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Internet Shopping Behavior of Turkish Customers: Comparison of Two Competing Models

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Abstract

In this Internet age, information technologies are increasingly penetrating our daily lives. Internet Shopping has become a daily activity for most of us. However, there are very limited studies to investigate cognitive factors influencing individuals' online shopping behavior in a developing country context. In this study, two widely used socio-psychology based theories, the extended version of Technology Acceptance Model (e-TAM) and Theory of Planned Behavior (TPB), have been tested in Internet shopping context and the results are compared for a Turkish sample. The results have revealed significant theoretical relationships for all of the proposed paths in both theories, yet the Theory of Planned Behavior presented better fit indices and proven to be a more detailed explanatory framework.

Keywords: Extended technology acceptance model, Theory of planned behavior, Comparison of theories, Structural equation modeling, Turkey

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1 Introduction

Due to the significant and important changes in the last couple of decades in Information and Communication Technologies (*ICTs*), the Internet and personal computers have significantly penetrated our daily lives. Coupled with changing consumer preferences and technological advances, individual shopping behaviors have also altered significantly. A new concept of technology-enabled shopping, called "Online Shopping," emerged after the first Internet web browser back in the 1990s. Since then, Internet Shopping has attracted significant attention by both academics and practitioners alike.

Although online sales are increasing, not everyone prefers to shop online. It is a questionable experience in a developing country. As Internet business becomes more competitive, it has become more important to understand the antecedents of customer acceptance of online shopping [74]. It is important to know why some still prefer not to buy online, though they might use Internet regularly and frequently. Whereas ICT adoption and usage have been widely researched in developed countries, these findings usually cannot be applied to a developing country context [74].

Online shopping has important aspects in terms of individuals' preferences to use new ICTs. Better understanding of consumers' preferences and attitudes of adoption of different technologies would give valuable insights to both scholars, as well as firms, to better design their theories, products offerings, and web sites. Intention based theories such as the Technology Acceptance Model (*TAM*), Theory of Reasoned Action (*TRA*) and Theory of Planned Behavior, have been developed by and widely used in social psychology. These theories are also employed by Management Information Systems scholars to assess, explain, and predict cognitive and psychological factors behind consumers' preferences and including the preference to or not shop online.

It is useful to compare the capabilities of different models to predict technology acceptance and adoption. In general, existing evidence largely indicates that TAM is a powerful predictor of individual technology adoption. Few studies investigated TPB, which is also a significant framework as an explanatory theory in technology usage [25]. Therefore, it is not surprising that no research using TPB has been published in the Turkish setting so far. Although there are number of studies addressing technology adoption in a developing county context, there is relatively little research in a developing county context [25]. Given the lack of resources and the continuous struggle to enhance resource utilization, developing countries would benefit from knowing more about technology adoption and use in their own context.

In this study, the two most widely used cognitive based theories, extended version of TAM, e-TAM, and TPB are tested and compared to explain Turkish customers' online purchasing behaviors. This study compares two prevailing intention based theories, namely the TPB and extended version of TAM, and draws conclusions regarding their use to explain and predict the online shopping behaviors of Turkish customers. The study also reports some basic characteristics of Turkish customers and existing differences among their online purchasing characteristics and technology adoption behaviors, based on gender differences. The data has been collected from 350 academics and students at one of the newly established university in western part of Turkey, using a survey instrument. Structural Equation Modeling (*SEM*) has been used to compare the two competing theories (*TPB and e-TAM*) in terms of their overall fit, explanatory power, path significance and predictive power of costumer intentions to shop online.

2 Internet Shopping in an Emerging Nation: Turkey

Being a crossroad between East and West, Turkey is located between the Black Sea and the Mediterranean Sea. It has major characteristics of a Mediterranean culture. Turkish customers' demographic characteristics are significantly different from those of western customers' in terms of age and cultural aspects. Turkey has been suited between Asia and Europe and served as a bridge between Eastern and Western ideals, cultures and societies. As a predominantly Muslim society, Turkey has attempted to become a member of the European Union since the 1960s. Throughout the last four decades, Turkey has been trying to adjust to European values and the EU economic system. This has required them to accommodate extensive cultural, economic, and social changes to satisfy EU requirements. Investigating a new emerging phenomenon of Online Shopping of citizens of a developing country, which is in the process of accessing to prosperous European Union membership, with its unique location, culture and economy, would be useful for both practitioners and scholars.

Turkey's economy is developing very fast in the process of EU accession and structural transformations, after its 2001 economic crisis. With 8.710 USD Gross Domestic Product per head, Turkey is classified as a middle income country by the World Bank (Site 1). According to the World Bank, the country has dynamic emerging economy, and it is a regional power. Moreover, the recent 2010-2011 Global Competitiveness Report [72] ranks Turkey's competitiveness index as 61 among 131 economies and indicates that the country benefits from its large market, characterized by intense competition (ranked 15th) and reasonably sophisticated business practices (ranked 52th).

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As of 2008, there were around 25 million Internet users in Turkey according to BBC Monitoring (Site 2). The Turkish telecommunication industry has also developed significantly in the recent years and has reached 18.2 million land line subscribers, 63.1 million mobile phone users, and about 5 million ADSL subscribers as of the end of 2007 [67]. The Internet penetration rate in the country is relatively low comparing to other Western nations. There are only 81 ISPs operating in the country; however, Turkey is the leading country in the region with the number of broadband Internet subscribers increasing pace in Europe between 2005 and 2007, considering countries with more than 1 million ADSL subscribers [50].

A previous study by Lighther et al [41] revealed that there are some significant differences in online shopping habits and preferences of Turkish customers, when compared to US customers. Turkish subjects responded that they are more concerned about technology issues, security, and privacy in Internet shopping than are their US counterparts [41]. In general, technology infrastructure is still an issue in Turkey. Therefore, Turkish consumers expressed more concern about the speed of online information retrieval. Turkish participants expressed more concern with Internet security and privacy, which were mentioned as major limitations of developing countries in EC diffusion [41]. Since Turkish culture is more risk aversive [34] and Internet shopping is a new phenomenon for many Turkish individuals, it is not surprising that Turkish consumers would be more concerned about Internet security and privacy.

Another study by Küçük and Arslan [39] investigated socio-psychological factors to compare Turkish, British, and Danish consumers Internet shopping behavior and employed TAM framework. The authors found significant differences among countries in terms of online shopping adoption. Paralleling Lighther et al's [41] findings, insufficient technology infrastructure was found to be the main reason that Turkish customers found Internet shopping less satisfactory than British and Danish customers. On the other hand, Turkish consumers found Internet shopping equally useful as Danish and British customers, except Turks did not agree that the Internet saves money and time. Still today, according to a recent OECD report in 2007, Turkish Internet subscribers pay the highest connection fees for Internet access of megabit per second among 30 EOCD member countries [52]. Moreover, Internet is not as diffused as traditional shops throughout the country. Negotiation is still a part of the culture as well. Therefore, most Turks would see little benefit of going online to shop.

However, the Internet is becoming rapidly widespread among Turkish citizens. According to a recent survey by the Turkish Statistical Institute, 30.00 percent of households have Internet access and 40.01 percent of individuals between the ages of 16 and 74 are using the Internet [66]. About 70.00 percent used Internet for reading newspapers, 72.40 percent used Internet for communication, 57.80 per cent used for chatting and sending instant messages and 56.30 percent used Internet for downloading music and movies [66]. Only 11.80 percent ordered and purchased products or services from Internet [66].

In Turkey, Internet shopping is very limited and individuals use the Internet mostly for information search [69]. Individuals usually employ Internet to chat, play games, download music and other programs, and lastly for commerce [7]. Younger Turkish customers and more educated ones have reported online purchasing more frequently, yet they still have some suspicions about security and privacy [56]. In a parallel finding, Stafford et al [60] found that Turkish Internet users are less eager to shop online and have less favorable attitudes to Internet shopping and Internet usage than Jordanian Internet users.

3 Electronic Commerce Diffusion in the Developing World

As of 2004, there were about 700 million people online in the world that would represent about 8 percent average annual increase, yet developing countries accounted about 36 percent of this total with a remarkable 15 percent annual increase in number of online citizens [68]. Electronic Commerce (EC) has been widely seen by policy makers, scholars, and practitioners as an essential ingredient for the socioeconomic advancement of a developing country [6]. There is profound evidence that ICT investment and economic performance are positively related [35]. EC can create social, socio-cultural and legal improvements for a developing country. EC seems to extend firms' market reach, enhance product differentiation and loyalty, improve revenues, communication and relationships, gender development, employee skills, local entrepreneurship, e-readiness, time efficiency, and reduce transaction costs [12]. Developing countries seem to have the level of EC diffusion that developed countries had 10-15 years ago. Yet, some empirical studies [46] found that EC is not effective in reducing transaction costs, transforming firms' business models, and opening up new global marketing opportunities for organizations in the developing world. However, little is known about the conditions and circumstances of EC adoption in developing countries [18].

A number of studies outlined the major hindrances of EC diffusion in developing countries. Lack of telecommunications infrastructure and education, lack of skilled professionals to support EC activities, low incomes, low computer availability, low Internet and credit card penetration, and insufficient delivery systems are widely mentioned as the major hindrances of EC in the developing world [33].

Developing countries have limited human, technical and financial resources and cannot waste these limited resources on IT investments that would not produce desired economic and social returns. The presence of developing countries on the Internet has been increasing, yet this also remains largely concentrated on very a small number of countries. China, Korea, Brazil and Mexico make more than 60% of all Internet users in the developing

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world [68]. As of 2004, three out of four new Internet users live in the developing world, where Internet penetration growth was more than 8 times of developed countries. This warrants further empirical investigation in this part of our world.

4 Theoretical Models Developed to Predict Technology Acceptance Behavior

In the last decades, an important new phenomenon in the business world, EC, has emerged. Although we do not expect that these new retail channels will replace traditional retail, electronic retailing still could complement, supplement, and even replace a great deal of the traditional retailing media [71]. Because of lack of theoretical frameworks developed in Management Information Systems (*MIS*) literature, researchers adopted theories developed in other fields [49]. Numerous MIS researchers employed socio-psychology based theories to explain and predict consumers' online purchasing behavior and decision making processes [1]. Attitude and intention based theories are the most dominant and widely used cognitive models [13], and they can be valuable tools to explain individual behaviors. Those models provide a basis for examining the cognitive foundation of behavioral decisions. A number of competing models to predict intention to adopt ICT are employed in MIS studies. Among the major models used are The Innovation Diffusion Theory (*IDT*) [55], Theory of Reasoned Action [23], Theory of Planned Behavior [2] and Technology Acceptance Model [19]. Some of these theories and models (*such as IDT and TAM*) are also generally called "Technological Imperative" Models because they consider the complexity, compatibility, relative advantage, ease of use, usefulness, and other attributes as key drivers of adoption [45].

4.1 Innovation Diffusion Theory

Rogers [55] offered the earliest theory on technology acceptance as Innovation Diffusion Theory. IDT originates from sociology and views innovation diffusion as a communication process that passes a new idea on a technology from one member of a social system to another [73]. Researchers using this theory seek to identify key characteristics of technological innovations and their impacts on adoption behavior [18]. According to this theory, individuals gather and synthesize information about the technology to reduce uncertainty. IDT concentrates on the intrinsic characteristics of a particular technology [15]. The theory posits the adoption speed, amount and degree depends on such perceived attributes of an innovation, namely innovation characteristics. Later Rogers [54] proposed five characteristics affecting the technology adoption as relative advantage, compatibility, complexity, trialability, and observability.

In MIS research, Roger's [54] model seems to be the most widely accepted model by researchers to identify perceived critical characteristics of innovations [5]. Moore and Benbasat [47] adopted and expanded the original set of IDT adoption characteristics, developing a comprehensive instrument to measure ICT adoption by individuals. Other MIS studies [30], [63] outlined and emphasized the importance of technological, organizational and environmental characteristics to ICT adoption. They found that innovation characteristics, such as relative advantage, complexity, result demonstrability, and image, are more important factors in predicting users' intentions to adopt a new technology. Result demonstrability is similar to the original observability variable offered by Rogers [54], except that the new variable refers to tangible results of using a new technology that are both observable and communicable. A new variable image refers to the fact that the degree of using a new innovation leads to enhanced perceived image and status of the individual.

4.2 Theory of Reasoned Action

TRA is another widely used theory in MIS research to explain and predict users' acceptance of particular technologies. Fishbein and Ajzen [23] initially developed TRA to explain and predict human behavior in general. While IDT argues that perceived characteristics of technology would explain users' behavior in the process of adoption of a new technology, TRA focuses on the beliefs of particular individuals to explain adoption behavior. TRA anchors its analysis on how significant and important characteristics of a new technology are communicated and perceived by target users [15]. TRA is a well-established intention-based theory widely used in MIS literature. TRA argues that one's behavior is predicted by his or her intentions to engage in a particular behavior [49]. Behavioral intentions in turn are dictated by two factors: (a) individuals' attitudes, the degree to which a person has a favorable or unfavorable evaluation of the behavior in question, and (b) subjective norms, that is, other people's attitudes of what individual should do [14]. Subjective norms can also be defined as the perceived social pressure to perform or not to perform particular behavior [48].

Many researchers in the past ([20], [37]) and more recently Nysveen et al [51] have confirmed the ability of TRA to predict human behavior to adopt a certain technology. However, TRA was developed to explain individuals' voluntary and volitionally behaviors. It is among the most widely used theoretical bases in social science research [53]. Hartwick and Barki [31] argued the impacts of attitude and subjective norm differ if the technology use is voluntary or involuntary, and Ajzen [4] indicated that TRA is unable to comply with behaviors under incomplete volitional control of users. Hence, TRA is widely criticized as not adequately explaining behaviors that are not completely under the

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individual's control [14]. As discussed in the preceding sections, later TPB and TAM models have been developed, again based on TRA to deal with criticisms and deficiencies of TRA.

4.3 Theory of Planned Behavior

Derived from TRA, TPB follows the common thread of belief-intention and behavior sequence in predicting users' acceptance and adoption of particular technologies [45]. TPB was proposed by Ajzen [3] and incorporates the concept of volitional control that is individuals' assumption of the extent of control of his or her behavior. Hence, TPB tries to account for at least some effects of external factors left out in TRA. TPB is specifically designed "to predict and explain human behavior" (Ajzen [4], p.181). TPB incorporates behavioral conditions that are not entirely under volitional control [2]. Like TRA, TPB asserts that behavioral intention (*BI*) is a function of attitude (*A*) and subjective norms (*SN*). TPB adds perceived behavioral control (*PBC*) construct to determine behavioral intention. The model is presented in Figure 2. The social influence (*Subjective Norm*) component is unique to TPB. According to TPB, individual behavior is determined by his or her intent to perform that behavior. Intent is, in turn, formed by attitudes toward behavior, subjective norms about engaging behavior, and individual perceptions concerning whether individuals will be able to successfully engage in the target behavior [27]. Fishbein and Ajzen [23] argued that an individual's positive or negative feelings, namely attitudes to perform a behavior, is influenced by number of psychological factors and situations that are encountered. Hence, TPB incorporates a wide range of factors to explain human behavior in general.

TPB postulates that actual usage (*AU*) is determined by jointly behavioral intention and perceived behavioral control. PBC influences AU through intentions as well. BI in turn is determined by attitude, subjective norm and perceived behavioral control. TPB defines attitude as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" ([4], p.188). Attitude in the Internet shopping context can be defined as consumers' favorable or unfavorable feelings and evaluations towards online shopping [42]. SN refers to the influences and effects of people who are important and close to individuals who might influence whether the person performs a behavior [2]. In TPB, SN is defined as "the perceived social pressure to perform or not to perform the behavior" ([4], p.188). TPB asserts that normative beliefs relate to referent groups' or individuals' approvals of behavior questioned. Individuals are influenced largely by ideas, opinions and advices of other people around them and important to them. SN is defined as the person's desire to comply with the wishes of the other party [44]. Previous empirical studies ([64], [22]) have found statistical support for normative beliefs in technology adoption research.

The final component of TPB is perceived behavior control. PBC refers to "the perceived ease or difficulty of performing the behavior" ([4], p.188). In online shopping context, PBC refers to perceptions and beliefs of individuals of having the necessary resources, knowledge, and capabilities in the process of using the Internet [58] and, consequently, shopping online. PBC has two major dimensions: self-efficacy (*SE*) and facilitating conditions (*FC*). According to Social Cognitive Theory [11], personal, cognitive, demographic and behavioral characteristics of individuals influence each other. SE is the individuals' judgments of his or her self-capabilities and the resources to engage a particular behavior [11]. SE is the individuals' perceptions of his or her ability to do a certain action. Hence, SE is the consumers' self-assessment of their capabilities to shop online. Such self-assessments of individuals of their capacities and capabilities to use computers are important factors in forming their behavior intentions of using computers [17]. Although computers and Internet are readily available, for most of us online shopping would not be that much of intuitive and easy. Therefore, it is important to question self-efficacy in the Internet shopping context. The second dimension of PBC is the facilitating conditions refer to the availability of resources needed to perform particular behavior [63]. Among these resources could be time, money, and access to Internet and computers in online shopping context. TPB has been employed widely in a variety of MIS research ([63], [15], [49], [48], [28]). Although a number of studies found strong empirical support for TPB to predict BI of performing a particular behavior [57], TPB's predictive ability is limited, since it assumes that behavior is pre-planned and not subject to change [44]. Therefore, Davis [19] later developed TAM specifically to explain and to predict ICT adoption and use behavior of individuals.

4.4 Technology Acceptance Model

TAM was introduced by Davis [19] and seeks to explain technology adoption in workplace. TAM has adopted TRA and TPB as theoretical foundations and attempts to explain users' acceptance of Information Systems. TAM also follows belief-intention and behavior thread, widely applied to examine user acceptance of a wide array of information technologies [15]. Although originating from different disciplines, TAM and IDT have similarities. "TAM is a close analogue to the Diffusion Theory" [18] p. 21. TAM and IDT examine the underlying mechanisms of behavioral cues towards adopting particular Information Technologies [18]. The TAM constructs are basically a subset of innovation characteristics proposed by IDT [73].

TAM is a parsimonious model intended to explain the attitude behind the intention to use specific technology. TAM supposes that actual system use is determined by individual intentions that, in turn, are formed by attitude toward usage. TAM has two important and fundamental antecedents or silent beliefs - personal beliefs or attitudes, namely perceived ease of use (*PEU*), and perceived usefulness (*PU*) - that directly influence attitudes. PU is the personal

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beliefs of individuals about the perceived positive effects of using ICTs on their personal or work related productivity increases. PEU is the individual's personal beliefs of the perceptions of ease of use of particular ICTs [19]. In turn, behavioral intention is determined jointly by attitude and perceived usefulness. TAM also asserts that perceived usefulness influences attitude directly [42]. In addition, PEU directly influences both A and PU. Hence, attitude is influenced jointly by perceived ease of use and perceived usefulness.

This belief – effect – intention – behavior causality has been shown to be valid in empirical studies in the online shopping context [74]. User intentions were found to be a better predictor of system usage than expectations, motivation, value, satisfaction, or involvement [39]. Empirical studies using TAM found consistent support for the relationships between PU, A and BI [71]. Yet, the findings of the relationships among PEU, A, and BI are not consistent and the variance explained in some TAM studies have been rather low [71]. Low explanation powers and inconsistent results have led researchers to examine other variables to enhance TAM. Although TAM is the most widely used theory in Management Information Systems literature to explain users' attitudes of adoption of technology [24], it has been also criticized for not including antecedents of PEU and PU [14]. TAM also has been criticized for being too simple, decreasing the comprehensive understanding of behavioral intention [63]. Therefore, several authors (e.g. [38], [71]) have developed and proposed extensions/augmentations of TAM in the literature.

4.5 Extended Technology Acceptance Model

The extended TAM model has a compatibility (*C*) construct incorporated in it, as shown in Figure 1, derived from IDT. As an antecedent of PEU and PU, compatibility refers to individuals' perceptions of the degree and capabilities that technologies fit and are compatible in their daily lives, values, and working conditions as well as principles [54]. Rogers [54] argued that individual differences would create differences in forming personal intentions of performing an action or not. If consumers perceive that technologies are in line, compatible, and appropriate with their previous experiences and life styles, they would be more eager to shop online [70]. Tornatzky and Klein [65] also argued that an innovation is more likely to be adopted if it is compatible with existing values and work tasks of individuals. Extended TAM also employs a new variable, called actual usage construct added to the original model. E-TAM asserts that behavioral intention leads to actual ICT use *AU*. In general, individuals' attitudes toward performing particular behavior leads to the formation of behavioral intention to act and, finally, their actual behavior and usage (*AU*) of the system [15], in our case, using online shopping systems. Taylor and Todd [63] argued that, if the sole goal is to predict ICT usage, then e-TAM would be preferable. However, TPB provides more detailed and complete understanding of usage behavior and intentions.

5 Methodology and Data Analysis

In this section, subjects and major study characteristics, descriptive statistics, measurement of constructs, and reliability of scales and empirical models testing results have been presented and discussed.

5.1 Survey and Study Administrative Procedures

The survey is composed of two major sections. In the first section, the demographic characteristics of participants, their Internet usage capabilities, some major characteristics of their Internet usage and online shopping behaviors, and their reasons to shop online are assessed. In the second section of the survey, scales of two underlying theory of the study are included. Finally at the end, an open ended question is added to receive useful feedbacks from the participants. The survey instrument has 72 questions in total, and is provided in Appendix A.

The back translation method has been used to adopt the original instruments. The original scales of theories were translated from English to Turkish by the researcher and two other experienced academics. Later, the translated instrument was translated back to English by an independent translator who is also a scholar. Discrepancies were discussed before the questionnaire was finalized.

Subjects were chosen from the university faculty and students of one of the prominent universities in the Aegean Region of Turkey by a convenience sampling procedure. Although the Aegean region of Turkey is more developed than the Eastern part, the development level is still not as high as Istanbul and its surroundings. In the Aegean region of Turkey, the main industry is agriculture and tourism along the coast. Other industries are not well developed.

To enhance credibility, a written letter stating the support of the university was obtained from the Presidency Office, and the surveys were printed on University letterhead. To increase participation, all of the division heads informed their staff about the project and upcoming surveys. All faculties and vocational schools were visited and the survey administered by the researcher. If the subject was available, the survey is carried out in the presence of the researcher. If the subject was not available at the time of the visit, the survey was left and the individual requested to return the survey after completion. One week after the visit, the participants were reminded about the survey by email. Student subjects were chosen from the senior students. The survey was administered at the end of the class session in the presence of the researcher. In total, four faculties and six vocational schools were visited. In total, 500

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surveys were distributed. 365 surveys were returned; 15 were excluded since they were partially completed. We believe that the high return rate was due to the personal involvement of the researcher in the data collection process.

5.2 Subjects and Descriptive Statistics

The survey was conducted between January to April 2008 with the participation of faculty members and senior students at a prominent Turkish university. Participation to the survey was voluntary and limited to the campus of the university. A final sample of total 350 faculty members and students participated in the study. SPSS 13.0 and LISREL 8.51 were used for statistical analysis. The descriptive statistics and gender comparisons are presented in Table 1.

Table 1: Descriptive statistics and gender comparisons

Characteristics	Total N (%)	Woman N (%)	Man N (%)	Gender Differences
Gender				
Woman	163 (46.6)			
Man	187 (53.4)			
Marital Status				
Single	247 (70.6)	127 (76.1)	123 (65.8)	χ 2 (2) =4.708, p = 0.095***
Married	96 (27.4)	37 (22.7)	59 (31.6)	
Other	7 (2.0)	2 (1.2)	5 (2.6)	
Income†				
<385USD	153 (43.7)	82 (50.3)	71 (38.0)	
385 – 770USD	63 (18.0)	31 (19.0)	32 (17.1)	
771 -1154USD	70 (20.0)	28 (17.2)	42 (22.5)	χ 2 (5) = 8.951, p = 0.111 (ns)
1155 - 1539USD	31 (8.9)	10 (6.1)	21 (11.2)	
1540 -1923USD	19 (5.4)	8 (4.9)	11 (5.9)	
>1923USD	14 (4.0)	4 (2.5)	10 (5.3)	
Education				
High School	97 (27.7)	45 (27.6)	52 (27.8)	
Some College	36 (10.3)	22 (13.5)	14 (7.5)	χ 2 (4) = 5.262, p = 0.261 (ns)
College	100 (28.6)	49 (30.1)	51 (27.3)	
Masters	46 (13.1)	19 (11.7)	27 (14.4)	
Doctorate	71 (20.3)	28 (17.2)	43 (23.0)	
Internet Usage Frequency				
Everyday	224 (64.0)	89 (54.6)	135 (72.2)	
Couple of times in every week	96 (27.4)	58 (35.6)	38 (20.3)	χ 2 (4) = 14.837, p = 0.005*
Once in every week	15 (4.3)	9 (5.5)	6 (3.2)	
Couple of times in every month	10 (2.9)	6 (3.7)	4 (2.1)	
Once in every month	5 (1.4)	1 (0.6)	4 (2.1)	
Weekly Internet Usage Hours				
1 - 5 hours	93 (26.6)	51 (31.3)	42 (22.5)	
6 – 10 hours	76 (21.7)	43 (26.4)	33 (17.6)	χ 2 (4) = 18.485, p = 0.001*
11 – 15 hours	48 (13.7)	25 (15.3)	23 (12.3)	
16 – 20 hours	50 (14.3)	21 (12.9)	29 (15.5)	
> 21 hours	83 (23.7)	23 (14.1)	60 (32.1)	
Length of Internet Usage				
< 1 year	17 (4.9)	9 (5.5)	8 (4.2)	
1 – 2 year	45 (12.9)	24 (14.7)	21 (11.2)	χ 2 (4) =7.732, p = 0.102 (ns)
3 – 4 year	104 (29.7)	56 (34.4)	48 (25.7)	
5 – 6 year	82 (23.4)	37 (22.7)	45 (24.1)	
> 7 year	102 (29.1)	37 (22.7)	66 (34.8)	
Have you ever shopped online?				
Yes	155 (44.3)	60 (36.8)	95 (50.8)	χ 2 (1) = 6.911, p = 0.009*
No	195 (55.7)	103 (63.2)	92 (49.2)	
Is Internet shopping enjoyable?				
Yes	153 (43.7)	73 (44.8)	80 (42.8)	χ 2 (1) = 0.142, p = 0.706 (ns)
No	197 (56.3)	90 (55.2))	107 (57.2)	
Is Internet shopping safe?				
Yes	107 (30.6)	31 (19.0)	76 (40.6)	χ 2 (1) = 19.185, p = 0.000*
No	243 (69.4)	132 (81.0)	111 (59.4)	

** p< 0.001, ** p < 0.05, *** p < 0.10, † Exchange Rate : 1 USD = 1.3 YTL, ns=non-significant*

The average age of the respondents is 27.9, with standard deviation of 7.7 and maximum and minimum values of respectively 17.0 and 57.0. Hence, the respondents are relatively young below their middle ages. 46.6 percent of the

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participants are females and 53.4 percent of participants are males. Most of the respondents are single (70.6 percent), while most of the rest are married (27.4 percent). At a low significance degree, there is some statistical differences between males and females in terms of marriage. In this sample, there are more single females than males ($\chi2$ (2) = 4.708, p<0.1). Most of the respondents (43.7 percent) have the lowest income, less than 385 USD per month, and this group consists of more females. However, there is no statistical difference between males and females in terms of their income level ($\chi2$ (5) = 8.951, p>0.1).

The majority of participants have higher education, with 72.30 percent having some university and above. However, there is no statistical difference between genders in terms of education level ($\chi2$ (4) = 5.262, p>0.1). Most of the participants use the Internet everyday (64.0 percent), but females use Internet at significantly lower frequency than males ($\chi2$ (4) = 14.837, p<0.001).

The literature suggests mixed results on Internet experience and online shopping frequency. Some studies [40] found positive relation between Internet experience and shopping intentions, while others found no effect at all [16]. The high penetration of the Internet and computers in our daily lives [74] and increased access to such technologies would diminish the effects of Internet experience on online shopping intentions. In this study, participants responded that they were using Internet in relatively prolonged time (82.2 per cent over 4 year) and there is no statistical difference between genders in terms of length of Internet use ($\chi2$ (4) = 7.732, p>0.1). Although respondents seem to use Internet in excessive amounts (on average over 20 hours weekly, p<0.001), males use the Internet more than females in a week (32.1 versus 14.1 percent: $\chi2$ (4) = 18.485, p<0.001).

Less than half of the participants responded that they have shopped online (44.3 percent). Not surprisingly, males seem to make more purchases online than females ($\chi2$ (1) = 6.911, p<0.001). This finding parallels existing literature [60], [59]) that found that male customers usually make more online purchases and spend more time and money online. Less than half of the participants responded that they enjoyed in shopping online (43.7 percent); however, there is no statistical difference between males and females ($\chi2$ (1) = 0.142, p>0.1) Not surprisingly, the majority of the respondents (69.4 percent) stated that Internet shopping is not safe, and much higher proportion of females think that online shopping is not safe (81.0 percent versus 59.4 percent: $\chi2$ (1) = 19.185, p<0.001). This finding emphasizes the idea that females are usually more cautious than males, resulting in the perception of negative outcomes of online shopping as suggested by Garbarino and Strabilevitz [26]. Susskind [61] and Bhatnagar and Ghose [10] suggested that individuals with more Internet apprehensiveness and risk perceptions would be less likely to spend more time online and make frequent purchases. This supports our findings that females are less active in online shopping.

5.3 Validity Measurements of Constructs and Reliability of Scales

Previously validated scales were used to measure the variables of interest. A questionnaire using a five point Likert scale (*1= Strongly Disagree, 5 = Strongly Agree*) was used to collect the data on the underlying constructs of previously mentioned underlying theories. Items from the previous studies were modified to measure Internet shopping adoption behaviors of individuals.

Table 2 below provides detailed information about the scales and their reliability measures. Reliabilities are measured with Cronbach alpha. The AU scale has been adopted from Lin [42], while BI, PEU and PU scales are adapted from Davis [19]. All the other scales, A, C, SN, PBC, SE, and FC, are adapted from Taylor and Todd [63]. The scales are aggregated using the method described by Tavakolian [62], where the arithmetic means of the scales are calculated as aggregated items. One PEU item has been re-coded before the aggregation.

Table 2: Scale information and reliabilities

Scale	Source	Number of Items	Cronbach Alpha
Actual Usage	Lin (2007)	2	0.829
Behavioral Intention	Davis (1989)	3	0.889
Attitude	Taylor and Todd (1995)	3	0.926
Perceived Usefulness	Davis (1989)	3	0.846
Perceived Ease of Use	Davis (1989)	2 (One item recoded)	0.595
Compatibility	Taylor and Todd (1995)	2	0.885
Subjective Norm	Taylor and Todd (1995)	2	0.880
Perceived Behavioral Control	Taylor and Todd (1995)	2	0.800
Self Efficacy	Taylor and Todd (1995)	2	0.925
Facilitating Conditions	Taylor and Todd (1995)	3	0.819

Hatcher [32] argued that Alpha value of 0.50 or greater is sufficient for social science research, while 0.70 is recommended and 0.80 is desirable. As it can be seen from Table 2, all except one scale values are greater than 0.80. Only PEU scale turned out to have reliability of 0.595 less than 0.70. However, it is still higher than the minimum requirement of 0.50 argued by Hatcher [32].

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Table 3: Factor analysis results

Question-item/Scale	Factor 1 Compatibility	Factor 2 Perceived Usefulness	Factor 3 Perceived Ease of Use	Factor 4 Subjective Norm	Factor 5 Self Efficacy	Factor 6 Resource Facilitating Conditions	Factor 7 Perceived Behavioral Control	Factor 8 Attitude	Factor 9 Behavioral Intention	Factor 10 Actual Usage
Shopping online fits well with my life style	0.735	0.216	0.236						0.332	
Shopping online satisfies my needs of making purchases	0.792								0.251	
Internet shopping enables me to do comparisons while shopping	0.224	0.744	0.209				0.336			
Internet shopping enables to reach useful shopping information		0.629	0.242				0.518			
I save time while shopping online	0.230	0.428				0.230	0.550			0.355
Shopping over Internet is not easy for me (R)		0.232	0.926							
It is easy for me to learn how to shop over the Internet and to shop online	0.258	0.389	0.692				0.316			
People, with whom I have similar ideas and opinions, are encouraging me to shop online	0.285			0.861						
People, who are important to me, think that I should shop online	0.225			0.889						
I could easily shop online on my own				0.213	0.875					
I could shop online even there is no one around me to help me	0.202				0.842					
I have the necessary computer and Internet connection to shop online		0.387				0.741				-0.346
I have time to shop online		0.457				0.693				
I have enough money to shop online						0.846				0.314
I have the knowledge to shop online				0.205			0.802			
While making purchases online, I have the control entirely			0.208				0.775			0.231
I feel making Internet shopping is a good idea			0.232				0.236	0.822		
I feel making Internet shopping is a wise idea			0.201		0.241	0.222	0.206	0.791		
I like to shop over Internet			0.461		0.232		0.205	0.653		
I will do online shopping within next month	0.380						0.206		0.743	
I intent to shop online in the near future	0.395								0.729	
I strongly advise to whom I know to shop online	0.368						0.218		0.510	
I prefer to shop online	0.433		0.301				0.218			0.649
I shop online frequently	0.332		0.245							0.772

The ten - factor solution has explained 85.7% of the total variance
The factor loadings larger than 0.40 are chosen to form the scales
In order to enhance readability factor loadings smaller than 0.20 are deleted

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To assess discriminant validity, the 24 items used to measure 10 research constructs are analyzed with principle component analysis with Varimax Rotation. The results are presented in Table 3. Hair et al [29] noted that the factor loadings larger than 0.40 are quite understandable and acceptable to form the underlying scale in the factor analysis. As it can be observed from Table 3, all factor loadings are higher than 0.40 and in fact factor loading usually turned out to be much higher (larger than 0.80). On the other hand, the factor loadings of individual items to other scales have yielded quite lower scores (0.20 or lower) that is another indication that the scales have discriminate validity.

5.4 Research Hypothesis

In order to actually perform a behavior, we usually first need to form positive intentions towards performing the particular behavior. Intentions have major influences on actually performing that particular behavior and in mediating the effects of other determinants of such behavior on actual performance [73]. Hence, Behavioral Intention is the major mediating variable in intention based theories towards the actual performance.

H_1: Behavioral intention is the major determinant of individuals' actual online shopping behavior (AU).

The relationship between Attitudes and Behavioral Intention is well established in TRA and TPB literature [21]. Attitudes derive from individuals' beliefs of adopting particular technology would lead certain consequences [49]. The more favorable one's attitude respects to a behavior, the stronger his or her intention to adopt the behavior and vice versa.

H_2: Personal attitudes are affecting individuals' behavioral intention to shop online

Over the last decade, cumulating evidence from TAM studies have strongly demonstrated the positive and profound effects of Perceived Ease of Use and Perceived Usefulness on forming positive or negative Attitudes to use or not to use particular ICT. If we perceive a technology would be easy to use and useful, we would most likely form positive attitudes towards using such technologies.

H_3: Perceived usefulness and perceived ease of use would form personal attitudes to shop online

The causal possible link between Perceived Ease of Use and Perceived Usefulness was first proposed by Davis [19] and validated by other studies in technology acceptance literature employing TAM framework. The correlations between PEU to PU and PU leading to BI are likely to be stronger when technology use is optional, as it is largely in doing Internet Shopping.

H_4: Higher perceptions of ease would significantly and positively affect perceptions of usefulness

Humans usually do not like changes. The literature suggests that innovations persistent and consistent with existing values, past experiences, and current needs are more likely to be perceived easy to use and useful [49]. Hence, such technologies are more likely to be adopted.

H_5: Individuals' perceptions of technology compatibility would determine their perceptions of ease and usefulness

TPB includes Perceived Behavioral Control as an important determinant of Behavioral Intention and Actual Usage. PBC reflects users' perceptions of internal and external constraints; hence consumers' perceptions of individual internal and external control, would have effect on their intentions, and eventually affect actual utilization of Internet for shopping. The easier, simpler, and more controllable that performing particular behavior is perceived to be, the more likely and stronger we form intentions to perform that particular behavior and actually performing it [21].

H_6: Perceived behavioral control of individuals would form behavioral intention and actual use decisions (AU)

The internal perception of behavioral control is self confidence in the ability to conduct particular behavior. Behavior towards adopting a particular technology is strongly influenced by self-confidence (*or self-efficacy - SE*) to be able to use that particular technology. Resource Facilitating Conditions (*RFC*) is our beliefs and perceptions of availability of resources to perform particular behavior. If individuals perceive that they have the necessary resources to do Internet shopping, they are most likely to form perceptions of behavior control of shopping online and engage in that behavior.

H_7: Self efficacy of individuals and their perceptions of resource facilitating conditions would form their perceptions of behavioral control

Research in psychology argues that Subjective Norm is an important determinant of intentions. While TAM does not include SN, TPB includes SN as a determinant of Behavioral Intentions. However, empirical evidence is mixed on the effects of SN on Behavioral Intentions [73]. Attitudes and beliefs of others in a group towards to usage of particular technology will shape our intentions to use that technology.
H_8: Subjective norm perceptions of individuals would determine their online purchasing intentions

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The hypotheses presented above are tested and the results are elaborated in the following sections.

5.5 Model Testing Results

Previously discussed models based on two theories, namely e-TAM and TPB, have been tested with Structural Equation Modeling technique [36]. The analysis results have been presented in the Figure 1, Figure 2 and Table 3 below and discussed as follows. Figure 1 below displays all of the structural relationships among e-TAM constructs. Path coefficients, their significance and R^2 values for each dependent constructs are all presented in the Figure 1 as well.

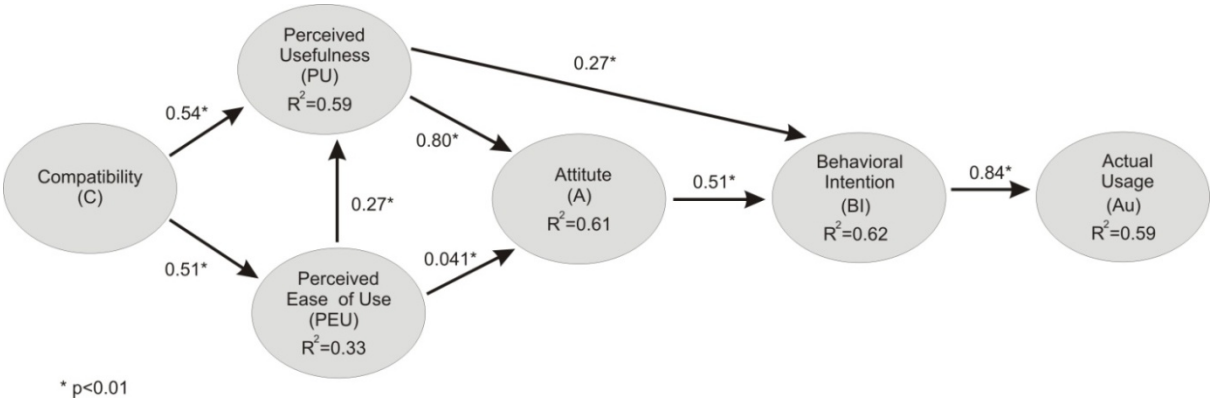

Figure 1: Analysis results of e-TAM model

As indicated in Figure 1, the paths from perceived ease of use to perceived usefulness and attitude are significant at the low significance level (p<0.01), as the paths from perceived usefulness to attitude and behavioral intention are significant at again the low significance (p<0.0.1). The paths from behavioral intention to actual use and compatibility to perceived use and perceived usefulness are also significant with low significance (p<0.01). Hence, all the theoretical relations have strongly supported with the data available. The explanatory powers of dependent constructs are quite high at 59 percent for actual use, 62 percent for behavioral intention, 61 percent for attitude, 59 percent for perceived usefulness and 33 percent for perceived ease of use. Therefore, all theoretical paths, representing relations have turned out be highly significant. Figure 2 below displays model test results and model test parameters for TPB.

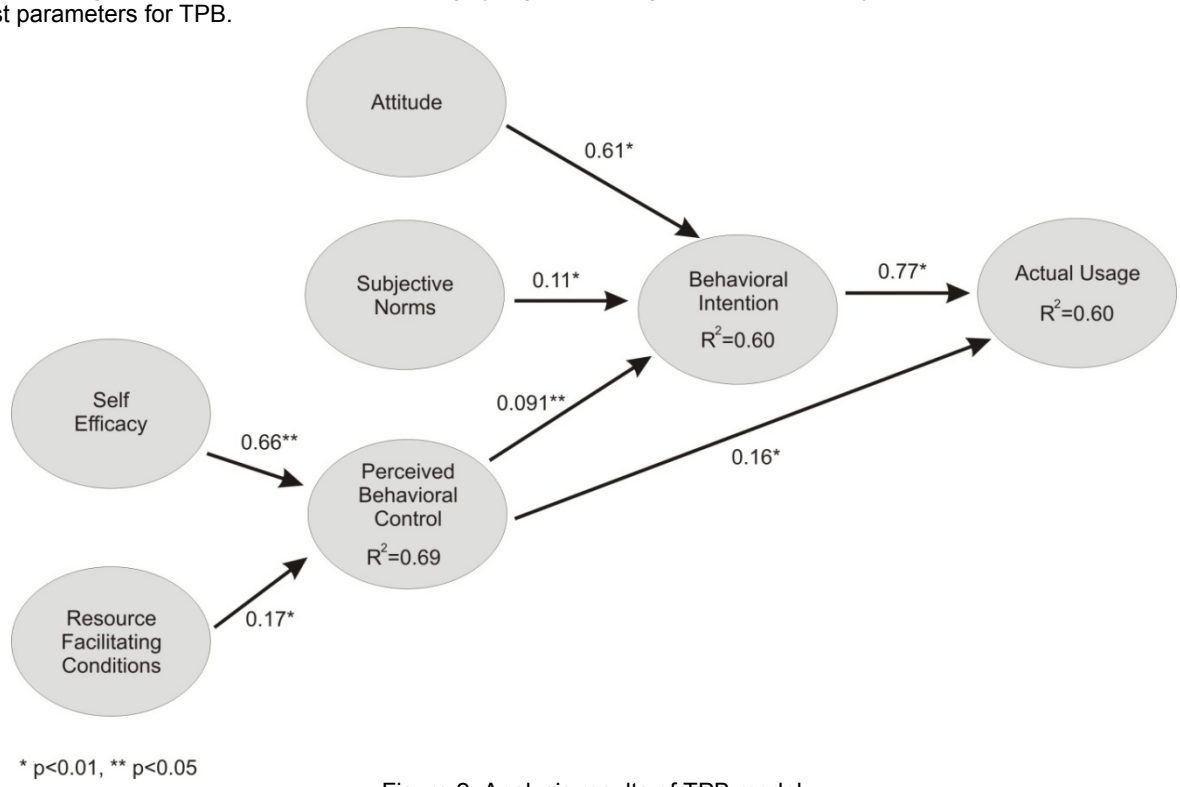

Figure 2: Analysis results of TPB model

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As indicated in Figure 2, all paths from behavioral intention to actual use, perceived behavioral control to actual use, attitude, subjective norm, and perceived behavioral control to behavioral intention, self-efficacy, and resource facilitating conditions to perceived behavioral control are significant at low significance level of 1 percent. The proposed relationships between perceived behavioral control to behavioral intention and self-efficacy to perceived behavioral control have again revealed significant paths, yet with higher significance level of 5 percent. The explanatory powers of dependent constructs are pretty high with 0.60 percent for actual use, 0.60 percent for behavioral intention and 0.69 percent for perceived behavioral control. Relatively large R^2 values indicate that important portion of variances in dependent variables can be explained by independent variables in models. Therefore, intention based theories, especially TPB, is a good explanatory framework of intention and behavior to prefer to use online shopping tools. The findings reveal that besides ease of use and usefulness, there would be other factors to consider in online shopping behavior.

Table 4 below summarizes, compares and discusses the major fit indices and explanatory powers of proposed relationships in the previously mentioned two theoretical models.

Table 4: Fit indices and explanatory powers of the structural models

Criteria	e-TAM	TPB	Recommended Criteria
df	7	8	
$\chi 2$	173.18	66.90	
$\chi 2$/df	24.74	8.36	<= 3
AGFI	0.57	0.82	=> 0.80
CFI	0.88	0.96	= > 0.90
NNFI	0.73	0.90	= > 0.90
RMSEA	0.262	0.146	< = 0.10
Explanatory Powers			
R^2_{AU}	0.59	0.60	
R^2_{BI}	0.62	0.60	
R^2_{A}	0.61	-	
R^2_{PU}	0.59	-	
R^2_{PEU}	0.33	-	
R^2_{PBC}	-	0.69	

Table 4 above shows overall good fit statistics for TPB model, yet the fit indices for e-TAM have not come out to be very good, compared with the suggested fit criteria by Bagozzi and Yi [9]. In addition, Table 4 summarizes the variance explained (*R^2 values*) of each dependent construct (*regression models*). The observed $\chi 2$ for structural models for e-TAM and TPB are 173.18 and 66.90 respectively. The $\chi 2$/df values for e-TAM and TPB are respectively 24.74 and 8.36 that are above the benchmark level of 3.0. The fit indices of AGFI, CFI, NNFI of TPB are above their recommended level, making the model a good fit. Yet, the same fit indices of e-TAM are below the recommended level, making the model a poor fitted model. Similarly, RMSEA has turned out to be higher than recommended level of 0.10 for both models, not satisfying the recommended criteria by Bagozzi and Yi [9]. Overall, while TPB has provided better fit indices, e-TAM has not revealed good fit indices values. The explanatory powers of regression models have revealed comparable results in both underlying theories usually around 60 per cent levels.

6 Discussions and Summary

Information Technology can significantly increase personal and organizational performance and productivity. Developing countries are facing many barriers hindering the adoption and diffusion of ICTs. Some of these barriers are lack of sufficient IT structure, IT expertise, government support, conceiving of information as an important assets, and effective national policies pertaining to information technology [43]. However, accelerating globalization and increasing deployment of IT in developing countries occur, ICTs adoptions in non-Western countries are gaining significant pace and success.

Although there are a number of studies on Internet shopping, there is no coherent model to comprehend consumer acceptance of online shopping [74]. This study compares the two most widely used, competing and extensive theoretical models (*Extended TAM and TPB*) to explain Turkish consumers' online shopping behaviors. Overall, TPB gave better empirical results and model fit indices than e-TAM. If we examine more closely path significance and their explanatory power, the following conclusions could be made.

1. In both models, behavioral intention is the main determinant of actual use behavior. Hence, H_1 is accepted. In TPB, PBC is also an additional determinant of behavior. In terms of the ability of additional models to explain actual use, e-TAM and TPB are roughly equivalent. e-TAM explains about 59 percent and TPB explains about 60 percent of the variance in actual use.

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2. Regarding the explanatory power of behavioral intention between two models, e-TAM explains about 62 percent and TPB explains about 60 percent of the variance in behavioral intention. This result indicates that, although TPB has more variables to explain behavioral intention, the explanatory power turned out to be lower than e-TAM. Therefore, e-TAM offers fewer, but better, variables to explain variability in behavioral intention.

3. The findings of this study showed that consumer intentions to shop online can be explained by attitude in both models. Therefore, H_2 is accepted. As TAM asserts, customers that perceive a higher usefulness and ease of use of web sites would have more positive attitudes to shopping online. H_3 is accepted. In addition, higher perceptions of ease of use would significantly affect perceptions of usefulness, meaning H_4 is accepted. Hence, it is important to create web sites that are easy to use and that have useful tools and features.

4. Compatibility constructs significantly affected and explained variability in both ease of use and usefulness perceptions. Hence, H_5 is accepted. As consumers begin to consider online shopping as fitting their lifestyles and shopping needs, they will have higher perceptions of usefulness and ease of use.

5. In the TPB model, perceived behavioral control significantly and positively affects behavioral intention and actual use. That means that H_6 is accepted. Perceived behavioral intention, in turn, is significantly and positively determined by self-efficacy and resource facilitating conditions. Therefore, H_7 is accepted. This is consistent with previous findings (for example, [27]). Consumers who are confident and familiar with using technology and the Internet and that have easy online access are more likely to shop online.

6. Regarding the subjective norm construct of TPB, empirical results suggest that friends, family, and colleagues of potential Internet shoppers positively and significantly influence those individuals' online purchasing decisions and behaviors. Therefore, H_8 is accepted.

As discussed above, all research hypotheses have been supported by empirical results that gave significant support to theoretical frameworks discussed before with the Turkish consumer sample. TAM could be adequate to explain individual technology adoption at the workplace, where technology adoption is unavoidable, if not mandatory. In such situations usefulness and ease of use might be dominant factors behind technology use [71]. However, when individuals have a choice to pick particular media, then the decision is guided by more salient beliefs and criteria than simply usefulness and ease of use. Therefore, considering online shopping involves a number of individual preferences, choices, and to a large extent, consumer discretions; we would expect TPB would provide better explanation of individual choice.

By further comparing these two models, as Bagozzi [8] recommended the more parsimonious that the model is, the better model it is. TPB has seven variables and e-TAM has six variables that both models have almost the same number of variables, they are equivalently parsimonious. They have almost the same complexity; hence TPB is a better explanatory model of online shopping behavior, given better fit indices and higher explanatory powers of independent variables. If our sole objective is to predict online shopping behavior in terms of technology adoption, e-TAM would be a better model, while TPB provides an improved and more detailed method of predicting consumer intentions to shop online [42].

From a developing country perspective, this research would also offer some valuable insights. In developing countries, socio-cultural variables discussed by Hofstede [34] offer some differences comparing to developed nations that would tie behavioral based theories discussed in this article. One notable dimension would be individualism, which is the degree that individuals are integrated into groups. According to Hofstede [34], Turkey is a primarily collectivistic society, that is, individualism index is rather low (*37 among 91 countries*). This finding is emphasized in TPB with significant subjective norm variable in this research, where Turkish customers are highly affected and influenced by immediate friends and families. The compatibility dimension would be another interesting perspective having unique characteristics for developing countries, where lack of resources and lower per capita income is usually an issue. In this research, compatibility and resource facilitating conditions are influencing significantly and positively according to both theoretical frameworks, namely e-TAM and TPB. This finding is rarely surprising, given that the first priority in a developing country would be to utilize very limited resources in an efficient way and have all the resources, especially technology, in place and available at one's disposal.

The major limitation of this study is that the research sample is composed of mostly individuals with high Internet experience and availability of Internet access in a university setting, collected by convenience sampling. Yet, collecting data from the pool of Internet user students is a common practice of empirical studies of Internet shopping [71]. On the other hand, as literature suggests (for example, [37]) behavioral changes are largely based on experience level. However, given limited income and lack of experience, infrastructure and education, in a developing country context, accessing the Internet, let alone online shopping, is a high aspiration for large part of the population. Therefore, conducting research among individuals with higher education and presumably higher income levels will be largely justified.

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In addition, different product types cause different online shopping experiences, and limited academic attention so far has been given to product type and online shopping preferences [74]. Further research would also be useful to investigate specific online marketing strategies that would attract female customers, since they are the major shoppers in traditional stores [74]. Hence, further research would be useful to compare and contrast with individuals with low and high levels of Internet and online shopping experiences with different genders and ages.

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Appendix A: The Scales

Variable	Measure
Gender	Female Male
Marital Status	Single Married Other (Divorced, Separate)
Year of Birth	Entered
Monthly Income (TL/Month)	Below 500 501-1000 1001-1500 1501-2000 2001-2500 Above 2501
Education	High School Some College College Graduate Masters Doctorate
Frequency of Internet Usage	Everyday Couple of Times Weekly Once Every Week Couple of Times Monthly Once Monthly
Average Monthly Internet Usage Hours	1-5 Hours 6-10 Hours 11-15 Hours 16-20 Hours Over 21 Hours
How Many Years Actively You Use Internet	Less Than 1 Year 1-2 Years 3-4 Years 5-6 Years Over 7 Years
Is Internet Shopping Enjoyable?	Yes No
Is Internet Shopping Safe?	Yes No
Have You Shopped on Internet so far?	Yes No
For How Many Years Are You Shopping Online?	Less Than 1 Year 1-2 Year 3-4 Year 5-6 Year Over 7 Years
How Many Times Have You Shopped on the Internet?	Entered
Approximately Value of Your Internet Purchase so Far?	Entered
Mostly Used Method of Payment of Your Internet Shopping?	Money Transfer Credit Card Virtual Credit Card Payment at the Door Money Order
Which Products are You Mostly Buying Online?	Book DVD/CD Electronic Products Home Appl. Clothes/Accessories Health/Cosmetic Other
Which Services are You Mostly Buying Online?	Flight Reservations Hotel/Tour Reservations Banking Other
Scales for Theoretical Models are Presented in Table 3	1 : Strongly Disagree 5: Strongly Agree