices for basic products. Also, companies may pay for celebrity endorsements to create a positive halo around the product [Djafarova & Rushworth 2017]. Schuldt & Schwarz [2010] suggested that consumers perceived an cookie labelled as organic as having fewer calories than a non-labeled one. Even though this claim is unrelated to healthiness or calories, consumers may be vulnerable to evaluate it based on their associations with organic food.

3. Research Model and Hypothesis Development

The original ECT [Oliver 1977; 1980] theorizes that expectation is an essential determinant of satisfaction. In the literature, satisfaction refers to a consumer's cognitive and affective fulfillment after a purchase, which is based on comparison of the expected quality of a product/service with the post-usage perceived performance [Mckinney et al.

2002; Oliver 2010]. As online knowledge products are emerging in the market, it is important to examine product satisfaction across different stages (including the pre-usage and post-usage stages) rather than focusing only on the post-usage stage. Therefore, this study considers both the direct (i.e., through H2) and indirect effects (i.e., through H3 and H4) of initial expectation on satisfaction as well as the distinct features of online knowledge products, perceived risk, and the moderating effect of product price. Perceived risk is regarded as a function of expended money/effort and the consumer's subjective certainty about the favorableness of the consequences of a purchase [Cox 1967; Featherman & Pavlou 2003]. In this study, we consider two common factors which might influence perceived risk: the free return policy and online reviews. A free return policy with a money-back guarantee will minimize the amount of money a consumer pays if the quality of the product does not meet his/her requirements, and therefore it might greatly reduce the perceived risk of purchase. On the other hand, as a typical way to reduce information asymmetry, online reviews provide potential customers additional information (e.g., the experience of using the product, product evaluation) from the perspective of a third party. As more review information becomes available, customers may develop a better understanding of the product. Additionally, review volume might influence individuals' perceived risk, then reducing uncertainty. Therefore, return policy and review volume are used as antecedents of perceived risk, and product price is included as an antecedent of expectation, in the proposed model depicted in Figure 1. In this study, five hypotheses are developed. However, the direct effect of price on expectation is not presented as main hypotheses in this study because it has been widely explored in the extant literature on ECT[Valvi & West 2013]. In addition, the effects of both review volume and the return policy on the perceived risk are also not presented as hypotheses in this paper because this study focuses on the two paths of ECT and the antecedent of the expectation. Since both review volume and return policy are determinants of the perceived risk, which is an antecedent of expectation, they are beyond our paper. Note that demographic variables like age, education, and monthly income are used as control variables for all four constructs (i.e., perceived risk, expectation, confirmation, and satisfaction).

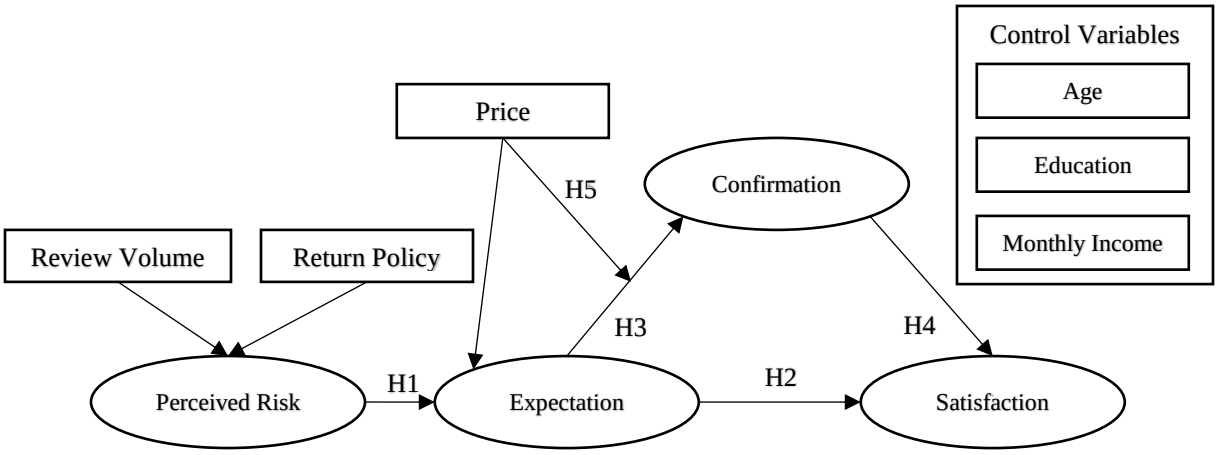

Figure 1: The proposed research model

Knowledge providers often have more information about the quality of the products than consumers. This is likely to introduce product uncertainty and information asymmetry. In addition, the quality of experience products is difficult to evaluate objectively [Moorthy & Srinivasan 1995]. Therefore, perceived risk has been consistently identified as a major concern, and this study introduces it into the traditional ECT framework. Perceived risk refers to the potential for loss while pursuing a desired outcome by using a product/service [Cox 1967; Featherman & Pavlou 2003]. It has been recognized as a salient determinant of consumers' behavioral intention and satisfaction. Previous studies have confirmed the existence of negative associations between perceived risk and consumer behaviors such as trust building [Hong 2015], purchase intention [Kim et al. 2009; Pavlou et al. 2007], continuous use of service [Lin et al. 2017], and performance expectancy [Martins et al. 2014].

Featherman & Pavlou [2003] proposed a model that integrates perceived risk theory and the technology acceptance model to investigate consumers' adoption intention regarding e-service. The results suggest that the perceived risk of e-service reduces its perceived usefulness. According to Davis et al. [1989], perceived usefulness represents the degree to which a person believes that using a particular system will enhance his or her job performance. Therefore, perceived usefulness is regarded as an equivalent construct to pre-use performance expectancy [Brown et al. 2014; Martins et al. 2014; Venkatesh et al. 2003]. The negative association between perceived risk and performance

expectancy was identified by Martins et al. [2014], who examined Internet banking adoption. In the knowledge product context, when consumers feel that the perceived risk of a knowledge product is low, they will have a high expectation to acquire the expected knowledge from a purchased product. Otherwise, their performance expectancy will be low. Accordingly, we developed the following hypothesis:

H1: *Consumers' perceived risk is negatively associated with their expectations for online knowledge products.*

Due to the coexistence of direct and indirect effects, the relationship between expectation and satisfaction is complicated, and studies have produced inconclusive results (see Section 2.2). ECT suggests that expectation is an important proxy for the effects of assimilation on satisfaction and that expectation is positively associated with satisfaction. This relationship can be explained by the cognitive dissonance theory [Festinger 1957] and the adaptation level theory (ALT) [Helson 1964]. Pre-usage expectation provides the baseline upon which consumers form satisfaction judgments, and individuals may adjust their perceptions of satisfaction to more closely align with their prior expectations and reduce dissonance [Bhattacherjee 2001; Kim et al. 2009; Lankton & McKnight 2012]. This helps consumers to increase pleasurable experiences and decrease painful experiences. Previous studies have found empirical support for the positive relationship between expectation and satisfaction (e.g., [Kim et al. 2009]).

Based on Oliver [1977; 1980]'s definition, this study defines expectation as what consumers predict they should and will benefit from a knowledge product based on audio materials, provided slides/materials, and interaction with knowledge sharers and other consumers. For knowledge products, consumers' prior experience and educational background contribute to the formation of product satisfaction. According to ECT and ALT, a high pre-usage expectation of an online knowledge product tends to enhance consumers' satisfaction, while a low pre-usage expectation tends to reduce satisfaction. Accordingly, we developed the following hypothesis:

H2: *Consumers' pre-usage expectations will have a positive influence on their satisfaction with online knowledge products.*

While H2 considers the direct effect of expectation on satisfaction, expectation can also have an indirect effect through confirmation. When forming product/service confirmations, pre-usage expectation and post-usage perceived performance are subjectively compared. Confirmation can be divided into two categories: (1) positive confirmation, which occurs when a consumer's perceived performance is either consistent with or exceeds his or her initial expectation, and (2) negative confirmation, which occurs when a consumer perceives a lower level of performance than they initially expected.

Because expectation provides a baseline or reference information for product or service confirmation, it is obvious that expectation is associated with confirmation. However, as discussed by Yi [1990] and Oliver [2010], the relationship between expectation and confirmation is rather complex, and the literature has reported inconclusive results (including positive, negative, and no relationships) within different research contexts. Most studies propose and support a negative association between expectation and confirmation [Kim et al. 2009; Oliver 1980; Venkatesh et al. 2011]. Assuming that perceived performance is constant, high expectations tend to be more difficult to meet or exceed, whereas low expectations are more easily satisfied; thus, lower expectations typically lead to greater confirmation [Bhattacherjee 2001; Kim et al. 2009]. However, because confirmation is formed in the post-usage stage and expectation is formed in the pre-usage stage, Oliver [2010] and Bhattacherjee [2001] argued that consumers may adjust or even forget their initial expectations when conducting comparisons to form confirmation, which negates the relationship between expectation and confirmation.

Some research has also empirically identified a positive association between expectation and confirmation. For example, Kim [2012] confirmed that expectation has a significant positive effect on confirmation in the context of e-commerce; high expectations encourage positive confirmation, while low expectations lead to negative confirmation. The common halo effect [Asch 1940; Leuthesser et al. 1995] has been proposed as a possible explanation for this phenomenon [Lankton & McKnight 2012; Oliver 2010]. Due to the halo effect, consumers with high expectations tend to focus only on the positive and better-than-expected outcomes of a product or service, resulting in overall positive confirmation, whereas consumers with low expectations tend to focus only on the negative and worse-than-expected performance outcomes. This creates a positive relationship between initial expectation and confirmation.

In practice, confirmation can be evaluated either subjectively or objectively. However, it has been well recognized that objective evaluation is less appropriate for measuring confirmation in many application domains [Susarla et al. 2003]. The content of online knowledge products can be classified into a wide variety of categories (e.g., technology, movies, books, fashion, lifestyle, and law), and consumers' motivations to purchase knowledge products vary greatly. Thus, it is difficult to employ objective criteria to measure the degree of confirmation in the context of online knowledge products. This study views confirmation as a subjective measure that is often influenced by the halo effect, and it employs perceived confirmation [Churchill & Surprenant 1982] to represent a subjective evaluation of the discrepancy between initial expectation and perceived performance in the proposed model. In addition, in accordance

with the simplified ECT model proposed by Oliver [2010], the association between perceived performance and confirmation is omitted in this study. Accordingly, we developed the following hypothesis:

H3: *Consumers' expectations will have a positive influence on their perceived confirmation in regard to online knowledge products.*

Consumers tend to be more satisfied when the perceived performance of a product or service exceeds their initial expectations (i.e., positive confirmation), while negative confirmation leads to a lower level of satisfaction [Bhattacherjee 2001; Brown et al. 2012; Oliver 1980]. The association between confirmation and satisfaction has not only been empirically examined in recent IS-related studies [Bhattacherjee 2001; Brown et al. 2012; Hong 2015; Lankton & McKnight 2012; Lin et al. 2017] but also has been supported by industrial case studies. For example, Brown et al. [2012] verified that service quality confirmation is positively associated with web service quality satisfaction. Additionally, Kim et al. [2009] pointed out that consumers' confirmation level positively affects their satisfaction with e-commerce websites.

In this study, consumer satisfaction is conceptualized as an affective state that represents the consumer's emotional reaction after fully experiencing the purchased knowledge product. As consumers may have varied backgrounds, product satisfaction mainly refers to their subjective judgment of their experience of the product's performance. The more a consumer subjectively feels that his or her expectations for the knowledge products are confirmed and/or the expected benefits are achieved, the more satisfied he or she will be. Accordingly, we developed the following hypothesis:

H4: *The extent of consumers' confirmation is positively associated with their satisfaction with online knowledge products.*

Online knowledge products are distinguished from traditional digital knowledge content in that they can only be accessed after paying a certain price, defined as the cost that must be paid to own a product. A product with a higher price is more likely to impress customers, and therefore, price is associated with perceived confirmation and product satisfaction. As mentioned previously, a general impression halo plays an important role in consumers' evaluations of the performance of products or services. If an online knowledge product has a higher price, consumers will have a stronger overall impression of the product. After experiencing a product, if the perceived performance is consistent with the consumer's previous positive impression, he or she will interpret the product's quality more positively and form a more positive confirmation of the purchased product. Accordingly, the role of product price was included in the proposed model and the following hypothesis was developed:

H5: *The price of a product will positively moderate the relationship between consumers' expectation and confirmation in regard to online knowledge products.*

4. Research Design and Methodology

4.1. Research Setting

Due to the rapid development of the knowledge-sharing economy, several online knowledge-sharing platforms have released a diverse range of knowledge products. In this study, a representative knowledge product, Zhihu Live (https://www.zhihu.com/lives), was selected as the research object. Zhihu Live is a third-party platform that supports online knowledge trading and knowledge delivery via video, audio message, slides, and text for bilateral users (i.e., sellers and consumers). Zhihu Live was chosen because it is produced and supported by the Q&A platform Zhihu, which is the largest knowledge-sharing social network in China. From its inception until December 2017, Zhihu Live had attracted more than 5 million registered users who paid for knowledge. During the same period, nearly 3,000 registered users had provided knowledge products [Tang & Zhu 2017].

Zhihu Live is a real-time knowledge broadcasting product. Only registered Zhihu users can join Zhihu Live, and they can act as both "speakers" (i.e., knowledge providers) and consumers. To host a Live broadcast, a speaker sends his or her proposal to the platform. Once the proposal is approved, the speaker is allowed to trade their ideas, knowledge, skills, and/or experiences (i.e., knowledge products) with potential consumers on the platform. Figure 2 provides screenshots of example knowledge products on Zhihu Live. As shown in Figure 2(a), each Live has a homepage that provides a basic introduction to the product, including the title and description, speaker, broadcast time, price, number of consumers, and warranty policy (e.g., whether the Live supports a free trial or free return). Lives are organized by category (see Figure 2(b)). After a Live broadcast finishes, consumers can purchase the product as a recorded voice message at any time, as long as it is available.

(a) Homepage of a Live product (b) List of Live products within a category

Figure 2: Screenshots of knowledge products offered on Zhihu Live

4.2. Online Survey Design

Considering that the proposed research model includes constructs at two different stages (i.e., perceived risk and expectations in the pre-usage stage and others in the post-usage stage), a two-stage online survey was designed. During the pre-usage stage, participants were randomly assigned to eight different scenarios within three general categories: (1) a Live product with a low/high price (i.e., RMB 4.99 vs. 19.99); (2) a Live product with/without a free return (FR) policy; and (3) a Live product with low/high volume of reviews (i.e., 5 reviews vs. 31 reviews). At the beginning of the study, all participants read the introduction page for a Live product (see Figure 3). To ensure that the participants carefully read the product information and noticed key attributes, they were required to answer three questions about the price, return policy, and review volume. Only participants who had correctly answered all three questions were qualified to continue. In the next step, the participants were asked questions regarding perceived risk and initial expectations. Then, they were required to listen to a selected part of a Live broadcast for about 10 minutes. When it ended, another question was asked regarding the content to ensure that participants had carefully and completely listened to the broadcast. During the post-usage stage, qualified participants continued to answer questions about their

confirmation and satisfaction with the product as well as some demographic questions. After the survey was completed, each participant who submitted a valid response received RMB 20 as a reward.

Figure 3: Live introduction page used in the survey

4.3. Instruments and Data Collection

The proposed model contains four main instruments: perceived risk, pre-usage expectation, perceived confirmation, and satisfaction. All instruments are adapted from the literature and revised based on the context of Zhihu Live. The instruments are then translated from English to Chinese by two experts in this field. The definitions of all instruments are listed in Table 2, and the scale items for these instruments and their sources are given in Appendix A. All items use seven-point Likert-type scales with the anchors strongly disagree (1) and strongly agree (7).

Table 2: Summarized definitions of instruments

Instruments	Definition	Sources
Perceived Risk	The possibility of cognitively evaluating different types of risk based on the objective features of the Zhihu Live product, including cost (financial risk) and performance (performance risk).	[Dholakia 2001]
Expectation	Consumers' predictions, beliefs, or opinions about the quality of the Zhihu Live product and the possible benefits of listening to the product and reading the provided information.	[Brown et al. 2014; Kim et al. 2009]
Confirmation	Consumers' subjective judgment of the extent to which their pre-usage expectations are confirmed.	[Bhattacherjee & Premkumar 2004; Kim et al. 2009]
Satisfaction	Consumers' feelings about listening to the Zhihu Live product.	[Bhattacherjee 2001; Brown et al. 2014; Hsu & Lin 2015]

The survey was conducted online through a leading professional survey company in China. The participants were a wide variety of professionals, including undergraduate and graduate students, office workers, managers, and teachers. Each participant could only participate once; participants with the same IP address or terminal device were filtered out. The survey was conducted in November 2018. In total, 838 responses were received and only 400 responses were valid after the screening questions were administered. In this survey, participants' birth month was included as a marker variable, and its distribution is depicted in Figure 4. The number of participants in each month

is similar, suggesting that there is no significant systematic sampling bias in the collected dataset. Statistical summaries of the demographic variables and descriptive statistics of each instrument are presented in Tables 3 and 4, respectively.

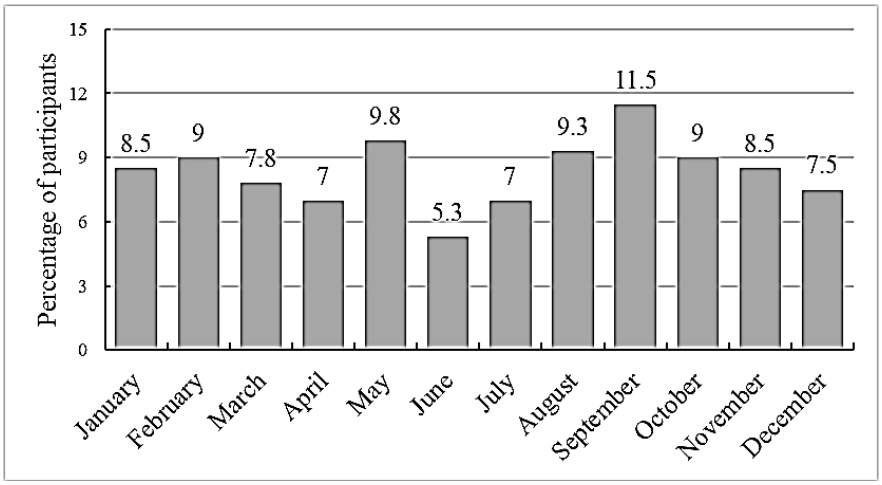

Figure 4: Distribution of participants' birth months

Table 3: Statistical summary of demographic variables

Variable	Value	Frequency
Price	4.99 RMB	203
	19.99 RMB	197
Return Policy	Free return	196
	Non-free return	204
Review Volume	5 reviews	196
	31 reviews	204
Gender	Male	139
	Female	261
Age	20 years old or under	137
	21–23 years old	134
	24–26 years old	55
	27–29 years old	37
	30–40 years old	29
	Over 40 years old	8
Education	Below high school	8
	High school	11
	Undergraduate	282
	Master	91
	Ph.D.	8
Monthly income	Less than RMB 500	12
	RMB 501–1000	33
	RMB 1001–2000	166
	RMB 2001–3000	64
	RMB 3001–5000	36
	RMB 5001–8000	50
	More than RMB 8,000	39

Table 4: Descriptive statistics of instruments

Groups		Statistics	Perceived Risk	Pre-usage Expectation	Confirmation	Satisfaction
All	(N = 400)	Mean	5.3	4.44	5.07	4.94
		S.D.	1.14	0.99	1.37	1.33
Price	Low (N = 203)	Mean	5.32	4.39	5.11	5
		S.D.	1.16	0.99	1.33	1.3
	High (N = 197)	Mean	5.27	4.49	5.02	4.88
		S.D.	1.13	0.99	1.41	1.36
Return policy	Free Return (FR) (N = 196)	Mean	5.23	4.6	5.21	5.11
		S.D.	1.18	0.97	1.33	1.32
	Non-FR (N = 204)	Mean	5.36	4.28	4.93	4.78
		S.D.	1.11	0.98	1.4	1.32
Review Volume	Low (N=196)	Mean	5.42	4.35	5.04	4.9
		S.D.	1.13	0.99	1.39	1.35
	High (N=204)	Mean	5.18	4.52	5.1	4.99
		S.D.	1.15	0.98	1.35	1.31

5. Data Analysis and Results

Structural equation modeling was applied to analyze the data in AMOS 21.0, and maximum likelihood estimation (MLE) was employed as the estimation algorithm. The literature suggests that the data samples should be at least 10 times larger than the number of scale items in MLE [Hair et al. 2010; Hu et al. 1992]. Therefore, the 400 valid samples in this study are sufficient for analysis. The structural equation model includes a measurement model and a structural model. In this study, the measurement model was verified by confirmatory factor analysis (CFA), and then the structural model was run to verify the research hypotheses.

5.1. Measurement Model

The measurement model confirmed the reliability and validity of all constructs and revealed that the constructs had both convergent and discriminant validity. Item factor loading, average variance extracted (AVE), and composite reliability were used to verify the reliability and convergent validity of each construct in this study. The results are reported in Table 5. The item loadings range from 0.72 to 0.94, above the ideal value of 0.7 suggested by Hair et al. [2010]. The composite reliabilities, which range from 0.85 to 0.95, are also greater than the ideal value of 0.7 [Hair et al. 2010]. Further, the AVE of the constructs ranges from 0.654 to 0.871 in this study, above the value of 0.5 suggested by Fornell & Larcker [1981] and Hair et al. [2010]. These results indicate that the constructs have sufficient reliable and convergent validity. Furthermore, the discriminant validity of the constructs is sufficient because the square root of the AVE of each construct is greater than its Pearson correlations with other constructs [Fornell & Larcker 1981]. This indicates that the constructs are empirically distinct.

Table 5: Reliability and validity results

		Reliability and Convergent Validity			**Discriminant Validity**			
Construct	Items	Item Loading	Composite Reliability	AVE	Perceived Risk	Expectation	Confirmation	Satisfaction
Perceived Risk	PR1	0.77	0.85	0.654	0.81			
	PR2	0.89						
	PR3	0.76						
Pre-usage Expectation	E1	0.9	0.92	0.737	-0.132	0.86		
	E2	0.9						
	E3	0.9						
	E4	0.72						
Confirmation	C1	0.92	0.953	0.871	-0.012	0.336	0.93	
	C2	0.94						
	C3	0.94						
Satisfaction	S1	0.79	0.904	0.76	-0.073	0.4	0.847	0.87
	S2	0.92						
	S3	0.9						

Taken together, the results suggest that both the reliability and validity of constructs are highly acceptable. Table 6 shows the goodness of fit of the overall CFA model as well as recommended criteria. Since all fitness measures of the measurement models satisfy the corresponding criteria, the measurement model fits the collected data well. Harman's single-factor test was employed to evaluate the influence of common method bias [Podsakoff et al. 2003]. All the construct items were included in principle component factor analysis with rotation. Because the variance of the first extracted factor was 37%, which is less than the suggested variance of 50%, common method bias is not significant in this study.

Table 6: Goodness-of-fit indices for the measurement and structural models

Measures	Recommended Criteria	Measurement Model	Structural Model	References
X^2/d.f. (p-value)	<3	1.781(0.000)*	1.760(0.000)*	[Bentler & Bonett 1980; Hair et al. 2010; Schumacker & Lomax 2004; Scott 1994; Seyal et al. 2002; Ullman 2006]
GFI	>0.9	0.950	0.945	
AGFI	>0.9	0.917	0.917	
NFI	>0.9	0.958	0.954	
CFI	>0.9	0.981	0.979	
RMSEA	<0.08	0.044	0.044	

Note: It is expected that a larger sample size would produce significant p-values [Hair et al. 2010].

5.2. Structural Model

The fitness between the proposed model and collected data was tested. As the goodness-of-fit indices of our model shown in Table 6 indicate that the structural model fits the data well, the proposed hypotheses can be empirically verified. Figure 5 illustrates the standardized path coefficient, path significance, and variance explained (R^2) for each endogenous construct, which are estimated by AMOS. Some control variables (i.e., age, monthly income, and education) were also included for each construct. According to Figure 5, review volume has a significant negative effect on consumers' perceived risk of knowledge products (β = -0.11, p = 0.039), and return policy does not have a significant impact (β = -0.073, p = 0.171). In addition, product price does not influence expectation (β = 0.047, p = 0.350). Perceived risk has a negative effect on pre-usage expectation because the coefficient is negative and significant (β = -0.1, p = 0.074). Therefore, H1 is supported. Pre-usage expectation has a direct positive effect on consumers' satisfaction (β = 0.12, p < 0.01), supporting H2 and indicating that higher expectations will lead to higher satisfaction. Perceived confirmation is also positively influenced by expectation (β = 0.30, p < 0.01), supporting H3. H4 is also supported, as the coefficient of the relationship between confirmation and satisfaction is positive and significant (β = 0.85, p < 0.01). Together, the results for H3 and H4 suggest that pre-usage expectations indirectly influence consumers' satisfaction through confirmation.

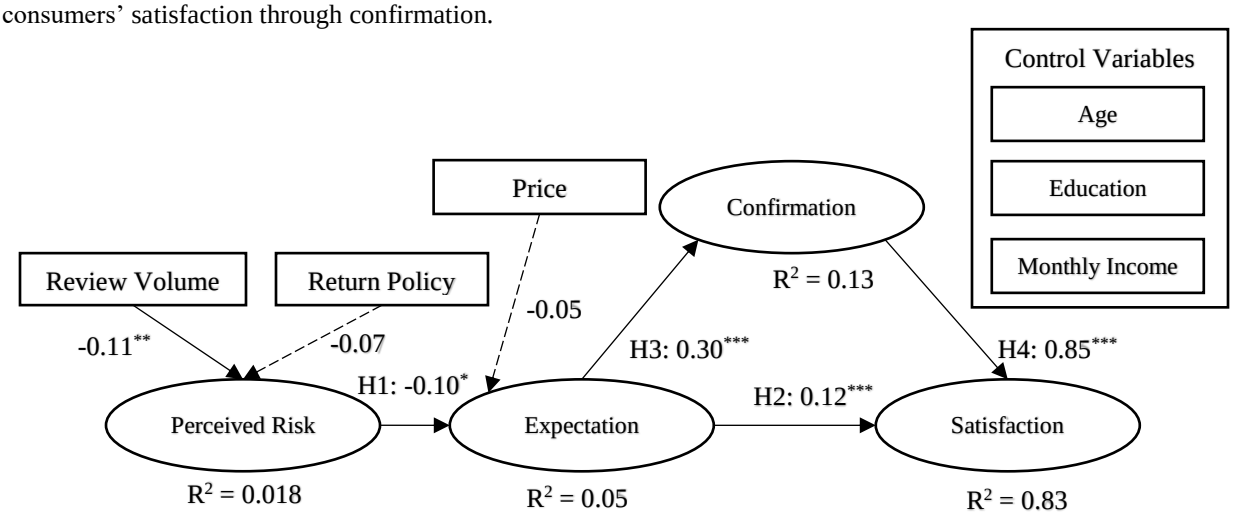

Figure 5: Results of the SEM path analysis
Note: * p < 0.1, ** p < 0.05, *** p < 0.01.

To identify whether the direct or indirect influence of expectation on consumers' satisfaction is stronger, the bootstrap methods proposed by Mackinnon et al. [2004], Williams & Mackinnon [2008], and Hayes [2009] are used

to test the relative estimations of mediating effects between expectation and satisfaction. The standardized results are presented in Table 7. The estimated total effect of expectation on satisfaction is 0.377, a significant value. Further, the estimated indirect effect of expectation on satisfaction is 0.258, which accounts for 68.44% of the meditating effect on the total effect. Both the bootstrap percentile confidence interval (0.169, 0.346) and the bootstrap bias-corrected percentile confidence interval (0.17, 0.347) suggest indirect effects. However, the estimated direct effect of expectation on satisfaction (0.119) is also significant. Hence, this is a partial mediation model.

Table 7: Standardized results of bootstrap methods regarding the mediation effect

Path	Point Estimate	Product of Coefficients		Bootstrapping			
				Bias-corrected 95% CI		Percentile 95% CI	
		Std.Err.	Z	Lower	Upper	Lower	Upper
Total Effect							
Expectation→Satisfaction	0.377	0.055	6.85	0.264	0.480	0.267	0.481
Indirect Effect							
Expectation→Satisfaction	0.258	0.045	5.73	0.17	0.347	0.169	0.346
Direct Effect							
Expectation→Satisfaction	0.119	0.032	3.72	0.059	0.182	0.06	0.183

Notes: 5,000 bootstrap samples [Hayes 2009]; CI = confidence interval.

The above results reveal that pre-usage expectations can influence consumer satisfaction through both direct and indirect means. Moreover, the indirect effect of expectation has a stronger influence on satisfaction than the direct effect, as evidenced by the greater coefficient of the indirect effect (0.258 vs. 0.119). Brown et al. [2012] noted that the outcomes of an analysis may be associated with the magnitude of confirmation deviations. More specifically, if deviations are small enough to be tolerated, the direct positive effect of expectations on customer satisfaction dominates the outcomes. Otherwise, the outcomes are dominated by the indirect effect. In this study, due to the halo effect, expectation also has a positive influence on perceived confirmation. Consumers' satisfaction with the knowledge product relies more heavily on the indirect effect of expectation through perceived confirmation. This result is consistent with the fact that consumers' evaluations of perceived confirmation in regard to experience products is more subjective than for search products. Although consumers will adjust their satisfaction to align with their initial expectation, the halo effect (through perceived confirmation) plays an important role in enhancing consumers' satisfaction in the context of knowledge products.

To verify H5 and identify the moderating effect of product price, a multi-group analysis across different price groups (i.e., low-price and high-price) was conducted. The results are reported in Table 8. As AMOS does not allow product price to simultaneously be a moderator variable on the path of expectation to confirmation and an antecedent of expectation, product price as an antecedent was eliminated from this test[1]. Analysis of the structural model was performed for both the low-price (N = 203) and high-price (N = 197) groups. The coefficients of the path from pre-usage expectation to confirmation across these two groups were then statistically compared by a χ^2 difference test [Satorra & Bentler 2001]. The results suggest that product price has a moderating effect on the relationship between expectation and confirmation ($p < 0.05$). The influence of expectation on confirmation is stronger in the high-price group ($\beta = 0.39$, $p < 0.001$) than in the low-price group ($\beta = 0.23$, $p = 0.002$), supporting H5.

Table 8: Estimated coefficients in the multi-group analysis

Hypothesis: Path	Low Price (N = 203)	High Price (N = 197)	χ^2 Test of Difference	Moderating Effect
	STD Estimate	STD Estimate		
Expectation→Confirmation	0.23^{***}	0.39^{***}	Significant at $p<0.05$	Yes

Notes: Estimates are standardized; N = sample size; *p<0.1, **p<0.05, *** p<0.01.

6. Conclusions

Drawing upon ECT, an online survey was conducted to capture consumers' attitudes towards online knowledge products in both the pre-usage and post-usage stages. Four hundred valid responses were collected, and the proposed hypotheses were empirically verified. In addition to confirming ECT in the context of online knowledge products,

[1] The authors also performed an additional test for the model without product price (both as antecedent and moderator), and the results were largely consistent with the main model.

there are three major findings of this study. First, perceived risk could be an antecedent of pre-usage expectations. Second, pre-usage expectations positively influence consumer satisfaction in both direct and indirect ways, although the indirect path through confirmation has a stronger influence on consumer satisfaction. Third, the price of knowledge products positively moderates the relationship between consumers' pre-usage expectations and confirmation.

This study contributes to the extant ECT literature in several ways. First, it appears to be the first attempt to extend ECT to the context of online knowledge products. As they are individual level experience products without interactions with others, purchased knowledge products tend to be evaluated more subjectively by individuals than other applications, such as IS adoption and usage intentions (e.g., [Bhattacherjee 2001; Bhattacherjee & Premkumar 2004; Brown et al. 2012; Kim et al. 2009; Lin et al. 2017]). Thus, the results of ECT in this emerging context might be different than those reported in previous studies. Indeed, the results of this study reveal that expectation exerts a positive effect on confirmation due to the halo effect, although this association has often been reported to be negative in the literature (e.g., [Bhattacherjee & Premkumar 2004; Kim et al. 2009]). This may be due to the unique characteristics of online knowledge products, which are discussed in Section 3.

Second, this is one of the first studies to investigate both the direct and indirect effects of expectation on satisfaction in the context of online knowledge products. Although the original ECT shows that expectation can influence satisfaction in two ways, little research has examined both effects; most studies focus on just one. A two-stage online survey was employed in this study, and the results indicate that direct and indirect effects are both positive and significant, although the indirect effect has a stronger influence than the direct effect. This study highlights the significance of pre-usage expectations and suggests that neither effect should be neglected in the ECT framework. The findings contribute to the literature by providing a new explanation for the inconclusive association between expectation and satisfaction.

Third, this study further extends ECT by adding new constructs in the context of knowledge products, and contributes to the literature by exploring the effect of perceived risk (i.e., associated with return policy and review volume) and product price. It identified a negative association between perceived risk and expectation, providing a more comprehensive understanding of consumers' behavior in e-commerce. In addition, product price was introduced to ECT as an antecedent of expectation and a moderator, but only the moderating effect is significant. Prior studies ignored the influence of product price because it may not be applicable or identical for all consumers. However, price is obviously a critical factor in consumers' decision-making. By manipulating product price in the online survey, this study showed that price could positively moderate the positive relationship between pre-usage expectations and confirmation. Thus, the study sheds new light on future ECT studies, encouraging consideration of more exogenous factors in the model.

Fourth, this study designed an innovative two-stage online survey to allow for accurate measurement of expectation, confirmation, and satisfaction in two different stages without considering the influence they may have on each other. As a result, the effects of both the direct and indirect paths between expectation and satisfaction could be empirically tested. In addition, the online survey allowed for manipulation of some variables (e.g., product price, return policy, and review volume) while ensuring that other product attributes remained constant, thereby enabling examination of the moderating effect of product price.

The results of this study have practical implications. First, the positive effect of pre-usage expectations on consumer satisfaction suggests that knowledge providers and third-party knowledge-sharing platforms should make an effort to increase consumers' pre-usage expectations at the pre-sale stage. For example, platforms could invite celebrities or users with high social capital to host Live broadcasts, and product providers could circulate advertisements and promotional discussions to increase potential consumers' initial expectations. Moreover, because the halo effect was empirically confirmed, if it is not feasible to provide a Live broadcast that is of good overall quality, knowledge providers are guided to ensure that certain aspects of the Live broadcast attract or leave good impressions on consumers. Second, because product price positively moderates the relationship between expectation and confirmation, increasing the price of a knowledge product will, surprisingly, increase consumers' satisfaction. However, it is worth noting that increasing the price will also risk losing consumers who find the product unaffordable. Therefore, providers should set a higher, but still reasonable, product price. Third, knowledge providers and platforms should increase consumers' pre-usage expectations by reducing the perceived risks associated with a knowledge product. For example, platforms can encourage consumers to writing product reviews, because this study reveals that review volume helps to reduce consumers' perceived risk or a third-party payment platform (e.g., Alipay) could be introduced to ensure the security of consumers' money.

In addition to the above contributions, this study has several limitations. First, the survey was conducted in China and all the participants are Chinese. To make the proposed model more generalizable, future studies should use more data from other countries or cultural settings. Second, this study employs Zhihu Live as the research object and examines only real-time broadcasts as knowledge products. Taking various forms of knowledge products into

consideration and investigating how different knowledge products influence consumers' behavior in different ways may be an interesting direction for future research. Third, the proposed model can be applied in future studies aiming to explore diverse post-purchase behaviors, such as rating products, writing online reviews, repurchasing products, and returning products.

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Appendix A. Questionnaire Design

Table A1: Instrument constructs, items, and sources

Instruments	Items	Sources
Perceived Risk	PR1: If I were buying a Zhihu Live product, I would worry about the reliability of the information provided by the product. PR2: I would be afraid that the Zhihu Live product would not provide me with the level of benefits that I expected. PR3: I would be concerned that I may not get my money's worth from the Zhihu Live product.	[Dholakia 2001]
Expectation	E1: I expect that the Zhihu Live product will improve my ability to finding a reliable restaurant. E2: I expect that the Zhihu Live product will make it easier for me to find a reliable restaurant. E3: I expect that the Zhihu Live product will enhance my effectiveness in finding a reliable restaurant. E4: How would you rate your overall expectations of the quality of Zhihu Live?	[Brown et al. 2014; Kim et al. 2009]
Confirmation	C1: The Zhihu Live product enhanced my effectiveness in selecting a restaurant more than expected. C2: My experience of listening to the Zhihu Live product was better than expected. C3: The content of the Zhihu Live product was better than expected.	[Bhattacherjee & Premkumar 2004; Kim et al. 2009]
Satisfaction	S1: I feel absolutely terrible/absolutely delighted about my overall experience of listening to the Zhihu Live product. S2: Listening to the Zhihu Live product gave me a sense of enjoyment. S3: All things considered, listening to the Zhihu Live product was beneficial.	[Bhattacherjee 2001; Brown et al. 2014; Hsu & Lin 2015]