# MOTHERS' CONTINUANCE USAGE INTENTION OF A PREGNANCY AND PARENTING COMMUNITY E-COMMERCE PLATFORM: PLATFORM GRATIFICATIONS AND MOTHER CHARACTERISTICS

Jing An School of Management, Nanjing University of Posts and Telecommunications 66 Xin Mofan Road, Nanjing 210003, P.R. China 13776855935@163.com

Michael D. Myers\* Department of Information Systems and Operations Management, University of Auckland Business School Private Bag 92019, Auckland 1010, New Zealand <u>m.myers@auckland.ac.nz</u>

Xueping Yang Department of Information Systems and Operations Management, University of Auckland Business School Private Bag 92019, Auckland 1010, New Zealand xueping.yang@auckland.ac.nz

#### ABSTRACT

China's recent shift to a two-child policy has important implications for the mother and baby industry in China. E-commerce platforms of pregnancy and parenting are likely to see substantial growth in the coming years. This paper looks at mothers' intention to continue using a community e-commerce platform of pregnancy and parenting. A community e-commerce platform is one which combines both social interaction and business transaction functionality in the one e-commerce website. Drawing upon uses and gratifications theory, we develop a theoretical model to explain the joint effects of content, social and self-presentation gratifications, and mother characteristics on their intention to continue using a community e-commerce platform of pregnancy and parenting in China. Our findings suggest that platform usefulness, social interaction and self-presentation positively influence a mothers' intention to continue using a community e-commerce platform of pregnancy and parenting. Interestingly, we find a negative interaction effect of the number of children on mothers' continuance usage intention. These findings enrich our understanding of mothers' continuance usage intention of a community e-commerce platform of a community e-commerce platform of we may and parenting. The set findings enrich our understanding of mothers' continuance usage intention of a community e-commerce platform of pregnancy and parenting.

Keywords: Pregnancy and parenting community e-commerce platform; Intention to continue using; Uses and gratifications theory

## 1. Introduction

China shifted to a two-child policy in 2016. This new policy is expected to create a surge in demand for baby products [Chinadaily 2016], with the number of newborns in China predicted to reach 19 million per year [Linda 2017]. The total spend for online childcare and parenting in China was approximately RMB 387 billion (or USD 56 billion) in 2017, representing an increase of 32.3% from the previous year [WJS 2018b]. Given the steady increase in the number of Chinese active users of e-commerce platforms of pregnancy and parenting - numbering 56 million as of January 2018 [WJS 2018b] - the Electronic Commerce Research Center of China (ECRC) estimates that annual online sales of baby products will increase by more than RMB 30 billion [WJS-ECRC 2017] (approximately USD \$4.5 billion).

<sup>\*</sup> Corresponding Author

This increase in online sales of baby products is occurring in conjunction with a relatively new trend of e-commerce platforms offering a combination of social interaction and business transaction functionalities in their websites. Prior research has found that over 75 percent of parents search the Internet for parenting information [Radey & Randolph 2009; Rothbaum et al. 2008]. Specifically, parenting websites (64.5%) and social media (45.1%) are frequently used [Baker et al. 2017] when parents are purchasing or considering the purchase of baby products.

The users of pregnancy and parenting community e-commerce platforms (where they can both socially interact and make business transactions) are predominately women who are pregnant or who have given birth to at least one child [Lupton & Pedersen 2016]. Women more actively use online parenting sources than men, as they are often the primary caregivers and responsible for children's health and wellbeing [Baker et al. 2017]. Most use these platforms [Lupton & Pedersen 2016] to request and provide emotional support, share information and facilitate learning [Drentea & Moren-Cross 2005; Hall & Irvine 2009]. Mothers find these kinds of platforms helpful, particularly for providing information, monitoring fetal or child development, and providing reassurance [Lupton & Pedersen 2016].

Like the e-commerce market as a whole [Guo et al. 2017], the online market for pregnancy and parenting is highly attractive. However, it is also extremely competitive [WJS 2020]. While some community e-commerce platforms have prospered, others have failed and gone out of business [WJS-ECRC 2017]. The failure of some pregnancy and parenting community e-commerce platforms in what is a booming market in China provides one of the motivations for this paper. Since women are often the family purchasing agents [Davis 1971], and mothers are the main users of online community and e-commerce platforms of pregnancy and parenting, we assume that mothers' purchasing power [Minahan & Huddleston 2013] and community participation are critical to the success of the mother and baby e-commerce industry. Hence, we aim to explore the factors contributing to mothers' intention to continue using the community e-commerce platforms of pregnancy and parenting.

A second motivation for this paper is that the emergence of community e-commerce platforms, where both social interaction and business transactions occur, is a relatively new phenomenon. This paper is one of the first to consider this emerging subject. Community e-commerce platforms combine traditional e-commerce functionality - the conducting of all kinds of business online such as servicing customers, delivering e-learning, and conducting electronic transactions [Turban et al. 2015] – with social networking functionality. Social networks provide free online storage and Web 2.0 tools for community members to build profiles, interact, share, connect, create and publish content [Turban et al. 2015]. Social networks also provide a forum for sharing the various activities and discussions of their users [Kaushik et al. 2018]. Community e-commerce platforms combine both kinds of functionalities. This kind of enhanced functionality has been described as social network integration, where social media is integrated with other online platforms [Huang et al. 2017]. Until now, few IS studies have looked at this recent combination of both kinds of functionalities, yet we believe this kind of one stop platform represents the future for e-commerce in China [WJS 2018a] and possibly elsewhere.

Of course, much IS research in the past has focused on the factors that contribute to users' behavioral intention to continue using IT [Karahanna et al. 1999] or IT platforms [Bhattacherjee 2001; Hur et al. 2017]. However, few studies have looked at mothers' continuance usage intention of online community e-commerce platforms of pregnancy and parenting, especially under the context of China's new two-child policy.

Mothers are unique for a few reasons. Firstly, mothers differ from users in general due to their need to receive social and emotional support from professionals or experienced mothers after having a baby [Lowe et al. 2009]. Depression, anxiety and perceived stress are common complications during pregnancy and the childbearing years[Gentile 2017; Ibanez et al. 2012; Rallis et al. 2014; Staneva et al. 2015], and this drives the demand for sharing experiences with others, connectivity and professional consultation and reassurance [Tripp et al. 2014]. Receiving support from pregnancy and mothering websites [Drentea & Moren-Cross 2005] can help with maternity care and pregnancy experiences [Tripp et al. 2014]. Mothers can obtain knowledge relevant to their concerns associated with pregnancy, childbirth and parenting through the open and free sharing processes of social interaction that occur [Young et al. 2012].

Secondly, mothers are more likely to be primary caregivers than fathers, thus, they may have greater opportunity and interest to seek out childcare and parenting information [Radey & Randolph 2009]. Almost 95% of mothers use the Internet as a source to find pregnancy-related information [Bjelke et al. 2016]. Mothers can obtain knowledge, non-judgmental support and online friendships from virtual parenting communities [Madge & O'Connor 2006].

All of the above considerations motivated us to conduct this research project. Drawing upon uses and gratifications theory (U&G), we develop a theoretical model to answer the following research questions: 1) How do mothers' perceived content, social and self-presentation gratifications jointly affect their intention to continue using the community e-commerce platforms of childcare and parenting? 2) Will only-child mothers or expecting mothers value content gratifications more than mothers with two or more children?

Specifically, we draw on U&G theory to examine the effects of content gratifications (platform usefulness), social gratifications (social interaction), and self-presentation gratifications (self-presentation) on mothers' intention to continue using community e-commerce platforms of childcare and parenting. According to U&G theory, users choose one medium over others because of its ability to better serve their gratifications [Xu et al. 2012]. In addition, we propose the moderation effect of the number of children on mothers' intention to continue using community e-commerce platforms of pregnancy and parenting.

Our model, based on U&G, was tested using survey data from mothers using the community e-commerce platform of Babytree.com. Babytree.com is one of the most popular community e-commerce platforms of pregnancy and parenting in China. Our findings show that content gratifications (platform usefulness), social gratifications (social interaction) and self-presentation gratifications (self-presentation) significantly and positively influence mothers' continuance usage intention of a pregnancy and parenting community e-commerce platform. Additionally, the number of children is found to have a significant negative moderation effect on the relationship between platform usefulness and mothers' continuance usage intention. Our proposed theoretical model thus helps to explain the impacts of mother characteristics and perceived platform gratifications on mother's continuance usage intention of the community e-commerce platforms of pregnancy and parenting. In addition, this study is novel in developing a theoretical model to understand the moderation effect of number of children on mothers' continuance usage intention. Furthermore, our study adds to prior research on U&G by examining the effects of content, social and self-presentation gratifications on mothers' intention to continue using the community e-commerce platform of pregnancy and parenting. Finally, our study extends the IS research literature on user continuance usage intention by focusing on the context of community e-commerce platforms and specifically, those related to pregnancy and parenting.

We believe our research findings have implications for practitioners involved with the development or management of community e-commerce platforms of pregnancy and parenting. The findings of this study might help practitioners to understand when perceived platform usefulness is more effective in enhancing mothers' continuance usage intention of community e-commerce platforms of pregnancy and parenting.

#### 2. Conceptual Background

In this section we introduce uses and gratifications (U&G) theory upon which our research model builds. We employ U&G theory to explain the effects of content, social, and self-presentation gratifications on mothers' intention to continue using community e-commerce platforms of pregnancy and parenting.

The theory of U&G was proposed by Katz [Katz 1959] and has been applied in the context of the Internet. Consumers use the Internet to gain content and social gratifications [Shang et al. 2017; Stafford et al. 2004], as well as self-presentation gratifications [Shang et al. 2017]. Content gratifications concern the content (e.g., information) carried by the medium [Jahn & Kunz 2012], while social gratifications value interpersonal connections and conversations [Shang et al. 2017]. Self-presentation gratifications reflect personal-integrative needs [Shang et al. 2017].

Given the inherent interactive and user-directed nature of e-commerce platforms, U&G is particularly appropriate for investigating consumer e-commerce platform use [Huang 2008], specifically in the consumer market [Shang et al. 2017]. Three aspects of uses and gratifications, including content gratification (utilitarian value), social-relation (social tie) gratification, and self-presentation gratification (self-presentation) [Shang et al. 2017], motivate people's online purchase intention.

In IS research, U&G theory has been used to study smartphone users [Sutanto et al. 2013]. It has also been used to explain the use of social media. Belonging, hedonism, self-esteem, and reciprocity are the four main values that users attain through the use of social networking sites [Pai & Arnott 2013]. Self-discovery, entertainment value, social enhancement, and the need to maintain interpersonal connectivity have been found to have positive impacts on students' pervasive use of social networking sites [Ifinedo 2016]. There are three types of gratifications that positively affect WeChat users' liking behavior: hedonic gratification (enjoyment), social gratification (social support) and utilitarian gratification (information seeking) [Gan 2017]. Information seeking, entertainment, and relationship maintenance motivate travelers to display higher social media continuance usage and information sharing intentions [Hur et al. 2017]. People driven by gratifications of information seeking, socializing, and status seeking are more likely to share news in social media platforms [Lee & Ma 2012].

Drawing on U&G theory [Xu et al. 2012], we propose that mothers play an active role in their continuance usage intention of community e-commerce platforms of pregnancy and parenting based on the types of uses and gratifications they seek. Building upon previous research [Shang et al. 2017; Stafford et al. 2004], we employ U&G theory to explain the effects of content, social, and self-presentation gratifications on mothers' intention to continue using the pregnancy and parenting community e-commerce platform. We define content gratifications [Stafford et al.

2004] as the enjoyment of the specific informational and site-related content of the community e-commerce platforms of pregnancy and parenting, while we define social gratifications [Stafford et al. 2004] as the satisfaction mothers gain from interpersonal communication and social interaction when using community e-commerce platforms. Self-presentation gratifications [Shang et al. 2017] reflect mothers' personal-integrative needs to present themselves to others that are met when using a pregnancy and parenting community e-commerce platform.

#### 3. Research Model and Hypotheses

IS continuance usage intention refers to a user's intention to continue using the information system, which is determined by their satisfaction with IS use [Bhattacherjee 2001]. Thus, we define intention to continue using as mother's intention to continue using a pregnancy and parenting community e-commerce platform. We employ the theory of U&G to identify and conceptualize content, social and self-presentation gratification constructs (i.e., platform usefulness, social interaction, and self-presentation). Further, we expect that the number of children and platform usefulness interact to impact mothers' continuance usage intention. Figure 1 shows the proposed model.



#### 3.1. Content Gratifications

Many previous studies identify that content is one key characteristic of high quality websites [Ranganathan & Ganapathy 2002; Wolfinbarger & Gilly 2003], where content refers to the information, features or services offered in a website [Huizingh 2000]. Content gratifications are gained from the utilitarian value of content such as useful or beneficial information and site-related content (e.g., convenience, customization) [Jahn & Kunz 2012; Shang et al. 2017; Xu et al. 2012], which are the major dimensions of platform usefulness. Previous studies identify that utilitarian value is one key characteristic of high quality websites [Shang et al. 2017]. Perceived usefulness of continued IS use is one determinant of users' continuance usage intention [Bhattacherjee 2001]. Following previous research [Bhattacherjee 2001; Burton-Jones & Grange 2013; Huang 2008], we define platform usefulness as mothers' perception of the expected benefits of using a pregnancy and parenting community e-commerce platform. Studies have found that perceived usefulness is important for consumers to use a system [Hsu & Lin 2015], or to choose an e-commerce channel [Devaraj et al. 2002]. In addition, perceived usefulness has been identified as one key driver of people's behavioral intention with IT, and further as a driver of their actual adoption or usage behavior [Huang 2008].

Specifically, platform usefulness affects consumers' behavior or behavioral intention through the following aspects. As suggested by previous research [Palmer 2002], information content, interactivity (customization and interactivity) and responsiveness are significantly associated with website success. Gratifications from information seeking are important in users' selection of a particular type of medium rather than alternatives [Jahn & Kunz 2012;

Xu et al. 2012]. In addition, system reliability and perceived tracking fulfillment are important factors when people seek and contribute knowledge in online communities [Phang et al. 2009]. Whether users' needs can be understood [Clemes et al. 2014; Gordon et al. 2018], tracing mechanisms [Chen et al. 2010], search functions [Chen et al. 2010], and firmness and convenience are important in enhancing website usefulness [Gordon et al. 2018]. Thus, characteristics of the platforms such as useful information for decision making, navigability, stability, convenient tracking of one's own activities, and positive response to mothers' needs are important factors influencing mothers' continuance usage intention of a community e-commerce platform of pregnancy and parenting. Therefore, we hypothesize

H1: Platform usefulness positively affects mothers' intention to continue using the community e-commerce platform of pregnancy and parenting.

## 3.2. Social Gratifications

People gain social gratifications from social interaction [Lee & Ma 2012]. Chatting and interacting with people over the Internet leads to social gratifications [Stafford et al. 2004], which refers to social interaction with others [Jahn & Kunz 2012]. Social interaction has a positive effect on gratification and subsequently websites' continuance usage intention [Chiu & Huang 2015]. Based on prior research [Chiu & Huang 2015; Jahn & Kunz 2012], we define social interaction as the extent to which mothers can interact and connect with others on the platform in order to establish and maintain a relationship of friendship or intimacy with other mothers. Interaction with other users (social interaction) is found to be a major motivation for using a social networking site [Jahn & Kunz 2012]. Further, people are more likely to communicate and interact with those having the same socio-demographic characteristics such as gender [Gilly et al. 1998], or sharing similar attributes [Mouw 2006]. Thus, female-dominated websites are much more likely to be supportive for mothers [Drentea & Moren-Cross 2005]. Women use their own experiences of mothering to help themselves and one another [Drentea & Moren-Cross 2005], which are important in forming connections with other mothers dealing with issues such as postnatal depression or toddler tantrums. They interact with each other to obtain social support and social benefits such as maintaining interpersonal connectivity and social enhancement, and such interaction is positively related to their behavioral intention [Zhang et al. 2014]. In addition, women's purchasing decisions are strongly influenced by their evaluation of personal interaction processes [Homburg & Giering 2001]. Therefore, we hypothesize

H2: Social interaction positively affects mothers' intention to continue using the community e-commerce platform of pregnancy and parenting.

#### 3.3. Self-Presentation Gratifications

People gain self-presentation gratifications when they present themselves to others [Shang et al. 2017]. Following previous research [Feng et al. 2018], we define self-presentation in our study as mothers' willingness and desire to express themselves to others regarding their identities. People tell their stories, share their photos, present personal information, and express their opinions in their posts in an online community, which positively affects their satisfaction with the platform [Ma & Agarwal 2007]. As implied by self-presentation theory, people desire to express themselves to others and to project a social self-image among other users and thus are motivated to use some kind of medium to fulfill their desire [Zhang et al. 2014]. Online self-presentation acts as a key motivator for user participation [Feng et al. 2018] and the purchasing of products on virtual community websites [Kim et al. 2012; Shang et al. 2017]. Specifically, self-presentation value is positively associated with online community engagement and usage [Jahn & Kunz 2012]. Previous studies confirm the positive role of social presence in shaping online purchase and usage intentions [Lu et al. 2016; Xu et al. 2012; Zhang et al. 2014]. Self-presentation theory explains why people engage in such projecting activities [Kim et al. 2012; Schau et al. 2003]. Moreover, people will contribute their knowledge when they have the experience to share [Wasko & Faraj 2005]. Based on self-presentation theory, mothers can influence other mothers and gain rewards through projecting baby and family images and pregnancy and parenting related experiences on the community e-commerce platforms of pregnancy and parenting. On these platforms they can find similar mothers and build relationships with them, and thus create and enhance their role of motherhood [Gieve 1987]. Hence, we hypothesize

H3: Self-presentation positively affects mothers' intention to continue using the community e-commerce platform of pregnancy and parenting.

# 3.4. Interaction Effects

Previous studies have demonstrated that individual characteristics such as experience and related knowledge play a significant moderating role in users' behavioral intention [Song et al. 2018]. Compared with previous generations, new mothers are less familiar with child-bearing and rearing [Drentea & Moren-Cross 2005]. Pregnancy is a unique life experience and evokes a range of emotions from great joy and anticipation to crippling anxiety. More than ten percent of women experience depression during pregnancy [Dietz et al. 2007]. Many mothers find themselves isolated and alone after having a baby [Ribbens 1994]. Hence, new mothers have a need to learn

about pregnancy, health and mothering [Tardy & Hale 1998]. A virtual community of mothers with young children can increase information giving for new mothers [Drentea & Moren-Cross 2005]. A virtual community of mothers with young children increases emotional support when they feel isolated as new mothers [Drentea & Moren-Cross 2005]. Information sources provided by the Internet increase new mothers' real sense of empowerment in the transition to motherhood [Madge & O'Connor 2006]. Previous experience with older children is frequently used as a source of pregnancy, childcare, and parenting information (58.5%) [Baker et al. 2017].

We expect that the number of children will moderate the relationship between platform usefulness and mothers' intention to continue using the community e-commerce platform of pregnancy and parenting. Consumers often make decisions based on one single dominant attribute of the product, such as first-hand information (e.g., consumer's own prior experience) or second-hand information (e.g., literature or the media). Thus, mothers with only one child or expecting mothers - who know less about pregnancy and mothering – may have more need to use the site for informational content than mothers with two or more children. Therefore, we assume that number of children plays an important role in the relationship between the utility functions of the platform (such as second-hand information and a broader amount of information for exploratory learning) and mothers' continuance usage intention of a community e-commerce platform of pregnancy and parenting. Thus, we hypothesize

H4: Number of children negatively moderates the relationship between platform usefulness and mothers' intention to continue using the community e-commerce platform of pregnancy and parenting.

#### 4. Research Methodology

We used a survey to test the research model. Two bilingual authors translated a survey from English to Chinese before it was employed. Interviews with mothers of community e-commerce platforms of pregnancy and parenting were conducted to validate the instrument and enrich our understanding of the study context.

# 4.1. Operationalization of Model Variables

Since several constructs were adapted to the study context, we adapted existing scales to our study context as far as possible. In addition, new items were developed as per the construct definitions shown in Table 1 or through interviews with users. We used the survey instrument to measure the independent variables (one dimension of content gratifications, one dimension of social gratifications, and one dimension of self-presentation gratifications) and the dependent variables (intention to continue using). These variables were operationalized as reflective constructs and were measured with items adapted or self-developed from previously validated instruments (see Table 2). All items were measured using seven-point Likert scales anchored from "completely disagree" to "completely agree". With the number of children as the moderator, we also included age, education, household annual income, Internet experience of mothers, and age of children as the control variables in our model.

Constructs	Definition	Source	
Intention to	Mother's intention to continue using a pregnancy and	Adapted from Phottophonics (2001)	
Continue Using	parenting community e-commerce platform	Adapted from Bhattacherjee (2001)	
Distform	Mothers' perception of the expected benefits of using a		
Usefulness	pregnancy and parenting community e-commerce	Adapted from Bhattacherjee (2001)	
	platform		
	The extent to which mothers can interact and connect		
Social Interaction	with others on the platform, in order to establish and	Adapted from Chiu and Huang (2015); Jahn and Kunz (2012)	
Social Interaction	maintain a relationship of friendship or intimacy with		
	other mothers		
Self-presentation	Mothers' willingness and desire to express themselves	Adapted from Eang et al. (2018)	
	to others regarding their mother identities	Adapted from Felig et al. (2018)	

Constructs		Items	Sources
Intention to Continue Using	INT1 INT2 INT3	I will continue using this platform (i.e., browsing information, participating in social interactions, and engaging in e-commerce activities) as my first choice. To me, this platform that I intend to continue using is the best platform. I will seldom consider switching to another platform.	Adapted from Bhattacherjee (2001); Hur et al. (2017); Karahanna et al. (1999)
	USA1	The information that I obtained from this platform is helpful for decision making.	Self-developed from Gordon et al. (2018);
Diatform	USA2	This platform is stable.	Huang (2008); Hur et
Usefulness	USA3	This platform conveniently allows me to keep track of all my activities on this platform.	al. (2017); Jahn and Kunz (2012); Ma and
	USA4	This platform can respond to my needs quickly and positively.	Agarwal (2007); Phang et al. (2009)
	SOI1	I make friends with others on this platform.	Self-developed from
Social Interaction	SOI2	Users help each other on this platform.	Jahn and Kunz
	SOI3	I interact with others on this platform.	(2012)
	SPE1	I present my parenting experience to others on this platform.	Self-developed from
Self-presentation	SPE2	I project my baby's growth on this platform.	Feng et al. (2018);
	SPE3	I post the parent-offspring moments of my family on this platform.	Jahn and Kunz (2012); Kim et al.
	SPE4	I show my family's life on this platform.	(2012); Shang et al. (2017)

 Table 2. Operationalization of Constructs

## 4.2 Survey Instruments Translation

Following previous research [Cha et al. 2007], we applied a combination of back-translation method, committee approach, and the pretest procedure. Firstly, our two bilingual authors independently translated the instruments from English to Chinese. They then compared the two translations. Both authors discussed the differences until they reached consensus on the translated instrument. Secondly, two bilingual postgraduates in IS blindly translated the Chinese version measures back into English. Thirdly, a monolingual English-speaking author and the two translators had a group discussion to compare the original English version and the back-translated English version. Based on this discussion, two translators modified the wording of the instruments in the Chinese version. Then, the two back-translated the modified items from Chinese to English again. This process was continued until the monolingual reviewer agreed that the two English versions were identical.

#### 4.3. Pilot Study

A pilot study [Boudreau et al. 2001] was conducted to assess reliability and validity and to identify any potential problems with the instrument. We pilot tested the instrument with 92 users of Babytree.com, one of the most popular community e-commerce platforms in China. On Babytree.com mothers share comments and parenting experiences as well as purchase products for mothers and babies. Based on the pilot test results, we removed one item each for Social Interaction and Self-presentation due to their low loadings. After removing these items, the exploratory factor analysis demonstrated sufficient instrument validity. We also edited item wordings in the instrument according to the feedback from the pilot test and follow-up interviews. The final instrument is shown in Table 2. Please note that all wording has been translated from Chinese to English.

#### 4.4 Data Collection

We collected data from users of Babytree.com. As one of the largest online community and e-commerce platforms of pregnancy and parenting in China, Babytree focuses on growing its e-commerce arm Meitun, which sells milk powder, nappies, toys, clothes, and pregnancy-related products. Currently there are more than 170 million independent visits to Babytree's community per month. The monthly sales of Meitun reached RMB 250 million in late 2015. Among the mobile apps of pregnancy and parenting community in China, Babytree is the only one whose monthly active users exceeds tens of millions as of January 2018 [WJS 2018b].

We decided to use a convenience sample for our survey. A convenience sample refers to a nonrandom sampling method and consists of participants that are easy to reach and thus conveniently available [Thomas et al. 2019]. In order to reach Babytree users, we posted a link to the online survey on Babytree for one month. We also posted online survey links on various other mother groups such as the Wenjuanxing Platform. In addition, we invited

mothers on Babytree to participate in our survey through the internal messaging tool. In appreciation of respondents' effort, we offered a token amount of \$5 for each response. After removing incomplete data, 146 valid responses remained. The number of 146 observations meets the rules of thumb for minimum sample size requirements as suggested in previous research [Hair et al. 2014a]. Following the more rigorous recommendations from a power analysis [Hair et al. 2014a], 146 observations are sufficient to detect R2 values of around 0.10 at a significance level of 5% and a power level of 80% in our model. Since very little sociodemographic data on Babytree users is available, we could only perform such an assessment by means of a chi-square test of homogeneity with regard to demographics distribution [Thomas et al. 2019]. The results of this test showed that there was no significant difference between the observed and expected frequencies of age of children (Asymp. Sig = 0.741), indicating that the sample can at least be considered as representative with regard to age of children distribution. The demographic information of these respondents is listed in Table 3.

Demographic Variables		Frequency (N=146)	Percentage	Demographic Variables		Frequency (N=146)	Percentage
	20-28	76	52.1%	Age of	< 1 year	71	48.6%
Age	29-38	65	44.5%	Children	$\geq$ 1 year	75	51.4%
	>38	5	3.4%		< 3 years	14	9.6%
Number of	One or expecting	96	65.8%	Internet	3 - 6 years	31	21.3%
Children	Two or more	50	34.2%	Experience	6 - 10 years	37	25.3%
	High School and below	45	30.8%		> 10 years	64	43.8%
Education	Junior College	52	35.6%	Household	<100,000	71	48.6%
	Bachelors	44	30.1%	Income (RMB)	100,000-200,000	55	37.7%
	Postgraduates	5	3.5%		200,000-500,000 >500,000	16 4	11.0% 2.7%

Table 3. Demographic statistics of Respondents

Note: Age of Children was classified according to the oldest child.

### 5. Data Analysis and Results

We chose both PLS and Stata (a general-purpose statistical software package) to analyze the data. Partial least squares (PLS) is an evolving approach to structural equation modeling (SEM) [Hair et al. 2014b; Richter et al. 2016]. SEM can assess the measurement model and structural model [Gefen et al. 2011] and simultaneously test the hypotheses as direct and indirect paths of the research model [Garson 2016; Kamis & Stohr 2006]. PLS-SEM is a widely applied tool in the IS research literature [Hair et al. 2017]. In addition, PLS is a suitable choice for a multi-stage model [Fassott et al. 2016; Gefen et al. 2011; Hair et al. 2014a] and easy to measure latent variables and interaction effects [Huang et al. 2015; Wetzels et al. 2009]. We tested the interaction terms for moderating hypotheses using PLS.

The estimation procedure for PLS-SEM is an ordinary least squares (OLS) regression-based method [Hair et al. 2014a]. However, OLS regression may yield unstable results in the presence of important correlations between explanatory variables [Vinzi et al. 2010]. Also, structural model relationships are generally underestimated (PLS-SEM bias) [Hair et al. 2014a]. Therefore we examined support for the direct effect hypotheses using Stata with a regression analysis.

## 5.1. Instrument Validation

To validate our instrument, internal consistency, reliability, indicator reliability, convergent validity and discriminant validity were tested, as suggested in previous research [Hair et al. 2017; Hair et al. 2014a]. Internal consistency reliability was assessed by examining the composite reliability (CR > 0.7) and Cronbach's  $\alpha$  (CA > 0.7). The indicator's outer loadings should be higher than 0.7 to meet the rule of indicator reliability. We assessed convergent validity by average variance extracted (AVE > 0.5), and factor analysis results [Straub et al., 2004]. Table 4 shows that the CA, CR, and AVE for each construct in the model satisfy the thresholds. Convergent validity was also demonstrated since each item loaded on its posited construct in the principal component factor analysis [Straub et al. 2004] and its factor loading was larger than 0.6 (see Table 5). Table 6 demonstrates that each indicator's outer loadings satisfy the thresholds.

Table 4. Descriptive Statistics, Correlations, AVE										
	1	2	3	4	5	6	7	8	9	10
1. Age	1.00									
2. Education	-0.28	1.00								
3. Income	-0.19	0.39	1.00							
4. Age of Children	0.19	-0.03	-0.18	1.00						
5. Internet Experience	-0.27	0.38	0.24	-0.02	1.00					
6. NOC	-0.23	-0.04	0.13	-0.50	0.11	1.00				
7. INT	0.09	-0.14	-0.07	-0.07	0.05	0.19	0.88			
8. USA	0.01	-0.08	0.02	-0.13	0.17	0.20	0.53	0.84		
9. SOI	0.04	-0.10	-0.04	-0.14	0.03	0.12	0.45	0.58	0.90	
10. SPE	0.06	-0.01	-0.02	-0.18	0.13	0.15	0.50	0.56	0.45	0.90
Mean	1.53	2.06	1.68	0.49	4.03	0.34	6.27	6.03	6.20	6.25
SD	0.61	0.86	0.78	0.50	1.04	0.48	1.03	1.02	1.07	1.06
CA	-	-	-	-	-	-	0.85	0.86	0.88	0.92
CR	-	-	-	-	-	-	0.91	0.90	0.93	0.94
AVE	-	-	-	-	-	-	0.77	0.70	0.81	0.80

Table 4. Descriptive Statistics, Correlations, AVE

Notes: 1. Intention to Continue Using (INT), Platform Usefulness (USA), Social Interaction (SOI), Self-presentation (SPE), Number of Children (NOC) 2. Diagonal elements are the square root of average variance extracted (AVE) for constructs.

i		1	2	3	4
	INT1	0.33	0.22	0.27	0.72
Intention to Continue Using	INT2	0.20	0.15	0.17	0.87
-	INT3	0.09	0.15	0.06	0.86
	USA1	0.20	0.61	0.29	0.31
Distform Usefulness	USA2	0.05	0.84	0.22	0.09
Platform Usefulness	USA3	0.45	0.76	0.14	0.07
	USA4	0.26	0.77	0.20	0.30
	SOI1	0.12	0.43	0.71	0.16
Social Interaction	SOI2	0.19	0.18	0.88	0.17
	SOI3	0.21	0.17	0.89	0.12
	SPE1	0.71	0.30	0.20	0.27
Salf presentation	SPE2	0.87	0.21	0.14	0.13
Sen-presentation	SPE3	0.90	0.14	0.10	0.13
	SPE4	0.86	0.13	0.20	0.18

Table 5. Exploratory Factor Analysis Results

## Table 6. Outer Loadings and Cross-loadings

	INT	USA	SOI	SPE
INT1	0.90	0.54	0.48	0.55
INT2	0.91	0.45	0.38	0.42
INT3	0.81	0.37	0.28	0.31
USA1	0.50	0.81	0.51	0.43
USA2	0.32	0.80	0.46	0.31
USA3	0.38	0.85	0.47	0.60
USA4	0.52	0.90	0.51	0.51
SOI1	0.41	0.61	0.86	0.37
SOI2	0.42	0.49	0.92	0.41
SOI3	0.38	0.47	0.91	0.42
SPE1	0.53	0.57	0.45	0.86
SPE2	0.41	0.50	0.38	0.91
SPE3	0.40	0.45	0.34	0.90
SPE4	0.45	0.47	0.41	0.90

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Discriminant validity was assessed by examining the cross-loadings, the Fornell-Larcker criterion [Hair et al. 2012; Ringle et al. 2012], and the recently developed heterotrait-monotrait (HTMT) criterion [Hair et al. 2017; Henseler et al. 2015]. The results in Table 6 show that each indicator's outer loadings on a construct are higher than all its cross-loadings with other constructs [Hair et al. 2014a]. As Table 4 demonstrates, the square root of the AVE of each construct is higher than its highest correlation with any other construct (Fornell-Larcker criterion) [Hair et al. 2014a]. The results of the HTMT.<sub>85</sub> criterion are below the critical value of 0.85 as shown in Table 7. Thus, the model constructs demonstrate sufficient discriminant validity.

#### Table 7. HTMT results

INT	USA	SOI	SPE					
0.59								
0.50	0.66							
0.54	0.62	0.49						
	<b>INT</b> 0.59 0.50 0.54	INT         USA           0.59         0.50         0.66           0.54         0.62         0.62	INT         USA         SOI           0.59         0.50         0.66           0.54         0.62         0.49					

An exploratory factor analysis was conducted with all the variables loaded using Harman's single-factor test [Podsakoff et al. 2003]. The result of factor analysis produced neither a single factor nor one general factor accounting for the majority of the variance (>50%), which suggests that common method bias is not present in this study.

#### 5.2. Results of Hypothesis Testing

We tested the interaction terms for moderating hypotheses by cross-multiplying the mean-centered items of the relevant constructs using PLS. Further, the terms were entered in hierarchical steps of controls, then main effects, followed by all corresponding second-order and the two-way interaction terms, as suggested in prior research [Hair et al. 2014a; Jaccard & Turrisi 2003; Wetzels et al. 2009; Ye & Kankanhalli 2018]. Table 8 shows the path coefficients and explained variances for the regression model (Model 3). The model explains 42% of the variance in mothers' intention to continue using the community e-commerce platform of pregnancy and parenting. The results in Table 8 suggest that the independent variables and interactions offer unique contributions to the explanation of the variance in mothers' intention to continue using the community e-commerce platform of pregnancy and parenting.

	DV = INT					
	1	2	3			
Age	0.09 (0.115)	0.10 (0.156)	0.05 (0.074)			
Education	-0.15 (0.093)	-0.10 (0.105)	-0.06 (0.063)			
Income	-0.04 (0.109)	-0.01 (0.160)	-0.03 (0.066)			
Age of Children	-0.10 (0.091)	0.05 (0.152)	0.09 (0.074)			
Internet Experience	0.15 (0.116)	0.01 (0.095)	-0.01 (0.081)			
USA		0.27*** (0.097)	0.20 (0.159)	H1 supported		
SOI		0.15* (0.085)	0.20 (0.112)	H2 supported		
SPE		0.25*** (0.083)	0.32** (0.131)	H3 supported		
NOC			0.16** (0.081)			
USA * NOC			-0.20** (0.093)	H4 supported		
$\mathbb{R}^2$	0.05	0.33	0.42			

Table 8. Results of Hypotheses Testing

Notes: 1. Intention to Continue Using (INT), Platform Usefulness (USA), Social Interaction (SOI), Self-presentation (SPE), Number of Children (NOC) 2. Path coefficients are shown. Standard deviations/error are shown in the bracket. 3. Significance at \*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1 4. The number of observations is 146 for all the models.

We examined support for the direct effect hypotheses predicting mothers' intention to continue using the community e-commerce platform of pregnancy and parenting using Stata with regression analysis. The results are shown in Model 2 of Table 8. As hypothesized (H1), platform usefulness is found to positively affect the dependent variable. Social interaction significantly impacts mothers' intention to continue using the community e-commerce platform as expected (H2). Consistent with our prediction, self-presentation is positively related to mothers' continuance usage intention of the community e-commerce platform of pregnancy and parenting, indicating H3 is supported as well.

Following previous research, we examined support for the moderation hypothesis predicting the dependent variable using PLS [Carte & Russell 2003; Chin et al. 2003; Vinzi et al. 2010]. As expected, a significant interaction effect is found as shown in Model 3 of Table 8. Specifically, the number of children is found to negatively moderate the relationship between platform usefulness and mothers' intention to continue using the community e-commerce platform of pregnancy and parenting. Therefore, H4 is supported. For H1 and H2, the estimated regression coefficients turn insignificant when the interaction effect is included, as shown in Model 3 of Table 8, meaning that USA and SOI do not have significant effects when NOC is at its mean value after NOC is mean-centered in the model.

#### 6. Discussion

In this study we sought to explain how mother characteristics (number of children) and perceived platform gratifications (content, social and self-presentation) influence mothers' continuance usage intention with respect to community e-commerce platforms of pregnancy and parenting. Our findings show that content (platform usefulness), social (social interaction) and self-presentation gratifications (self-presentation) significantly and positively influence mothers' continuance usage intention of the community e-commerce platform of pregnancy and parenting. Additionally, the number of children is found to have a significant negative moderation effect on the relationship between platform usefulness and mothers' continuance usage intention. Overall, the four hypotheses in our model are supported.

#### 6.1. Theoretical Contributions

Our study offers several theoretical contributions. First, our paper is one of the first to explore the influence of mother perceived gratifications (content, social and self-presentation) on mothers' intention to continue using community e-commerce platforms of pregnancy and parenting. As expected, platform usefulness, social interaction and self-presentation have significant positive effects on mothers' continuance usage intention of the community e-commerce platforms of pregnancy and parenting.

Second, our study is the first to include mother attributes in the model to estimate the moderation effect of number of children on mothers' continuance usage intention of the community e-commerce platform of pregnancy and parenting. In line with our hypothesis, the number of children negatively moderates the relationship between platform usefulness and mothers' continuance usage intention. Specifically, only-child mothers or expecting mothers place more importance on platform usefulness than mothers with two or more children. All of these findings enrich our understanding of mothers' continuance usage intention of the community e-commerce platform of pregnancy and parenting.

Third, our study adds to prior research on U&G by examining the effects of content, social, and self-presentation gratifications on mothers' intention to continue using the community e-commerce platforms of pregnancy and parenting. The U&G theory has been mainly applied to understand the gratifications that motivate people's decision making in the context of Internet [e.g., Stafford et al. 2004], including social networking sites [e.g., Xu et al. 2012] and e-commerce platforms [e.g., Huang 2008]. Our study extends the application of U&G theory to explain mothers' continuance usage intention of community e-commerce platforms of pregnancy and parenting, identifying new relationships for the first time. Specifically, platform usefulness, social interaction, and self-presentation positively affect mothers' continuance usage intention of community e-commerce platforms of pregnancy and parenting, and the number of children negatively moderates the relationship between platform usefulness and mothers' continuance usage intention.

Finally, our study is the first paper extending the IS research literature on mothers' continuance usage intention of the community e-commerce platforms of pregnancy and parenting. In line with previous research on people's intention to use a system [e.g., Davis et al. 1989] or user's continuance usage intention of IS [Bhattacherjee 2001], platform usefulness has a positive effect on mothers' intention to continue using the community e-commerce platform of pregnancy and parenting. In addition, similar to previous research showing that social interaction has a positive effect on gratification and subsequently continuance intention [Chiu & Huang 2015], social interaction affects mothers' intention to continue using this kind of platform. Furthermore, self-presentation exerts a positive effect on mothers' continuance usage intention in this unique context, consistent with previous studies about virtual community websites [e.g., Kim et al. 2012]. Additionally, the finding regarding the moderation effect of the number of children on mothers' continuance usage intention of the community e-commerce platform of pregnancy and parenting makes a contribution to IS research.

# 6.2. Practical Implications

Our research findings have implications for practitioners involved with the development or management of community e-commerce platforms of pregnancy and parenting. The findings suggest that practitioners should

differentiate their strategies in attracting mothers to their community e-commerce platform, while focusing on improving platform usefulness, social interaction and self-presentation gratifications.

Our study is the first to find that the number of children negatively moderates the relationship between platform usefulness and mothers' continuance usage intention of community e-commerce platforms of pregnancy and parenting. Specifically, mothers who currently have one child or are expecting their first child place more importance on platform usefulness than mothers with two or more children. Thus, practitioners could use this finding to heighten different gratification perceptions for mothers with different numbers of children.

For only-child mothers or expecting mothers, practitioners should attach more importance to their platform usefulness and thus possibly increase the continuance usage intention of these mothers. A pregnancy and parenting community e-commerce platform may provide only-child mothers or expecting mothers with beneficial information related to pregnancy, childcare, and parenting [Huberty et al. 2013]. This information could come from professionals or experienced mothers, including physical activity, nutrition, and emotional support related information, etc. The platform could post authoritative and reliable information from health professionals directly on the website, or send the information directly to these mothers through an internal messaging tool. In addition, only-child mothers or expecting mothers could actively obtain this beneficial information from the platform's online community. Additionally, practitioners could consider strategies to provide stable and convenient tracking, enabling quick responses to mothers' needs.

# 6.3. Limitations and Future Research

The limitations of this study are as follows. First, our study has focused on just one community e-commerce platform of pregnancy and parenting in China. Future research could examine users' continuance usage intention behavior on other pregnancy and parenting platforms in China and/or other countries (cultures) [Herrando et al. 2019].

Second, this study has examined the effects of mother characteristics and perceived platform gratifications on the outcome of mothers' intention to continue using the community e-commerce platform of pregnancy and parenting. Future research could explore mothers' actual usage behavior.

Third, we examined the main effect of three salient sets of antecedents only (i.e., content, social and self-presentation gratifications) on mothers' continuance usage intention. Future research could explore other platform gratification factors, such as entertainment [Cheung et al. 2011; Lee & Ma 2012], trust [Phua et al. 2017] and enjoyment [Heijden 2004; Lin & Lu 2011; Moon & Kim 2001; Song et al. 2018], and the association between mothers' continuance usage intention and their engagement behavior [Chiang et al. 2020].

Last, we used a convenience sample in our study. The sample size could be enlarged and the number of children could be considered in more depth in future studies, such as doing separate PLS tests on both subgroups and then compare the coefficients.

#### 7. Conclusion

Community e-commerce platforms, which combine both social interaction and business transaction functionality, are a relatively new phenomenon. Users' continuance usage intention of these platforms is vital to their survival and to achieving beneficial outcomes for product and service providers. In this paper, we developed a model based on the uses and gratifications theory to examine the impacts of perceived platform gratifications (content, social and self-presentation) and mother characteristics (number of children) on their intention to continue using community e-commerce platform of pregnancy and parenting. Our findings indicate that, in addition to the demonstrated direct effects of platform usefulness, social interaction and self-presentation on mothers' continuance usage intention, mother characteristics have an influence as well. These findings contribute to research on community e-commerce platforms and specifically to research on mothers' platform continuance usage intention.

#### Acknowledgment

This study was supported by the National Natural Science Foundation of China (NSFC) Youth Science Foundation (Grant No. 71904019), and the China Postdoctoral Science Foundation (Grant No. 2018M632285).

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