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School of Economics and Management

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Analyzing Key Factors Affecting the Adoption Intentions of 3G Mobile Services in Turkey

Ezgi Baran
ezgi.baran.030@student.lu.se

Abstract: Third generation mobile communication standard (3G) is an incremental innovation which follows the prior developments from 1G to 2,5G and provides several services including intranet/extranet access, customized infotainment, multimedia messaging service, internet access, location-based services and rich voice. This study aims to analyze key factors influencing possible 3G acceptance in Turkey, where 3G is expected to be released by July, 2009. This study provides explanations to (1) the significance of the influence of critical factors, adapted from established theories of innovation, on the acceptance of 3G (2) demographic characteristics of the individuals influencing adoption intentions of 3G technologies. In doing so, this study draws upon several well-known theories, namely, technology acceptance model (TAM), the theory of planned behavior (TPB), diffusion of innovation theory and network externalities theory. The study is conducted via an online survey, through which 282 responses are obtained. It uses descriptive statistics and Multinomial Logistic Regression to analyze data and examine the influence of the defined critical factors and demographic characteristics on 3G adoption intentions.

Keywords: Innovation, adoption, diffusion of innovations, network externalities, 3G

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CHAPTER 1
INTRODUCTION

The first cellular phone call was placed in 1973 in the USA, which has given the start in cellular telecoms industry. Afterwards, the focal center for the continuous innovations in the industry was not the USA. Japan introduced the first cellular network in 1979, three years earlier than the USA did. First internationally roaming cellular network standard, NMT (Nordic Mobile Telecoms) was commercialized in 1981 and the first digital cellular network, GSM (Global System for Mobile communications) was initiated in 1991 in Finland (Ahonen et al. 2004, p.2).

Third generation of mobile technology, 3G, has become widespread more and more around the globe owing to the various applications it brings to the mobile phones. 3G mobile technologies can be seen as an incremental innovation that stands over the continuous development starting from First Generation (1G) which was emerged in early 1990s, allowing voice traffic only, to Second Generation (2G) which appeared in 2000s, allowing limited data services like Short Message Services (SMS) and lastly to Second and the half generation (2,5G) evolving between the years 2000-2002, providing personalized data services, Intranet access and emailing through Wireless Application Protocol (WAP) applications. (Campilho & Kamel, 2004, p.224) As WAP was introduced to the mobile phones, bringing Internet to the pockets, it gave rise to high expectations. Although WAP is considered to have reached success in Asia, USA and Canada, it turned out to be a failure in Europe, because of the tiny screens, slow connections and high prices (Ahonen et al. 2004, p6). What 3G brought to the mobile technologies over these previous developments can be listed as mobile intranet/extranet access, customized infotainment, multimedia messaging service, mobile internet access, location-based services and rich voice. (UMTS Report 09, p44) Mobile intranet/extranet access is a business service that allows secure access to Local Area Networks (LAN) and Virtual Private Networks (VPN). Customized infotainment provides device-independent access to personalized content. Multimedia messaging services include communications by text, graphics, images, audio and video. Mobile internet access provides full access to the Internet, including file transferring, e-mailing etc. Location based services allow users to identify their location and find other users by making use of terminals and vehicles. Rich voice service facilitates advanced voice capabilities, for example Voiceover IP, VoIP, Web-initiated phone calls, etc. (UMTS Report 09, p61) The usage rates of mobile services such as video and multimedia messaging have been increased together with the

progresses in the 3G networks (Lin et al. 2008, p.2048). According to the "3G/UMTS Evolution: Towards a new generation of broadband mobile services" report by UMTS Forum, by 2006 3G network reached 100 million subscriptions, with a rate of 3 million subscribers per month (UMTS Forum 2006, p.2). UMTS Report 13 forecasts that by 2010, subscribers will spend about $30 per month for 3G services and total 3G services provider-retained revenues will exceed $ 300 million. (UMTS Report 13, p.2) While world is getting for the 4G technology, Turkey, being a late-comer, is preparing for the infrastructure of this new technology and said to be ready for the utilization of it by July 2009.

1.1 Purpose of the Study

As experienced in the introduction of all new, innovative products and services, '3G technology initiate' in Turkey brings some uncertainties that may obstruct the intentions of people to purchase. One objective of my research thesis is to understand the customer perceptions concerning 3G mobile services, revealing the important attributes of this technology that affect the possible adoption rates.

Other than the customer perceptions about 3G mobile services, user characteristics also tend to affect the adoption rates of the innovations. Individuals, who are more innovative, are more eager to try out new technologies, hence more likely to adopt innovations, while less innovative ones should be more hesitant. Regarding the 3G innovation in Turkey, this study also aims to reveal whether personal innovativeness affects the adoption intentions of people.

Another objective in this study is to inquire the importance of the network effects on the adoption intentions of innovations. Mobile technologies bring more benefits to users when more people use it in the network. This research will show the impact of network effects on the adoption intentions of 3G mobile technologies.

I have chosen to analyze the 3G mobile technologies because mobile services is a dynamic and fast improving market, which is continuously emerging new properties and diffusing to all over the world. The number of people using mobile services like video, multimedia messaging, etc has increased thanks to the advances in wireless technology and 3G networks (Tang, 2008) However it shouldn't be forgotten that the diffusion process is subject to different rates of adoption, depending on the development levels of countries, education levels, income levels, cultural norms, etc. Since 3G service is not available in Turkey now, a basic pre-market analysis, concerning the potential customers' views, expectations and perceived drawbacks about the 3G technology, can be helpful for the 3G

service providers and the 3G mobile phone producers in defining designs, starting prices, services, advertisements, campaigns, etc. Hence, from a practical perspective for the 3G service providers and the 3G mobile phone producers, the thesis will shed light on the adoption criteria of the customers, their perceptions regarding the possible benefits and drawbacks of the new technology, and show the target market regarding demographics like age, gender, education levels. From academic point of view, the thesis will reveal factors affecting the adoption rates of 3G in a developing country, hence give way to further cross-national studies. Also network effects and personal innovativeness dimensions, which are considered as important factors in the literature, will be tested for the 3G innovation in Turkey.

1.2 Review about Turkish consumers

In order to get a clear understanding of the Turkish consumers regarding the IT technologies' usage and awareness, The Ericsson Consumer Lab has prepared a report, named Turkey Report 08 (Kulabas, Y. 2008). According to the report, Turkey has great interest on IT services, more than average, but usage of these services is below the average. People, who have an internet connection at their houses, have been increased from 25% in 2006 to 47% in 2008, showing an almost 100% increase in two years, which verifies the increasing addiction to information technologies. Additionally, the report has revealed that the majority of people are more willing to adopt new technologies with relevant support, which gives clues to the 3G mobile phone producers and service providers to put emphasis on publicity campaigns. Concerning the 3G awareness, 19% of people know about the 3G technology. However half of the people are willing to utilize those mobile services everyday which illustrates a significant market potential for the mobile phone services and 3G. Also it should be noticed that this survey was conducted in 2008, hence in the meantime, approaching closer to the installation of 3G, more people should have been informed of the technology with increasing advertisements.

1.3 Research Questions

Considering the overall purpose, research questions can be constructed as follows:

- What are the critical factors that drive consumers' acceptance and adoption of 3G technologies in Turkey?

- How do the demographic characteristics of the individuals affect the acceptance of 3G technology in Turkey?

CHAPTER 2
THEORETICAL FRAMEWORK

Innovation is defined as an idea, practice or object which is perceived as new by the unit of adoption (Agarwall & Prasad, 1997 p.560: Zaltman et. al., 1973). A vast literature have searched about the adoption and diffusion of innovations, developed models to reflect the rates of adoptions and to perceive consumer behaviors and attitudes towards innovations. Innovation adoption has been addressed in different disciplines, such as in marketing literature by Mahajan, Muller & Bass (1990), in organizational theory by Zaltman et. al. (1973), in social psychology by Ajzen & Fishbein (1980) (Agarwal & Prasad, 1997). Several models have been cited in the adoption research including Theory of Reasoned Action (Ajzen & Fishbein, 1980), Technology Acceptance Model (Davis et. al., 1989), Theory of Planned Behavior (Ajzen, 1991) and Diffusion of Innovation Theory (Rogers 1995).

2.1 The Theory of Reasoned Action

The Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein (1980), proposes that intention to perform a behavior determines the behavior, while intention is shaped by attitude of the individual and the subjective norms. Individual's attitude towards accepting an innovation is described as personal beliefs regarding the outcomes of the adoption. Social norms imply adopter's perceptions of the social pressure regarding the behavior. The latter models, Technology Acceptance Model and Theory of Planned Behavior are based on the refinement of the preceding model, Theory of Reasoned Action.

2.2 Technology Acceptance Model

Since seventies, considerable research has been made on identifying the conditions and factors influencing the integration of the computer systems into business (Legris, Ingham & Collerette, 2003). Many of these innovation acceptance researches have made use of the Technology Acceptance Model (TAM), which aimed to explain information systems (IS) adoption. (Plouffe, Hulland & Vandenbosch 2001). TAM proposes that attitude towards using

a system is controlled by two external variables, namely perceived usefulness and perceived ease of use. Attitude towards using a system directly affects the behavioral intention to use the system, which then determines the actual system use. (Davis et al., 1989) *Perceived Usefulness* is defined to be "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational concept" while *Perceived Ease of Use* is described as "the degree to which the prospective user expects the target system to be free of effort". (Davis et al., 1989) Various researches have utilized TAM to study the acceptance of different Internet-based technologies such as World Wide Web by Agarwal & Prasad (1997), online shopping by Gefen et. al. (2003). Theory of Planned Behavior (TPB), developed by Ajzen (1991), has extended TAM to include Perceived Behavioral Control as a factor determining the behavioral intention together with the other factors Attitude and Subjective Norms. Perceived Behavioral Control is illustrated as the individual's confidence and control over performing that behavior.

2.3 Diffusion of Innovation Theory

Diffusion of Innovation Theory, developed by Rogers (1995), has brought a deep understanding with regard to the characteristics of adopters, innovation-decision process and adopter behavior over time. The innovation decision process is defined as a five-staged process which takes start when an individual gains first knowledge about an innovation (1), later he develops an attitude toward the innovation (2), then arrives at a decision of adopting or rejecting (3), steps to the implementation of the innovation (4) and ends up with confirmation of the decision (5). (Rogers, 1995) Individuals form a favorable or unfavorable attitude in the second phase, the persuasion stage, depending on the perceived characteristics of the innovations. According to Rogers (1995), the previous literature is based on the 'people differences' in innovativeness, pointing out different adopter categories – innovators, early adopters, early majority, late majority, laggards - and indicated the lack of the analyses about 'innovation differences', specifically the attributes of innovations which give rise to differences in rate of adoption in different innovations (Rogers, E.M. (1995) p. 204). Rogers defined five perceived attributes of an innovation, determining the rate of adoption of innovations:

Relative Advantage: the degree to which the innovation is perceived as superior than the one it replaces

Compatibility: the degree to which the innovation is perceived to show consistency with the existing values, past experiences, etc

Complexity: the difficulty degree to which the innovation is perceived to be understood and used

Trialability: the degree to which the innovation is perceived to be open for trials on a limited basis

Observability: the degree to which the results of the innovation are perceived to be observable by the others

2.4 Extensions of the Diffusion and Acceptance Theories

A substantial amount of researches have utilized and extended the model of the perceived attributes of innovations. Moore and Benbasat (1991), in their research designed for measuring different perceptions of individuals that affect the adoption of information technology (IT) innovation, developed five perceived attributes model and included two more influential aspects, image and voluntariness of use. Image is defined as the degree to which the use of an innovation is perceived to improve the adopter's social status. Rogers has analyzed image as a feature of relative advantage; however Tornatzky and Klein (1982) have discussed that the impact of 'image' is different enough from 'relative advantage' to be studied as a separate aspect (Moore and Benbasat, 1991, p 195). Another attribute introduced by Moore and Benbasat is the voluntariness of use, which is defined as the degree to which the use of an innovation is perceived as voluntarily. Moore and Benbasat also diversify from Roger's model with respect to the handling of perceptions. Rogers investigate individual perceptions of innovation itself, while Moore and Benbasat examine the perceptions of using the innovation, which is consistent with the discussion of Ajzen and Fishbein (1980, p8) about the difference between attitudes and behaviors. Another point Moore and Benbasat have indicated is the affinity between the models, Technology Acceptance Model and Diffusion of Innovation Theory. Two variables of TAM, perceived usefulness and perceived ease of use are the identical with the two attributes of Diffusion Theory, relative advantage and antonym of complexity.

Lu et. al. (2003) researched factors affecting the acceptance of Wireless Internet via Mobile Technologies (WIMT) in China. With this aim, they developed a technology acceptance model, proposing six key elements as influential in acceptance of WIMT; Wireless trust environment, perceived usefulness, perceived ease of use, facilitating conditions, system

complexity and social influences. Security and privacy matters have been addressed under wireless trust, while resource factors such as time and money together with technology factors including compatibility issues are handled under facilitating conditions. Social influences are described to comprise both 'subjective norms' from TRA and 'image' from Diffusion of Innovations Theory.

Venkatesh et al. (2003) reviewed eight leading models regarding IT acceptance, and developed a unified model. Performance expectancy, effort expectancy, social influence and facilitating conditions are modeled as the direct determinants of user acceptance. Performance expectancy is inspired from relative advantage and perceived usefulness, while effort expectancy is aroused from perceived ease of use and complexity.

Childers et al. (2001) developed an attitudinal model reflecting motivations to engage in online shopping, including both utilitarian and hedonic dimensions. Usefulness, ease of use and enjoyment are defined as variables determining the attitude towards online shopping. Igbaria et. al. (1996) utilized a motivational model of microcomputer usage, proposing perceived usefulness, perceived enjoyment and social pressure as driving forces for increased use of microcomputers. The research hypothesized that, individuals experiencing pleasure and joy from using microcomputers use the technology more extensively than others.

Agarwal & Prasad (1998) proposed a new construct to technology acceptance models, "personal innovativeness in the domain of IT". Rogers (1995, p.252) defined innovativeness as the degree to which an individual is earlier in adopting innovations than others; hence used innovativeness in 'time of adoption' context. However, Agarwal & Prasad (1998) redefined innovativeness concept and described it as the individual's willingness to try an innovative information technology.

Pagani (2004) has formulated a model intended for revealing the determinants of consumer adoption of 3G mobile multimedia services. The model is based on TAM, where perceived ease of use and perceived usefulness determines the attitude toward using the technology and behavioral intention to use is controlled by attitudes generated. In the study, different factors influencing perceived ease of use and perceived usefulness are defined. Input device, output device, software facilities and bandwidth affects user's perceived ease of use, while service offerings, degree of mobility and compatibility affects user's perceived usefulness. Also, price and enjoyment are included as two significant constructs affecting the user's intention to use.

2.5 Network Externalities

Another important factor affecting the adoption of telecommunication innovations is the network externalities. Network effect theory described the network effect as the change in the benefit obtained from a good or service, when the number of the other users changes (Liebowitz & Margolis, 1994). Gruber and Verboven (2001) explained network externalities as “a system is subject to network externalities if consumers value a system more the more users adopt it”. Katz and Shapiro (1985) have distinguished three sources of positive externalities; direct network externalities implies the direct physical effects of the number of the users on the quality of the product or service while indirect network externalities is driven by interdependencies between complementary goods. Third source for the positive externalities is described as the quality and the availability of the post-purchase service increases as the size of the network becomes larger. Schoder (2000) stated that telecommunication services like sending and receiving messages, online chat services, video calls, online multi-player games, etc lead to direct network effects.

CHAPTER 3
RESEARCH FRAMEWORK AND HYPOTHESES DEVELOPMENT

The main goal of this study is to reveal the factors influencing the acceptance of the third generation mobile services in Turkey. The factors are examined under two headings; one is the critical factors that are defined to influence the acceptance of 3G, while the other is the demographic characteristics.

3.1 Critical Factors Affecting Acceptance of 3G

Reviewing the innovation adoption literature, it is obvious that there are several factors explored, affecting the adoption of innovations. Based on the literature; the factors, which are observed as more influential in the 3G acceptance, are listed as follows:

- *Perceived usefulness*
- *Perceived ease of use*
- *Perceived enjoyment*
- *Image*
- *Personal innovativeness*
- *Network effects*

Six hypotheses have been developed which fall into three major research fields, perceived innovation characteristics, user characteristics and network externalities theory. The factors and the related hypotheses are stated as follows:

3.1.1 Perceived usefulness

Perceived usefulness, first explored by Technology Acceptance Model by Davis et al. (1989), is also a critical factor, with the name ‘relative advantage’, in the Diffusion of Innovations Theory by Rogers (1995). Reviewing the literature, both perceived usefulness and relative advantage have been analyzed as a crucial construct affecting the acceptance of the innovations (Lu et al., 2003; Taylor & Todd, 1995; Moore & Benbasat, 1991; Agarwal & Prasad, 1997). Hence, considering 3G mobile technology implementation in Turkey,

perceived usefulness is considered as an influential factor directly affecting the acceptance of the technology.

H1: *Perceived usefulness of the third generation mobile technologies has an influence on the adoption intentions.*

3.1.2 Perceived Ease of Use

Perceived ease of use is also first mentioned in the Technology Acceptance Model. Later, Rogers (1995) utilized the opposite of the concept 'complexity' in Diffusion of Innovations Theory. Many studies have proposed that, systems which are perceived to be easier to use and less complex are more likely to be adopted by users (Moore & Benbasat, 1991; Lu et. al., 2003). Hence, for the 3G mobile technology acceptance research, perceived ease of use is proposed as an influential factor directly affecting the adoption of the technology.

H2: *Perceived ease of use of the third generation mobile technologies has an influence on the adoption intentions.*

3.1.3 Perceived Enjoyment

Igbaria et al. (1996) has defined perceived enjoyment as intrinsic motivation for using the technologies and proposed that individuals, who find it enjoyable to use microcomputers, apart from their performance concerns, are more likely to use the technology extensively. Exploring the motivations to do retail shopping in their research, Childers et. al. (2001) have illustrated the strong influence of enjoyment on attitudes. Hence, concerning 3G acceptance in Turkey, perceived enjoyment is considered as an influential factor in adoption of the technology.

H3: *Perceived enjoyment of the third generation mobile technologies has an influence on the adoption intentions.*

3.1.4 Image

Image, which is analyzed under 'relative advantage' attribute in Diffusion of Innovations theory, is the degree to which adopting an innovation is perceived to be a status symbol and to provide a high profile (Moore and Benbasat, 1991). Lu et. al. (2003) also utilized 'image' with subjective norms, and analyzed the social influence which is considered as an influential factor affecting the acceptance of innovations. Hence, considering 3G mobile technology implementation in Turkey, image is considered as an effective factor influencing the acceptance of the technology.

H4: *Image has an influence on the adoption intentions of the third generation mobile technologies.*

3.1.5 Network Effects

Network effects, despite being very crucial on the adoption of communication technology innovations, were not considered as a distinct variable in the 'Structural Model' developed by Pagani (2004). Nevertheless, Pagani and Fine (2008), in their research about the forces influencing the 3G wireless communication networks, have complemented the research with different systems thinking approaches. In the study, 'network externalities loop' is developed which illustrates that additional customer adoption extends the user population, which then gives rise to increasing returns per user. Consequently total expected benefits to new adoption also increases and causes further new adoptions. These causes and effects generate a loop inside, triggering one another. In addition, Pagani (2004) proposed that one feature of perceived usefulness by adopters is the ability to utilize the services with others; hence network effects tend to have an essential impact on perceived usefulness, as well.

Considering the adoption of 3G technologies, network effects tend to affect the consumer intentions, with the logic that users will get additional benefits as the network expands – video calls, multi-player games, multi-media messaging services will be more available as more people adopts the technology. Thus, network effects are proposed to be effective on the adoption intentions of the 3G technologies.

H5: *Network effects have an influence on the adoption intentions of the third generation mobile technologies.*

3.1.6 Personal Innovativeness

Agarwal and Prasad (1998) have claimed that individuals, who have high innovativeness, are more likely to develop positive perceptions towards the innovation in terms of relative advantage, ease of use; hence are more eager to use it. Earlier research has revealed that personal characteristics highly affect decisions to adopt or reject innovation (Rogers, 1995). Hung, Ku and Chang (2003) proposed that personal innovativeness plays an important role in shaping individual's attitude towards the usage of Wireless Application Protocol (WAP) services. Besides, Karahanna et al (2002) have deduced that personal innovativeness is one of the influential factors affecting individual's perceived relative advantage of using Group Support Systems (GSS). Regarding 3G adoption in Turkey, the innovators and early adopters tend to be the ones who will adopt the technology before the others do; hence personal innovativeness is also included in the research as an influential variable on adoption intentions.

H6: *Personal innovativeness has an influence on the adoption intentions of the third generation mobile technologies.*

3.2 Demographic Characteristics

After exploring a vast literature, Rogers (1995, p.269) have deduced several generalizations about the adopter characteristics affecting innovativeness. Socioeconomic status, personality values and communication behavior are the headings under which Rogers has placed the related deductions. Under the heading socioeconomic status, the generalization he has arrived at regarding the characteristic 'age' is stated below:

- *"Earlier adopters are not different from later adopters in age"*

Relationship between age and innovativeness is generalized as insignificant however there are some studies showing that early adopters are younger and some others showing that they are older as well.

Another generalization Rogers arrived at is related with the education levels of the individuals, stated as: (Rogers, 1995, p.269)

- "Earlier adopters have more years of formal education than later adopters."

According to Rogers, previous literature has shown that education levels of the individuals are effective on their adoption intentions for innovations.

Another demographic characteristic that is under focus in this research study is the city size. City size and distance are identified to be two essential factors that explain the spatial diffusion of innovations (Murayama et al, 2000, p19). City size is found to be influential in innovation adoptions; larger cities tend to encourage both innovation and its diffusion. The flow of information is rapid in large cities owing to the higher population density that promotes human contacts. Another reason can be stated as more concentrated educational activities taking place in large cities (Bairoch, 1991, p336). Hence city size is also considered as an effective demographic factor and included in this research study.

Occupation and gender are other demographic control variables that are examined in the research paper. The significance of the influence of these variables on adoption intentions is inquired.

To sum up, demographics control part in this research study is seeking for whether there exists a relationship between the characteristics gender, age, education levels, city of residence and occupation of the participants and adoption intentions for 3G technologies. Therefore, following hypotheses are generated:

H7: *Age of the individuals has an influence on the adoption intentions of the third generation mobile technologies*

H8: *Gender of the individuals has an influence on the adoption intentions of the third generation mobile technologies*

H9: *Education level of the individual has an influence on the adoption intentions of the third generation mobile technologies*

H10: *The city of residence of the individual has an influence on the adoption intentions of the third generation mobile technologies*

H11: *Occupation of the individual has an influence on the adoption intentions of the third generation mobile technologies*

CHAPTER 4
METHODOLOGY

Considering the research topic, which is about the consumer behaviors and perceptions concerning innovations, particularly the 3G technology, it may be deduced that individual viewpoints are inquired. The appropriate research designs for this study can be seen as the qualitative research or sample surveys, which give the opportunity to stay on consumers' side and get their views regarding the research issues. According to Hakim, qualitative research seeks for the individual's attitudes, perceptions and behaviors. Qualitative research is described to be designed for exploratory studies, and viewed as an initial step for quantitative studies (Hakim, C. 2000, p.34). Qualitative research is conducted through two different types of interviews, the depth interview and the focus group interview. Focus group interviews are said to be extensively used in market research (Hakim, C. 2000, p.35). Hence concerning this research topic, which can be stated as a basic pre-market research, the focus group interview could be an option for handling the subject. The qualitative researches are likely to be in depth; both focus group researches and depth interviews help the researcher to go deep in the subject through personal interviews or brainstorming in the focus groups. Regarding this research study, it could be useful to catch the consumer perspectives deeper. However, one should also note that the discussions are limited with small groups, which can provide a deeper analysis but cannot be generalized. Also the objective of the qualitative research is discovery rather than verification; whereas the study is searching for the verification of the significance of different variables affecting the adoption intentions. Hence, eliminating the qualitative research from the options, the research will be carried out through sample surveys. It could be favorable to conduct a qualitative study before the quantitative analysis, having in depth perspectives and constructing the study accordingly, however, due to the time restrictions, the study is limited to the quantitative research, specifically sample surveys.

4.1 Sample Surveys

According to Hakim, sample surveys have become one of the most common methods to collect data for social research (Hakim, C. 2000, p.76). Sample surveys are widely used for collecting information on various social and economic issues. Sample surveys can be utilized under the conditions when (Singh & Chaudhary 1986, p.3)

- maximum accuracy and reliability is required with limited budget

- the units show significant variation
- total number of population is impossible or too costly to analyze
- scope of the analysis is wide and population not completely known
- time, money and other resources are scarce

Regarding this research thesis, the conditions for applying sample surveys fit quite well, with limited resources in terms of time, money, etc and the requirement for accuracy and reliability and the impossibility for analyzing the whole population of Turkey which is more than 70 millions.

The possible methods of gathering data in sample surveys are viewed as interviews, which can be face-to-face or through telephones, questionnaires and time diaries. Considering the time limitations, it is impossible to make deeper interviews one by one in quite a large sample, and time diaries are not applicable in this study. Hence, the way for getting information of the sample will be through questionnaires which are designed to get the personal perceptions about the 3G innovation.

Sample surveys can be designed to analyze the causal relationships, the reasons behind the social patterns, which is actually what this study is seeking for (Hakim, C. 2000, p.76). The study is analyzing the causal relationships, factors affecting consumer behaviors, and their perceptions regarding innovations, in this case - the 3G technology.

Sample surveys are very beneficial to develop an understanding of a population with low costs, by analyzing a representative sample. Also sample surveys are less time-consuming because of the reduced number of the population that is under investigation. Other than these, the benefits of using surveys may be followed by the transparency of the research, which makes the work visible to other parties and gives opportunity for the replications in different times and different locations (Hakim, C. 2000, p.77).

There are also some drawbacks using sample surveys for gathering data, giving rise to biases in the results, which can be analyzed as follows: (Weisberg et al. 1996, p.65)

'Noncoverage errors' may be described as the omission of some of the relevant population, which for example challenges the telephone surveys because of the exclusion of the households without telephone services. Regarding this study, since the surveys are conducted through web based questionnaires, non-coverage errors are expected to be faced due to the exclusion of the individuals that don't have internet access. However web-based surveys also have several advantages, which can be listed as: (Fenech & O'Cass, 2001) (1) web-based surveys provide a single common medium, Web, which makes it easy to complete

and return (2) do not allow incomplete answers (3) directly transfer the data to the statistical analysis software, without manual data entry.

'The response rate' is a common problem the surveyors face, resulting from individuals refusing to take part in the surveys, because they can be busy or unwilling to answer the questions, or simply do not trust the surveyor. Regarding this study, the focus will be on individuals, inquiring their perceptions about the 3G technology through the questionnaires. However the possible response rate can be quite low because the 3G technology concept is quite new, even not available in Turkey currently. People may not have heard of 3G technology, which may make them lose their interest to take part in the research. In order to include the unaware participants in the survey, an introductory paragraph about 3G technology and services is added at the beginning of the questionnaire, which will inform the unaware people about 3G. This way, it will be possible to get the viewpoints of people who have not heard of 3G but interested in purchasing the technology after they are informed. Even if they are not interested in buying such technologies, still their perceptions are critical and should be included as well, so that the reasons lying behind their unwillingness to purchase the 3G services can be analyzed.

Another problem arising during conducting surveys is the interviewer effect, which is a biasing effect that is sourced from the different characteristics of the interviewers involved in the same survey, including different sex, race, age, etc. The different characteristics of the interviewers tend to affect the respondents' answers hence end up with non-reliable data. Considering this study, owing to the utilization of the web-based questionnaires, interviewer effect becomes invalid.

4.2 Sampling

Sampling, which is an important step in conducting surveys, is the selection of a subgroup from a population. In order to make generalizations in the end of the research, it is crucial for the samples to be representative for the whole population.

Sampling design process is described to start with the definition of the target population (Malhotra & Birks 2000, p.358). In this research paper, the target population is identified as the population of Turkey, in the pursuit of their perceptions about 3G technologies.

Next step is the decision of the sampling technique which will be used in the research. Regarding the sampling technique in this research, snowball sampling is applied, which is a

kind of a non-probability technique. In snowball sampling, an initial group of respondents is selected, after interviewing the initial respondents, they are asked to direct the researcher to others who also belong to the target population. The survey is conducted based on the referrals of the participants; hence the sample will be expanded through waves, obtaining referrals from referrals. Snowball sampling technique is shown to be proper for the analyses of samples having special characteristics which are rare in the wider population, such as the drug addicts or members of a minority ethnic group (Malhotra & Birks 2000, p.366). This way, the researcher is able to get referrals from the respondents and reach a scattered and marginal population. Main objective of the snowball sampling does not match with this research paper; however it is the most appropriate technique considering the time restrictions. Also the survey is conducted through web-based questionnaires, so that snowball technique gives the opportunity to broaden the sample with minimum bias via getting forwards from the respondents. Taking respondents from researcher's own network ends up with considerable biases because of the possible similarities of the respondents. However, owing to the snowball sampling technique, only the initial group will be chosen from the researcher's network, then it will be scattered with referrals taken from the respondents. Hence, the respondents from the second and subsequent waves are neither familiar with the researcher nor with each other participated in the research.

Last step is to determine the sample size which is the number of the respondents that will attend the survey. This research study regarding the 3G mobile technologies can be placed under the heading 'product test' which is characterized with a minimum size of 200, while the typical range changes between 300 and 500 (Malhotra & Birks 2000, p.361). Hence sample size is aimed to be 300, which will be sufficient enough to make statistically meaningful analyses.

4.3 Questionnaire Design

Questionnaire is a technique for obtaining data from respondents by making use of a series of questions. Questionnaires are said to have three specific objectives (Malhotra & Birks 2000, p.326): (1) translating the needed information into questions (2) increasing the motivation of the respondents towards participating (3) minimizing response errors which occur as a result of exploiting inaccurate, mis-recorded or mis-analyzed answers.

The questionnaire design process takes start with the specification of the information needed. The required information for this study may be stated as the consumer perceptions

regarding different factors affecting the adoption of 3G technology. These factors have been analyzed in detail in the research framework part.

Next, the type of the interviewing method is specified as the web-based questionnaires. The questions included in the web-based questionnaires should have some features listed as; (1) the questions should be simple enough for the respondents' to answer accurately (2) the questions should be short enough in order not to diminish respondents' willingness to answer them (3) detailed instructions should be included to make sure that everything is clear concerning the meaning of the questions and how to answer them (Malhotra & Birks 2000, p.330).

For a questionnaire to be designed properly, the surveyor should also pay attention to the question wording, which has a direct impact on the responsiveness of the participants. It is important to use simple words, which should not exceed the intellectual levels of the target respondents (Malhotra & Birks 2000, p.338).

The questionnaire is prepared considering all concerns about the directive statements, question wording and simplicity. For the respondents who are not well informed about the 3G mobile technologies, the introductory paragraph is placed at the beginning of the each page in the questionnaire. The text is typed with the efforts of being objective and aiming not to manipulate the respondents' views about the 3G technologies. Hence, the introductory paragraph is descriptive, giving information about the additional 3G services, the telecommunication companies that have signed for the contracts and the expected release date of the services.

First part of the questionnaire is searching for the importance of the different factors that are considered as effective in adoption behaviors. Second part is inquiring the demographic characteristics of the respondents, specifically, gender, age, education, occupation and city of residence. In the first part of the questionnaire, the questions are constructed as inquiring the respondents' affinity towards different statements. The respondents are asked to reflect their opinions about the statements on a five point Likert scale, where 1 corresponds to "Strongly disagree", 2 to "Disagree", 3 to "Neither agree nor disagree", 4 to "Agree" and 5 to "Strongly agree". Based on the previous literature; the statements are grouped representing different factors affecting the adoption criteria of the respondents, namely perceived usefulness, perceived ease of use, perceived enjoyment, image, personal innovativeness and network effects. Each factor is inquired with different number of questions, ranging from 2 to 6. Based on the previous researches Moore & Benbasat (1991), Liao et al. (2007), Pagani (2004) perceived usefulness is questioned with six

statements. The statements included possible utilities of the 3G technologies, such as increased productivity, mobility and quality of communication, and possible drawbacks such as the inconvenience of the mobile phones for using high speed internet connection. Adapting from Agarwal & Prasad (1997) perceived ease of use is questioned with three statements, one of which is about the clearness of the 3G mobile services, while the other two are the degree of the easiness of using the 3G technologies and easiness of learning to use. Another factor perceived enjoyment is based on the study of Liao et al. (2007), questioning the excitement levels of the respondents for 3G services and the degree to which the new services are interesting to them. Adapting from the research by Agarwal & Prasad (1997), image is questioned with the respondents' perceptions towards considerations like 3G services being a prestige symbol or a medium to obtain higher prestige. Basing on the previous study by Agarwal & Prasad (1998), personal innovativeness is inquired with three statements focusing on the likeliness of the respondents to adopt new information / communication technologies. The last factor, network effects, is questioned with two statements, concerning the eagerness of the contacts of the respondents towards using new information / communication technologies. Adoption intention of the respondents towards 3G technologies is also questioned after the factors that are defined to be effective on determining the adoption criteria are inspected. The scale used for this variable is the nominal scale where the respondents are asked to indicate their intentions to purchase 3G technologies. Three options are set to capture their expectations regarding adoption intentions (1) intend to purchase (2) do not intend to purchase (3) indecisive. The questionnaire is available in Appendix A.

Content validity is achieved through a subjective evaluation of the representativeness of the content of the scale (Malhotra & Birks 2000, p.314). The majority of the content of this questionnaire is adapted from the previous literature. Factors utilized in this research have been analyzed and found significant in the previous studies; hence content validity is supported in this research paper.

Each factor affecting the adoption behavior is questioned with several statements in the questionnaire. The mean scores of these items are calculated in order to obtain the summated scales for the principal factors. Summated scales are created by taking the mean or summated scores of the responses to a set of questionnaire items that are designed to measure a single factor. (Gravely, 1998, p. 55) To illustrate, perceived usefulness is questioned with six questions on a likert scale; hence the summated scale for perceived usefulness is computed by taking the mean values of the six questions. Summated scales computed for each factor are applied in the regression analysis. Internal consistency reliability is used to evaluate the

reliability of the items composing the summated scales. Internal consistency reliability should be applicable for the items that are summed to get a mean score, in other words the items should be consistent enough to form a primary factor. The coefficient alpha or Cronbach's alpha test is utilized, which states that a Cronbach's alpha value of 0,6 or less implies an unacceptable internal consistency reliability (Malhotra & Birks 2000, p.314). For the factors analyzed in this research paper, computed reliability values can be seen in Table 1 below:

Table 1: Alpha Values of the Summated Factors

Factors	**Alpha values**
Perceived usefulness	0,7853
Perceived ease of use	0,7035
Perceived enjoyment	0,8979
Image	0,8095
Personal innovativeness	0,7913
Network effects	0,7920

As can be seen in the table above, the alpha values for the summated factors are far above the critical value of 0,6; hence the internal consistency reliability is achieved for the scale. Detailed reliability analysis outputs can be viewed in Appendix B.

In the second part of the questionnaire, the demographic characteristics of the respondents are under focus. Gender, education level, occupation and the city of residence are searched via categorical questions, seeking answers for the specified classes. Education level is questioned in three categories, (1) college and lower (2) university (3) higher education and upper. Occupation is questioned in four categories, (1) employee (2) self-employed (3) student (4) unemployed / retired. City of residence is questioned in four categories: (1) Ankara, (2) Istanbul, (3) Izmir, (4) Others. City of residence variable is concerned whether or not the respondent is residing in a metropolitan. Respondents are asked to type their age in the questionnaire; hence the responses for the variable 'age' have continuous basis. In order to organize data for analysis, variable 'age' is recoded and categorized into four groups later: (1) 25 and below (2) between 25 and 35 (3) between 35 and 45 (4) 45 and above.

Before the distribution of the questionnaires, the text is translated into Turkish in order to reach more respondents. The translated version is proofread by three Turkish post-graduate students from different departments in Lund University. Since they are studying in different departments, they provided different perspectives, confirming the clearness of the statements used in the questionnaire. The translation is made considering linguistic attainments. The translated version of the questionnaire can be found in Appendix C.

The web-page http://www.createsurvey.com/ is utilized to display the questionnaire in the internet medium. The questionnaire is distributed via e-mails and different online forums. Data collection period lasted for two weeks and in the end of the period May 6th – May 19th web-based survey ended up with 282 responses. The responses are directly transferred from the web-page http://www.createsurvey.com/ to the Statistical Package for Social Sciences (SPSS), thereby possible errors resulting from manual data entry is avoided. Further analyses displayed in the following chapters have been conducted via SPSS 11.5.

CHAPTER 5
DATA ANALYSIS AND PRESENTATION

In this chapter, data analysis and results will be summarized to better understand the adoption criteria of the respondents towards 3G technologies. First part deals with the descriptive statistics of the variables included in the demographics control part. The frequencies of the variables associated with the dependent variable 'adoption intentions' will be analyzed. In the second part the critical factors affecting the acceptance of the 3G mobile technologies will be explored.

5.1 Descriptive Statistics

The completed survey provided data on several demographics control variables, such as gender, age, education level, occupation and the city of residence, which brings the characteristics of the respondents to light. The overall frequencies for adoption behaviors can be seen in Table 2 below:

Table 2: Frequencies of the adoption behaviors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	negative	38	13,5	13,5	13,5
	neutral	67	23,8	23,8	37,2
	positive	177	62,8	62,8	100,0
	Total	282	100,0	100,0	

The respondents showing positive behaviors, in other words, having adoption intentions towards 3G technologies corresponds to the 62,8 % of the total respondents while those who do not expect to be purchasing 3G technologies are the 13,5 % of the total respondents. People, who are indecisive about the adoption of 3G services, are viewed to be the 23,8% of the whole respondents.

5.1.1 Age

The age profile of the respondents can be observed in Table 3 below. The variable age is categorized in 4 groups. The category 1 '25 and below' corresponds to the 31,6 %, while

category 2 ‘between 25 and 35’ to 29,4 %; category 3 ‘between 35 and 45’ to 22,3% and category 4 ’45 and above’ to %16,7 of the total respondents. The population census report 2000 released by Turkish Statistical Institute (TUIK), available in Appendix D, represents the percentages of the population according to the age groups. The age group “25 and below” includes the age group between 0-10, which is out of focus when the subject of the research paper is considered. Hence, after the percentages of the age groups are calculated with exclusion of the 0-10 age group the percentages can be seen as “25 and below” 38%, “between 25 and 35” 20%, “between 35 and 45” 16%, “45 and over” 25%. The percentages of the survey sample regarding the age groups shows consistency with the percentages of Turkey population.

Within the age groups, age group 1 has the highest percentage of positive intentions towards 3G technologies with 73 %, while age group 3 has the lowest with 17,5 %. Besides within the age groups, age group 4 has the highest percentage of having negative intention towards 3G services

Table 3: Age vs Behavior Crosstabulation

			BEHAVIOR			Total
			negative	Neutral	positive	
AGE	1	Count	7	17	65	89
		% within AGE	7,9%	19,1%	73,0%	100,0%
		% within BEHAVIOR	18,4%	25,4%	36,7%	31,6%
	2	Count	13	14	56	83
		% within AGE	15,7%	16,9%	67,5%	100,0%
		% within BEHAVIOR	34,2%	20,9%	31,6%	29,4%
	3	Count	8	24	31	63
		% within AGE	12,7%	38,1%	49,2%	100,0%
		% within BEHAVIOR	21,1%	35,8%	17,5%	22,3%
	4	Count	10	12	25	47
		% within AGE	21,3%	25,5%	53,2%	100,0%
		% within BEHAVIOR	26,3%	17,9%	14,1%	16,7%
Total		Count	38	67	177	282
		% within AGE	13,5%	23,8%	62,8%	100,0%
		% within BEHAVIOR	100,0%	100,0%	100,0%	100,0%

5.1.2 Gender

Table 4 represents the gender profiles of the respondents which illustrates that 44,3 % of the respondents is female while males accounts for 55,7 % of the respondents. Within the males, positive intentions towards 3G technologies is higher with a percentage of 66,2 % than 58,4 % within females. Within the gender groups, the highest percentage of having negative intention towards 3G services is observed in the female group with 15,2%, while within the male group the percentage of negative intentions drops to 12,1%. According to the population census report 2000 released by Turkish Statistical Institute (TUIK), available in Appendix D, gender percentages of Turkey's population is 51% for men and 49% for women.

Table 4: Gender vs Behavior Crosstabulation

			BEHAVIOR			
			negative	neutral	positive	Total
GENDER	F	Count	19	33	73	125
		% within GENDER	15,2%	26,4%	58,4%	100,0%
		% within BEHAVIOR	50,0%	49,3%	41,2%	44,3%
	M	Count	19	34	104	157
		% within GENDER	12,1%	21,7%	66,2%	100,0%
		% within BEHAVIOR	50,0%	50,7%	58,8%	55,7%
Total		Count	38	67	177	282
		% within GENDER	13,5%	23,8%	62,8%	100,0%
		% within BEHAVIOR	100,0%	100,0%	100,0%	100,0%

5.1.3 Education Levels

Table 5 represents the crosstabulation of the adoption behaviors and the education levels of the respondents. Almost half of the respondents has graduated from a university, while 32,6 % of the respondents has completed college or lower degrees and 19,5 % has completed post graduate and higher degrees. Within different education levels, the highest percentage for the positive intention towards 3G technologies is observed in the university graduates with 68,9 % and the lowest percentage for positive intention is observed in college and lower degree graduates with 56,5%.

Table 5: Education vs Behavior Crosstabulation

			BEHAVIOR			Total
			negative	neutral	positive	
EDU	College	Count	20	20	52	92
		% within EDU	21,7%	21,7%	56,5%	100,0%
		% within BEHAVIOR	52,6%	29,9%	29,4%	32,6%
	Higher	Count	7	16	32	55
		% within EDU	12,7%	29,1%	58,2%	100,0%
		% within BEHAVIOR	18,4%	23,9%	18,1%	19,5%
	Uni	Count	11	31	93	135
		% within EDU	8,1%	23,0%	68,9%	100,0%
		% within BEHAVIOR	28,9%	46,3%	52,5%	47,9%
Total		Count	38	67	177	282
		% within EDU	13,5%	23,8%	62,8%	100,0%
		% within BEHAVIOR	100,0%	100,0%	100,0%	100,0%

5.1.4 City of Residence

City of residence is the last demographic variable analyzed in this paper. The crosstabulation between the adoption behavior and city of residence can be seen below in Table 6. The majority of the respondents are residing in Ankara, with 36,9% of the total, while Istanbul has 30,9%, 'others' have 18,8% and Izmir has 13,5% of the whole respondents. Within different cities, the highest percentage for positive intentions towards 3G technologies is observed in 'Istanbul' with 69% and lowest in Izmir with 52,6%. Besides; within the cities, the highest percentage for negative intention towards 3G technologies is examined in 'others'. According to the population census report 2000 released by Turkish Statistical Institute (TUIK), available in Appendix D, the percentages of the population residing in Ankara, Istanbul, Izmir and 'others' are 6%, 15%, 5% and 74% respectively. Comparing the percentages of the sample with Turkey's population, people living in metropolitan cities are found to be more predominant. Hence; considering the fact that larger cities tend to encourage diffusion of innovation more, the sample may overestimate the adoption intentions of the real population.

Table 6: City vs Behavior Crosstabulation

			BEHAVIOR			Total
			negative	neutral	positive	
CITY	Ankara	Count	12	27	65	104
		% within CITY	11,5%	26,0%	62,5%	100,0%
		% within BEHAVIOR	31,6%	40,3%	36,7%	36,9%
	Others	Count	10	11	32	53
		% within CITY	18,9%	20,8%	60,4%	100,0%
		% within BEHAVIOR	26,3%	16,4%	18,1%	18,8%
	İstanbul	Count	11	16	60	87
		% within CITY	12,6%	18,4%	69,0%	100,0%
		% within BEHAVIOR	28,9%	23,9%	33,9%	30,9%
	İzmir	Count	5	13	20	38
		% within CITY	13,2%	34,2%	52,6%	100,0%
		% within BEHAVIOR	13,2%	19,4%	11,3%	13,5%
Total		Count	38	67	177	282
		% within CITY	13,5%	23,8%	62,8%	100,0%
		% within BEHAVIOR	100,0%	100,0%	100,0%	100,0%

5.1.5 Occupation

In Table 7 below, the crosstabulation between adoption behaviors and occupation profiles of the respondents can be observed. It is shown that more than half of the respondents are workers, while students correspond to 36,2% of the total respondents, employers to 6% and unemployed / retired to 4%. Within the occupational groups, the highest percentage of having positive intention towards 3G services is observed in the students group with 72.5%, while the lowest percentage is in unemployed / retired with 46,2%.

Table 7: Occupation vs Behavior Crosstabulation

			BEHAVIOR			Total
			negative	neutral	positive	
OCCUP	Employer	Count	2	6	9	17
		% within OCCUP	11,8%	35,3%	52,9%	100,0%
		% within BEHAVIOR	5,3%	9,0%	5,1%	6,0%
	Student	Count	11	17	74	102
		% within OCCUP	10,8%	16,7%	72,5%	100,0%
		% within BEHAVIOR	28,9%	25,4%	41,8%	36,2%
	Unemp	Count	2	5	6	13
		% within OCCUP	15,4%	38,5%	46,2%	100,0%
		% within BEHAVIOR	5,3%	7,5%	3,4%	4,6%
	Worker	Count	23	39	88	150
		% within OCCUP	15,3%	26,0%	58,7%	100,0%
		% within BEHAVIOR	60,5%	58,2%	49,7%	53,2%
Total		Count	38	67	177	282
		% within OCCUP	13,5%	23,8%	62,8%	100,0%
		% within BEHAVIOR	100,0%	100,0%	100,0%	100,0%

5.2 Evaluation of the Multinomial Regression Model

Different factors influencing the adoption intentions of 3G mobile technologies have been described in Chapter 3 and various hypotheses have been developed concerning the relationship between the defined factors, demographic profiles and adoption intentions. Hypotheses H1 through H6 address the possible relationship between the factors, perceived usefulness, perceived ease of use, perceived enjoyment, image, personal innovativeness, network effects, and the adoption intentions of the individuals. Furthermore, hypotheses H7 through H11 handle some demographic characteristics of the individuals that may drive the 3G technology acceptance of the individuals. Gender, age, education level, occupation and the city of residence are proposed to be influential on the adoption choices of the individuals. In order to analyze the influence of the independent variables, which are the defined critical factors and demographic characteristics, on the dependent variable - adoption intentions, a multinomial logistic regression is employed. Logistic regression is determined to be the most appropriate regression model considering the type of the dependent variable, which is set to be either binary or dichotomous, and the lenient assumptions logistic regression imposes

unlike other regression models. In the past years, the logistic regression model has been well-liked in the case that the dependent variable is discrete, having two or more possible values (Hosmer and Lemeshow, 2000:1). Hence, due to the discrete nature of the dependent variable, which has three possible outcomes as 'intend to purchase', 'do not intend to purchase' and 'indecisive', multinomial logistic regression is verified to be the proper analysis for this research. Also concerning the assumptions, unlike multiple regression and discriminant analysis, logistic regression does not entail assumptions related with normality, linearity and homogeneity of variance for the independent variable, which evidences the popularity of the model. Logistic regression assumes that the outcomes are independent, mutually exclusive, and finally in order to obtain accuracy, requires large samples, which is set to be a minimum of 20 cases per predictor (Leech et al, 2004, p 109). Having six critical factors and five demographic control variables, in total eleven independent variables are taking part in the regression model; hence the sample size assumption of the logistic regression requires at least 220 cases to be under investigation. Provided that 282 responses for the survey are collected which validates the assumptions for the logistic regression, multinomial logistic regression is applied on SPSS 11.5 for further analysis.

The multinomial logistic regression is employed identifying the adoption behaviors as dependent variable having three discrete values; negative, neutral, positive, and independent variables as the defined critical factors and demographic control variables. While applying the multinomial logistic regression, dependent variable is selected as 'behavior', the demographic characteristics, age, education level (edu), gender, occupation (occup) and city, being categorical variables, or in other words, non-metric variables, are moved to 'Factors' and the six summated factors; perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), image (I), personal innovativeness (PI), network effects (NE), having ordinal scales, hence being metric variables are specified as 'Covariates'. Confidence interval is preserved as 95%, which is the default value assigned by SPSS. Multinomial logistic regression is operated with these arrangements. The output tables can be found in Appendix E. The results obtained from the analysis are presented in the following parts.

5.2.1 Overall Test of Relationship

The relationship between the dependent variable 'behavior' and the overall combination of the independent variables is tested in the model fitting information table represented in Table 8. The statistical significance of the Chi-Square of the final model is represented in the second

row. The probability of the model chi-square (198,003) is found to be 0,000, at a level which is less than the significance level of 0,05. The null hypothesis, which proposes that there is no difference between the models with and without the independent variables, is rejected. Hence, the relationship between the combination of the independent variables and the dependent variable is verified.

Table 8: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	509,793			
Final	311,791	198,003	36	,000

5.2.2 Accuracy

A multinomial logistic regression model is characterized as useful when overall percentage accuracy rate is considerably higher than the accuracy by chance. This is the case when independent variables are able to differentiate the survey respondents with regard to the classification of the dependent variable. By chance accuracy is found when the independent variables have no relationship with the classifications of the dependent variable, but still, by chance it is expected to be correct in the predictions of the group memberships sometimes. By chance accuracy is computed by summing the squared percentage of cases in each class of the dependent variable. The benchmark that is used to illustrate the model as useful is 25% improvement over the by chance accuracy rate (Schwab, 2006). In this research, the dependent variable 'behavior' is characterized with three different classes, namely negative, neutral and positive. In the Table 9 below, the percentages of participants choosing each class among the whole sample is shown.

Table 9: Case Processing Summary

		N	Marginal Percentage
BEHAVIOR	negative	38	13,5%
	neutral	67	23,8%
	positive	177	62,8%

In order to calculate by chance accuracy, the squared percentages of cases are added:
$(0{,}135^2 + 0{,}238^2 + 0{,}628^2)$

By chance accuracy is computed as 0,47. Classification accuracy rate is supposed to be at least 25% higher than the by chance accuracy rate; hence by chance accuracy criteria is (0,47 + 0,47*0,25) computed as 0,587 or 58,7%. The classification accuracy rate, which is found in the Table 10 and displayed as 76,6%, is high above the by chance accuracy criteria, 58,7%. The test for holding classification accuracy is supported. Also models having classification accuracy above 50% is considered as acceptable, which applies for the classification accuracy of this model. (Kahn, 2006, p 109)

Table 10: Classification Table

Observed	Predicted			
	negative	neutral	positive	Percent Correct
negative	20	8	10	52,6%
neutral	3	35	29	52,2%
positive	3	13	161	91,0%
Overall Percentage	9,2%	19,9%	70,9%	76,6%

5.2.3 Numerical Problems

Multicollinearity between the independent variables should be identified in the results and the parts showing numerical errors should be ignored in the analysis. The numerical problems are identified from the Parameter Estimates table in the multinomial regression results. The column Standard Errors (Std Error) for B coefficients is examined to detect whether the independent variable possess any numerical problems. Standard error exceeding the value 2,0 shows numerical problems, which stems from the multicollinearity among the independent variables (Schwab, 2006). The standard errors for B coefficients column in the Parameter Estimates table is represented in Table 11:

Table 11: Parameter Estimates Table – Standard Error

BEHAVIOR*	Negative		neutral	
	B	Std. Error	B	Std. Error
Intercept	17,437	2,704	11,766	2,093
PU (Perceived Usefulness)	-1,795	0,499	-1,590	0,360
PEU (Perceived Ease of Use)	-0,673	0,370	-0,845	0,298
PE (Perceived Enjoyment)	-0,862	0,392	-0,085	0,300
I (Image)	0,151	0,269	0,097	0,191
PI (Personal Innovativeness)	-1,051	0,307	-0,614	0,223
NET (Network effects)	-0,969	0,309	-0,519	0,228
[AGE=1]	-2,094	0,791	-1,104	0,571
[AGE=2]	-1,478	0,754	-1,032	0,567
[AGE=3]	-1,089	0,805	0,314	0,559
[AGE=4]	0,000	.	0,000	.
[EDU=College]	1,937	0,639	1,130	0,473
[EDU=Higher]	0,867	0,732	0,596	0,493
[EDU=Uni]	0,000	.	0,000	.
[GENDER=F]	1,011	0,546	0,576	0,394
[GENDER=M]	0,000	.	0,000	.
[OCCUP=employer]	-0,999	1,252	0,316	0,750
[OCCUP=student]	-0,884	0,665	-1,008	0,473
[OCCUP=unemp]	-0,209	1,213	0,761	0,890
[OCCUP=worker]	0,000	.	0,000	.
[CITY=Ankara]	-1,229	0,746	0,146	0,564
[CITY=İstanbul]	-0,613	0,725	-0,245	0,581
[CITY=İzmir]	-0,562	0,921	0,839	0,664
[CITY=Others]	0,000	.	0,000	.

*The reference category is: positive.

When the standard errors for B coefficients are analyzed for both behavior categories, neutral and negative, it is observed that none of the standard error values of the independent values is higher than the error limit of 2,0. Hence, all the independent variables have shown that there are not any numerical problems related with the data.

5.2.4 The relationship between the dependent and independent variables

The significance of the individual independent variables can be checked with two types of tests, the Likelihood ratio test and the Wald test. The likelihood ratio test assesses the overall relationship between the independent variable and dependent variable while the Wald test checks the statistical significance of the independent variable in distinguishing the two groups of the dependent variable; one of which is the reference group and the other is the one of the two groups under comparison. An independent variable may have an overall relationship with the dependent variable and may not have the statistical significance to

distinguish between the pairs of the dependent variable at the same time. Hence; an overall relationship between an independent variable and the dependent variable does not necessarily provide statistical significance for the independent variable to distinguish between the groups of the dependent variable. However, in order to check the significance of an independent variable's role in differentiating the groups of the dependent variable, its overall relationship with the dependent variable should be verified first.

The likelihood ratio test imposes the null hypothesis stating that the effect of the parameters on the dependent variable is zero. The null hypothesis is tested with the comparison of the significance levels of the independent variables with regards to the confidence intervals defined (Schwab, 2006) The likelihood ratio test output of the multinomial logistic regression can be seen in Table 12.

Table 12: Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	311,791(a)	,000	0	.
Perceived Usefulness	337,822	26,031	2	,000
Perceived Ease of Use	320,416	8,626	2	,013
Perceived Enjoyment	317,765	5,974	2	,050
Image	312,200	,409	2	,815
Personal Innovativeness	326,865	15,074	2	,001
Network Effects	323,303	11,513	2	,003
AGE	328,065	16,274	6	,012
EDUC	323,253	11,462	4	,022
GENDER	315,864	4,074	2	,130
OCCUP	320,279	8,488	6	,204
CITY	319,613	7,822	6	,251

As can be seen in the table, the overall relationship between independent variables and the dependent variable are found significant for some independent variables, while for some others, the null hypothesis is supported. Provided that the regression is applied with the 95% confidence interval; independent variables, which have significance level less than 0,05, are supported to have significant relationship with the dependent variable. Hence among the factors described, perceived usefulness, perceived ease of use, perceived enjoyment, personal innovativeness and network effects are found to have a significant relationship with the dependent variable, adoption behaviors, while only image, having a significance level of 0,937, is observed to be insignificant. Among the demographic characteristics; age and

education levels are perceived to be significant while gender, occupation and city of residence do not have a significant relationship with adoption behaviors.

After the analysis of the likelihood of ratio tests, one should move to the parameter estimates table next, where the effects of the significant independent variables on the dependent variable are analyzed deeper. The output of parameter estimates table can be seen in Table 13.

Table 13: Parameter Estimates Table – Exp (B)

	negative				neutral			
	Wald	**df**	**Sig.**	**Exp(B)**	**Wald**	**df**	**Sig.**	**Exp(B)**
Intercept	41,601	1	0,000		31,614	1	0,000	
Perceived Usefulness	12,944	1	0,000	0,166	19,509	1	0,000	0,204
Percevied Ease of Use	3,299	1	0,069	0,510	8,074	1	0,004	0,429
Perceived Enjoyment	4,839	1	0,028	0,422	0,079	1	0,778	0,919
Image	0,313	1	0,576	1,163	0,261	1	0,610	1,102
Personal Innovativeness	11,724	1	0,001	0,350	7,583	1	0,006	0,541
Network Effects	9,849	1	0,002	0,379	5,200	1	0,023	0,595
[AGE=1]	7,001	1	0,008	0,123	3,740	1	0,053	0,332
[AGE=2]	3,841	1	0,050	0,228	3,311	1	0,069	0,356
[AGE=3]	1,828	1	0,176	0,337	0,315	1	0,575	1,369
[AGE=4]	.	0	.	.	.	0	.	.
[EDUC=College]	9,191	1	0,002	6,941	5,705	1	0,017	3,094
[EDUC=Higher]	1,403	1	0,236	2,380	1,460	1	0,227	1,815
[EDUC=Uni]	.	0	.	.	.	0	.	.
[GENDER=F]	3,438	1	0,064	2,750	2,137	1	0,144	1,778
[GENDER=M]	.	0	.	.	.	0	.	.
[OCCUP=employer]	0,637	1	0,425	0,368	0,178	1	0,673	1,372
[OCCUP=student]	1,764	1	0,184	0,413	4,538	1	0,033	0,365
[OCCUP=unemp]	0,030	1	0,863	0,812	0,732	1	0,392	2,141
[OCCUP=worker]	.	0	.	.	.	0	.	.
[CITY=Ankara]	2,714	1	0,099	0,293	0,067	1	0,796	1,157
[CITY=İstanbul]	0,716	1	0,397	0,542	0,178	1	0,673	0,783
[CITY=İzmir]	0,372	1	0,542	0,570	1,599	1	0,206	2,315
[CITY=Others]	.	0	.	.	.	0	.	.

The reference category is: positive.

Disregarding the factors that are found insignificant in the likelihood ratio test, the role of the remaining independent variables in differentiating between different groups of the dependent variables is analyzed from the parameter estimates table. The parameter estimates table allows users to make comparisons between the pairs of dependent variable groups, where the reference group is illustrated in the footnote embedded to the table. Considering the table above, the reference group is defined as the dependent variable group, ‘positive’, and

two comparisons between the groups are represented. The reference category 'positive' is compared both with the dependent variable group 'negative' and the 'neutral' group.

5.3 Hypotheses testing

5.3.1 Testing Hypotheses of Critical Factors Affecting the Acceptance of 3G

The significance of the critical factors affecting the acceptance of the 3G mobile technologies are analyzed according to the results obtained in the likelihood ratio tests and the parameter estimates outputs of the multinomial logistic regression.

H1: *Perceived usefulness of the third generation mobile technologies has an influence on the adoption intentions.*

Perceived usefulness (PU) is found to be significant in the likelihood of ratio test, having a significance level 0,000 which can be seen in the likelihood ratio tests shown in Appendix E. This confirms that there is an effect of the factor perceived usefulness on the dependent variable adoption intentions. Hence the Hypothesis 1, which proposes that adoption intentions are influenced by the factor perceived usefulness, is supported.

Shown that perceived usefulness has an influence on adoption intentions, the relationship between perceived usefulness and adoption intentions should be analyzed further in order to realize if positive correlation exists. The further interpretations are made according to the parameter estimates table displayed in Appendix E.

Starting from the comparison between the group 'negative' and 'positive', the significance of the factor perceived usefulness in differentiating the dependent variable groups is checked by the significance levels. Perceived usefulness, having a significance level of 0,000, is found to be significant in terms of distinguishing the categories 'positive' and 'negative' of the dependent variable 'adoption behaviors'. In order to examine the dependent variable group which is favored by this factor, Exp(B) values will be examined. Exp(B) value less than 1 indicates that the odds of being in the reference dependent group increases for each unit increase in the related independent variable (Schwab, 2006). Hence, Exp (B) values less than 1 show that the survey respondents, who rated the factor perceived usefulness higher than the others, will be more likely to be in the dependent group 'positive'. The value of Exp(B) for the factor PU is displayed as 0,166, which implies that for each increase in the

rate of perceived usefulness, the likelihood of being in the group of respondents who are negative towards the 3G adoption, is decreased by 83,4% (0,166 – 1,0 = -0,834). In the same way, it is found out that the respondents who have rated perceived usefulness higher, is more likely to be in the dependent group 'positive' than the group 'neutral'. Hence it can also be concluded that perceived usefulness shows a positive relationship with the adoption intentions.

H2: *Perceived ease of use of the third generation mobile technologies has an influence on the adoption intentions.*

The likelihood of ratio test verifies the significance of the factor perceived ease of use (PEU) which has a significance level of 0,013. This test implies that the adoption intentions are influenced by the perceived ease of use factor, which consequently substantiates Hypothesis 2.

Provided that perceived ease of use has an effect on adoption intentions, the relationship between the variables is analyzed further.

The comparison between the reference category 'positive' and the group 'negative' shows insignificancy, hence it can be deduced that perceived ease of use is not a significant factor that differentiate respondents' adoption intentions between 'negative' and 'positive'. However, when the groups 'positive' and 'neutral' are compared, it is found out that respondents, who rates the factor 'perceived ease of use' higher, are more likely to have positive adoption intentions rather than neutral.

H3: *Perceived enjoyment of the third generation mobile technologies has an influence on the adoption intentions.*

Perceived enjoyment (PE), having a significance level of 0,050, is found to be significant in the likelihood of ratio test. This implies that the relationship between perceived enjoyment and the adoption intentions is significant. Thus Hypothesis 3, proposing that perceived enjoyment is influential on the adoption intentions, is supported.

Provided that perceived enjoyment has an influence on adoption intentions, the relationship between the variables should be investigated further. The interpretations regarding the relationship between perceived usefulness and adoption intentions can be made from the parameter estimates output of the regression analysis.

The comparison between the reference category ‘positive’ and the group ‘negative’ has an acceptable significance level and the corresponding Exp(B) value is less than 1 which implies that respondents, who rates perceived enjoyment higher, are more likely to be in the ‘positive’ group than the groups ‘negative’. However this conclusion does not apply for the comparison between ‘positive’ and ‘neutral’ since the significance level does not meet the 95% confidence level requirement. Perceived enjoyment does not play a considerable role in the respondents’ choices between having neutral or positive behaviors.

H4: *Image has an influence on the adoption intentions of the third generation mobile technologies.*

Image (I) is found to be insignificant according to the likelihood of ratio test shown in the table below. Having a significance level of 0,815, which is greater than the level 0,05; the existence of a relationship between image and adoption intentions is not supported. Hence, Hypothesis 4, proposing that image is influential on adoption intentions, is rejected.

Further analysis on the parameter estimates table for the factor ‘image’ is pointless, since there is not a significant relationship between the factor image and the adoption intentions.

H5: *Network effects have an influence on the adoption intentions of the third generation mobile technologies.*

The likelihood of ratio test shown below verifies the significance of network effects (NE), which has a significance level of 0,003. This test demonstrates that network effects influence the adoption intentions, which consequently supports Hypothesis 5.

After illustrating that a relationship exists between network effects and adoption intentions, now the relationship between the variables is analyzed further. Both comparisons between the reference category and the groups ‘negative’ and ‘neutral’ have an acceptable significance level. Furthermore since the Exp(B) values are less than 1 in both cases, respondents, who rates network effects higher, are more likely to be in the ‘positive’ group than the groups ‘negative’ or ‘neutral’. This implies a positive relationship between network effects and the adoption intentions.

H6: *Personal innovativeness has an influence on the adoption intentions of the third generation mobile technologies.*

Personal innovativeness (PI), having a significance level of 0,001, is found to be significant in the likelihood of ratio test. Hence, the relationship between personal innovativeness and the adoption intentions is significant. Consequently Hypothesis 6, proposing that personal innovativeness has an influence on the adoption intentions, is supported.

The relationship between perceived usefulness and adoption intentions are interpreted from the parameter estimates table. Comparing the reference category with the groups 'negative' and 'neutral'; it is found that respondents, who rates personal innovativeness higher, are more likely to be in the 'positive' group than the groups 'negative' or 'neutral'. Hence a positive relationship between personal innovativeness and the adoption intentions is confirmed.

5.3.2 Testing Hypotheses of Demographic Characteristics

The demographic control variables are all categorical variables, which are characterized by different number of groups. One category of the demographic independent variable is chosen to be the reference category and remaining categories of each demographic variable are compared with the reference category, in terms of the significance in differentiating the dependent variable groups.

H7: *Age of the individuals has an influence on the adoption intentions of the third generation mobile technologies*

The likelihood of ratio test shown below verifies the significance of the independent variable age, which has a significance level of 0,012. This is the evidence for the existence of a relationship between age and adoption intentions, which consequently supports Hypothesis 7.

Considering the parameter estimates table for further analyses, it is observed that the independent variable 'age', is specified by four categories, where the age group four is identified as the reference category.

Considering the significance level which is 0,008, it can be resulted that the relationship between age group 1 and age group 4 is significant in differentiating the dependent variable group ‘positive’ from ‘negative’. And considering the Exp (B) value which is 0,123, it is concluded that age group 1 is more likely to be in the group of respondents who are ‘positive’ with regards to the 3G technology than the group of respondents who are negative. In other words, age group one is more likely to have positive behaviors regarding the 3G adoption than age group 4. Likewise the significance of the condition ‘age group 2 being more likely to have positive behaviors than age group four’ is supported. Lastly, the age group does not play a significant role in differentiating the respondents’ choices between having neutral or positive behaviors.

H8: *Gender of the individuals has an influence on the adoption intentions of the third generation mobile technologies*

The significance of the relationship between gender and adoption intentions is tested via likelihood ratio test.

The significance level is observed as 0,130, which does not meet the %95 confidence level requirement. Hence, the significance of the relationship between gender and adoption intentions is disproved and Hypothesis 8 is rejected.

H9: *Education level of the individual has an influence on the adoption intentions of the third generation mobile technologies*

Education levels of the respondents, having a significance level of 0,022, are found significant according to the likelihood ratio test table. Hence, the relationship between education levels and adoption intentions is approved, which supports Hypothesis 9.

According to the parameter estimates table, education levels are categorized into three, where the reference category is specified as university level. The comparisons between the categories, ‘university’ and ‘college’ show significance. Hence respondents who have the university level education are more likely to be in the positive group rather than the negative or neutral groups, when compared with the college level. However there is not a significant difference in the respondents’ intentions towards 3G technologies between the education levels ‘higher’ and ‘university’.

H10: *The city of residence of the individual has an influence on the adoption intentions of the third generation mobile technologies*

The city of residence of the respondents is found insignificant according to the likelihood ratio test. Hence, it can be concluded that there is not any effects of city of residence on the adoption behaviors of the respondents, which rejects Hypothesis 10.

H11: *Occupation of the individual has an influence on the adoption intentions of the third generation mobile technologies*

The last hypothesis proposes that occupation of the individuals is effective on the adoption intentions of the respondents. However, the likelihood ratio test shows that the relationship between occupation and the adoption intentions is insignificant which leads to the rejection of the Hypothesis 11.

CHAPTER 6
DISCUSSION

The purpose of this part is to understand the results obtained in the previous chapter and relate them to the previous literature which has been analyzed in detail in Chapter 2. This study has benefited from different research fields, including diffusion of innovations theory, user characteristics, network externalities theory. Two research questions have been proposed in chapter one and eleven hypotheses have been developed in chapter three addressing the two research questions. This research mainly focuses on the influence of defined critical factors and the demographic characteristics on the acceptance. Hence, the results can be analyzed separately under two headings, 'critical factors' and the 'demographic characteristics'. Critical factors section addresses the first research question and the hypotheses from one to six, while demographic characteristics section deals with the second question and the remaining five hypotheses.

6.1 Critical factors affecting the acceptance of 3G technologies

RQ1: What are the critical factors that drive consumers' acceptance and adoption of 3G technologies in Turkey?

In order to answer the research question one; based on the previous literature six factors are defined which can be listed as Perceived Usefulness (PU), Perceived Ease of Use (PEU), Perceived Enjoyment (PE), Image (I), Personal Innovativeness (PI) and Network Effects (NE). The critical factors are analyzed one by one and comprehensively considering the results obtained in the previous chapter.

6.1.1 Perceived Usefulness

Hypothesis one is proposed to examine the role of perceived usefulness in the acceptance of the 3G technologies. According to the data and analyses in the previous chapter, hypothesis one is supported and perceived usefulness is found to have positive effect on the adoption intentions. Perceived usefulness concept is identified by six questions, which indicates different benefits of 3G technology, such as increased productivity, mobility and quality of communication. Considering the positive influence of the perceived usefulness on

adoption intentions, it can be concluded that the benefits of the 3G mobile technologies are important for respondents in their decision making process. Respondents, who find 3G technologies more useful, are more likely to purchase the service, than the ones who considers 3G as useless. The significant effect of perceived usefulness on adoption intentions is consistent with the prior empirical research. (Davis et al., 1989; Moore and Benbasat, 1991; Agarwal and Prasad, 1997)

6.1.2 Perceived Ease of Use

Hypothesis two is developed to analyze the effect of perceived ease of use on the adoption of 3G technologies. According to the data and findings, perceived ease of use has a significant influence on the adoption intentions for 3G technologies, hence hypothesis two is substantiated. Perceived ease of use is represented with three questions, which reflects ease of use of 3G services, such as being understandable, easy to use and easy to learn. An increase in the degree of perceived ease of use will increase the likeliness of indecisive respondents to purchase 3G services. Respondents, who find 3G easy to use, are more likely to have positive intentions towards the purchase of 3G services, than staying undecided. Validation of the hypothesis two supports previous literature which has also concluded that systems, perceived to be easier to use and more simple, are more likely to be accepted by the users (Moore & Benbasat, 1991; Lu et. al., 2003).

6.1.3 Perceived Enjoyment

Hypothesis three is proposed to examine the influence of perceived enjoyment on the acceptance of 3G services. In regards to perceived enjoyment, the research data shows a significant influence of perceived enjoyment on 3G acceptance, which validates hypothesis three. Perceived enjoyment is tested by three questions, indicating enjoyment dimensions of 3G, such as being fun, exciting and interesting. According to the analyses, respondents, who find 3G services more enjoyable, are more likely to purchase 3G services rather than refusing to adopt it. Hence, perceived enjoyment plays an important role in distinguishing the respondents who intends to purchase from who do not. Prior research studies have found perceived enjoyment to affect user's intention to use (Childers et al., 2001; Igbaria et al., 1996; Pagani, 2004). The research study indicates an influence of perceived enjoyment on adoption intentions for 3G, which supports the previous literature.

6.1.4 Image

Hypothesis four is developed to analyze the role of image on the acceptance of 3G mobile services. Image is represented by two questions, showing image perceptions regarding 3G, such as having more prestige by means of 3G and 3G being a status symbol. According to the research study data, image has no significant influence on the adoption intentions of 3G; hypothesis four is not supported. However, prior research has found significant effect of image on acceptance of innovations (Lu et al., 2003; Moore and Benbasat, 1991). The non-support for hypothesis four is one of the unexpected findings of this study. It is observed that image is not an effective factor for respondents in their decision whether or not to purchase 3G services.

6.1.5 Network Effects

Hypothesis six is developed to analyze the role of network effects on the acceptance of the 3G technologies. Network effects are represented by two questions, reflecting the innovativeness of the contacts of the respondents, through inquiring their eagerness for using new telecommunication innovations. The research data illustrates a significant influence of network effects on 3G acceptance, which supports hypothesis six. Respondents, having contacts that follow communication technology innovations more closely, are more likely to purchase 3G services than others who have not. This founding supports the prior research which has found that network effects play an important role on the adoption of communication technology innovations (Pagani, 2004; Pagani and Fine, 2008).

6.1.6 Personal Innovativeness

Hypothesis five is proposed to examine the influence of personal innovativeness on the adoption intentions for 3G services. Personal innovativeness is identified by three questions reflecting the innovativeness of the respondents, through inquiring their interest on new information / communication technologies. In regards to the research study data, personal innovativeness is found to have a significant impact on 3G acceptance. Respondents who are more innovative are more likely to purchase 3G technologies than the others, which is very logical. Prior research also claimed that personal innovativeness is an influential factor affecting innovation adoption decisions (Agarwal and Prasad, 1998; Hung, Ku and Chang,

2003; Karahanna et al, 2002). Hence, validation of hypothesis five supports previous literature.

6.2 Demographic Characteristics

RQ2: How do the demographic characteristics of the individuals affect the acceptance of 3G technology in Turkey?

In order to address research question two; based on the prior research studies, five demographic characteristics are analyzed in this research. User characteristics; age, gender, education level, city of residence and occupation are hypothesized to be effective on 3G acceptance. Next, the results of the analysis concerning demographic characteristics, is explored one by one.

6.2.1 Age

Hypothesis seven is proposed to examine the influence of the age of the respondents on their adoption intentions for 3G. Age is represented by four categories, including '25 and below', 'between 25 and 35', 'between 35 and 45' and '45 and over'. The findings of this study show a significant influence of age on 3G acceptance, which supports hypothesis seven. According to the analyses, when compared with age group 4, respondents from age group 1 and age group 2 are more likely to purchase 3G services rather than refusing to adopt it. In other words adoption intentions for 3G tend to decrease with age; older age groups have less eagerness to accept new technologies. However, according to the analyses, there is not a significant difference between age group 4 and 3 in terms of their acceptance for 3G.

The conclusion drawn for the relationship between adoption intentions and age violates the generalization which emphasizes the insignificancy of the relationship between age and innovativeness (Rogers, 1995). However, it should also be noted that Rogers (1995) also indicated the existence of studies showing that the early adopters are younger which is supported by this research study.

6.2.2 Gender

Hypothesis eight is developed to examine the influence of gender of the respondents on their adoption intentions for 3G. According to the data analyzed in this research study, it is found out that the relationship between age and the respondents' intentions for adopting 3G technologies is insignificant. Gender is not an influential factor for determining the 3G adoption intentions of the respondents. Hence, it can be concluded that demographic characteristic 'gender' does not favor one group to another in adopting 3G technologies.

6.2.3 Education Levels

Hypothesis nine is proposed to determine the effect of the education levels of the respondents on their adoption intentions for 3G. Education levels are represented by three categories, 'college and lower', 'university' and 'postgraduate and higher'. According to the findings of this research paper, respondents who have a university degree are more eager to adopt 3G technologies when compared with college graduates, while there is not a significant difference in adoption intentions between 'post graduate and higher' level and 'university'. This can be interpreted as; upward education after university level does not make a considerable difference in the graduates' propensity to adopt 3G technologies. However the probability of an individual's acceptance towards 3G increases as he completes university degree after college.

Prior research has shown that individuals having more years of formal educations are expected to adopt new technologies earlier than the ones who have less (Rogers, 1995). The results obtained in this research study shows partial verification for the previous literature. Respondents having university level degree have more tendencies towards 3G adoption when compared with college graduates. But university level education does not make a distinction when compared with post graduate and higher although there supposed to be a difference favoring higher education more. Hence, it can be interpreted that university education tends to be a threshold level for differentiating individuals' intentions, those having university and higher degrees are more likely to adopt 3G.

6.2.4 City of Residence

Hypothesis ten is developed to analyze the relationship between city of residence and adoption intentions of individuals. City of residence is represented with four categories, including three metropolitan cities, Ankara, Istanbul and Izmir, and the others apart from these three. The objective for this part is to find the difference between the 3G adoption intentions of people living in metropolitan cities and smaller ones, if it exists. According to the results obtained in this research study, city of residence is found insignificant in determining the intentions of respondents. Residence in a metropolitan city does not have a distinct influence on respondents' likeliness to purchase 3G services when compared with 'other' cities.

Prior research has identified city size as an influential factor in innovation adoptions. Due to the intense interactions and information flow in big cities, people tend to be more informed about innovations hence more eager to adopt them (Bairoch, 1991; Murayama et al., 2000). However, the results of this research paper have not supported the previous literature concerning the impact of city size on adoption intentions. It can be concluded that the belief that potential market for 3G services will be the metropolitan cities is inaccurate, since the respondents from 'other' cities are also interested in purchasing 3G services as much as the others residing in metropolitan ones.

6.2.5 Occupation

Hypothesis eleven is proposed to determine the influence of occupation of the individuals on their adoption intentions for 3G. Occupation is represented by four categories, including, 'employer', 'worker', 'student' and 'unemployed/retired'. As indicated in the results section, there is not a significant relationship between occupation of the respondents and their acceptance for 3G. It can be said that adoption intentions of the respondents are not influenced by the occupations them.

CHAPTER 7
CONCLUSION

This research study has explored the possible 3G acceptance in Turkey, where the implementation of 3G technologies is being deployed and will be accessible by July 2009. The factors affecting the adoption intentions of the individuals towards 3G technologies are questioned. Hence, a basic market research, seeking for the adoption criteria of the individuals, is applied prior to the release of the technology in Turkey. This chapter summarizes the models assessed in this research study, practical implications, limitations and future research for the study.

7.1 Theoretical Contribution

This study benefits from different theories including technology acceptance model, theory of planned behavior, diffusion of innovations theory and network externalities theory. This research clarifies the essential factors, which are adapted from the mentioned theories, influencing the acceptance of 3G services in Turkey. Hence, the findings of the study add to the cumulative knowledge in adoption of innovations. In particular, major theoretical contribution of this research thesis is the illustration of the impact of the defined six factors on 3G acceptance. The results obtained shows that the adoption intentions of 3G services is dependent on the influences of the perceived usefulness, perceived ease of use, perceived enjoyment, personal innovativeness and network effects. However, image is found to be insignificant on people's choices regarding the purchase of 3G services. Hence; considerations like gaining prestige or having 3G as a status symbol are not founded as effective on 3G acceptance of individuals.

Another major finding of this research study is the demonstration of the significant effects of the demographic characteristics, 'age' and 'education levels'. The findings confirmed the previous literature, by clarifying that, individuals who belong to lower age categories and completed higher education levels tend to be more eager to purchase 3G technologies, which is very logical. The study has also demonstrated that demographic features gender, occupation and city of residence do not affect the acceptance of 3G technologies.

7.2 Practical Implications

In addition to its theoretical contributions, this research study has also some practical implications. Five out of six factors have found significant in terms of affecting individual's purchasing intentions for 3G. Perceived usefulness is one of the critical factors that influence acceptance for 3G which means that people care about the benefits they will get from the 3G services. This can be developed with managerial implications, seeking for the ways to expand the usage of 3G services. Operators need to draw attention to the benefits of 3G technologies which may be effective in convincing people for adopting the services. Perceived ease of use is another significant dimension that determines the adoption intentions of people. Again, operators may show the easiness of the services with showrooms where people can try and learn different features of 3G. This way, the purchasing tendencies may be prevented from the forejudgements of people concerning the difficulty degree of the 3G services. Perceived enjoyment, which is another critical factor influencing the adoption intentions of people, can be supported with various multimedia services 3G technologies can offer. Lastly, adoption intentions are also found to be affected by the network effects. Operators may attract more people with different promotions and advertisements, which will increase the utility that will be gained from the purchase of 3G services and consequently end up with more adoptions.

7.3 Limitations

The research study also holds some limitations regarding the sampling method and the content. Snowball sampling is employed in the research, which is partially subjective, because of the selection of the initial group by the researcher. Snowball sampling is a non-probability sampling which gives no certainty that the sample will be representative of the population under focus. However even though probability sampling is more precise in representing the population, it is more time-consuming and costly. The resources time and money are the restrictions for this study which explains the reason for the choice of the snowball sampling. Also, the survey is conducted via web-based questionnaires, which basically results in the exclusion of the people who do not have internet connection. Hence the sample tends to overestimate the innovativeness profiles of the population because solely the ones having internet are included in the study.

Another limitation regarding the study is about the content. 3G services are new in Turkey, in fact it is still in the implementation phase and the advertisements about 3G have

been recently shown. In the survey, the respondents are asked for indicating their perceptions regarding 3G, about which maybe they are not informed much. Hence, the research demonstrates anticipations rather than real experiences. Subsequent to deployment of the new technology, views about usefulness, easiness or enjoyment of 3G may change. Therefore, this study should be counted as a pre-market analysis which seeks for individual's perceptions about 3G.

7.4 Future Research

Some possibilities for future research are available. One possible future research study may be executed after some years, in order to examine the difference in people's perceptions regarding 3G services, before and after the deployment of 3G. Also after the release of 3G services, the changes on the adoption rates with respect to differing prices and price sensitivities of the consumers may be examined in a further research. The substitute effects of wireless fidelity (wi-fi) networks and the factors influencing the choices of the consumers between 3G and wi-fi may also be another possible subject for future research. Another opportunity for future research can be stated as a cross-national study, which compares the similarities and differences in the 3G adoption criteria between Turkey and the other country under focus.

7.5 Conclusion

The overall objective of this research study is to analyze the factors and user characteristics influencing 3G acceptance. This objective is achieved by adapting several technology acceptance theories, identifying critical factors that are likely to affect 3G adoption intentions. The effects of the user characteristics on 3G acceptance are examined through the demographic control section of the study. In the end, after using SPSS to run logistic regression, the relationship between each factor and the adoption intentions is demonstrated. The results support some of the previous researches, while at the same time giving practical implications for 3G operators.

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APPENDIX A

Questionnaire

3G stands for the third generation mobile technologies. 3G mobile services provide advanced multimedia services, as well as rapid internet connection, video conference, television and radio broadcasts with extra service costs. Contracts for 3G mobile services have been signed with the operators, Turkcell, Vodafone and Avea. 3G services are anticipated to be utilized by the end of July.

Below you will find several expressions about 3G mobile services. Please answer the following according to the scale from 1 (strongly disagree) to 5 (strongly agree)
Perceived Usefulness - adapted from Moore & Benbasat (1991), Liao et al. (2007), Pagani (2004)
3G mobile services will allow me to do things faster
3G mobile services will make me more productive
3G mobile services will increase my degree of mobility
3G mobile services will increase the quality of communication
Additional services that will be available with 3G are useless for me
Mobile phones are not comfortable enough for using high speed internet
Perceived Ease of Use - adapted from Agarwal & Prasad (1997)
Using 3G mobile services seems complicated for me
It will be easy to learn using 3G mobile services.
Using 3G mobile services will be clear and understandable
Perceived Enjoyment - adapted from Liao et al. (2007)
Using 3G mobile services seems to be unpleasant
Upcoming 3G mobile services excite me
It will be interesting to use 3G mobile services
Image – adapted from Agarwal & Prasad (1997)
People who use 3G mobile services will have more prestige than those who wont
Using 3G mobile services will be a status symbol

Personal Innovativeness – adapted from Agarwal & Prasad (1998)
I like to purchase new information/communication technologies
Among my peers, I am usually the first to try out new information/communication technologies
In general I am hesitant to try out new information technologies
Network Effects
I think my contacts are eager to use 3G services
My contacts usually follow the innovations about mobile phones closely.
Adoption Intention – adapted from Vijayasarathy (2004), Nicolas et. al.(2008)
Do you expect to be using 3G mobile technologies? Yes / No / Indecisive

Demographics Control	
Please specify your gender.	Male
	Female
Please specify your age.	
What is the highest level of education you have completed?	High school and below
	University
	Post Graduate and higher
Which city are you living in?	Ankara
	Istanbul
	Izmir
	Others
Which is your occupation?	Employee
	Self-employed
	Student
	Unemployed /Retired

APPENDIX B

Reliability Analysis for 'Perceived Usefulness' (PU)

```
****** Method 1 (space saver) will be used for this analysis ******
_
```

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	PU1	3,7021	1,0688	282,0
2.	PU2	3,6099	1,0351	282,0
3.	PU3	3,7199	1,0686	282,0
4.	PU4	3,8404	1,0329	282,0
5.	PU5	3,7234	1,1907	282,0
6.	PU6	2,8369	1,2406	282,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	21,4326	21,3567	4,6213	6

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
PU1	17,7305	14,4182	,7141	,7092
PU2	17,8227	14,8866	,6759	,7203
PU3	17,7128	14,6040	,6870	,7161
PU4	17,5922	16,3278	,4746	,7667
PU5	17,7092	14,6340	,5823	,7408
PU6	18,5957	17,9356	,1791	,8430

Reliability Coefficients

N of Cases = 282,0 N of Items = 6

Alpha = ,7853

APPENDIX B

Reliability Analysis for 'Perceived Ease of Use' (PEU)

```
****** Method 1 (space saver) will be used for this analysis ******
_
```

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	PEU1	3,6312	1,0699	282,0
2.	PEU2	4,1206	,9240	282,0
3.	PEU3	3,7305	,8919	282,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	11,4823	5,2613	2,2937	3

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
PEU1	7,8511	2,5115	,4733	,6867
PEU2	7,3617	2,6374	,5898	,5288
PEU3	7,7518	2,9061	,5129	,6247

Reliability Coefficients

N of Cases = 282,0 N of Items = 3

Alpha = ,7035

```
****** Method 1 (space saver) will be used for this analysis ******
_
```

APPENDIX B

Reliability Analysis for 'Perceived Enjoyment' (PE)

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	PE1	4,0390	,9518	282,0
2.	PE2	4,0035	,9637	282,0
3.	PE3	3,9468	1,1100	282,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	11,9894	7,6405	2,7641	3

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
PE1	7,9504	3,6986	,8293	,8315
PE2	7,9858	3,5656	,8644	,8008
PE3	8,0426	3,4430	,7199	,9342

Reliability Coefficients

N of Cases = 282,0 N of Items = 3

Alpha = ,8979

APPENDIX B

Reliability Analysis for 'Image' (I)

```
****** Method 1 (space saver) will be used for this analysis ******
_
```

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	I1	3,2021	1,2534	282,0
2.	I2	2,9007	1,3005	282,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	6,1028	5,4805	2,3410	2

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
I1	2,9007	1,6912	,6804	.
I2	3,2021	1,5711	,6804	.

Reliability Coefficients

N of Cases = 282,0 N of Items = 2

Alpha = ,8095

APPENDIX B

Reliability Analysis for 'Personal Innovativeness' (PI)

****** Method 1 (space saver) will be used for this analysis ******

_

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	PI1	3,7057	1,1546	282,0
2.	PI2	2,9397	1,1871	282,0
3.	PI3	3,7021	1,1490	282,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	10,3475	8,5977	2,9322	3

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
PI1	6,6418	3,9175	,7324	,6066
PI2	7,4078	4,1285	,6343	,7147
PI3	6,6454	4,6140	,5396	,8114

Reliability Coefficients

N of Cases = 282,0 N of Items = 3

Alpha = ,7913

APPENDIX B

Reliability Analysis for 'Network Effects' (NE)

```
****** Method 1 (space saver) will be used for this analysis ******
_
```

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

		Mean	Std Dev	Cases
1.	NE1	3,4752	1,0094	282,0
2.	NE2	3,5532	1,0048	282,0

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	7,0284	3,3586	1,8327	2

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
NE1	3,5532	1,0096	,6557	.
NE2	3,4752	1,0190	,6557	.

Reliability Coefficients

N of Cases = 282,0 N of Items = 2

Alpha = ,7920

APPENDIX C

Turkish Translation of the Questionnaire

3. Nesil GSM Hizmetleri üçüncü nesil kablosuz telefon teknolojilerine verilen genel addır. 3N, sağladığı gelişmiş multimedya özelliklerinin yanı sıra, WAP sisteminden daha yüksek hızda internet, görüntülü konuşma, televizyon ve radyo kanallarının yayını gibi hizmetleri ekstra servis ücreti karşılığında sunuyor. 3. Nesil mobil iletişim hizmetleri için sözleşmeler Turkcell, Vodafone ve Avea ile imzalandı. Temmuz sonunda 3G'ye geçilmesi planlanıyor.

Aşağıda çeşitli ifadeler sıralanmıştır. Lütfen her ifade için fikrinizi aşağıdaki ölçeğe göre belirtiniz.

Kesinlikle katılmıyorum (1)
Katılmıyorum (2)
Kararsızım (3)
Katılıyorum (4)
Kesinlikle katılıyorum (5)

Sayfa 1

3N mobil hizmetleri sayesinde islerimi daha hızlı yapacağımı düşünüyorum.

3N mobil hizmetleri sayesinde daha verimli olabileceğimi düşünüyorum.

3N mobil hizmetlerinin mobilitemi arttıracağını düşünüyorum.

3N mobil hizmetlerinin iletişim kalitesini arttıracağını düşünüyorum.

3N mobil hizmetlerinin benim için faydasız olacağını düşünüyorum.

Cep telefonlarının yüksek hızda internet kullanımı için yeterince kullanışlı olmadığını düşünüyorum.

Sayfa 2

3N mobil hizmetlerini kullanmanın zor olacağını düşünüyorum.

3N mobil hizmetlerini kullanmayı çabuk öğreneceğimi düşünüyorum.

3N mobil hizmetlerini kullanmanın açık ve anlaşılır olacağını düşünüyorum.

Sayfa 3

3N mobil hizmetlerini kullanmanın keyifli olacağını düşünüyorum.

3N mobil hizmetlerini kullanmanın ilgi çekici olacağını düşünüyorum.

3N mobil hizmetlerini merak ediyorum.

Sayfa 4

3N mobil hizmetlerinin, kullananlarin prestijini arttiracağını düşünüyorum.

3N cep telefonu hizmetlerini kullanmanin statü göstergesi olacağını düşünüyorum.

Sayfa 5

Yeni teknoloji ürünlerini satın almayı severim

Çevremdeki insanlar arasında yeni teknoloji ürünlerini ilk deneyenler arasında olurum

Yeni teknoloji ürünlerini denemek konusunda genellikle çekingen davranırım

Sayfa 6

Çevremdeki insanların 3N mobil hizmetlerini kullanmaya hevesli olduklarını düşünüyorum.

Çevremdeki insanlar cep telefonları ile ilgili teknolojik yenilikleri genellikle yakından takip ederler

Sayfa 7

3N mobil hizmetlerini kullanmayı düşünür müsünüz?

Evet / Hayir / Kararsizim

Sayfa 8

Cinsiyetiniz nedir? Bayan / Bay

Yaşınız kaç?

Tamamladığınız en yüksek eğitim seviyesi hangisidir?

İlköğretim

Lise

Universite

Yüksek lisans ve daha üstü

Mesleğiniz nedir?

Çalışan

İşveren

Öğrenci

İşsiz/Emekli

Hangi şehirde ikamet ediyorsunuz?

Ankara

İstanbul

İzmir

Diğer

APPENDIX D

The population census report 2000 by Turkish Statistical Institute

			Province		
Age group		**Total**	**Ankara**	**İstanbul**	**İzmir**
Total	**Total (T)**	**67 803 927**	**4 007 860**	**10 018 735**	**3 370 866**
	Male (M)	**34 346 735**	**2 027 105**	**5 088 535**	**1 698 819**
	Female (F)	**33 457 192**	**1 980 755**	**4 930 200**	**1 672 047**
0-4	**T**	6 584 822	322 001	863 801	242 391
	M	3 396 690	165 588	444 602	124 785
	F	3 188 132	156 413	419 199	117 606
5-9	**T**	6 756 617	333 234	886 289	266 450
	M	3 485 746	170 536	455 931	136 733
	F	3 270 871	162 698	430 358	129 717
10-14	**T**	6 878 656	355 639	887 898	289 091
	M	3 570 657	183 400	462 730	148 600
	F	3 307 999	172 239	425 168	140 491
15-19	**T**	7 209 475	409 893	1 043 067	325 271
	M	3 691 218	213 244	560 056	168 671
	F	3 518 257	196 649	483 011	156 600
20-24	**T**	6 690 146	444 505	1 059 601	335 920
	M	3 426 714	237 397	516 580	176 004
	F	3 263 432	207 108	543 021	159 916
25-29	**T**	5 895 255	377 693	1 067 011	300 071
	M	2 976 430	190 334	550 732	150 742
	F	2 918 825	187 359	516 279	149 329
30-34	**T**	5 009 655	333 638	869 672	266 512
	M	2 552 370	166 532	450 067	133 766
	F	2 457 285	167 106	419 605	132 746
35-39	**T**	4 854 387	329 966	797 767	268 261
	M	2 453 579	165 010	407 694	134 547
	F	2 400 808	164 956	390 073	133 714
40-44	**T**	4 068 756	275 002	656 519	240 907
	M	2 083 531	139 783	337 606	122 037
	F	1 985 225	135 219	318 913	118 870
45-49	**T**	3 368 769	220 966	520 588	208 222
	M	1 710 757	111 481	263 788	105 460
	F	1 658 012	109 485	256 800	102 762
50-54	**T**	2 717 349	171 916	400 017	166 541
	M	1 356 391	85 622	202 833	84 229
	F	1 360 958	86 294	197 184	82 312
55-59	**T**	2 058 422	122 428	277 874	124 064
	M	1 016 254	60 502	138 326	62 499
	F	1 042 168	61 926	139 548	61 565
60-64	**T**	1 829 288	101 015	219 622	106 926
	M	864 299	46 252	101 471	50 898
	F	964 989	54 763	118 151	56 028
65-69	**T**	1 645 517	87 611	190 138	92 707
	M	794 881	40 869	87 109	43 245
	F	850 636	46 742	103 029	49 462
70-74	**T**	1 172 643	63 680	140 206	71 274

	M	517 870	26 823	56 191	30 200
	F	654 773	36 857	84 015	41 074
75-79	**T**	577 597	31 848	75 525	38 114
	M	254 443	13 389	30 153	16 290
	F	323 154	18 459	45 372	21 824
80-84	**T**	246 692	13 978	32 845	14 945
	M	98 797	5 365	12 162	5 586
	F	147 895	8 613	20 683	9 359
85+	**T**	216 500	11 645	28 184	12 583
	M	83 572	4 306	9 489	4 211
	F	132 928	7 339	18 695	8 372
Unknown	**T**	23 381	1 202	2 111	616
	M	12 536	672	1 015	316
	F	10 845	530	1 096	300

APPENDIX E

Multinomial Logistic Regression Results

Case Processing Summary

		N	Marginal Percentage
BEHAVIOR	negative	38	13,5%
	neutral	67	23,8%
	positive	177	62,8%
AGE	1	89	31,6%
	2	83	29,4%
	3	63	22,3%
	4	47	16,7%
EDUC	College	92	32,6%
	Higher	55	19,5%
	Uni	135	47,9%
GENDER	F	125	44,3%
	M	157	55,7%
OCCUP	employer	17	6,0%
	student	102	36,2%
	unemp	13	4,6%
	worker	150	53,2%
CITY	Ankara	104	36,9%
	İstanbul	87	30,9%
	İzmir	38	13,5%
	Others	53	18,8%
Valid		282	100,0%
Missing		0	
Total		282	
Subpopulation		281(a)	

a The dependent variable has only one value observed in 281 (100,0%) subpopulations.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	509,793			
Final	311,791	198,003	36	,000

Pseudo R-Square

Cox and Snell	,504
Nagelkerke	,603
McFadden	,388

Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	311,791(a)	,000	0	.
PU	337,822	26,031	2	,000
PEU	320,416	8,626	2	,013
PE	317,765	5,974	2	,050
I	312,200	,409	2	,815
PI	326,865	15,074	2	,001
NE	323,303	11,513	2	,003
AGE	328,065	16,274	6	,012
EDUC	323,253	11,462	4	,022
GENDER	315,864	4,074	2	,130
OCCUP	320,279	8,488	6	,204
CITY	319,613	7,822	6	,251

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Parameter Estimates

BEHAVIOR		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
negative	Intercept	17,437	2,704	41,601	1	0,000			
	PU	-1,795	0,499	12,944	1	0,000	0,166	0,062	0,4416
	PEU	-0,673	0,370	3,299	1	0,069	0,510	0,247	1,0546
	PE	-0,862	0,392	4,839	1	0,028	0,422	0,196	0,9103
	I	0,151	0,269	0,313	1	0,576	1,163	0,686	1,9708
	PI	-1,051	0,307	11,724	1	0,001	0,350	0,192	0,6381
	NE	-0,969	0,309	9,849	1	0,002	0,379	0,207	0,6949
	[AGE=1]	-2,094	0,791	7,001	1	0,008	0,123	0,026	0,581
	[AGE=2]	-1,478	0,754	3,841	1	0,050	0,228	0,052	1
	[AGE=3]	-1,089	0,805	1,828	1	0,176	0,337	0,069	1,6316
	[AGE=4]	0,000	.	.	0	.	.	.	.
	[EDUC=College]	1,937	0,639	9,191	1	0,002	6,941	1,984	24,291
	[EDUC=Higher]	0,867	0,732	1,403	1	0,236	2,380	0,567	9,9923
	[EDUC=Uni]	0,000	.	.	0	.	.	.	.
	[GENDER=F]	1,011	0,546	3,438	1	0,064	2,750	0,944	8,0101
	[GENDER=M]	0,000	.	.	0	.	.	.	.
	[OCCUP=employer]	-0,999	1,252	0,637	1	0,425	0,368	0,032	4,2812
	[OCCUP=student]	-0,884	0,665	1,764	1	0,184	0,413	0,112	1,5227
	[OCCUP=unemp]	-0,209	1,213	0,030	1	0,863	0,812	0,075	8,7462
	[OCCUP=worker]	0,000	.	.	0	.	.	.	.
	[CITY=Ankara]	-1,229	0,746	2,714	1	0,099	0,293	0,068	1,2626
	[CITY=İstanbul]	-0,613	0,725	0,716	1	0,397	0,542	0,131	2,2412
	[CITY=İzmir]	-0,562	0,921	0,372	1	0,542	0,570	0,094	3,4667
	[CITY=Others]	0,000	.	.	0	.	.	.	.

neutral	Intercept	11,766	2,093	31,614	1	0,000			
	PU	-1,590	0,360	19,509	1	0,000	0,204	0,101	0,413
	PEU	-0,845	0,298	8,074	1	0,004	0,429	0,240	0,7693
	PE	-0,085	0,300	0,079	1	0,778	0,919	0,510	1,6544
	I	0,097	0,191	0,261	1	0,610	1,102	0,759	1,6015
	PI	-0,614	0,223	7,583	1	0,006	0,541	0,350	0,8378
	NE	-0,519	0,228	5,200	1	0,023	0,595	0,381	0,9296
	[AGE=1]	-1,104	0,571	3,740	1	0,053	0,332	0,108	1,015
	[AGE=2]	-1,032	0,567	3,311	1	0,069	0,356	0,117	1,0828
	[AGE=3]	0,314	0,559	0,315	1	0,575	1,369	0,457	4,0964
	[AGE=4]	0,000	.	.	0	.	.	.	.
	[EDUC=College]	1,130	0,473	5,705	1	0,017	3,094	1,225	7,8183
	[EDUC=Higher]	0,596	0,493	1,460	1	0,227	1,815	0,690	4,7696
	[EDUC=Uni]	0,000	.	.	0	.	.	.	.
	[GENDER=F]	0,576	0,394	2,137	1	0,144	1,778	0,822	3,8484
	[GENDER=M]	0,000	.	.	0	.	.	.	.
	[OCCUP=employer]	0,316	0,750	0,178	1	0,673	1,372	0,316	5,9599
	[OCCUP=student]	-1,008	0,473	4,538	1	0,033	0,365	0,144	0,9226
	[OCCUP=unemp]	0,761	0,890	0,732	1	0,392	2,141	0,374	12,245
	[OCCUP=worker]	0,000	.	.	0	.	.	.	.
	[CITY=Ankara]	0,146	0,564	0,067	1	0,796	1,157	0,383	3,4928
	[CITY=İstanbul]	-0,245	0,581	0,178	1	0,673	0,783	0,251	2,4439
	[CITY=İzmir]	0,839	0,664	1,599	1	0,206	2,315	0,630	8,5
	[CITY=Others]	0,000	.	.	0	.	.	.	.

The reference category is: positive.
This parameter is set to zero because it is redundant.

Classification

	Predicted			
Observed	negative	neutral	positive	Percent Correct
negative	20	8	10	52,6%
neutral	3	35	29	52,2%
positive	3	13	161	91,0%
Overall Percentage	9,2%	19,9%	70,9%	76,6%