

Analysis of Gender Differences in Internet Use of Children: Evidence from Turkey

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Abstract

In this study, factors in Internet use of female and male children in Turkey were determined with probit regression model by using micro data set in Household Information Technologies Usage Research of 2013 carried out by Turkish Statistical Institute. Dependent variable of the study is two category variable, namely Internet use and non-use of female and male children. Independent variables are socio-economic and demographic variables. According to chi-square analysis, there is a relation between Internet use of female and male children and socio-economic and demographic characteristics. According to probit regression analysis results, for female children, region, educational status, having computer or mobile phone on their own, frequency of watching TV, watching movie, series; floor show, music, game show; watching educational programs such as documentaries, culture, art, reading newspaper and journal in printed media, using mobile phone and frequency of using computer are variables effective in Internet use. Region, rural-urban difference, age, being literate, educational status, having mobile phone or game console on their own, watching entertainment, music, competition programs, reading newspaper and journal in printed media, using mobile phone and, frequency of using computer are variables effective in Internet use among male children. Frequency of using computer is the most effective variable in Internet use and it is more effective among female children compared to male children.

Keywords: internet use, children, probit regression, gender, marginal effect

1. Introduction

Today, digital media and Internet became a part of communication and information tools of many children. Internet access and use of children has been increasing throughout the world (McQuillan & O'Neill, 2009). Internet which was founded in 1960's in America has spread out all around the world in the last 50 years and according to data of June 2012, it has reached 2,405,518,376 people around the world (Mayda & Yılmaz, 2015). The section who is especially born after 1979 and named as "Generation Y" is on the frontline both due to their population and the new technology they use. This section and children and young people of today are primary actors of technology in general sense and in parts which require interaction and communication of computer and Internet. Considering in this sense, children are the factors who use technology well and progress to future (Canbek & Sağıroğlu, 2007). 87% of 5-7 year olds are known to use the Internet in UK, 21% of the 6-7 years old and 48% of the 8-9 year old use the Internet "at least rarely" in Germany, 64% of 7 year olds use the Internet in Finland, 70% of Flemish pre-schoolers are online, usually from the age of 3 to 4 onwards, and mostly on a regular basis of at least several times a month in Belgium, 70% of 3 to 4 year olds go online at least sometimes in Sweden, 78% of Dutch toddlers and pre-schoolers are already online and 5% of babies under 1 are going online in Netherlands, almost half of 3-6 year olds use the Internet on a regular basis in Austria, 58% of 0-6 year olds go online in Norway, 93% of 3-9 year olds go online for an average of 8-9 hours a week in South Korea, 25% of 3 year olds go online daily, rising to about 50% by age 5 and nearly 70% by age 8 in the US and 79% of children aged between 5-8 years go online at home in Australia (Holloway, Green, & Livingstone, 2013). Research across Europe provides evidence that gender gaps in access to the Internet are closing in nearly all countries, as home and school access becomes more commonplace. Although in most countries the percentage of boys using the Internet is slightly higher than girls, in only three countries are the differences statistically significant: Austria (boys: 62 per cent, girls: 45 per cent), Italy (boys: 41 per cent, girls: 30 per cent), and Germany (boys: 52 per cent, girls: 43 per cent) (McQuillan & O'Neill, 2009).

Many factors such as demographic, geographic and economic factors are effective in Internet use of children (Cleary, Pierce, & Trauth, 2006). Internet use and Internet access are important factors in the sense of equality. Internet can be used for entertainment and educational purposes and may also provide social benefits via communication mediums such as e-mail and social media (Madell & Muncer, 2004). Young adults are avid Internet users. Online social media, such as social networking sites (e.g., Facebook, MySpace), blogs, status updating sites (e.g., Twitter) and chat rooms, have become integral parts of childrens' and young adults' lives (Pujazon-Zazik & Park, 2010). Internet use influence sleeping behavior (Van den Bulck, 2004), health and social life (Koyuncu, Unsal, & Arslantas, 2014), familial communication and time spent with family (Lee & Chae, 2007), academic performance (Jackson et al., 2008; Kim & So, 2012) of children. Numerous surveys have attempted to measure how frequently children use the Internet at home. Estimates vary from as high as several hours a day to as low as 3 hours a week, depending on how Internet use is measured (e.g., self-report, automatically recorded), age of children sampled, and the year data were collected. Despite high variability in empirical estimates, public perception is that children spend a great deal of time online (Jackson, von Eye, & Biocca 2003). In a research carried out on 9-19 years old age group children in UK in 2004, it was determined that 84% of the children used Internet at least one time in a week (Livingstone, 2011).

In Turkey, internet use has been increasingly become wide and physical and mental health problems as relevant to internet addiction has been increasing at youths (Kayıran, Comert, Kose, & Gurakan, 2012). Misuse of internet may affect especially social life of the children in various ways. Important problems occur at social development of the children who use internet very frequently and play computer games. Having low self-esteem, increasing their social concerns and making peevish behaviors are one of these problems seen on children. While it is provided that children and youths are getting benefit from computer and internet opportunities in the right, effective and efficient way, their safeties are given particular importance (Harman, Hansen, Cochran, & Lindsey, 2005; Holloway *et al.*, 2013; Livingstone, Görzig, & Ólafsson, 2011). The basic aim of this study is to determine effect size of socio-economic and demographic factors which are effective in Internet use of children considering gender difference of them. Therefore, by using cross-section data in Household Information Technologies Usage Research carried out by Turkish Statistical Institute in 2013, factors which are effective in Internet use of female and male children in 6-15 age group will be analyzed with chi-square and probit regression analysis. The rest of this study was designed as such. In the second section, literature review was carried out about Internet use of children. In the third section, the method to be used in the study was explained and data, variables to be used were expressed. In the fourth section, analysis results were given in details. In the fifth section, discussion of findings was given.

2. Literatur Review

The Internet may be a global technology but children work in local/national contexts, and have differences in other aspects of their identities; one of the most important of which is gender identity (Li & Kirkup, 2007). Gender differences in the use of children's Internet have been well documented with studies in recent years (McQuillan & O'Neill, 2009; Madell & Muncer, 2004; Miliany, 2014; Talves & Kalmus, 2015). Although the Internet frequently has been characterized as male-dominated, recent evidence indicates that the gender differences in Internet use is rapidly diminishing (Weiser, 2000). Studies in recent years pay attention to gender differences. In these studies, gender differences are not very pronounced for interactive media use (McQuillan & O'Neill, 2009). Traditionally, technology is a male sphere, and research has previously shown that boys have a greater interest in technology itself than girls. Girls want to use the technology (Enochsson, 2005).

There are many academic studies which analyze gender differences in Internet use. In the study carried out for female and male children in Korea, Kim and So (2012) stated that school performance and success of female and male students who spend 3 or more hours on Internet on daily basis decrease compared to students who do not use Internet. Miliany (2014) found that Saudi females are less likely to engage in certain online activities such as social networking. Li and Kirkup (2007) indicated that gender difference still existed in college students or adult users in terms of access to and use of the Internet, attitudes towards the Internet, frequency of Internet use and self-assessment of Internet competency. Enochsson (2005) indicated that boys talk about their knowledge to a greater extent, and this interplays with their reflections about the Internet's reliability. Joiner et al. (2005) found that males were proportionally more likely to have their own web page than were females. They used the Internet more than females, in particular, they were more likely to use game websites, to use other specialist websites, and to download material from the Internet. However, females did not use the Internet for communication more than males. Jackson, Ervin, Gardner and Schmitt (2001) predicted and found that females used e-mail more than did males, males used the Web more than did females, and females reported more computer anxiety, less computer self-efficacy, and less favorable and less stereotypic computer attitudes. Jackson et al. (2008) indicated

race and gender differences in the intensity of IT use; African American males were the least intense users of computers and the Internet, and African American females were the most intense users of the Internet. Males, regardless of race, were the most intense videogame players, and females, regardless of race, were the most intense cell phone users. Schumacher and Morahan-Martin (2001) found that males were more experienced with computers, more likely to have taken high school courses requiring computer use, and reported higher skill levels in applications such as programming, games and graphics than females. Martin (1998) indicated that girls were at least as able as boys to complete the Internet activity. Furthermore, girls displayed greater enthusiasm for the task than did their male classmates. Durndell and Haag (2002) indicated that gender effects were found throughout, with males tending to report greater computer self-efficacy, lower computer anxiety, more positive attitudes towards the Internet and longer use of the Internet than females. Jackson et al. (2010) found that boys played videogames far more than did girls. Videogame playing was associated with a lower behavioral self-concept and lower self-esteem.

3. Material and Method

3.1 Probit Regression

Probit regression is one of the qualitative methods which has been widely used in health, science and social sciences fields from 1933 up to now (Cramer, 2003). In probit regression model, dependent variable is two-category variable which has the values of 0 and 1. While 1 shows that mentioned case has occurred, 0 shows that it has not. In other words, in probit regression two category dependent variable is explained such as yes-no, successful-unsucessful, wrong-correct. In probit regression, probability is used while dependent variable values are estimated. Probit model uses cumulative normal distribution function. According to this, probit model is written as;

$$P_i = F(P_i) = P(y_i = 1) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_0 + \beta_1 x_i + \dots + \beta_k x_k} e^{-u^2/2} du, \quad i = 1, 2, \dots, n \quad (1)$$

When the reciprocal of cumulative normal distribution function;

$$F^{-1}(P_i) = \beta_0 + \beta_1 x_i + \dots + \beta_k x_k \quad (2)$$

equation is obtained (Aldrich & Nelson, 1984). When parameters of probit regression model are estimated, maximum likelihood method is used. In Probit regression, each observation value complies with Bernoulli distribution. Then probability distribution for each observation is,

$$f_i(y_i) = P_i^{y_i} (1 - P_i)^{1-y_i}, \quad i = 1, 2, \dots, n \quad (3)$$

Since observations are independent, likelihood function is,

$$L = (y_1, y_2, \dots, y_n, \beta) = \prod_{i=1}^n f_i(y_i) = \prod_{i=1}^n P_i^{y_i} (1 - P_i)^{1-y_i} \quad (4)$$

Following necessary mathematical processes, log-likelihood function through which model parameters were estimated as such (Montgomery, Peck, & Vining, 2012),

$$\ln L(y, \beta) = \sum_{i=1}^n y_i \ln(P_i) + \sum_{i=1}^n (n_i - P_i) \ln(1 - P_i) \quad (5)$$

By using this function, model parameters which would maximize lnL value are estimated.

Since marginal effects are dependent on independent variables in regression model, marginal effects vary according to different observations. In a probit regression model where there is n observation and k independent variables, the effect of j . Independent variable can be calculated through average marginal effects. In other words, marginal effect for each independent variable,

$$\frac{1}{n} \sum_{i=1}^n \frac{\partial P[y_i=1]}{\partial x_{ji}} = \beta_j \frac{1}{n} \sum_{i=1}^n f(x_i \beta) \quad (6)$$

equation is obtained (Heij, De Boer, Franses, Kloek & Van Dijk, 2004).

3.2 Data

Data used in this study was obtained from the survey of Household Information Technologies Usage Research which was carried out by TUIK in 2013. Household Information Technologies Usage Research is carried out annually on regular basis since 2004 (except for 2006) by TUIK compatible to EU regulations, with the help of model question form developed in close association of European Union Statistical Office with EU member states offices and OECD. Every settlement place was included in the scope for sample choice throughout Turkey. Sampling method of the research is two stage stratified cluster sampling. In the first stage, clusters (blocks) composed of 100 houses on average were chosen into (PPS) sample in proportion to the size, in the second stage by using systematic choice method from clusters chosen for sample, sample addresses were determined. In this study, cross-section data of 6-15 age group children were used (TUIK).

3.3 Measures and Variables

Dependent variable of the study is the status of Internet use which is measured with the question “Do you use Internet?” (Yes/No). Dependent variable is two category variable in this study. In probit regression model, dependent variable categories are 1 if the child is using Internet and 0 is the child is not using Internet.

Independent variables are Statistical Territorial Units Classification (STUC)-Level 1 sub-regions (TR1/TR2/TR3/TR4/TR5/TR6/TR7/TR8/TR9/TRA/TRB/TRC); place of residence (rural/urban); age (6-10/11-15); gender (female/male); being literate (yes/no); school attended (elementary/secondary/vocational-technical secondary/general high-school/vocational-technical high-school/not attending); having computer (no/yes); having mobile phone (no/yes); having game console (no/yes); frequency of watching media TV (at least once in a week/nearly every day); watching news (no/yes); watching movies, series (no/yes); watching cartoons (no/yes); watching entertainment, music, competitions (no/yes); watching sports programs (no/yes); watching educational programs such as documentaries, culture, art (no/yes); reading newspaper/journal in printed media (no/yes); using mobile phone (no/yes) and frequency of using computer (nearly every day/at least once in a week/at least once in a month/less than once in a week/never).

Under the name of Statistical Territorial Units Classification (STUC), Turkey was divided into 12 regions at Section 1. These regions and cities in these regions are given in details in Table 1. In the basis of forming STUC regions in Turkey, there is the compulsion of founding Development Agencies. Since accession partnership contract signed with EU and national program prepared later on regard STUC regions as a precondition to found Development Agencies, it was a compulsion to found STUC regions. Available geographical regions were not considered in forming STUC regions in Turkey, region boundaries were determined depending on different criteria. One of the most important factor is population. Apart from population, cultural structure and development level of cities were also considered (Taş, 2006).

Table 1. Statistical region units classification—Level 1

Code	Level 1	Provinces
TR1	İstanbul	İstanbul
TR2	West Marmara	Tekirdağ, Edirne, Kırklareli, Balıkesir, Çanakkale
TR3	Aegean	İzmir, Aydın, Denizli, Muğla, Manisa, Afyonkarahisar, Kütahya, Uşak
TR4	East Marmara	Bursa, Eskişehir, Bilecik, Kocaeli, Sakarya, Düzce, Bolu, Yalova
TR5	Western Anatolia	Ankara, Konya, Karaman
TR6	Mediterranean	Antalya, Isparta, Burdur, Adana, Mersin, Hatay, Kahramanmaraş, Osmaniye
TR7	Central Anatolia	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir, Kayseri, Sivas, Yozgat
TR8	West Blacksea	Zonguldak, Karabük, Bartın, Kastamonu, Çankırı, Sinop, Samsun, Tokat, Çorum, Amasya
TR9	East Blacksea	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane
TRA	NortheasternAnatolia	Erzurum, Erzincan, Bayburt, Ağrı, Kars, Iğdır, Ardahan
TRB	East Anatolia	Malatya, Elazığ, Bingöl, Tunceli, Van, Muş, Bitlis, Hakkâri
TRC	Southeastern Anatolia	Gaziantep, Adıyaman, Kilis, Şanlıurfa, Diyarbakır, Mardin, Batman, Şırnak, Siirt

Source: TUIK

4. Application Results

4.1 Descriptive Statistics

Independent variables in the study, number of Internet use of children according to genders, percentages and chi-square test results related with status of Internet use are given in Table 2. According to chi-square independent test results, it was determined that there was a significant relation between Internet use status of both females and males and socio-economic and demographic variables. The rate of female and male children who use Internet in more developed regions in economic sense is higher. While 16.41% of female children and 13.57% of male children who use Internet is in TR1 (İstanbul) region, 23.73% of female children and 22.69% of

male children who do not use Internet is in TRC (Gaziantep, Adıyaman, Kilis, Şanlıurfa, Diyarbakır, Mardin, Batman, Şırnak, Siirt) region. 80.9% and 81.01% of female and male children respectively who use Internet live in urban regions. Nearly all of the female and male children who use Internet (98%) are literate. It is seen in Table 2 that 66.95% of female children who use Internet are in 11-15 age group, 38.84% are at elementary school, 45.55% are at general secondary school, 66.23% of female children who use Internet are in 11-15 age group, 41.78% are at elementary school, 42.66% are at general secondary school. When Table 2 is analyzed, it is seen that 60.3% of female children who use Internet do not have computer on their own, 76.25% do not have mobile phone and 97.19% do not have a game console; 61.23% of male children who use Internet do not have computer on their own, 75.22% do not have mobile phone and 93.61% do not have game console. Respectively 89.67% and 92.26% of female and male children who use Internet watch TV nearly every day. It was determined that Internet use status of children varies according to status of watching television. It was determined that 12.97% of female children who use Internet watch news programs, 74.41% watch movies, series; 57.03% watch cartoons, 68.39% watch entertainment, music-competition programs, 10.27% watch sports programs and 25.76% watch educational programs such as documentaries, culture, art programs. It was determined that 15.98% of male children who use Internet watch news programs, 64.43% watch movies, series; 63.13% watch cartoons, 54.19% watch entertainment, music-competition programs, 51.69% watch sports programs and 28.58% watch educational programs such as documentaries, culture, art programs. When the rate of Internet use of children according to frequency of computer use is analyzed, 43.6% of female children who use Internet use computer nearly every day and 46.41% use computer at least once in a week. 50.2% of female children who use Internet use computer nearly every day and 41.18% use computer at least once in a week.

Table 2. Internet use of children according to gender

Variables	Female				Chi-square test	Male				Chi-square test
	Internet notuser (n = 1964)		Internet user (n = 1743)			Internet notuser (n = 1913)		Internet user (n = 2159)		
	n	%	n	%		n	%	n	%	
STUC-Level 1					0.000*					0.000*
TR1	136	6.92	286	16.41		142	7.42	293	13.57	
TR2	28	1.43	102	5.85		34	1.78	130	6.02	
TR3	122	6.21	197	11.30		108	5.65	248	11.49	
TR4	94	4.79	191	10.96		82	4.29	233	10.79	
TR5	125	6.36	177	10.15		127	6.64	248	11.49	
TR6	215	10.95	198	11.36		210	10.98	261	12.09	
TR7	102	5.19	127	7.29		99	5.18	163	7.55	
TR8	117	5.96	104	5.97		104	5.44	106	4.91	
TR9	50	2.55	76	4.36		68	3.55	84	3.89	
TRA	246	12.53	73	4.19		200	10.45	92	4.26	
TRB	263	13.39	76	4.36		305	15.94	111	5.14	
TRC	466	23.73	136	7.80		434	22.69	190	8.80	
Place of residence					0.000*					0.000*
Rural	842	42.87	333	19.10		835	43.65	410	18.99	
Urban	1122	57.13	1410	80.90		1078	56.35	1749	81.01	
Age					0.000*					0.000*
6-10	1155	58.81	576	33.05		1233	64.45	729	33.77	
11-15	809	41.19	1167	66.95		680	35.55	1430	66.23	
Being literate					0.000*					0.000*

No	185	9.42	36	2.07		234	12.23	48	2.22
Yes	1779	90.58	1707	97.93		1679	87.77	2111	97.78
School attended					0.000*				0.000*
Elementary	1161	59.11	677	38.84		1195	62.47	902	41.78
Secondary	468	23.83	792	45.44		428	22.37	921	42.66
Vocational/Technical Secondary	21	1.07	41	2.35		15	0.78	54	2.50
General High-School	53	2.70	158	9.06		26	1.36	174	8.06
Vocational/Technical High-School	11	0.56	35	2.01		8	0.42	45	2.08
Not Attending	250	12.73	40	2.29		241	12.60	63	2.92
Computer belonging to the child					0.000*				0.000*
No	1806	91.96	1051	60.30		1731	90.49	1322	61.23
Yes	158	8.04	692	39.70		182	9.51	837	38.77
Mobile phone belonging to the child					0.000*				0.000*
No	1914	97.45	1329	76.25		1863	97.39	1624	75.22
Yes	50	2.55	414	23.75		50	2.61	535	24.78
Game console belonging to the child					0.000*				0.000*
No	1954	99.49	1694	97.19		1900	99.32	2021	93.61
Yes	10	0.51	49	2.81		13	0.68	138	6.39
Frequency of watching media TV					0.000*				0.025**
At Least Once in a Week	113	5.75	180	10.33		118	6.17	167	7.74
Nearly Every Day	1851	94.25	1563	89.67		1795	93.83	1992	92.26
Watching news					0.000*				0.000*
No	1826	92.97	1517	87.03		1794	93.78	1814	84.02
Yes	138	7.03	226	12.97		119	6.22	345	15.98
Watching movies, series					0.000*				0.000*
No	787	40.07	446	25.59		943	49.29	768	35.57
Yes	1177	59.93	1297	74.41		970	50.71	1391	64.43
Watching cartoons					0.000*				0.000*
No	451	22.96	749	42.97		288	15.05	796	36.87
Yes	1513	77.04	994	57.03		1625	84.95	1363	63.13
Watching entertainment, music, competitions					0.000*				0.000*
No	1096	55.80	551	31.61		1300	67.96	989	45.81
Yes	868	44.20	1192	68.39		613	32.04	1170	54.19
Watching sports programs					0.000*				0.000*
No	1904	96.95	1564	89.73		1431	74.80	1043	48.31
Yes	60	3.05	179	10.27		482	25.20	1116	51.69
Watching educational programs such as documentaries, culture, art					0.000*				0.000*
No	1754	89.31	1294	74.24		1653	86.41	1542	71.42
Yes	210	10.69	449	25.76		260	13.59	617	28.58

Reading newspaper/journal in printed media				0.000*	0.000*			
No	1778	90.53	1163	66.72	1790	93.57	1597	73.97
Yes	186	9.47	580	33.28	123	6.43	562	26.03
Using mobile phone				0.000*	0.000*			
No	1780	90.63	1065	61.10	1731	90.49	1262	58.45
Yes	184	9.37	678	38.90	182	9.51	897	41.55
Frequency of using computer				0.000*	0.000*			
Nearly Every Day	90	4.58	760	43.60	154	8.05	1084	50.21
At Least Once in a Week	275	14.00	809	46.41	216	11.29	889	41.18
At Least Once in a Month	42	2.14	110	6.31	52	2.72	100	4.63
Less Than Once in a Week	16	0.81	29	1.66	19	0.99	25	1.16
Never	1541	78.46	35	2.01	1472	76.95	61	2.83

*p<.01; **p<.05

4.2 Estimated Model

Probit regression model was used in order to determine factors effective in Internet use of children according to gender. In order to analyze effects of categories belonging to all variables to be included in probit regression model, ordinal and nominal variables were defined as dummy variable. It was tested whether there is multiple linear relation between independent variables to be included in probit regression model. It is thought that if variance inflation factor (VIF) values are 5 and above, it results in medium level, if it is 10 and above it results in high level of multiple linear relation (Bagheri, Habshah, & Imon, 2012). As it is seen in Table 3, none of the independent variables included in model have 5 or more variance inflation factor. According to this, there is no variable which cause multiple linear relation problem between variables in model.

General probit regression model formed after independent variables of model are determined is written as such.

$$\begin{aligned}
 F^{-1}(P_i) = & Intercept + \beta_1 D_{TR1,i} + \beta_2 D_{TR2,i} + \beta_3 D_{TR3,i} + \beta_4 D_{TR4,i} + \beta_5 D_{TR5,i} + \beta_6 D_{TR6,i} + \beta_7 D_{TR7,i} \\
 & + \beta_8 D_{TR8,i} + \beta_9 D_{TR9,i} + \beta_{10} D_{TRA,i} + \beta_{11} D_{TRB,i} + \beta_{12} D_{ikametyeri,i} + \beta_{13} D_{yas,i} + \beta_{14} D_{cinsiyet,i} \\
 & + \beta_{15} D_{okur-yazarlık,i} + \beta_{16} D_{okumuyor,i} + \beta_{17} D_{genel ortaokul,i} + \beta_{18} D_{mesleki/teknikortaokul,i} \\
 & + \beta_{19} D_{genel lise,i} + \beta_{20} D_{mesleki/tekniklise,i} + \beta_{21} D_{bilgisayar,i} + \beta_{22} D_{ceptelefonu,i} \\
 & + \beta_{23} D_{oyunkonsolu,i} + \beta_{24} D_{medya TV izleme,i} + \beta_{25} D_{haber,i} + \beta_{26} D_{film,i} + \beta_{27} D_{çizgi film,i} \\
 & + \beta_{28} D_{eğlence,i} + \beta_{29} D_{spor,i} + \beta_{30} D_{belgesel,i} + \beta_{31} D_{gazete/degiokuma,i} + \beta_{32} D_{ceptelkullanımı,i} \\
 & + \beta_{33} D_{hemenhergün,i} + \beta_{34} D_{haftada,i} + \beta_{35} D_{ayda,i} + \beta_{36} D_{birkaçay,i} \\
 & i = 1,2,3, \dots, 7779
 \end{aligned}$$

Results and marginal effects of estimated probit regression models are given in Table 3. Models formed were found statistically significant (P<0,000). Pseudo R² values of models were calculated as 0.5728, 0.5853 and 0.5679 respectively.

4.3 Marginal Effects

Marginal effects show change in the probability of estimated Internet use against one unit of change in independent variable. According to probit regression models, estimated possibility of Internet use of female and male children in TR1 (İstanbul) region is 8.4% and 4.9% more respectively compared to female and male children in TRC (Southeast Anatolia) region. Estimated possibility of Internet use of female and male children in TR2 (Western Marmara), TR3 (Aegean), TR4 (Southern Marmara), TR5 (Western Anatolia), TR6 (Mediterranean), TR7 (Central Anatolia) and TR9 (Eastern Black Sea) is (11.4%, 2.8%), (7%, 9.4%), (9.1%, 12.8%), (5.4%, 6%), (4.9%, 5.7%), (5.6%, 4.6%) and (10.2%, 6.9%) more compared to female and male children in TRC (Southeastern Anatolia) region. It was determined that place of residence, age and being literate are not effective in Internet use of female children. Estimated possibility of Internet use of male children in urban area is 4.6% more than those in rural area. Estimated possibility of Internet use of male children in 11-15 age group is 3.6%

more than male children in 6-10 age group. Estimated possibility of Internet use of male children who are literate is 6.9% more than those who are illiterate. Estimated possibility of Internet use of male children who attend general secondary and general high-school is respectively 3.9% and 11.7% more compared to male children who attend elementary school. For female children, estimated possibility of Internet use of those who attend general secondary school is 4.2% more compared to those who attend elementary school. Estimated possibility of Internet use of female children who has computer and mobile phone on their own is 2.8% and 3.9% more compared to those who do not have. Estimated possibility of Internet use of male children who have mobile phone and game console is respectively 4.1% and 6.8% more compared to those who do not have. Estimated possibility of Internet use of female children who watch television nearly every day is 4.2% more compared to those who watch at least once in a week. Estimated possibility of Internet use of female children who watch movies, series, entertainment, music, competition; educational programs such as documentaries, culture, art is respectively 2.9%, 2% and 2.7% more compared to those who do not watch. Estimated possibility of Internet use of male children who watch entertainment, music, competition programs is 2.3% more compared to those who do not watch. Estimated possibility of Internet use of female and male children who read newspaper and journal in printed media is respectively 4.4% and 4.8% more compared those who do not read. Estimated possibility of Internet use of female and male children who use mobile phone is respectively 4.9% and 3.1% more compared to those who do not use. Frequency of using computer is the most effective variable in Internet use of female and male children. Estimated possibility of Internet use of female and male children who use computer nearly every day is respectively 44.7% and 41.6% more compared to those who do never use. Estimated possibility of Internet use of female and male children who use computer at least once in a week is respectively 37.3% and 38.4% more compared to those who do not use. Estimated possibility of Internet use of female and male children who use computer at least once in a month is respectively 36% and 33.1% more compared to those who do not use. Estimated possibility of Internet use of female and male children who use computer less than at least once in a month is respectively 31.7% and 26.4% more compared to those who do not use.

Table 3. Factors effective in Internet use of female and male children

Variables	All			Female			Male		
	dy/dx	Std. Error	Vif	dy/dx	Std. Error	Vif	dy/dx	Std. Error	Vif
Gender (Reference: Female)									
Male	0,116	0,008	1,27	-	-	-	-	-	-
STUC-Level 1 (Reference: TRC)									
TR1	0.067*	0.014	1.70	0.084*	0.020	1.72	0.049*	0.019	1.69
TR2	0.113*	0.021	1.29	0.114*	0.031	1.28	0.113*	0.028	1.32
TR3	0.082*	0.014	1.51	0.070*	0.020	1.49	0.094*	0.020	1.53
TR4	0.107*	0.016	1.48	0.091*	0.022	1.48	0.128*	0.023	1.49
TR5	0.058*	0.014	1.53	0.054*	0.021	1.49	0.060*	0.020	1.58
TR6	0.053*	0.013	1.58	0.049**	0.019	1.56	0.057*	0.018	1.61
TR7	0.051*	0.016	1.37	0.056**	0.022	1.37	0.046*	0.021	1.38
TR8	0.008	0.016	1.33	0.017	0.023	1.35	0.002	0.023	1.32
TR9	0.084*	0.019	1.23	0.102*	0.028	1.22	0.069*	0.026	1.25
TRA	-0.013	0.016	1.44	0.003	0.023	1.46	-0.021	0.023	1.42
TRB	-0.006	0.015	1.48	-0.013	0.023	1.44	-0.004	0.020	1.53
Place of residence (Reference: Rural)									
Urban	0.032*	0.008	1.28	0.016	0.012	1.28	0.046*	0.012	1.29
Age (Reference: 6-10)									
11-15	0.023**	0.011	2.65	0.005	0.016	2.75	0.036**	0.014	2.58
Being literate (Reference: No)									

Yes	0.055*	0.021	1.74	0.041	0.031	1.66	0.069**	0.028	1.84
School attended (Reference: Elementary)									
Not Attending	-0.013	0.019	1.79	-0.030	0.030	1.77	0.001	0.026	1.84
Secondary	0.040*	0.040	2.42	0.042*	0.016	2.50	0.039*	0.015	2.37
Vocational/Technical	0.024	0.029	1.18	-0.002	0.040	1.19	0.049	0.043	1.19
Secondary	0.080*	0.020	1.52	0.045	0.026	1.56	0.117*	0.030	1.50
General High-School	0.028	0.032	1.15	0.024	0.045	1.16	0.032	0.046	1.16
Vocational/Technical									
High-School									
Computer belonging to the child (Reference: No)									
Yes	0.012	0.008	1.33	0.028**	0.011	1.33	-0.002	0.011	1.35
Mobile phone belonging to the child (Reference: No)									
Yes	0.041*	0.014	1.95	0.039**	0.021	1.96	0.041**	0.020	1.96
Game console belonging to the child (Reference: No)									
Yes	0.043	0.024	1.08	0.002	0.040	1.05	0.068**	0.031	1.10
Frequency of watching media TV (Reference: At Least Once in a Week)									
Nearly Every Day	-0.024	0.013	1.05	-0.042**	0.018	1.06	-0.006	0.019	1.04
Watching news (Reference: No)									
Yes	0.005	0.012	1.18	-0.008	0.017	1.17	0.015	0.016	1.20
Watching movies, series (Reference: No)									
Yes	0.018**	0.008	1.22	0.029*	0.011	1.25	0.008	0.010	1.19
Watching cartoons (Reference: No)									
Yes	0.001	0.009	1.52	0.008	0.012	1.57	-0.010	0.013	1.52
Watching entertainment, music, competitions (Reference: No)									
Yes	0.021*	0.007	1.26	0.020**	0.011	1.26	0.023**	0.010	1.26
Watching sports programs (Reference: No)									
Yes	0.019**	0.009	1.41	0.024	0.021	1.13	0.011	0.011	1.35
Watching educational programs such as documentaries, culture, art (Reference: No)									
Yes	0.012	0.009	1.22	0.027**	0.013	1.25	0.002	0.012	1.22
Reading newspaper/journal in printed media (Reference: No)									
Yes	0.045*	0.009	1.20	0.044*	0.012	1.23	0.048*	0.014	1.19
Using mobile phone (Reference: No)									
Yes	0.039*	0.010	1.89	0.049*	0.014	1.87	0.031**	0.013	1.93
Frequency of using computer (Reference: Never)									
Nearly Every Day	0.430*	0.008	2.01	0.447*	0.012	1.93	0.416*	0.011	2.06
At Least Once in a Week	0.379*	0.007	1.64	0.373*	0.011	1.63	0.384*	0.010	1.67
At Least Once in a Month	0.345*	0.014	1.11	0.360*	0.020	1.13	0.331*	0.020	1.11
Less Than Once in a Week	0.289*	0.024	1.04	0.317*	0.033	1.05	0.264*	0.033	1.04
All (n = 7779)	Log likelihood = -2303.5352; Prob > chi2 = 0.000*; Pseudo R ² = 0.5728; McFadden's R ² = 0.573; Correctly classified = 87.75%								

Female (n = 3707)	Log likelihood = -1062.7663; Prob > chi2 = 0.000* ; Pseudo R ² = 0.5853 ; McFadden's R ² = 0.585 ; Correctly classified = 87.56%
Male (n = 4072)	Log likelihood = -1216.2791 ; Prob > chi2 = 0.000* ; Pseudo R ² = 0.5679 ; McFadden's R ² = 0.568 ; Correctly classified = 87.82%

*p<.01; **p<.05

5. Discussion

In this study, socio-economic and demographic factors which effect Internet use of female and male children in Turkey were determined by using probit regression model. Moreover it was determined how much these factors are effective in Internet use of female and male children.

It was determined that possibilities of Internet use of female and male children in economically more developed regions was higher. High level of wealth of regions has positive effect on Internet use possibility of female and male children. Regional geography may also influence Internet use. Spooner (2003) found that web use was highest in the New England states, 1 with 66 percent of the residents having Internet access, and the Pacific Northwest, 2 with 68 percent of these residents having web access. By contrast, Internet access was lowest in the south, 3 with only 48 percent of the residents having web access. It is likely that regional variations in education and income may partially explain the regional variation in web Access (Wasserman & Richmond-Abbott, 2005). Urban-rural region discrimination is only effective in Internet use of male children. Age and status of being literate also increase only possibility of Internet use of male children. As the age increase among male children, so does the possibility of Internet use. Similarly, as the educational status increase among male children, so does the possibility of Internet use. Having computer and mobile phone increases possibility of using Internet among female children, and having mobile phone and game console increases possibility of using Internet among male children. In a study carried out on Korean children, it was found that possibility of playing online game among male children was higher than female children (Lee & Chae, 2007). Similar results were found in another study (Jackson, 2008). Frequency of watching TV is not effective in Internet use of male children. However, it was determined that possibility of Internet use of female children who watch television nearly every day is higher. While it was determined that possibility of Internet use of male children who watch entertainment, music, competition programs is higher, watching movies, series; entertainment, music, competition; educational programs such as documentaries, culture and are increase possibility of Internet use among female children. Reading newspaper and journal in printed media has positive effect on Internet use of female and male children. Status of using mobile phone is more effective in Internet use of female children compared to male children. Frequency of using computer is the most effective variables in Internet use of female and male children. As the frequency of computer using increases for both female and male children, so does possibility of estimated Internet use. It was determined that frequency of computer using is more effective in Internet use of female children compared to male children.

This study has specific limitations. Since cross-section data are used, inference cannot be done for the future. Estimations only for the current status were obtained. Since secondary data are used; variables which would be important such as monthly income, occupations of parents, educational status of the household were not included in the study.

In this study, factors which only effect Internet use were analyzed. In studies which would be carried out in the future, factors which effect Internet addiction of children in Turkey can be analyzed in details. Similarly, frequency of Internet use of children can be analyzed in more than two categories by using ordered probit regression model.

6. Conclusions

According to probit regression analysis results, for female children, region, educational status, having computer or mobile phone on their own, frequency of watching TV, watching movie, series; floor show, music, game show; watching educational programs such as documentaries, culture, art, reading newspaper and journal in printed media, using mobile phone and frequency of using computer are variables effective in Internet use. Region, rural-urban difference, age, being literate, educational status, having mobile phone or game console on their own, watching entertainment, music, competition programs, reading newspaper and journal in printed media, using mobile phone and , frequency of using computer are variables effective in Internet use among male children. Frequency of using computer is the most effective variable in Internet use and it is more effective among female children compared to male children.

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