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Does Identification Influence Continuous E-Commerce Consumption? The Mediating Role of Intrinsic Motivations

Xi Chen *, Shaofen Fang, Yujie Li and Haibin Wang

School of Business and Tourism Management, Yunnan University, Kunming 650091, China; fangshaofenaha@163.com (S.F.); Liyujie@ynu.edu.cn (Y.L.); hbwang@ynu.edu.cn (H.W.)

* Correspondence: chenxi1231@ynu.edu.cn

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Abstract: The motivation behind online consumption behavior is different from that of online social behavior, and research is lacking regarding the impact of identification on e-commerce consumption. The current research examines the influence of identification, which is perceived anonymity, and intrinsic motivation on the continuous purchasing behaviors on retailing e-commerce websites based on self-determination theory. The mediating role of intrinsic motivation was also empirically tested from a sample of 661 frequent consumers using the partial least squares approach. The findings were: (1) Identification negatively influences perceived anonymity, and its low, but significantly positive, influence on continuous e-commerce consumption were totally mediated by perceived competence, perceived autonomy, and perceived relatedness. (2) Perceived anonymity positively influences self-determination factors, which has partly mediating impact between perceived anonymity and continuous consumption. (3) The authenticity and concealment of identity are based on different mechanisms, but both of them are conducive to promoting continuous purchases. On retailing e-commerce websites, customers' identity management should consider both identification in the background and anonymity perception in the service, and the contributions of the service to promote consumers' perceived competence and perceived autonomy are important in continuous consumption.

Keywords: identification; perceived anonymity; continuous consumption online; customer identity management

1. Introduction

Over several years of development, e-commerce has been undergoing an evolution to enhance customer participation and produce greater economic value [1]. As a result, an e-commerce website should motivate consumers to shop and maintain an efficient relationship with them. This has transformed e-commerce from a product-oriented to a customer-centered environment [2,3]. One view holds that e-commerce is moving into the age of social commerce [1]. However, the psychological motivation behind online consumption behavior is different from that of online social behavior; identity plays different roles in two application scenarios. People may not be willing to recommend products through their social media accounts, such as Facebook, WeChat, etc., owing to considerations regarding the impact on their personal image [4]. Moreover, being influenced by behavioral patterns, a decision-making mechanism exists in common e-commerce retailing environments, such as B2C (business to customer) and C2C (customer to customer), which directly provides products and services to consumers, currently serve as the main platforms for online shopping [5]. Identification is the recognizability of identity, and evidence is still being gathered on the emergence of a widely used

platform for product shopping decision behaviors that are based on the users' identification. Intrinsic motives trigger behavior that is driven by interest and enjoyment, and the satisfaction that is caused by the behavior itself.

Since the emergence of e-commerce, the study of motivations as predictors of consumer purchasing behavior has gained attention in the literature [6]. The factors affecting the use of e-commerce services include usability, information quality, website quality, service quality, and playfulness [1]. Usability refers to the effectiveness, efficiency, and satisfaction that specific users achieve [7]. Information quality is a source of value to customers [8]. Website quality is the e-commerce system's performance in delivering information and services [9]. Service quality refers to the online support capabilities that are offered by e-commerce providers [10]. Playfulness refers to perceived enjoyment when customers interact with the e-commerce website [11]. For the maintenance of sustainable consuming behavior of the users, two implications have been reported in researches regarding the social impact factors on these platforms. Firstly, the customer relationship management of platforms, like B2C and C2C, benefits from improvements in customer service design, which also increases profitability [7–11]. Secondly, some research provides significant insight to the construction of socialized e-commerce [1]. Most of these studies focused on the external factors that influence online continuing shopping behavior. Deci separated motive into intrinsic and extrinsic motives [12]. As for the sustainable purchase behavior of e-commerce users, the impact of intrinsic motivation structure needs further verification and clarification, which contribute to more continuous motivation for online shopping.

The continuous consumption behavior of e-commerce users is also related to the verifiability of their identity. Management on user identity is an important component of the sustainable operation of e-commerce sites. User identity authentication on e-commerce platforms is a security issue that is regarded as the guarantee of reliability of e-commerce transactions [13]. However, research on the impact of identity authentication on continuing shopping motives and behaviors is lacking. Identification is not only related to Internet security technology, but also to the social attributes, social relationships, and psychological decision-making mechanisms of customers [14]. Based on the understanding of above problems, the current study attempted to explore the impact of the identification and perception of identity secrecy on intrinsic consumption motivation and sustainable consuming behavioral on the B2C and C2C e-commerce platforms. E-commerce is undergoing a new evolution by adopting a variety of functions and capabilities to enhance customer participation [15]. To promote customer relationships management, customer identification is thought of as the foundation in construction of long-term customer relations [16].

Currently, Internet services typically adopt modes that authenticate real identity in the background and provide a virtual identity service in the foreground [17]. Certification assures reliability for e-commerce transactions and provides a basis for the formation of a socialized structure of e-commerce platforms [13]. The real identity is usually authenticated during the user's registration, which will be checked during the execution of the transaction. How this process is completed in the background of the Internet service affects the front-end user's psychological perception of identity secrecy.

The literature on anonymity and regulation in Internet interactions, which was generated during the 1990s, requires a reevaluation through a more contemporary lens [18]. Depending on the social space, anonymity has been shown to have different effects on behavior. People may use different online contexts to strengthen the different aspects of their relationships in the real [19]. Communication on the Internet always involves a certain degree of anonymity [20], and how anonymity influences user behavior on e-commerce websites requires clarification. However, few researchers have acknowledged the importance of motivations in explaining the relationship between anonymity and sustainable consumer behavior [21]. The exploration that was reported in this study is important in the design of sustainable customer relationship management of e-commerce platforms.

Therefore, the current study focused on the following research questions: Does identification influence continuous retailing e-commerce consumption? Do consumer intrinsic motivations play an

important mediating role between identification, anonymity perception, and continuous purchasing intention? What are the differences between different intrinsic motivation factors?

To answer the above questions, first, we reviewed the prior literature to describe the theory on identification and anonymity on the Internet, self-determination factors, and motivation theory in Section 2. Subsequently, we derived research model theoretically, and then proposed ten hypotheses based on research model in Section 3. Afterwards, we described the research design and the results of the data analysis. Finally, the research concluded by discussing the implications for both research and practice, and the limitations and potential avenues for future research were also discussed.

2. Theoretical Background

2.1. Identification and Anonymity on the Internet

Identity is a significant topic in studies on the overlapping terrains of the Internet [22]. Social identity explains how identification works, being viewed as a social process, which is a matter of external categorization as much as of internal self-identification [23]. Anonymity and a lack of social context cues are the two most salient features of computer-mediated communication (CMC), which refers to communication using devices, such as computers and smartphones, as the media. Most online communications are considered as CMC environments [24]. However, with the integration of the Internet and the real world, the confirmation of real identity has become the basis for the orderly operation of Internet society, and especially for e-commerce platforms, where the identification of both sides of the transaction is crucial for the safety of the funds and goods.

The Internet has become a huge social information system. Computer and communication technology serve as the infrastructure that supports the running of Internet society. Identity authentication technologies for Internet users are relatively systematic, and they can be used across all Internet applications to authenticate identity and manage customers [13].

As shown in Figure 1, two levels of identity management are available for Internet users: front-end and background. The users are authenticated upon registration and log in, and the authentication process is implemented through the information systems in the background level of the Internet, which exchanges data with the public security system. The users usually hide their real identity behind their virtual identities with network nicknames at the front-end of Internet applications.

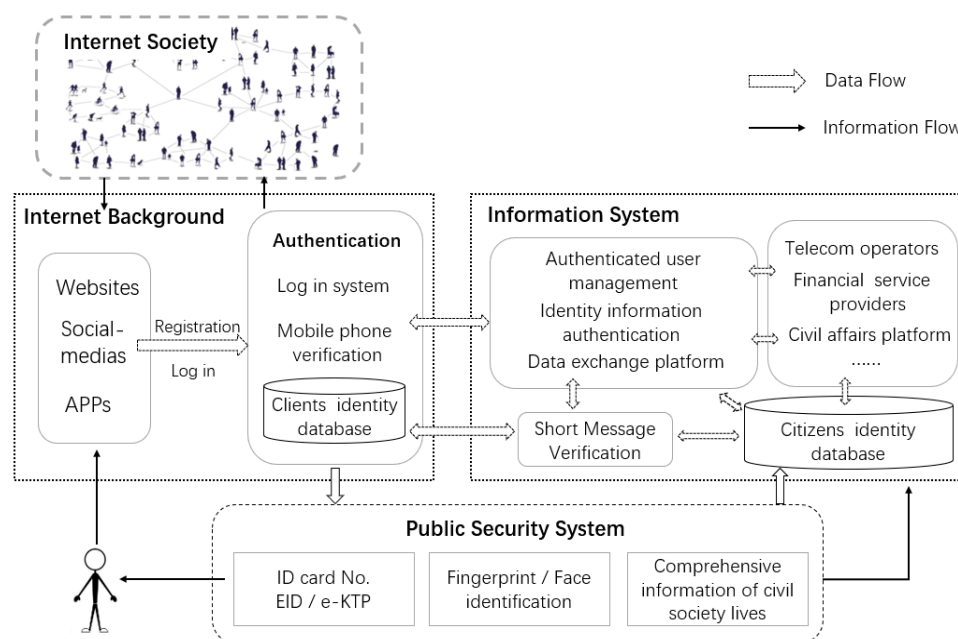


Figure 1. Architecture of the Internet identity authentication system. *Source:* Authors.

However, virtual identities are not completely anonymous [25]. Online identities are often continuous with the offline selves and they somewhat overlap the non-reconfigured versions of subjectivities in real life—user’s online identity changes—thus becoming fluid and fragmented [26]. According to the identity, identification is less fixed, more fluid, and contingent [27], which is a process, but identification also reflects inner perception [28]. The opposite concept to identification is anonymity. Authentication is implemented in the background of the service provider, where the concept of anonymity in Internet identity research assumes a fixed, continuous relationship between being and feeling [23]. The distinction between being anonymous and feeling anonymous in Internet identities should be considered. How anonymity influences human behavior depends on the context [29]. Anonymity may have positive or negative effects on online information sharing behaviors according to the specific situation [30,31]. However, on an e-commerce transaction platform, how identification and perceived anonymity influence purchase behavior still needs exploration and clarification.

2.2. Motivation and Self-Determination Theory

Motivation is an affectively charged state that directs and promotes behavior, and it results from the interaction of internal needs and external incentives [32]. Motivation can be classified into intrinsic and extrinsic motives [33]. Intrinsic motives trigger behavior that is driven by interest and enjoyment, and the satisfaction that is caused by the behavior itself. Extrinsic motives are followed by a sense of fulfillment obtained from external activity [34]. In e-commerce participation, research has indicated that intrinsic motivation plays more important role [35,36]. Self-determination theory is a theory of cognitive evaluation [37], with a focus on the behavior’s determination process of individuals without external influence, as well as the basic psychological needs that are the basis for their self-motivation [12].

Self-determination is a behavioral choice to develop and adjust oneself and one’s actions [38], and this theory employs conventional empirical methods to explore human motivation and personality. The theory emphasizes the influence of the individual’s internal psychological resources on personality development and self-adjustment of behaviors [39]. Self-determination theory is a theory on the motivational processes concerning human behavior [40], which provides the basis for the integration of numerous motivational theories [41]. Autonomy, competence, and relatedness have been defined as three basic human psychological needs [42].

Autonomy indicates an individual’s sense of self-control when engaging in an activity. Intrinsically motivated behaviors represent the prototype of self-determined activities, which people naturally and spontaneously undertake when they feel free to follow their inner interests [33]. Some factors affect intrinsic motivation and quality of functioning, because they influence peoples experienced autonomy while engaged in an activity [42]. Providing choice and acknowledging feelings can provide satisfaction of autonomy and result in positive outcomes [43].

Competence indicates an individual’s need to feel competent while engaging in activities. Intrinsic motivation involves people freely engaging in activities that they feel capable and find interesting, which provides novelty and an optimal challenge [44]. Positive feedback provides satisfaction of the need for competence [45]. People must feel responsible for competent performance, and perceived competence tends to enhance intrinsic motivation [42].

Relatedness indicates an individual’s need to maintain relationships with others. Attachment theory [46] posits that implicit relatedness is important for intrinsic. Intrinsic motivation will be more likely to motivated by a sense of secure relatedness [42]. Maintain interpersonal relationships is within the need for ongoing relational bond, and all human beings need social connections [47].

According to self-determination theory, the environment can strengthen a person’s internal motivation through the internalization of external motivation and the maintenance of good behavior by nurturing the psychological needs of autonomy, competence, and relatedness. Each of these three basic psychological needs are important for the individual, as they generate personality growth, psychological health, and the maintenance of good living conditions and social relations [48].

When viewing motivation on a continuum of purchase behavior that responds to individual levels of self-determination, it is important to recognize the impact of motivation on behavior. Research has suggested that individuals are more likely to persist and perform better when basic needs are satisfied [49]. Online buying behaviors are driven by different types of motivations, for example, profit, value, emotion, and achievement, which can reflect the dynamic process of motivations in group buying [50]. On e-commerce websites, the user's purchase actions can be regarded as self-motivated behaviors that are intended to meet the needs of their daily lives. Self-determination theory is a comprehensive and strong theoretical foundation in researching the intrinsic motivation of human behavior, having provided a good theoretical base for investigating the research questions.

3. Research Model and Hypotheses

E-commerce system design factors that are related to user identity, such as identification and perceived anonymity, are viewed as the determinants of individual consumer's motivation for continuous purchases on an e-commerce website. The mediating effect of self-determination on identification, perceived anonymity, and continuous purchase behavior was also considered. The current research extended the self-determination theory [47] by investigating the mediating effect of intrinsic motivation factors. The current study included the role of the three intrinsic motivations as mediating continuous product purchase intentions, which focus on the effects of identification. This research also sheds light on the social impact of existing e-commerce services. Figure 2 depicts the research model.

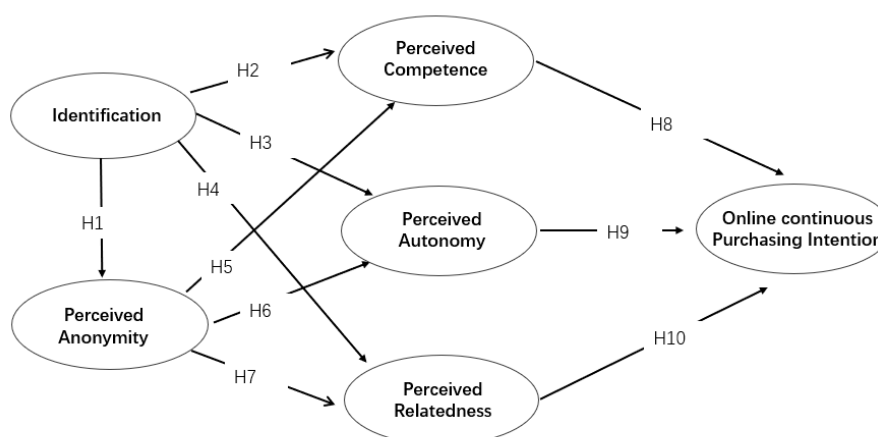


Figure 2. Research model. Source: Authors.

3.1. Identification

The phenomenon of identification is related to the linkage between a user's real social identity and online virtual identity. Authentication of the real identity of both sides of a transaction is the foundation of e-commerce security. The Chinese government has implemented real name verification law, requiring Internet users to verify their real names before using all online services, including major portals, social networking sites, newspaper websites, and e-commerce sites [28]. The real name system has enhanced the identification process and reduced the number of messages that contain swear words and slanderous comments, as well as anti-normative expressions [51].

The impact of the real name authentication process in the background of the Internet provides identification and a reduction in the anonymity perception of users. Perceptions of anonymity revolve around individuals' perspectives in terms of the levels of identifiability [21]. The use of virtual identities by users at the front-end of the Internet does not mean absolute anonymity, as the content created by users at the front-end of websites provides clues to determining real identity. As a result, anonymity is only related to the state of being unidentifiable [14]. There is a distinction between being anonymous and feeling anonymous in Internet identification [23]. The environment affects

psychological perception [52]. The identity-related information on Internet websites reduces user anonymity. Thus, we hypothesized that:

Hypothesis 1 (H1). *Users' identification negatively impacts on their perception of anonymity on e-commerce websites.*

People are motivated to identify with another individual or social category [53]. Users identify themselves to meet their needs on self-definition with a company or product [34]. The research has indicated that consumer's attitude is related to their self-cognition, which is influenced by the process of matching product image perception with self-concept of their own [54]. Identification will help to reduce uncertainty and improve users' competency perception [55]. The online experience has been confirmed to have a directly positive effect on self-efficacy, as well as on usefulness perception [56], which had close relationships with the perception of competence. Thus, we hypothesized that:

Hypothesis 2 (H2). *User identification positively impacts on their perception of competence on e-commerce websites.*

Identification includes a customer's feeling with respect to interactions [34]. Customers who have a significant involvement with a seller, a service, or a product that benefit the identification promotion usually become a supporter and advocator [57]. Identification that is revised by deep participants in commercial activities increases the perception of autonomy. Identification helps to reduce uncertainty and improve users' perception of control [55]. Social status and identification have a positive influence on the willingness of consumer to re-consumption and recommend the product [58]. Moreover, self-enhancement is a motivation that contributes to make consumers feel happy on them own, to promote autonomy perception through online consuming [59]. Thus, we hypothesized that:

Hypothesis 3 (H3). *User identification positively impacts on their perception of autonomy on e-commerce websites.*

The degree to which the customer thinks these relationships are valuable, as well as how the relationships facilitate the achievement of an identity in the online customer community are included in identification [34], which reduces the uncertainty by providing a sense of familiarity, and conduces to people experiencing relatedness and feel connected and supported by others [31]. Perceived relatedness can be conceptualized as the sense of identification or connectedness that one feels with others [31]. Identification is also with regard to the sense of trust. It directly or indirectly influences consumers' purchasing decisions and has a significant impact on whether the consumers will continue to buy or not rely on the satisfaction [60]. Thus, we hypothesized that:

Hypothesis 4 (H4). *User identification positively impacts on their perception of relatedness on e-commerce websites.*

3.2. Anonymity Perception

The relationship between online anonymity perception and behaviors depends on the context [20]. Anonymous online communication has both positive and negative effects, as reflected in situations of online consumer behavior on e-commerce platforms: it introduces uncertainty into the interpersonal interactions between the two sides of the transaction, and anonymity reduces the risks regarding online privacy and security [61]. To the users, circumventing recognition can preserve privacy and anonymity [62]. In different countries, the majority of Internet users usually take measures to avoid surveillance by others or organizations when using all online services [61]. In group

decision-making, user anonymity increases behavioral contribution and effective suggestions [63]. Thus, we hypothesized that:

Hypothesis 5 (H5). *User perception of anonymity positively impacts on their perception of competence on e-commerce websites.*

Human decision-making should adapt to the environment, and high anonymity perception typically offers a low threat environment [63], as participants do not have to be responsible for the outcomes. Anonymity perception reduces identity recognition and it makes users feel that they are unidentified in online communications [64], which decreases pressure from social identity constraints [20]. In online e-commerce, anonymity reduces the social barriers and discriminations that are associated with imbalances in social status and power within communities [65] and it provides the mechanism and freedom for users to participate in online activities [66]. Thus, we hypothesized that:

Hypothesis 6 (H6). *User perception of anonymity positively impacts on their perception of autonomy on e-commerce websites.*

Anonymity has been proven to promote some negative online behavior [67]. Unlikability and unobservability accompany anonymity [24]. In an anonymous online environment, computer-mediated communications become a veil to online interpersonal relationships, where social ties are more weakened and social norms are more likely to be broken [25]. In group discussion situations, anonymous users were found to be more likely to embellish ideas that are proposed by others than the contributions of users who were identified by name [63]. Being anonymous means a lack of identity authentication [14] and, to some extent, this pattern of relationships shows the decline in interpersonal correlation. Thus, anonymity means the absence of familiar social connections. Accordingly, we hypothesized that:

Hypothesis 7 (H7). *User perception of anonymity negatively impacts on their perception of relatedness on e-commerce websites.*

3.3. Online Continuous Purchasing Intention

Studies on e-commerce websites supports the relationship between intrinsic motivation and a user's online purchasing behavior [68,69]. The current study assumes that the satisfaction gained by the meeting of intrinsic needs affects users' continuous e-commerce consumption behavior.

The expectations of perceived competence or personal efficacy determine whether coping behaviors are initiated, how much effort is required, and how long the behaviors persist in the face of obstacles and adverse experiences [70]. Self-perceived competence was found to be a highly effective predictor of performance, motivation, and learning [71,72], for it has become an important predictor of communicated willingness [73]. The ease of use perception directly affects information technology (IT) adoption, including e-commerce online purchases [74]. Thus, we think that self-competence encourages users to continuously purchase on social e-commerce websites and hypothesized that:

Hypothesis 8 (H8). *User perception of competence positively impacts on their online continuous purchasing intentions on e-commerce websites.*

Users' personal status also plays an enormous role in the dissemination of information on social networking sites [75]. Perceived autonomy is the degree to which a person perceives the control that they exert over their behavior. Perceived website usability positively affects repurchase intention of customers [76], and both the utilitarian value and hedonic value are positively correlated with the buyers' repurchase intention [77]. Research shows that the sense of autonomy has an impact on users'

continued use of social virtual world [78], while user participation has a positive impact on their purchasing intentions [79]. With the development of mobile Internet, the perceived enjoyment of users' willingness to use smart phone shopping becomes particularly important [80]. Users' satisfaction with the ordering and fulfillment process, as well as their perception of the usability of the website, has an important impact on their willingness to continue to use e-commerce websites [81]. Thus, we hypothesized that:

Hypothesis 9 (H9). *User perception of autonomy positively impacts on their online continuous purchasing intentions on e-commerce websites.*

E-commerce is undergoing an evolution by adopting social networking features to improve customer engagement and generate greater economic value [1]. Perceived relevance is a concept that is concerned with social relations, which can be conceptualized as a person's sense of identity or connectivity with others [31]. The results show that the intention to participate in online group-buying is expected to result in close interpersonal relationships among online e-commerce websites, which are expected to result in collective consumer reciprocity, satisfaction, trust, and seller creativity [82]. Social support affects users' willingness to use social commerce, which is regulated by the relationship quality between users [16]. Thus, we hypothesized that:

Hypothesis 10 (H10). *User perception of relatedness negatively impacts on their online continuous purchasing intentions on e-commerce websites.*

3.4. Self-Determination Factors

Several studies have confirmed the intrinsic motivation links between psychological factors and behavioral outcomes [83–86]. Human motivation is a multidimensional and complicated internal process [87]. According to the self-determination theory, intrinsic motivation can be described by three basic needs: competency, relatedness, and autonomy [40]. Mehrabian and Russell's Stimulus-Organism-Response model has been implemented in the research on consumer behavior [88–92]. The self-determination factors belong to the mechanism of organism, which mediates the stimulus from identification and anonymity and the response of purchasing intention. The studies on computer and human interactions have proved that the perceptions of user competence mediate user behavior [93,94]. Thus, we hypothesized that:

Hypothesis 11 (H11). *Perceived competency, perceived autonomy, and perceived relatedness have a mediating effect on identification and online continuous purchasing intention.*

Hypothesis 12 (H12). *Perceived competency, perceived autonomy, and perceived relatedness have a mediating effect on anonymity perception and online continuous purchasing intention.*

4. Methodology

In the current study, we intended to study how identification influences online continuous purchasing intentions. Based on Taobao website, which is the largest retail e-commerce website in China, and it provides Chinese retailers and consumers with an online business model using both B2B and B2C platforms [95]. Taobao has successfully replaced the eBay in China and become the world's largest consumer market [96]. As the latest data released by Taobao shows that Taobao has 600 million active users. We launched an online survey and looked for respondents to fill out the questionnaire. To verify and test these hypotheses, we collected data from Taobao users with different backgrounds in China, who have a Taobao account and use it frequently. We also used previously validated measuring instruments to ensure that measurement measures are appropriate and representative, and thus revised accordingly. Variance-based structural equation modeling (SEM) statistical techniques, such as partial

least squares (PLS) path modeling, were used to test the research model by using smart PLS version 3, which is a widely used analytical technique in behavioral and business research, because it provides flexibility [97]. PLS is very suitable for predictive exploratory modeling and research [98]. Through performing t-tests on path coefficients, the standard error of structural model path is taken to confirm analysis. In the current research model, all of the factors are modeled as reflecting indicators and are regarded as the influence of potential variables.

4.1. Data Collection

At the beginning stage of the study, the research model was tested through the survey data of Taobao users in China. We conducted the survey on an online survey platform at www.wjx.com and posted hyperlinks to job listings and online surveys through email and social networking sites. We used targeted sampling and recruited participants from Taobao users in mainland China. Volunteers can access the online questionnaire through hyperlinks on their mobile phones and personal computers. We adopt the method of screening problems, where only frequent users of Taobao are screened. To encourage participation, the respondents will be automatically drawn to win shopping vouchers. In this study, screening questions were used as the screening criteria, and 715 valid questionnaires were selected from 661 questionnaires to identify the frequent users of Taobao. Table 1 shows detailed descriptive statistics of the characteristics of respondents, which provides an appropriate and representative sample for e-commerce users.

Table 1. Descriptive statistics of the respondent characteristics.

Measure	Value	Frequency (%)
Sex	Female	357 (54.0)
	Male	304 (46.0)
Age (years)	18–25	149 (22.5)
	26–30	171 (25.9)
	31–40	269 (40.7)
	41–50	63 (9.5)
	Older	9 (1.4)
User history	<2 years	23 (3.5)
	2–3 years	85 (12.9)
	3–4 years	110 (16.6)
	4–5 years	115 (17.4)
	>5 years	328 (49.6)
Frequency of using Taobao	A few times/day	29 (4.4)
	A few times/week	273 (41.3)
	A few times/month	300 (45.4)
	A few times/year	59 (8.9)

Note: The questions only had one possible answer.

The distribution of the sample demographic information was reasonable. The age distribution was mainly young and middle-aged persons, which are the main consuming groups on e-commerce websites. The 18–40 age group accounts for 89.1% of all subjects. 83.6% of the subjects have three years of online shopping experience at Taobao. Only 3.5% of the subjects have less than two years of online shopping experience at Taobao. Generally speaking, the subjects often shopped at Taobao. 91.1% of the subjects have shopped at Taobao at least several times per month.

4.2. Measures

All of the measures were referenced from relevant literature and modified appropriately to fit into the current research background. We used multi-item indicators to ensure the effectiveness and reliability of the structure. All the indicators were made using a five-point Likert scales (1 = strongly

disagree to 5 = strongly agree). The reliability and validity of the measurement model were evaluated by testing the internal consistency, convergent validity, and discriminant validity. Table 2 summarizes the measures and structures that were used in the current study. For excessive kurtosis, except for CP3 that has an absolute value larger than 2, which is 2.486, other measurement counters have an absolute value smaller than 2. The absolute value of skewness of all measurement counters is smaller than 2. Accordingly, the data are not serious distortions. In addition, PLS does not require normality, so nominal, ordinal, and interval-scale variables can be used without distribution assumptions [99].

Table 2. Psychometric properties of measures.

Items	Loading	t-Value	Mean	SD
ID: Identification (Cronbach' α = 0.789; CR = 0.861; AVE = 0.609) [28]				
ID1: I use my real name or screen name on Taobao.com	—	—	—	—
ID2: I post content about my true identity from my Taobao account	0.740	28.805	3.157	1.187
ID3: My Taobao information contains personal characteristics that enable others to know my true identity	0.778	37.934	3.190	1.114
ID4: I left clues in Taobao that will allow people to find out my true Identity	0.777	35.266	3.321	1.182
ID5: People who do not know me can easily find out who I am through my Taobao information	0.824	63.894	2.668	1.186
PA: Perceived Anonymity (Cronbach' α = 0.845; CR = 0.889; AVE = 0.618) [21]				
PA1: I believe that people who can see my Taobao information do not know who I am	0.691	25.164	3.590	0.968
PA2: I think that people who connect to my Taobao information do not know my real identity	0.747	34.626	3.550	1.120
PA3: My Taobao information easily tells people who I am *	0.841	62.264	3.313	1.151
PA4: People who can see my Taobao profile know my real identity *	0.826	55.512	3.527	1.06
PA5: My real personal identity can be guessed or known by people who can see my Taobao information *	0.816	56.982	3.250	1.121
PC: Perceived Competence (Cronbach' α = 0.668; CR = 0.818; AVE = 0.601) [31,40]				
PC1: I am capable of using Taobao well	0.817	43.358	4.228	0.744
PC2: Buying in Taobao gives me a sense of accomplishment (dropped)	—	—	—	—
PC3: Purchasing the products using Taobao makes me feel that I am a capable person	0.804	34.868	4.374	0.753
PC4: I often feel that I am competent when shopping on Taobao	0.700	20.034	3.956	0.842
PO: Perceived Autonomy (Cronbach' α = 0.659; CR = 0.813; AVE = 0.592) [31,40]				
PO1: I feel that I can buy products freely on Taobao	0.800	42.597	4.143	0.791
PO2: I feel that I am more of myself on Taobao (dropped)	—	—	—	—
PO3: I can control over what I want to buy following my own wishes	0.711	22.797	4.167	0.736
PO4: I can buy whatever I want as I desire on Taobao	0.794	45.769	4.316	0.810
PR: Perceived Relatedness (Cronbach' α = 0.744; CR = 0.836; AVE = 0.560) [31,40]				
PR1: I really like the sellers on Taobao	0.795	32.142	3.583	0.776
PR2: The sellers on Taobao care about me.	0.735	28.015	3.580	0.954
PR3: The sellers on Taobao are friendly towards me	0.708	19.642	3.432	0.930
PR4: I feel a lot of closeness and intimacy on Taobao	0.752	22.725	3.414	0.981
PI: Online continuous purchasing intention (Cronbach' α = 0.758; CR = 0.848; AVE = 0.585) [92]				
PI1: I intend to use Taobao to shop in the next 12 months	0.864	68.166	4.178	0.859
PI2: I would continue to use Taobao in the next 12 months	0.721	27.969	4.184	0.854
PI3: I plan to shop on Taobao in the next 12 months	0.641	18.795	4.256	0.782
PI4: I expect to shop on Taobao in the next 12 months	0.813	41.000	4.146	0.914

Note: * Reversed scale; CR: Composite reliability; AVE: average variance extracted.

5. Data Analysis and Results

The structural equation model has been used to verify the model in the research. Partial least square (PLS) was used for statistical analysis. Smart PLS version 3 [97] has been used to test the research model and as an analytical technique widely used in behavioral and business research, because it provides method with flexibility, which is widely used by researchers studying human behavior, with coherent explanations for complex relationships [98]. A two-step analysis method is used to

verify the validity of measured data and the structural model is then evaluated. We can confidently conclude that the structural relationships could be derived from a set of measuring instruments with ideal psychometric properties.

5.1. Reliability and Validity of the Measurement Items

To verify the measurement model, we tested the convergent validity and discriminant validity, and then used the following general criteria to evaluate the convergent validity of these constructs: all of the item loads should be larger than 0.60 [99]. The average variance extraction (AVE) is supposed to be at least 0.50 [98] and the composite reliability (CR) is supposed to be at least 0.70 [100]. Table 3 shows the results of our analysis. All three convergent validity conditions are satisfied. Factor loads over 0.60 for all items and three items that are less than 0.60 were excluded.

Table 3. Correlation matrix and psychometric properties of key constructs.

X	ID	PA	PC	PO	PR	PI
Identification (ID)	(0.780)					
Perceived Anonymity (PA)	−0.690	(0.786)				
Perceived Competence (PC)	0.018	0.145	(0.775)			
Perceived Autonomy (PO)	0.153	0.233	0.528	(0.770)		
Perceived Relatedness (PR)	0.248	−0.085	0.306	0.186	(0.748)	
Continuous purchasing intention (PI)	0.080	0.212	0.609	0.651	0.307	(0.765)

Notes: SQRT (AVE) is provided in parentheses; off-diagonal elements are the correlations between constructs.

The correlation between the value of specific measurement and the value of other constructs is low, indicating the discriminative validity [98]. Discriminant validity is proved when the square root of AVE of each construct is higher than its correlation coefficient with other constructs. As shown in Table 3, the square root of each construct AVE is greater than its correlation with other constructs. The results show that all of the methods have sufficient discriminant validity. In recent studies, the results of our data analysis provide strong evidence of convergent validity and discriminant validity.

According to Hair et al. (2016), PLS-SEM's use for theory testing and confirmation is limited, since it does not have an adequate global goodness-of-model fit measure [99]. Researchers using PLS-SEM may not draw on a global goodness-of-fit measure to evaluate the overall model fit, as PLS-SEM focuses on prediction [100]. Standardized Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI) may assess the model fit. For SRMR, the recommended value should be lower than 0.08; NFI values between 0 and 1 are recommended. For the current model, SRMR is 0.076 and NFI is 0.712. The GoF value of the model is 0.454, which is significantly higher than the standard of substantial fitting, in which 0.36, 0.25, or 0.1 can be described as, respectively, substantial, moderate, and weak [101]. The indices indicate an acceptable model fit of the data.

5.2. Structural Model

We conducted a structural model analysis based on the hypothesized research model. Figure 3 illustrates the paths and their significance in the structural model, as well as the coefficients, their *t*-values on the structural model, and the coefficients of determination (R^2) for each dependent construct. The perceived anonymity has a positive significant impact on perceived relatedness, whereas the other impacts were significant with the hypothesis being supported. The impact from perceived relatedness was just moderate significant, with the significance level at $p < 0.05$.

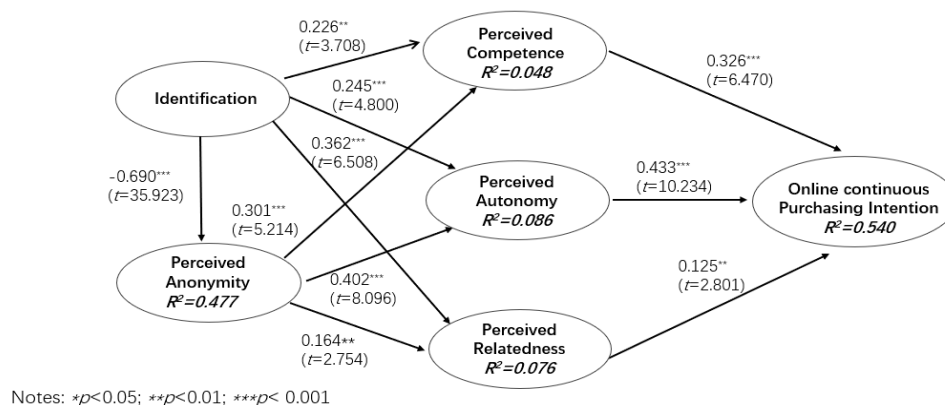


Figure 3. Results of the research model. *Source:* Authors

The results illustrate that the independent variables explained a substantial amount of the variance in the dependent variables. In the current model, the independent variables explained 47.7% of the variance in perceived anonymity ($R^2 = 0.477$, $Q^2 = 0.275$), and 54.0% of the variance in online continuous purchasing intention ($R^2 = 0.540$, $Q^2 = 0.297$) was explained. As a result, the model had a moderate level of predictive effectiveness for online continuous purchasing intentions from the self-determination factors. However, the identification and perceived anonymity had relatively low predictive effectiveness for self-determination factors, perceived competence ($R^2 = 0.048$, $Q^2 = 0.026$), perceived relatedness ($R^2 = 0.076$, $Q^2 = 0.039$), and perceived autonomy ($R^2 = 0.086$, $Q^2 = 0.048$). All VIFs (variance inflation factors) of the explanatory variables were below 2, not reaching the critical value of collinearity [102]. Therefore, multicollinearity was not found in the explanatory variables of the model.

The R^2 statistic can be small, yet the coefficient p-values can be statistically significant. Such a relationship between predictors and the response may be very important, even though it may not explain a large amount of variation in the response [103]. The identification and perceived anonymity had relatively low predictive effectiveness for the self-determination factors, but the coefficient is at a strong significance level. Many other real-world occurrences can lead to lower values of R^2 , though significant effects that have practical importance may be present. A wide variation level reflecting user's behavior may lead to the low values of R^2 [103]. As referred to in Table 2, obviously a high standard error in identification and perceived anonymity may account for this. Even though identification and perceived anonymity may not explain a large amount of variation in the self-determination factors, but the relationship is of great significance to understand the role of identification in e-commerce purchasing motivation. In addition, the Q^2 value obtained is larger than 0, indicating that the exogenous constructs have predictive correlation with endogenous constructs under consideration [99]. As the relative measure of prediction correlation (q^2), 0.02, 0.15, and 0.35, respectively, indicate that exogenous constructs have a small, medium, and large prediction correlation to a certain endogenous structure [99].

5.3. Mediating Effect Test of Self-Determination

Based on Baron and Kenny's research, the mediation of the self-determined factors can be investigated through regression analysis [104]. The existence of mediation needs to satisfy three conditions at the same time: (1) the regression coefficient of the dependent variable (DV) is significant to the independent variable (IV); (2) the regression coefficient of the mediating variable (MV) is significant to the independent variable (IV); and, (3) when the independent variable (IV) and mediating variable (MV) regress based on the dependent variable (DV), the regression coefficient of the mediating variable (MV) is significant. If the regression coefficient of the independent variable (IV) is significant, but it is smaller than the regression coefficient of the mediating variable (MV), this means partial mediation; and, if the regression coefficient of the independent variable (IV) is not significant, this

means full mediation. Software SPSS 19 was used to test the mediating effects. Table 4 verifies the mediation of three self-determined factors:

Table 4. Regression-based mediating verification of self-determined factors.

IV	M	DV	IV > DV	IV > M	IV + M > DV	
					IV	M
ID	PC	PI	0.063 *	0.089 **	0.002	0.690 ***
ID	PO	PI	0.063 *	0.095 ***	−0.10	0.774 ***
ID	PR	PI	0.063 *	0.206 ***	0.012	0.206 ***
PA	PC	PI	0.266 ***	0.08 **	0.108 ***	0.671 ***
PA	PO	PI	0.266 ***	0.090 ***	0.095 ***	0.749 ***
PA	PR	PI	0.266 ***	−0.072 *	0.182 ***	0.268 ***

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The findings suggest that the three determination factors (i.e., PC, PO, and PR) play the role of full mediation between identification and online continuous purchasing intentions, but they play a role of partial mediation between perceived anonymity and online continuous purchasing intentions. As Preacher and Hayes suggested, bootstrapping is a suitable method for testing the indirect effects [105]. In the current study, the bootstrap method was used to test the mediating effect. As shown in Table 5, the results verify the mediating effect of self-determination factors.

Table 5. Bootstrapping analysis of the mediating effects of self-determination.

Effect Types	Effect Mean	S.E.	95% CI	
			Lower	Upper
ID→PI (Direct)	−0.0265	0.0225	−0.0707	0.0177
ID→PI (Total indirect)	0.0897	0.0228	0.0456	0.1368
ID→PC→PI	0.0376	0.0118	0.0173	0.0656
ID→PO→PI	0.0500	0.0132	0.0284	0.0802
ID→PR→PI	0.0021	0.0087	−0.0128	0.0211
PA→PI (Direct)	0.0858	0.0200	0.0427	0.1290
PA→PI (Total indirect)	0.0761	0.0235	0.0348	0.1265
PA→PC→PI	0.0324	0.0119	0.0117	0.0590
PA→PO→PI	0.0452	0.0134	0.0217	0.0754
PA→PR→PI	−0.0015	0.0032	−0.0095	0.0029

Note: CI—confidence Interval, 1000 bootstrap samples, SE—Standard Error.

The positive mediating effect of perceived competence between identification and continuous purchasing intention was significant (indirect effect = 0.0376, 95% CI = 0.0173, 0.0656). There was a positive mediating effect of perceived autonomy between identification and continuous purchasing intention (indirect effect = 0.050, 95% CI = 0.0284, 0.0802), and the positive mediating effect of perceived relatedness between identification and continuous purchasing intention was not significant (indirect effect = 0.0021, 95% CI = −0.0128, 0.0211). In general, identification has no direct effect on continuous purchasing intention and it had a positive indirect effect on continuous purchasing intention, due to perceived competence, perceived autonomy, and perceived relatedness. Among them, the separate mediation effect of perceived autonomy was the largest one, which accounts for the highest (55.7%) of the total indirect mediating effect.

The positive mediating effect of perceived competence between perceived anonymity and continuous purchasing intention was significant (indirect effect = 0.0324, 95% CI = 0.0117, 0.059), and the positive mediating effect of perceived autonomy between perceived anonymity and continuous purchasing intention was also significant (indirect effect = 0.0452, 95% CI = 0.0217, 0.0754). The mediating effect of perceived relatedness between perceived anonymity and continuous purchasing

intention was not significant (indirect effect = -0.0015 , 95% CI = $-0.0095, 0.0029$). When considering that perceived anonymity plays a significant role in the direct prediction of and continuous purchasing intention. Perceived competence, perceived autonomy plays a partial mediating role between perceived anonymity and continuous purchasing intention. In addition, the combination of perceived competence, perceived autonomy, and perceived relatedness plays a significantly positive mediating role between perceived anonymity and continuous purchasing intention, with the total mediating effect accounting for 47% of the total effect. Among them, the mediating effect of perceived autonomy accounts for the highest (27.9%) of the total mediating effect.

6. Discussion and Conclusions

In the current study, we constructed a research model to explain how identity recognition influences consumer behavior through examining the influence of two identity related factors, identification and perceived anonymity, on the intrinsic motivation of users' continuous purchasing intentions on retailing e-commerce websites, while using self-determination theory. Three self-determination factors, perceived competence, perceived autonomy, and perceived relatedness, revealed a significant mediating effect.

6.1. Discussion

The results show that intrinsic motivation, which is segmented into perceived competence, perceived autonomy, and perceived relatedness, significantly affects online continuous purchasing intentions. In this study, the structural model explained 54.0% of the variance in continuous purchasing intention on retailing e-commerce websites. The identification of users on retailing e-commerce websites has a relatively low but important factor that impacts user's motivation, and the intrinsic motivations also had a low but significant total mediating effect on identification and continuous purchasing intention.

This study also reveals the positive effect of perceived competence, perceived autonomy, and perceived relatedness on the continuous purchasing intention on retailing e-commerce websites. Perceived anonymity has a significant positive effect on perceived competence, perceived autonomy, and perceived relatedness, the three motivations had a significant partially mediating effect between perceived anonymity and continuous purchasing intention.

Though there is a negative correlation between perceived anonymity and perceived relatedness, it is in line with the research hypothesis. After controlling identification, there is a positive impact of perceived anonymity on perceived relatedness. Identification refers to the authentication degree of real identity, and perceived anonymity means the psychological perception of anonymity, meaning that perceived anonymity has a positive impact on perceived relatedness when identification is controlled. When it comes to the retail e-commerce websites, a certain degree of anonymity that is based on necessary identification contributes to a better perception of users' relationship with merchants, hence encouraging constant purchases. The conclusion acts as a good reference to the management system design of e-commerce website user identity, as users have to present authentic identity information for ensuring transaction reliability at the stage of registration, and merchants must ensure anonymity for users in the front end of network service. As a result, the fact that merchants are unable to collect authentic user identity information is contributory to the establishment of relevance perception with users.

The three self-determinants act as a full intermediary between identification and continuous purchasing intention, but their influence is relatively weak, mainly because identification has a weakly significant effect on continuous purchasing intention. In terms of user perception, this effect is still relatively low, but it is still significant. It suggests that, although the identity authentication has limited effect on the willingness of continuous use of e-commerce users, it still markedly contributes to the continuous consumption of e-commerce users. This weak and marked effect will only work on the continuous consumption behavior of e-commerce users through the full intermediary of intrinsic

motivations, of which perceived autonomy plays the biggest role and its role is significantly bigger than the other two self-determinants.

6.2. Theoretical Implications

The research that applies an existing model to a new environment has no academic value unless it improves the establishment conditions of the existing model [106]. The current research introduced self-determination theory into the present implications for the theoretical understanding of the mechanism of how identification and intrinsic motivations influence the continuous purchasing intention on retail e-commerce websites. The current study provides the following theoretical contributions:

Firstly, the effectiveness of self-determination theory, which was applied to explain user behaviors on retailing e-commerce websites, was validated. The low but still significant total intermediary effect of intrinsic motivations on the identification and continuous purchasing intention was confirmed. The results shed light on the studies of self-determination theory in a different context.

Secondly, these findings add to existing literature regarding the motivation of continuous purchasing intention on retailing e-commerce websites. The findings of the current research showed that, among the three self-determination factors, perceived autonomy has the most significant impact on continuous purchasing intention, whereas perceived competence also has an impact at an important level. However, the influence of perceived relatedness was of ordinary significance, demonstrating different characteristics from social media [107], which suggests that traditional e-commerce behavior may not be very involved with socialization connections. Therefore, we have relative doubts about whether social e-commerce will be widely popular in the future, when considering that the purchasing behavior is quite different from social interaction behavior. The current research informs researchers that it is important to consider different determination factors of social activities in behavior research in an online context.

Thirdly, the current study expands knowledge about online anonymous behavioral theory. Identification and anonymity both generate obvious positive influences on continuous purchasing intention. The two factors with reversed attributes have a positive impact on the internal motivation of online purchases. The finding proves that the certainty and anonymity of identity are helpful in improving the internal motivation of sustainable online consumption. Based on the analysis, the mechanisms of the two factor functions are varied, and the feeling of uncertainty can be reduced to improve the internal motivation of consumption. Anonymity can provide the safe feeling of privacy protection to improve the internal motivation of consumption. The contradictions on the surface were embedded with the rationality of intrinsic behavioral logics, which, to some extent, verified the complexity regarding the factors that influence online behaviors. Therefore, we need to constantly enhance and expand theories by referring to the developmental changes of the network environment and specific user network scenarios.

6.3. Practical Implications

The results of the current research have some practical implications, especially for e-commerce practitioners, service providers, and users. The findings indicate that identification has a low but significant effect on perceived anonymity, perceived competence, and perceived relatedness, which contribute to continuous purchasing behaviors on retailing e-commerce websites. For e-commerce practitioners and service providers, e-commerce platforms should introduce appropriate identity management systems to create a balanced rule to provide both identification and perceived anonymity to users. In the governance of the Internet, identity authentication should be regarded as an invisible but significant force. The significance lies in that it provides reliable protection for transaction, and its invisibility rests with that it does not interfere too much with users' psychological feeling of their own identity.

Service providers should introduce more user identity features to the authentication background of retailing e-commerce websites to increase identification. This will highlight individual identity while enhancing individual self-awareness to advance the reliability perception and contribute to the motivations of online consumers. For government, Internet regulators should establish systematic Internet identity management infrastructure, including hardware, software, legal systems, and corresponding regulatory organizational structures, to provide the basic environment for Internet society. Internet regulators should not only focus on promoting users' real identities, but they should also pay attention to the impact of real name systems on perceived anonymity in the design of an online identity regulation system.

6.4. Limitations and Future Research

The current research faced several limitations. Firstly, the data were only collected in China. Future research should consider a worldwide situation. Secondly, the measurement items were adapted from prior research with adjustments according to the current research context, although three measurement items were excluded due to low-level factor loading values. Future research should conduct more empirical tests and develop new measurement items. Thirdly, the current study did not explicitly include variables of individual differences into the investigation. Future studies are encouraged to incorporate additional factors on individual differences. An examination of consumers' identification and intrinsic motivation provides a good starting point in the quest for a greater understanding of consumer identity management systems toward online purchasing intentions based on different specific cultural contexts.

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