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## Abstract

Despite the increasing popularity of and interest in e-books, there has been little research that evaluates book consumers' actual interest in and preferences for digital content, and the factors that influence reading habits. To help fill this void, this study examines users' experience of e-books in order to identify the areas of development, using Uses and Gratifications Theory (UGT), Expectation Confirmation Theory (ECT) and Diffusion Theory (DT). The integration of these theories forms the basis of an extended UGT Expectancy concept. Users' responses to questions about cognitive perceptions and continuous use were collected and analyzed with various factors derived from the theories. The findings confirm the significant roles played by users' cognitive perceptions and also suggest the importance of affective factors. In the proposed extended model, the moderating effects of confirmation/gratification and demographics of the relations among the variables are found to be significant. The model integrates current research on e-books and suggests a cluster of antecedents related to technology acceptance.

## Keywords

affective factors, continuance intention, diffusion theory, e-book, e-book reader, expectation confirmation theory, uses and gratification

## Introduction

Electronic books (e-books) are defined as electronic versions of books that can be viewed on a computer screen or hand-held devices such as personal digital assistants (PDAs) and Tablet PCs (Lam et al., 2009). The technology emerged in the early 1990s with the expectation that it would pose a serious threat to traditional print publishing (Catenazzi

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et al., 1997). Major publishers and start-up businesses invested heavily in the hope that it would generate soaring revenues. As recently as August 2009, it was predicted that e-books would capture a 10 percent share of the book market in the USA by 2011, with sales forecast at \$3.8 billion a year (Vasileiou et al., 2008). However, the projected steady growth of e-books has yet to materialize. While they have now been in use for a number of years, they have not yet gained ground and remain a very small segment of the book market. In 2008, e-book sales totaled \$10 million in the USA, a small fraction of the overall \$24 billion book market (Siegel, 2009).

As with many rollouts, a key problem is that there is insufficient content, even though e-book readers have been available for several years. The e-book market has been held back by unsuccessful content capabilities, lack of appropriate technology and scarcity of content (Aedo et al., 2000). E-book vendors have struggled with how to make content usable, as well as how to facilitate downloading by e-book readers. Another challenge posed by many competing standards is the need to standardize e-book protocols, schemes and services (Diaz, 2003).

Customer apathy seems to be one of the greatest barriers to acceptance and use (Lam et al., 2009). According to Worlock (2009), consumers are uncomfortable with the idea of e-book reading and are not willing to consider reading with a strange device. While they acknowledge various advantages of reading e-books, they continue to favour some characteristics of paper books. In other words, while some functions are being cognitively perceived by users, some emotional factors are missing from the e-book experience. Despite concerns over usability (Kang et al., 2009), such issues have been addressed by only a few studies. Some have focused on e-books in a higher education context (Gil-Rodriguez and Planella-Ribera, 2008; Herson et al., 2006; Lam et al., 2009; Nelson, 2008; Shiratuddin et al., 2003; Simon, 2002; Wilson, 2003), while others have viewed them within the library (Just, 2007; Nicholas et al., 2007; Renner, 2008; Rowlands et al., 2007; Tedd, 2005) and medical contexts (Morton et al., 2007).

There is much discussion of the market potential for e-books from various industry perspectives, but few robust user studies have accompanied this discussion. Many questions remain unanswered regarding how users feel about e-books, their experiences in different contexts, and aspects that may facilitate engagement. It is important to research how users perceive e-book usability, how their intentions are formed, what cognitive perceptions are fulfilled, and what affective factors are absent from e-books. To consider such questions, this paper proposes a research model that incorporates perceived quality, gratification, confirmation, continuance and subjective norms as enhancing constructs to predict users' motivations for adopting e-books.

With the integrated theoretical framework, this study conducts an empirical assessment of the research model in the e-book context. While there are various aspects of e-books, the study specifically focuses on e-book readers and investigates the user experience of e-books. There are wide variations of e-books due to the fact that any file can be an e-book if it is uploaded to the web and thereby published. Thus, the definition and scope of 'e-book' should be clearly delineated when it is considered for a user study. The scope of this study is limited to users' attitudes and behaviors with regard to digitized content reading via e-book readers. This area has attracted the most attention but the least understanding.

This study attempts to fill this gap by examining the motivations and intentions of e-book users. It offers a set of implications that can help academic researchers to better understand how users develop perceived cognitive features, how these cognitive features contribute to users' intentions and how emotional factors influence continuance intention. The structural equation modeling approach was applied to assess the empirical strength of the relationships when combining the Uses and Gratification Theory (UGT) and Expectation Confirmation Theory (ECT) models. The findings should be of interest to academics in that they provide a model for identifying antecedents of user intention to adopt a new form of digital book. Implications and directions of future study are discussed.

## Literature review

### *The definition and trends of e-books*

E-books are 'text in digital form, or digital reading material, or a book in a computer file format, or an electronic file of words and images' (Lam et al., 2009: 30). E-books are usually read on dedicated hardware devices known as *e-Readers* or *e-book devices*. The main advantages of these devices are portability, readability of their screens in bright sunlight and long battery life. Any PDA capable of displaying text on a screen is also capable of being an e-book reader, albeit without the advantages of electronic ink displays (BISG, 2009). The technology has also made possible a growth in the number of publications with shorter publishing times. The rising costs of paper books and the potential to link multimedia resources to e-books have major impacts on the strategies used by university libraries in their support of scholarly communication (Ching et al., 2006).

Despite the steady growth, there are gloomy prospects for e-books. After a few years of unsuccessful take-up, Barnes and Noble stopped providing e-books to their customers because the latter did not embrace the technology (although they resumed providing an e-book service, called Nook, in 2009). Aside from some notable exceptions like Project Gutenberg, e-books are currently only as open and free as the publishing companies want them to be. Many consumers complain that Amazon's Kindle device is too small, too slow and too closed a system. Many researchers are skeptical about the future of the e-book. E-books have yet to achieve global distribution. At the time of writing, only four e-book readers dominate the market: Amazon's Kindle, Sony's PRS-500 and Bookeen's Cybook Gen3 and Cybook Opus. Questions remain as to whether these e-readers will ever become popular. It should be clear that the e-book will change the way we read and write. From this perspective, the main focus of this research is to determine: (1) how cognitive factors affect users' attitudes and gratification, and (2) how affective factors influence the continuance intention of using e-books? So far, answers to these questions have been elusive since the emergence of e-books; UGT and ECT model can provide them.

### *U & G and ECT model*

One influential tradition in media research is referred to as Uses and Gratifications (U & G); this has spanned user motivation studies of media ranging from radio and television to

cable TV and VCR remote controls, digital TV and now the internet and mobile phones (Leung and Wei, 2000). Gratifications are typically defined as some aspect of satisfaction reported by users, related to the active *use* of the medium in question. Since individual users essentially control the communicative process of the internet by virtue of their power to initiate access to commercial sites, the user-centric approach of U & G provides the theoretical framework for understanding the specific reasons that bring consumers to the mediated online spaces where commerce transpires.

This approach focuses on why people use particular media rather than on content. In contrast to the concern of the 'media effects' tradition with 'what media do to people,' U & G can be seen as part of a broader trend among media researchers who are more concerned with 'what people do with media,' allowing for a variety of responses and interpretations. A basic assumption of UGT is that users are actively involved in media usage and interact highly with the communication media (Leung, 2009). Since the interactive features of the mobile application require high user involvement, the application of UGT to improve our understanding of e-book user behavior seems legitimate.

Since the results of U & G studies based on scales from media research have subsequently not been very predictive of e-book use, there is a clear need to extend the process of developing U & G measures specific not only to the internet but also to the unique user interfaces of e-books when utilizing U & G to understand users' motivations. With UGT in place, this study incorporates continuance theory and ECT. This extension can be seen as meaningful considering the convergence trends in IT and media.

Mondi et al. (2008) argue that the U & G approach is too simplistic to accurately account for the gratification sought or obtained by users from the media. In response to this criticism of the approach, ECT was included in this study to extend and add detail to the basic tenets of U & G ideas. The integration of ECT and UGT serves to accommodate the suggestion that e-books offer gratifications which are expected and valued by users.

### *Expectation Confirmation Theory*

ECT is a theory that focuses on its explanatory power of post-adoption behavior and suggests that both pre- and post-behavior affect confirmation, which in turn influences satisfaction and continuance intention (Oliver, 1980). Confirmation is the user's judgment of the actual performance relative to a pre-purchase comparison standard such as expectation (Bhattacharjee, 2001). According to ECT, higher perceived performance leads to positive confirmation. The levels of confirmation then provide the basis for subsequent behaviors. Customers form a feeling of satisfaction or dissatisfaction based on their confirmation levels. Satisfied users form an intention to reuse the product in the future, while dissatisfied customers do not subsequently do so.

Applying the ECT framework to the study of how e-book users' individual differences affect their continuance intention is appropriate because individual differences are cognitive beliefs salient to e-book users' behavior (Chou and Chen, 2009; Compeau and Higgins, 1995; Thatcher and Perrewé, 2002). However, while ECT places emphasis on users' cognitive evaluation of how information systems will improve their performance, it does not consider the influence of users' beliefs on their motivation to use the specific technology. Given that e-reader users' continuance intention plays a key role in reuse,

understanding how the entrenched cognitions and emotional factors of users affect their continuance behaviors becomes important. Therefore, some theoretical extensions may be needed to explain the users' continuance behaviors in e-readers. UGT is a good theory to supplement ECT as both theories need modifications in terms of e-books in a study of this kind.

### ***Diffusion of Innovation Theory***

The *diffusion of innovation* paradigm provides a systematic, demand-side explanation of when and how newly-introduced technologies are communicated, evaluated, adopted, rejected, and re-evaluated by consumers (Rogers, 1995). Since the early applications of the theory to communications research, it has been applied and adapted in numerous ways. The diffusion process is conceived fundamentally as a process of information exchange facilitated by mass media and interpersonal channels within the social system (Rogers, 1995). According to Rogers (1995), the decision to adopt or reject an innovation is subject to a wide variety of factors. These factors can be grouped into four major categories (Leung and Wei, 2000), namely: (1) adopter-related personality traits; (2) socioeconomic influences; (3) interpersonal channels and mass media use; and (4) perceived attributes of an innovation.

The relative influence of adopter personality traits, socioeconomic influences and media exposure have been demonstrated in a wide range of technology diffusion research, ranging from videotex (Ettema, 1999), high-definition television (Dupagne, 1999), the internet (Atkin et al., 1998), cellular phones (Leung and Wei, 2000), and digital cable (Kang, 2002). In this study, demographic factors (age, gender and income) are included in the acceptance model to test how they moderate the path relations in the model. These three factors have been commonly used as adopter personality traits in the diffusion theory literature and communications studies (Vishwanath and Goldhaber, 2003).

### **Hypotheses**

The research model postulates four constructs that determine gratification, which then influences continuance intention (Figure 1). The model is well suited to reflect the nature of e-books because it addresses the evolutionary progression of e-books and usage dynamics toward a more fluid and agile digital environment.

#### ***Gratifications and continuance intention***

According to ECT, users' continuance intention is primarily determined by their satisfaction with prior IT use. Following prior work (Bhattacharjee, 2001; Mondy et al., 2008), gratification in this study is defined as a psychological or affect related to and resulting from a cognitive appraisal of the expectation–performance discrepancy. Gratification also refers to an affect, captured as a positive, indifferent or negative feeling. Affect has been theorized and validated in technology acceptance model (TAM)-based research as a key factor of technology use (Davis, 1989). Applying the above arguments to e-reader usage, the first hypothesis is proposed:

- H1. Users' gratification with initial e-book usage is positively associated with continuance intention.

### *Confirmation and gratification*

Bhattacharjee (2001) empirically validated that gratification is influenced by users' confirmation level of online services. Similarly, other studies such as Hackbarth et al. (2003) and Tse and Wilton (1988) have consistently showed a positive correlation between confirmation and gratification. In a number of other studies, it has been empirically established that confirmation has a causal link with gratification (Hayashi et al., 2004; Lin et al., 2005; Mondy et al., 2008; Oliver and DeSarbo, 1988).

- H2. Confirmation while using e-books has a positive effect on gratification.

### *Confirmation and perceived usability*

The classical definition of perceived usefulness by Davis (1989) is the degree to which a person believes that using a particular system will enhance his or her job performance. Bhattacharjee (2001) empirically validated that perceived usefulness is influenced by the users' confirmation level in online banking services, and also in the business-to-consumer e-commerce services. The positive correlation between confirmation and perceived usefulness has also been confirmed in e-books (Kang et al., 2009), virtual learning environments (Hayashi et al., 2004) and in the use of a web portal (Lin et al., 2005).

- H3. Confirmation has a positive effect on the perceived usefulness of e-books.

Perceived ease of use refers to the degree to which a person believes that utilizing a particular system will be free of effort (Davis, 1989). Roca et al. (2006) showed that perceived ease of use has a high correlation with confirmation. Similarly, Legris et al. (2003) showed that perceived ease of use has a high proportion of positive correlation with attitude. As perceived ease of use has been shown a strong belief in the TAM context, it can be tested in e-books.

- H4. Confirmation has a positive effect on the perceived ease of use of e-books.

### *Perceived usability and gratification*

The TAM studies have extensively found that there is a positive correlation between perceived usability and gratification. Hayashi et al. (2004) indicated that perceived usefulness was positively correlated with satisfaction in three different on-line training environments. Similarly, Rai et al. (2002) empirically showed that user gratification is significantly impacted by perceived usefulness and perceived ease of use. In mobile commerce, Shin (2009) found that perceived usefulness and perceived ease of use were significant antecedents of consumer gratification. It is suggested that perceived usefulness and ease of use are significant determinants of user gratification.

- H5. Perceived usefulness while reading e-books has a positive effect on gratification.
- H6. Perceived ease of use while using e-books has a positive effect on gratification.

### *Confirmation and perceived quality*

According to ECT, product performance during and after the consumption experience has a positive effect on disconfirmation since higher performance is more likely to be above expectations, creating positive confirmation and finally customer gratification (Spreng and Chiou, 2002). Roca et al. (2006) extended ECT by studying the relationship between perceived quality modeled in terms of information quality, service quality and system quality. Their study showed a significant relationship between quality and confirmation in e-learning service. The relationship can be applied to the e-book reader context.

- H7. Perceived service quality has a positive effect on confirmation of e-books.
- H8. Perceived content quality has a positive effect on confirmation of e-books.

### *Continuance intention and emotional factors*

Lee and Kwon (2009) show that affective factors, such as intimacy, are essential factors in strengthening users' continuance intention in web-based services. There have been many similar studies arguing the role of affective factors in users' intention (Kempf, 1999; Kim et al., 2007). In light of the previous findings, legacy ECT and affective factors may be integrated in order to provide a better explanation. Hence, the proposed model in this study contains affective as well as cognitive factors, related to feelings associated with paper books, such as easy portability and obtainability, ownership, tangibility, even the smell of or feeling derived from touching the paper. These feelings contribute to making users prefer paper books to e-books. Book lovers may have an emotional bond with paper: such feelings may be termed intimacy readers' attachment to traditional paper books. People tend to be more attached to their books than to any other media. Intimacy in this study is defined as the feeling for paper books.

- H9. Intimacy has a positive effect on continuance intention.

Along with intimacy, familiarity can be included in the model. Familiarity is defined as one's understanding of technologies, often based on previous interactions, experience and learning of the what, who, how and when of what is happening (Komiak and Benbasat, 2006). Familiarity is affected by the quantity of prior interactions and occurs through repeated interaction (Gefen, 2000). While familiarity can be divided into affective and subjective familiarity, this study focuses on the former, that is, a user's feeling of familiarity. Previous research has investigated whether or not cognitive familiarity has a direct influence on usage. Gefen (2000) examined the extent to which the degrees of familiarity with a specific e-commerce vendor and its procedures increase a customer's willingness to purchase products. Similarly, Van Slyke et al. (2006) argued that consumers' familiarity with a web merchant is positively related to their willingness to conduct

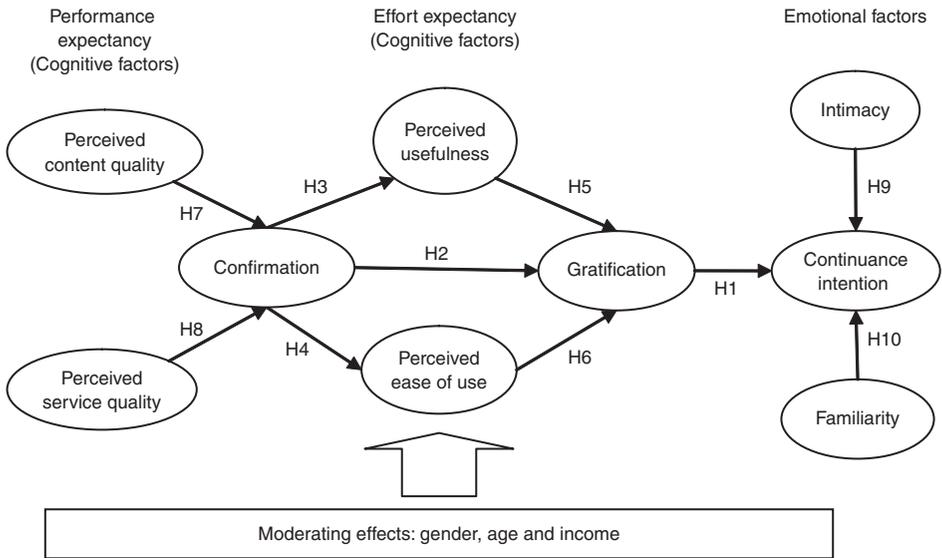


Figure 1. Proposed research model

transactions with the merchant. Based on these arguments, it can be inferred that affective familiarity with e-books has a positive influence on users' continuance intention.

H10. Familiarity has a positive effect on users' continuance intention.

Based on the literature review, the proposed model is illustrated in Figure 1.

### Study design

The survey questionnaire was developed through several comment rounds of an expert panel consisting of professors and researchers, as well as e-book systems experts. Prior to use, the questionnaire was tested by administering a pilot survey among possible users, who provided a comprehensive review of individual responses to the pretest survey. The pilot test analysis consisted of a detailed comparison of the data for each of the pretest survey participants with other responses. The wording of items was reviewed and modified, based on the pilot test outcomes, by three professors in communication studies knowledgeable in quantitative research.

A pilot test was undertaken to examine the test-retest reliability and construct reliability before conducting the fieldwork. Twenty undergraduates who had had experience with e-books and e-book readers participated, with tests given at a three-week interval. The participant group was familiar with e-book services, and, prior to answering the questionnaire, they were strictly instructed to ask the experimenter any questions about questionnaire items that they didn't understand. With these precautions, the possibility of participants' addressing questions without exactly understanding their content was eliminated. Finally, to reduce the possibility of questions' ambiguity in

syntax and semantics, a final pilot test, involving 22 respondents self-selected from the e-book community, was performed.

The finished survey was administered online. A web-based survey questionnaire was posted on discussion forums devoted to e-book reading, e-book readers and e-book content, and on the forums of several professional associations, and the members of each community were cordially invited to participate. A cover letter was attached to explain its purpose and to ensure confidentiality. A screening questionnaire was used to determine whether or not users had had substantial experiences with this mode of reading. It asked respondents about their usage patterns, their frequency of use of various e-book services, including e-book readers, and of their average amount of use. Table 1 presents the sample demographics. The final sample is rather unbalanced in terms of age, education and experience. This may have resulted from pre-screening procedures that selected users with substantial experience or knowledge of e-book usage. Given the nature of e-books, however, this imbalance is understandable because a large number of e-book users are young and college-educated and able to afford a computer or interested in having one.

### *Measurement development and data analysis*

The participants indicated their agreement with a set of statements, accepting a 7-point Likert-type scale drawn from previously validated instruments. The reliability and validity of the measurement instrument were evaluated with SPSS15, using reliability and convergent validity criteria. The reliability of the survey instrument was established by calculating Cronbach's alpha to measure the internal consistency. Each construct was tested for reliability and content validity with Cronbach's alpha (Cronbach, 1971). Most of the scores were above the acceptable level, that is, above 0.70. The variables in this study, derived from the existing literature, exhibited strong content validity.

**Table 1.** Characteristics of respondents (total = 257)

Age (years)	Number	%
Under 20	42	16.3
21–30	127	49.4
31–40	78	30.3
Over 41	9	0.30
User experience		
1–3 months	105	40.8
3–6 months	83	32.2
6 months–1 year	49	19.0
Over 1 year	25	9.7
Education		
High school	40	15.5
College	173	67.3
Graduate or postgraduate	44	17.1
Gender		
Female	131	44.2
Male	172	55.8

The convergent and discriminant validity of the model were examined utilizing the procedure suggested by Fornell and Larcker (1981), who recommend measuring the reliability of each measure and each construct, and the average variance extracted (AVE) for each construct. The reliability of each item was examined with a principal components factor analysis. Each item was loaded significantly on its underlying construct ( $p < 0.001$  in all cases). Therefore, all constructs in the model had adequate reliability and convergent validity. To examine discriminant validity, the study compared the shared variance among constructs with the AVE from the individual constructs. In short, the measurement model demonstrated adequate reliability, convergent validity and discriminant validity.

## Results

### *Structural paths and hypotheses tests*

To test structural relationships, the hypothesized causal paths were estimated. Eight hypotheses were supported and two were abandoned. The results are summarized and depicted in Table 2 and in Figure 2. The results generally support the proposed model, illustrating the new roles of the perceived quality of e-books. The key backbone relationships among confirmation, gratification and intention were supported by the data, as indicated by a significant critical ratio. Ease of use of e-books may not be significantly influenced by confirmation (H4, CR = 1.812), and it was more conducive to reaching a higher level of positive gratification (H6, CR = 3.254). In the same manner, the influence of confirmation on perceived usefulness was not significant (H3, CR = 1.953). On the other hand, gratification was the most important determinant of user continuance intention for e-books (CR = 5.322). This reflects the significant effect of confirmation on user gratification (CR = 3.152). The effect of external influences (CR = 3.280) on continuance intention of usage was also supported by the results. There is a significant positive relationship between confirmation and perceived usefulness (CR = 2.113). The results imply that perceived usefulness may influence gratification, which, in turn, affects customers' continuance intention of usage. Continuance intention is enhanced by intimacy (H9, CR = 3.280), as well as by familiarity (H10, CR = 2.910).

### *Results of moderator effects*

In order to investigate demographic moderator effects on e-book use/adoption, moderation analysis was done using the split sample approach (Shin, 2009). This approach uses a pre-established level of a moderator, which emerges naturally from the study and cannot be modified by researchers. For example, a person's gender, recorded as male or female, naturally forms two moderator levels.

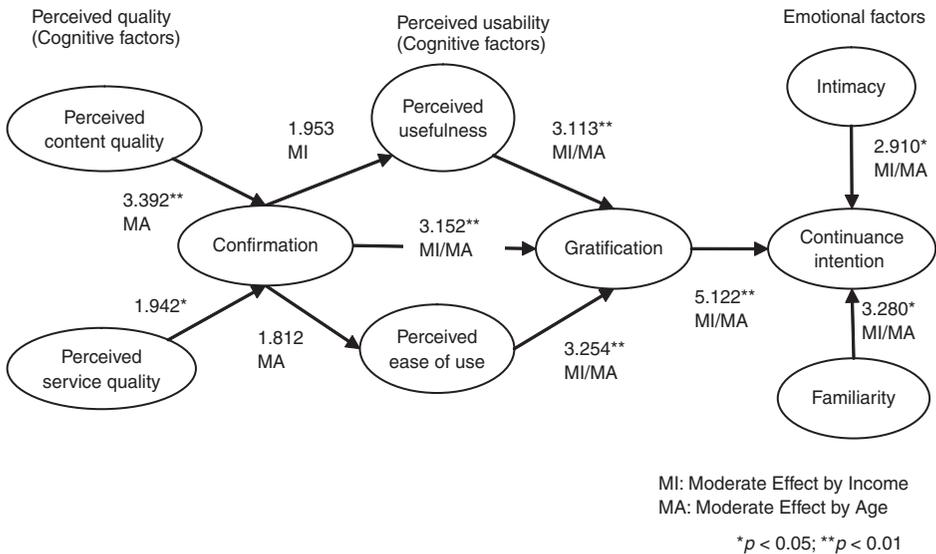
To identify a moderation level for age, the dataset was divided to form two sets, each representing individuals who belong to a particular generation. An analysis of age distribution demonstrates that two major age groups emerged: junior and senior groups. Representatives of these generations may be fundamentally different in terms of various characteristics, perceptions and behaviors. Serenko et al. (2006) used 40 years of age on

**Table 2.** Summary of hypothesis tests

Hypothesis	Standardized coefficient	SE	CR	Support
H1: Gratification → Continuance	0.54	0.014	5.322**	Yes
H2: Confirmation → Gratification	0.39	0.103	3.152**	Yes
H3: Confirmation → PU	0.22	0.016	1.953	No
H4: Confirmation → PEoU	0.21	0.091	1.812	No
H5: PU → Gratification	0.38	0.459	3.113**	Yes
H6: PEoU → Gratification	0.40	0.218	3.254**	Yes
H7: PSQ → Confirmation	0.38	0.154	3.392**	Yes
H8: PCQ → Confirmation	0.23	0.149	1.942*	Yes
H9: Intimacy → Continuance	0.42	0.089	3.280*	Yes
H10: Familiarity → Continuance	0.38	0.100	2.910*	Yes

\* values are critical ratios exceeding 1.96, at the 0.05 level of significance

\*\* values are critical ratios exceeding 2.32, at the 0.01 level of significance



**Figure 2.** Result of the research model

the day of their survey as a cut-off point. To specify a moderation level for income, they used the USA median household income reported by the United States Census Bureau.

The moderating effects of user variables were tested by comparing, between the two groups, the path coefficients produced for each moderator. Path coefficients were calculated with *t*-values suggested by Chow (1960). Table 3 shows the results of the path coefficient comparisons, which reveal a number of significantly different structural relationships. The path coefficient from familiarity/intimacy to continuance intention for the high-income group was significantly larger than that for the low-income group. However,

the other paths were not significantly affected by income level. Thus it can be inferred that the continuance intention of the high-income group is more easily affected because it finds it more economically affordable than the other group and thus it can more easily make a decision on the intention to buy/use.

The influence of acceptance factors differed substantially according to the subjects' age. Perceived ease of use was a more important factor among older than younger people in influencing attitude and intention. However, in the paths from perceived usefulness to gratification and from perceived content quality to confirmation, the coefficients from younger people were significantly stronger than those from older people. Gender did not affect any of the factors for adoption or use of e-books.

## Discussion

The goal of this study was to provide suggestions that can give a direction for consumer emotion-oriented e-book design. The study was designed to explain the development of individuals' behavioral continuance intentions toward, and use of, e-books. To achieve this goal, new constructs adapted from other studies were employed to reflect the features of the e-book services. The results add to our understanding of users' attitudes and intentions toward e-books and explore the implications for theoretical advancement regarding e-book services. One finding that attracts attention is that consumers like e-books that feel like paper books, but still have functional advantages of advanced digital devices. From this perspective, the study was successful in its attempt to integrate emotional (affective) and cognitive factors.

Consistent with prior research, the results show that gratification and confirmation are the two main predictors of intention. Previous studies and industry reports have shown that usability is the most critical factor of e-books (Gil-Rodriguez and Planella-Ribera, 2008; Herson et al., 2006; Lam et al., 2009; Shiratuddin et al., 2003; Simon, 2002; Wilson, 2003). This study confirms the importance of usability and further clarifies that usability can be enhanced by perceived service and content quality. These findings raise a need for e-books to provide quality content as well as excellence of service to customers. As Kang et al. (2009) argue, the perception of e-book quality by customers is a major factor in achieving market breakthrough. Although the issue of quality has emerged as a major inhibitor of e-book acceptance, research has hitherto rarely been conducted, especially from the viewpoint of customers or users. The current study seeks to approach the issue from an empirical perspective in order to come to a better understanding of the concept of e-book usability. It has been argued that the most significant weakness of e-books is the lack of content. As people increasingly turn to the web for the sort of content they used to get from books, their expectations for that content will change. Those changing expectations will undoubtedly have an impact on the development of future e-readers, not to mention future e-books. In this study, the users' perception of quality shows a much stronger impact on intention than previous studies on IT use have indicated (Beyah et al., 2003; Cheong and Park, 2005; Shin, 2008).

The findings in this study establish a significant role for perceived usefulness/ease of use and their underlying linkage to other variables – namely, how they are related

**Table 3.** The results of moderate effects

Path	Gender		t	Age		t	Income		t
	Male	Female		Senior	Junior		High	Low	
	H1: Gratification → Continuance	0.401*	0.398	1.482	0.421	0.592	<b>2.011*</b>	0.424	0.134
H2: Confirmation → Gratification	0.369*	0.401	0.391	0.193	0.439	<b>3.221*</b>	0.501	0.131	<b>2.921*</b>
H3: Confirmation → PU	0.422*	0.382	0.291	0.421	0.434	0.453	0.499	0.031	<b>3.422*</b>
H4: Confirmation → PEoU	0.301*	0.321	0.4011	0.101	0.322	<b>0.189*</b>	0.311	0.299	0.531
H5: PU → Gratification	0.621**	0.403	0.312	0.139	0.531	<b>2.322*</b>	0.410	0.124	<b>0.412**</b>
H6: PEoU → Gratification	0.530**	0.403	0.324	0.612	0.199	<b>4.422**</b>	0.611	0.139	<b>3.991*</b>
H7: PSQ → Confirmation	0.072	0.131	0.144	0.192	0.429	<b>0.323*</b>	0.291	0.432	1.643
H8: PCQ → Confirmation	0.034	0.013	0.153	0.123	0.331	0.203	0.153	0.014	0.431
H9: Intimacy → Continuance	0.411*	0.382	0.291	0.421	0.434	<b>0.442*</b>	0.499	0.030	<b>3.421*</b>
H10: Familiarity → Continuance	0.310*	0.321	0.4011	0.101	0.322	<b>0.188*</b>	0.311	0.299	<b>0.531*</b>

\*p < 0.05, \*\*p < 0.01

to confirmation, gratification and continuance intention. This finding constitutes a theoretical improvement for the UGT and ECT as well as TAM. As antecedent variables, the roles of perceived usefulness and perceived ease of use are important because one of the limitations of the current literature is that it does not help us explain acceptance in ways that guide development, beyond suggesting that system characteristics have an impact on perceptions of ease of use and usefulness. Therefore, it is essential to understand the antecedents of the key acceptance variables in order to be able to explain individuals' acceptance and use. This study sought the answers by focusing on the end-user perspective, how end users perceive and interact with e-books and how emotional factors play a role in the development of their attitudes. The findings in general support previous research on e-book adoption. As described in previous studies, users feel the primary disadvantage of e-books as being the difficulty of reading content on a screen. While this readability problem can be an ongoing challenge, users appear to find value in using e-books for specific purposes such as data and information retrieval and research. This quality of function seems to offset the perception of diminished readability.

## Implications for theory

The results of this study contain several implications for researchers in various fields. The empirical findings demonstrate that employing perceived usability and perceived quality would be a worthwhile extension of the ECT in the e-book context, as both were found to be influential in predicting attitude and behavioral intention of using e-books. A primary contribution of this study is that it highlights the roles of confirmation/gratification for ECT/UGT. In particular, the study revealed the significant roles of emotional factors in the e-book context – intimacy and familiarity.. As the digital media environment is developing at a very rapid rate, areas that can apply analogue emotional design are increasing. Analogue emotional design is expressed as human-oriented thoughts and natural human emotions such as warmth/comfort, relaxation, pleasure, enjoyment and stability. Emotional design is a means of finding human cultural and emotional values in an analogue way, as opposed to the digital media world in which people-oriented emotions are absent. Hand-made fashion, hand-knitted garments and handicrafts can be seen as examples of human-touch design adoption. Analogue emotional design adds the emotional aspect to various fields of digital media in an effort to search for people-oriented perspectives. From this perspective, Kim et al. (2007) argue that more emphasis should be given to emotional factors as new technologies advance as both emotional and cognitive factors affect users' decision making. Furthermore, extensive research has shown that emotions are important for many behaviors. Kempf (1999) has advocated the extension of the traditional one-sided cognitive view by integrating the affective components of consumption experiences. Feelings or emotions are expected to feature prominently in technology continuance studies (Lee and Kwon, 2009).

Although plenty of studies are presented in the e-book literature, few have used integrated models of cognition and emotion, or methods to assess these factors. Prior research on e-book adoption has examined the impact of usefulness and ease of use on usage intentions of e-books (e.g. DeSouza et al., 2004; Renner, 2008). However, these studies

have neglected to investigate the relationship of usability to other factors such as quality. This neglect leads to further confusion regarding how such factors are related to actual users' confirmation and gratification. In the UGT and ECT literature, exploration of how confirmation and gratification are formed with/by what factor has been neglected. In addition, this study contributes to the literature of the technology acceptance research by confirming that perceived quality, as a salient belief, can influence behavioral intention and loyalty through confirmation and gratification. Most importantly, the integration of emotional factors within ECT and TAM is worthwhile.

The recognition of the moderating role of demographics among the factors is noteworthy in this study. Current research suggests that confirmation and gratification play moderating roles in establishing a positive attitude and affecting intention. As the users' behaviors toward future digital media become more and more complicated and unpredictable, the links identified here can be a first step toward a synthesized and integrated model of e-book acceptance. However, future studies should further investigate the complex interrelationships among perceived quality, perceived usefulness, confirmation, gratification and social influence to clarify possible intricate relations. In particular, based on the finding of the moderating effects, future studies may delve further into the complicated effects of diverse demographics beyond gender, age and income. They may also add other demographic factors such as experience, literacy levels and reading habit.

In conclusion, considering the ever-changing nature of digital technologies, this study offers help in understanding behaviors that are associated with the e-book. As users accept e-books as a new means of reading, and as firms provide enabling platforms for users, the e-book might become a popular application for the next generation of e-reading platform applications. However, in order to become popular, e-books have several challenges to overcome, and user acceptance is probably the most important one.

## Limitations and future studies

Several limitations narrow the scope of the above conclusions. First and foremost, this study used a self-selection sampling procedure, which is used widely in theoretical research and can be acceptable in exploratory studies. While the technique is useful as it is quick and relatively easy to do, in that it reaches a wide variety of participants, the type of participants may not be representative of the target population for e-books for a number of reasons: (1) selected respondents may be more obedient and more motivated to take part in surveys; (2) selected respondents may be early adopters of e-books; and (3) selection of respondents might be dependent upon researcher bias as it is a judgment sampling. Thus, future studies may find a way to overcome this limitation by minimizing self-selection sampling bias. For example, they may adopt sifting methods, used when a universe of potential respondents can be over-sampled. This works by taking any respondents who care to answer a web questionnaire, rejecting those who are defined as ineligible. This may go some way to adjust the overall composition of the final sample and overcome some disadvantages of self-selection methods.

Second, the findings reflect only limited aspects of user experiences with e-books. This research is exploratory and the inferences are tentative because e-books are not yet a mainstream phenomenon in markets and society (Lam et al., 2009). These

circumstances lead to a limited generalizability for the results. Since this study focuses on e-books, it is hard to generalize the findings to other IT contexts such as PDAs and Tablet PCs. Given that the population of digital users currently runs to several millions, the sample size of 296 may be seen as disproportionate when compared to the whole population of digital content readers. In addition, the research model is only valid for the USA e-book market due to the restrictions of data collection.

Third, the current study did not apply UGT in a full-fledged fashion. Because what motivates users to create content online involves broad research, a single survey study may not be sufficient to provide a comprehensive account of a well-grounded theoretical overview of all the motives for acquiring and reading e-books. Given the important role of UGT, future research is necessary to explore its applications in various types of e-services on a range of platforms as experimental motivations.

With all these limitations, the lingering question is: To what extent do the findings of this study reflect the actual phenomena of e-books? Future studies will be able to sample a larger number of users from different contexts. This may be achieved by employing a stratified or quota sampling method to ensure a certain distribution of demographic variables. A generalized application of the extended model would require a global data collection process for a more thorough validation. In addition, since perceived quality and usability are additional antecedents of confirmation and gratification, it is not possible to generalize the findings to other applications. For example, since perceived quality is a subjective matter, every e-book user would rate quality differently although there are differing expectations and gratifications. The same logic applies to users' emotions. In sum, this study took a first step in exploring user experiences with e-books and found a number of metrics to be reliable and nomologically valid. Despite its several limitations, one modest contribution may be the exploring and testing of metrics for user behaviors with regard to the burgeoning e-book sector. In addition to the fact that all the scales used in the study showed fairly high reliability, those of gratification, confirmation and emotional factors demonstrated high nomological validity. Therefore, future research can use these metrics with some careful assurance. Testing them against other factors will advance the understanding of users' e-book behavior as a new paradigm of digital reading.

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## References

- Aedo I, Díaz P, Fernández C, Muñoz G, and Berlanga A (2000) Assessing the utility of an interactive e-book for learning the Pascal programming language. *IEEE Transactions on Education* 43(4): 403–13.
- Atkin DJ, Jeffres LW, and Neuendorf KA (1998) Understanding internet adoption as telecommunications behaviour. *Journal of Broadcasting and Electronic Media* 42: 475–90.

- Beyah G, Xu P, Woo H, Mohan K, and Straub D (2003) Development of an instrument to study the use of recommendation systems. *Proceedings of AMCIS 2003*, Tampa, Florida.
- Bhattacharjee A (2001) Understanding information systems continuance. *MIS Quarterly* 25(3): 351–70
- BISG (2009) Consumer attitudes toward ebook reading. A USA census-based survey. New York: Book Industry Study Group.
- Catenazzi N, Aedo I, Díaz P, and Sommaruga L (1997) The evaluation of e-books. *Journal of Educational Multimedia and Hypermedia* 6(1): 91–114.
- Cheong J, Park M (2005) Mobile internet acceptance in Korea. *Internet Research* 15(2): 125–40.
- Ching HS, Poon PWT, and McNaught C (eds) (2006) *eLearning and Digital Publishing*. Dordrecht: Springer.
- Chou S, Chen P (2009) The influence of individual differences on continuance intentions of enterprise resource planning. *International Journal of Human–Computer Studies* 67(6): 484–96.
- Chow GC (1960) Tests of equality between sets of coefficients in two linear regressions. *Econometrica* 28(3): 591–605.
- Compeau DR, Higgins CA (1995) Computer self-efficacy. *MIS Quarterly* 19(2): 189–211.
- Cronbach LJ (1971) Test validation. In: Thorndike RL (ed) *Educational Measurement* (2nd edn). Washington DC: American Council of Education, 443–507.
- Davis F (1989) Perceived usefulness, perceived ease of use and user acceptance of IT *MIS Quarterly* 13(3): 319–40
- DeSouza T, Hon C, Kim J, Lee E, Leong C (2004) eBook: An uphill battle for acceptance. Rolling Hills Estates, CA: The Electronic Document System Foundation.
- Diaz P (2003) Usability of hypermedia educational e-books. *D-Lib Magazine* 9 (3) URL (consulted Oct. 2009): <http://www.dlib.org/dlib/march03/diaz/03diazhtml>
- Dupagne M (1999) A profile of potential HDTV adopters in the United States. Paper presented at the Association for Education in Journalism and Mass Communication, July, Chicago IL.
- Ettema JS (1999) Interactive electronic text in the United States. In: Salvaggio J, Bryant J (eds) *Media Use in the Information Age*. Hillsdale, NJ: LEA, 105–23.
- Fornell C, Larcker VF (1981) Evaluating SEM with unobservable variables and measurement error. *Journal of Marketing Research* 18: 39–50.
- Gefen D (2000) e-Commerce: The role of familiarity and trust. *Omega* 28(6): 725–37.
- Gil-Rodriguez E, Planella-Ribera J (2008) Educational uses of the e-book. *Lecture Notes in Computer Science* 5298: 55–62.
- Hackbarth G, Grover V, and Yi MY (2003) Computer playfulness and anxiety. *Information & Management* 40(3): 221–32.
- Hayashi A, Chen C, Ryan T, and Wu J (2004) The role of social presence and moderating role of computer self efficacy in predicting the continuance usage of e-learning systems. *Journal of Information Systems Education* 15(2): 139–54.
- Hernon P, Hopper R, Leach MR, Saunders LL, and Zhang J (2006) E-book use by students. *The Journal of Academic Librarianship* 33(1): 3–13.
- Just P (2007) E-books in the USA. *Library High Tech* 25(1): 157–64.
- Kang MH (2002) Digital cable: exploring factors associated with early adoption. *Journal of Media Economics* 15(3): 193–207.
- Kang Y, Wang M, and Lin R (2009) Usability evaluation of e-books. *Displays* 30: 49–52.
- Kempf DS (1999) Attitude formation from product trial. *Psychology and Marketing* 16(1): 35–50.

- Kim H, Chan H, and Chan Y (2007) A balanced thinking–feelings model of information systems continuance. *International Journal of Human–Computer Studies* 65(6): 511–25.
- Komiak XS, Benbasat I (2006) The effects of personalization and familiarity on trust and adoption of recommendation agents. *MIS Quarterly* 30(4): 941–60.
- Lam P, Lam SL, Lam J, and McNaught C (2009) Usability and usefulness of ebooks on PPCs. *Australasian Journal of Educational Technology* 25(1): 30–44.
- Lee Y, Kwon O (2009) Can affective factors contribute to explain continuance intention of web-based services? *Proceedings of the 11th International Conference on Electronic Commerce*, 302–10.
- Legris P, Ingham J, and Colletette P (2003) Why do people use it? *Information and Management* 40(3): 191–204.
- Leung L (2009) User-generated content on the internet. *New Media and Society* 11(8): 1327–47.
- Leung L, Wei R (2000) More than just talk on the move: Uses and gratifications of the cellular phone. *J & MC Quarterly* 77(2): 308–20.
- Lin CS, Wu S, and Tsai RJ (2005) Integrating perceived playfulness into expectation-confirmation model for web portal context. *Information & Management* 42(5): 683–93.
- Mondi M, Woods P, and Rafi A (2008) A uses and gratification expectancy model to predict students' perceived e-learning experience. *Educational Technology & Society* 11(2): 241–61.
- Morton DA, Foreman KB, Goede PA, Bezzant JL, and Albertine KH (2007) TK3 eBook software to author, distribute, and use electronic course content for medical education. *Advances in Physiological Education* 31: 55–61.
- Nelson MR (2008) E-books in higher education. *EDUCAUSE Review* 43(2) URL (consulted Oct. 2009): <http://connect.educause.edu/>
- Nicholas D, Huntington P, and Rowlands I (2007) E-books: How are users responding? *Update* 6(11): 29–33.
- Oliver RL (1980) A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research* 17(4): 460–9
- Oliver RL, DeSarbo W (1988) Response determinants in satisfaction judgement. *Journal of Marketing* 14: 393–402.
- Rai A, Lang SS, and Welker RB (2002) Assessing the validity of IS success models. *Information Systems Research* 13(1): 50–69.
- Renner RA (2008) eBooks – costs and benefits to academic and research libraries. E-book white paper, Springer. URL (consulted Oct. 2009): <http://www.springer.com/cda/content/document/>
- Roca JC, Chiu C, and Martinez FJ (2006) Understanding e-learning continuance intention. *International Journal of Human–Computer Studies* 64(8): 683–96.
- Rogers EM (1995) *Diffusion of Innovations* (4th edn). New York: Free Press.
- Rowlands I, Nicholas D, Jamali H, and Huntington P (2007) What do faculty and students really think about eBooks? E-book white paper, Springer. URL (consulted Oct. 2009): <http://www.springer.com/cda/content/document/>
- Serenko A, Turel O, and Yol S (2006) Moderating roles of user demographics in the American Customer Satisfaction Model within the context of mobile services. *Journal of Information Technology Management* 17(4): 20–32.
- Shin D (2008) Understanding purchasing behaviors in virtual economy. *Interacting with Computers* 20(4): 433–46.
- Shin D (2009) Towards an understanding of the consumer acceptance of mobile wallet. *Computers in Human Behavior* 25(6): 1343–54.

- Shiratuddin N, Landoni M, Gibb F, and Hassan S (2003) E-book technology and its potential. *Journal of Digital Information* 3(4) URL (consulted Oct. 2009): <http://jodi.tamu.edu/Articles/v03/i04/Shiratuddin/>
- Siegel L (2009) Should we switch to reading books online? *The Observer Magazine*, 30 August.
- Simon EJ (2002) An experiment using e-books in the classroom. *Journal of Computers in Mathematics and Science Teaching* 21(1): 53–66.
- Spreng RA, Chiou S (2002) A cross-cultural assessment of the satisfaction formation process. *European Journal of Marketing* 36(8) 829–40.
- Tedd L (2005) E-books in academic libraries. *New Review of Academic Librarianship* 11(1): 57–59.
- Thatcher J, Perrewe PL (2002) An empirical examination of individual traits as antecedents to computer anxiety and computer self-efficacy. *MIS Quarterly* 26(4): 381–96.
- Tse DK, Wilton PC (1988) Models of consumer satisfaction. *Journal of Marketing Research* 25: 204–12.
- Van Slyke C, Shim JT, and Johnson R (2006) Concern for information privacy and online consumer purchasing. *Journal of the Association for Information Systems* 7(6): 415–44.
- Vasileiou M, Hartley R, and Rowley J (2008) An overview of the e-book marketplace. *Online Information Review* 33(1): 173–92.
- Vishwanath A, Goldhaber G (2003) An examination of the factors contributing to adoption decisions among late-diffused technology products. *New Media and Society* 5(4) 547–72.
- Wilson R (2003) E-book readers in higher education. *Educational Technology & Society* 6(4): 8–17.
- Worlock K (2009) E-books market size, share and forecast report. Burlingame CA: Outsell Research.

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