



Research Article

The Effects of Mobile Devices on Children Social Communication Behaviours in Oman: An Assessment of Parents' Happiness and Awareness

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Abstract

This research aimed to assess the impacts of mobile devices on children's social communication behaviours in Oman. It endeavored to examine parents' awareness of the risks of mobile devices on children, and their happiness about their children uses of the mobile devices. To achieve this, the research carried out an exploratory study on the Omani parents to assess their perspective on the effects of mobile devices on their children social communication behaviours. Advanced neural networks analysis was performed to assess key variables as possible predictors of the study's main variables (Parents' Happiness and Parents' Awareness). Parents' age was found common predictor of both key variables. A comprehensive model that depicts all predictors of the study's two main variables is presented at the end.

Keywords: Social Communication, Mobile Effects, Children, Parents.

Introduction

The recent improvements in communication technology have enabled billions of users in the developed and developing parts of the globe to join those already using mobile devices (Mieczakowski et al., 2011). According to the statistics provided by (Stats,

2015), the Internet users across the world are now 3,366,261,156 billion. In fact, mobile devices have put a great impact on individuals (example; teens, schools age, youth) to join this technological phenomenon. The usage of mobile devices has almost doubled over the past few years. According to (Statista, 2016), the number of

mobile phone users worldwide in 2016 expected to reach 4.61 billion. Oman is one of those developing nations that have a vast penetration in using mobile devices. According to the Telecommunication Regulatory Authority in Oman (TRA, 2015); the total number of mobile subscribers has been 6,428,707 during 2015 in Oman, a figure that is almost the double of the total number of population.

Nowadays, most children acquire portable devices (example: laptop, smart phone, tablet, etc...) which can easily be connected to the World Wide Web (Buzzi, 2012). A study conducted in the United Kingdom shows that almost one-third of the 3-4 years old go online "using a desktop PC, laptop or notebook, 6% go online via a tablet and 3% via a mobile phone". The use of mobile devices has created several problems for the people of different ages. The presence of mobile communication technology has affected the structure of human relationship (Turkle, 2012). "The mobile phones can interfere with human relationships, an effect that is prominent when individuals are discussing personally meaningful topics" (Przybylski and Weinstein, 2013). A mobile device encourages access to applications (Shuler, 2009) anytime and anywhere, which increasingly makes it difficult for parents to (physically) monitor their children's mobile device use (Campbell and Park, 2008). A study conducted by (Ravichandran, 2009) shows that the mobile usage weakens family relationships. Another study done by (Przybylski and Weinstein, 2013) says that mobile devices have an effect on the quality of face to face interaction. The usage of smart phones has affected the psychological traits including social interaction, anxiety (Lee et al., 2014). A study done by (Boxer et al., 2015) shows that technology has reduced the growth of children.

Parents are scarcely cognizant of the risks regarding the usage of mobile devices by their children and it is very crucial to make those parents aware of the impacts of mobile devices and the Internet in particular upon

their children's social communication behavior. The parents' ability and willingness to monitor, share and control their children's use of online media has to face many challenges due to the portability of personalized and private nature of smart phones, which is entailed from the normal mobile phones. (Mascheroni and Ólafsson, 2014). In Sweden, young parents, aged between 25-45 years are providing their children with an accessibility to the Internet via mobile devices (Holloway et al., 2013). Other studies show that parents are less concerned about their younger children using the Internet than the older ones (McPake et al., 2010, Wagner, 2013, Brouwer et al., 2011).

More research is needed to shed light on this issue and to investigate parents' role and perspective. There are many research studies that focus on studying the usage of mobile devices by older children and teens, see for example (Holloway et al., 2013) but younger children are under researched especially with the risks associated with the use of mobile devices. Accordingly, this research assesses parents' awareness about the effects of mobile devices on their children's social communication behaviors. It also investigates their happiness of the use of their children of mobile devices. This problem is being viewed from parent's perspective, investigating children aged between 6 and 12 years.

Literature Review

The use of new electronic media by children and youth has been growing due to the entertainment and communication facilities provided by these devices. (Kirwil, 2011, Lange, 2014) show that the actual use of electronic devices already begins at the age of 7-11. The parents, guardians or the caretakers equip their children with those devices, assuming that these devices support their development, learning process and observation skills (Tomczyk and Wąsiński, 2014). Sometimes the reasons parents provide their children with smart phones is

to persuade them to eat (Genc, 2014). There are obviously benefits and risks at the same time. The benefits may overcome the risks, and may not be recognized until years later (Rosenberg, 2013).

There are many risks or negative impacts associated with the use of mobile devices by children. "Cyberbullying" is one of them (Schrock and Boyd, 2008, Levy et al., 2012). Cyberbullying as a term is defined as "attempts to use emotional harm and social embarrassment through the use of instant messaging, emails, social media, and text messages via cell phones." (Berson and Berson, 2002, Henson, 2012, Twyman et al., 2010). Another study done by (Mascheroni and Ólafsson, 2014) shows that younger children are exposed to a higher rate of harm (21%). Some other statistics show that the "smartphone users (17%) and tablet users (15%) have a greater experience of any form of cyber bullying than children who do not use mobile devices (8%)". Another study mentions that the social networks are responsible for creating an environment for cyberbullying especially for girls and young children (O'Neill and Dinh, 2015).

Another risk associated with the use of mobile devices by children is "sexual messages". Prior studies showed that children are using mobile phones and the Internet to interact and search for sexual things (Lenhart, 2009, Livingstone, 2011). Sexual messaging can have "unintended consequences" and may result into hurtful or problematic practice for some children (Mascheroni and Ólafsson, 2014). There are

also many additional risks related to the use of mobile devices. Some of them are "happy slapping" (Sieci, 2012, Chan et al., 2012) which means "aggressive or degrading video(s) are taken by a bystander and then forwarded to other people's phones or posted on a website" (Grigg, 2010), "cyber baiting" (Davison and Stein, 2014, Nixon, 2014) which means "the intention of harassment" (JIOW, 2015), "hating" (Delgado and Stefancic, 2014), "improper use of media in education" (Chudý et al., 2015, Glassman and Burbidge, 2014), "perilous contacts through the Internet" (Blau, 2011), "child grooming" (Nair, 2006). On the other hand, young users of social media use the Internet not only to communicate with the known people, but also with the unknown, and this could lead to the possibility of sharing sensitive data with them such as: age, location of residence, e-mail address, personal pictures, profession, hobbies and other confidential information (Tomczyk and Kopecký, 2016).

In this research, the aim is to assess the effects of mobile devices on children social communication behaviors\skills. Several studies focused on assessing social communication skills among children with autism or other special needs in general (Hansen et al., 2014, Nesterova et al., 2015, Shukla-Mehta et al., 2009). In order to assess the impacts of mobile devices on children social communication skills/behaviors, Table 1 summarizes and describes the list of social skills and behaviors found from the literature.

Table 1: Social Communication Behaviors\ Skills

Social Communication Skill	Description	Reference
Language Skills	Refers to children writing, speaking, reading and listening skills in their respective native language.	(Kersner and Wright, 2013)
Grammar and Spelling	Refers to children Grammar and Spelling skills in their respective native language.	(Kemp et al., 2014)
Description	Refers to children ability to describe what they want easily and clearly.	(Kersner and Wright, 2013)
Talking	Refers to children ability to talk with their peers and friends easily	(Kersner and Wright, 2013)
Loneliness	Refers to children ability to stay in group.	(Li and Lam, 2013)
Alertness	Refers to children who seem to be absent minded when we talk to them\her.	(Foreman et al., 2014)
Reaction	Refers to children reaction when someone speaks to him\her.	(Grimshaw et al., 2007, Korat and Shamir, 2007)
Social	Refers to children ability to participate in social events like Eid and birthdays.	(Ravichandran, 2009)
Freedom	Refers to children ability to speak freely in social gatherings or to say 'No' easily when they don't want something.	(Benjamin, 2014)
Fluency	Refers to children ability to use mix-language when talking (e.g. Arabic and English) or to use new words when talking.	(Bishop and Norbury, 2005)

Scholars have varied opinions about the effects of mobile devices on children social communication skills and behaviors. According to (Hourcade et al., 2013), the social interaction among children improves when using tablet rather than while reading books especially in the storytelling activities. In addition, using mobile applications has a potential to support "children's creative writing skills in order to motivate them to

complete their writing tasks" (Kanala et al., 2013). Also (Kirkorian et al., 2008) mentions that the use of mobile devices by children could improve their social skills. On the other hand, a recent study done by (Genc, 2014) surveyed parents on the use of smartphones by their preschool children. Parents with a positive opinion and attitude towards smartphones said that they were a source of improvement for the children's motor and

cognitive skills, visual memory, and their adaptation to technology. While parents with a negative opinion said that they may cause a physical or mental problem in the future as they fear that their children will be introverted, will have an isolated life, or would be affected by harmful radiation.

Some studies have reported negative effects, since the use of some features in mobile devices such as animation could cause "distraction to reading comprehension and could divert the children's attention away from learning." (Grimshaw et al., 2007, Korat and Shamir, 2007). Apparently, the reaction of children would be somehow slower when using mobile devices and their reading skills could also be affected. Some parents confided that they are uncomfortable with the use of smartphones by their children. In addition, some parents mentioned that using these types of devices could affect the improvement or grooming of the kids. Therefore, the use of mobile devices should not be preferred by the children over their physical and developmental actions or social relationships or while communicating "with peers, family members, or teachers". Additionally and when children use e-book for learning, they recall few details due to the additional distracted features provided in the e-book such as games and Wi-Fi (Chiong et al., 2012).

On the other hand, according to (Radesky et al., 2015), the interaction between parents and children during mealtime could prevent children from a number of issues, such as obesity (Hammons and Fiese, 2011), asthma (Fiese et al., 2011) and adolescent behavioral risks (Skeer and Ballard, 2013). The presence of mobile devices during this time could mitigate these benefits (Coon et al., 2001). Generally, mobile devices affect a parent-child interaction and are ought to be studied further to understand the effects of their usage upon the parent-child engagement in a lifelike context (Radesky et al., 2015).

Research Methodology

This research started with a general literature review in an aim to define the research objectives and questions. It carried out an exploratory case study on the Omani parents to assess their perspective on the effects of mobile devices on their children social communication behaviors. In parallel, a more focused literature review was carried out to develop a survey instrument. The research instrument has been designed based on the literature review and research objectives. Afterwards, the survey validity was conducted in two stages. The first stage was "Face Validation", in which the questionnaire templates were distributed among Information Systems experts or other departments' experts to collect some comments about whether the questions effectively captured the topic under investigation (Are survey questions understandable or confusing?). The second stage was "Pilot Survey Test", in which the survey questions were distributed to 10 parents in the college to test the data for any statistically weak questions. The questionnaires were refined based upon the outcomes of the survey validation stage in order to match all the comments which were provided previously.

The questionnaire was divided into different sections to achieve different aims. The questionnaire template has been designed in four sections to emphasize a better understanding and easy way of completion. It begins with demographic (Background Information) questions of the parents; including relationship of the participant to the children, age, education, income level, marital status and number of children corresponding to their ages. The second section is about parents' usage of mobile devices to assess if they are a mobile device user, number and types of mobile devices they own, how often they change a mobile device, and finally the amount of time they spend while using the mobile devices. The third section is the same as the second section but asks questions about the children

and their usage of mobile devices. The aim of sections 2 and 3 is to assess the fluency of parents and children in using mobile devices (though this is beyond the scope of this paper). The last section is divided into two main parts: 1) social communication skills to survey parents take on the effects of mobile devices on their children social communication skills/behaviors, 2) Parents' awareness about the effects of mobile devices on their children social communication skills/behaviors.

Findings

Neural networks (non-linear statistics (Baxt and Skora, 1996)) is comparatively a new

mathematical approach for recognizing the perceptive patterns in data (Coats and Fant, 1993). It is capable of understanding complex relations in a data set. Since it tries to mimic the human brain, its performance is considered superior to the traditional causal explanatory models (Chong et al., 2013). The neural network modeling has been successfully applied in predicting bank bankruptcy, loan assessment and many other domains. Here, the study aimed to use neural networks analysis to assess key variables as possible predictors of the study's main variables (Parents' Happiness and Parents' Awareness). Tables 3, 4 define key variables that have been tested.

Table 3: Parents' happiness and independent variables

Dependent Variables	Independent Variables	Question No.
Parents' Happiness	Gender of parents	Q2
	Age of parents	Q3
	Education Level of parents	Q4
	Income Level of parents	Q5
	Number of hours spent by parents in using mobile devices	Q13
	Number of hours spent by children in using mobile devices	Q19
	My children's language skills are progressing well.	Q21_1
	My children's grammar and spelling skills are progressing well.	Q21_2
	My children are able to describe whatever they want easily and clearly.	Q21_3
	My children are able to talk with their peers and friends easily.	Q21_4
	My children like to stay in groups.	Q21_5
	My children often seem to be absent- minded when we talk to them.	Q21_6

My children's reaction is not slow when we start talking to them.	Q21_7
My children like to participate in social events like Eid and birthdays.	Q21_8
My children speak freely at social gatherings.	Q21_9
My children are able to say 'No' easily when they don't want something.	Q21_10
My children use multi-languages while talking. (e.g. Arabic and English)	Q21_11
My children always use new words while talking.	Q21_12
It is normal that my children own mobile devices.	Q23_1
I feel safe when my children use mobile devices when I am not with them.	Q23_2
It is normal that my children have access to social networks via mobile device.	Q23_3
It is normal that my children play online games via mobile devices.	Q23_4
It is good for a specific age of children to use and own mobile devices.	Q23_5
It is okay that parents do not allow their children to use mobile devices.	Q23_6
It is okay to allow the Wi-Fi network being connected to my children's mobile device all the time.	Q23_7
I feel safe when my children share personal photos via social networks.	Q23_8
I feel safe when my children contact strangers.	Q23_9
I talk with my children about mobile devices' risks.	Q23_10
Parent Mobile Fluency	PMF
Children Mobile Fluency	CMF
Parents' Awareness	PA

Parents' Happiness

Here we explore how parents perceive several issues that are seen to affect their happiness regarding the usage of mobile devices by their children. The dependent variable is presented in Q24 in which it is being asked about the parents' happiness for their children using the mobile devices. On the other hand, many independent variables may have an effect on parents' happiness in order to achieve the study objectives. Table 3 represents all 31 independent variables. After performing the neural networks

analysis, table 4 shows each variable with its importance to the base variable. The variables are in ascending order among which the first variable has the highest importance. The test, "It is normal that my children own mobile devices," scored the highest importance. More details are in table 4. All the variables with an importance level of 44.4% and above were selected for a second test that aims to rank the top variables against each other. Results are presented in Table 5.

Table 4: The Results of Neural Networks Tests (Parents' happiness as dependent variable)

Variables	Normalized Importance	Importance
It is normal that my children own mobile devices, Q23_1	100.0%	.066
It is okay that parent do not allow their children to use mobile devices. Q23_6	96.9%	.064
My children often seem to be absent- minded when we talk to them. Q21_6	96.3%	.064
My children's reaction is not slow when we start talking to them .Q21_7	95.9%	.064
It is normal that my children play online games via mobile devices. Q23_4	91.9%	.061
My children's grammar and spelling skills are progressing well. Q21_2	91.8%	.061
I feel safe when my children share personal photos via social networks .Q23_8	77.3%	.051
My children are able to talk with their peers and friends easily. Q21_4	71.0%	.047
I feel safe when my children use mobile devices when I am not with them. Q23_2	69.8%	.046
It is okay to allow the Wi-Fi network being connected to my children's mobile device all the time. Q23_7	68.9%	.046
My children's language skills are progressing well. Q21_1	66.7%	.044

My children like to stay in groups .Q21_5	59.4%	.039
My children are able to say 'No' easily when they don't want something. Q21_10	50.3%	.033
I talk with my children about mobile devices' risks. Q23_10	49.8%	.033
Age of Parents	46.3%	.031
Parents' Awareness	44.4%	.029
My children like to participate in social events like Eid and birthdays .Q21_8	39.5%	.026
Gender of Parents	39.2%	.026
Number of hours spent by parents	38.3%	.025
My children use multi-languages while talking. (e.g. Arabic and English) Q21_11	35.8%	.024
It is normal that my children can access social networks via mobile devices. Q23_3	31.5%	.021
I feel safe when my children contact strangers. Q23_9	22.8%	.015
Education Level of parents	22.3%	.015
Parent Mobile Fluency	18.3%	.012
My children speak freely at the social gatherings. Q21_9	16.3%	.011
Number of hours spent by children	13.9%	.009
It is good for a specific age of children to use and own mobile devices. Q23_5	12.2%	.008
My children are able to describe whatever they want easily and clearly. Q21_3	12.0%	.008
Income level of parents	10.9%	.007
My children always use new words while talking. Q21_12	10.0%	.007
Children Mobile Fluency	5.0%	.003

As shown in table 5, the first variable has a stronger relationship with the base variable, "I feel safe when my children use mobile devices when I am not with them," and it

scored the highest level of importance rather than the others with the normalized importance of 100%. Secondly, "My children like to stay in groups", scored the second

highest importance level, while the others were with the normalized importance level of 75.6%. On the other hand, "My children often seem to be absent minded when we talk to them" scored the least among others.

More details are in table 5. A comprehensive diagram for the top sixteen variables is provided in Figure 10, which shows the top sixteen predictors with the highest percentages.

Table 5: Top sixteen variables

Independent Variables	Normalized Importance	Importance
I feel safe when my children use mobile devices when I am not with them. Q23_2	100.0%	.150
My children like to stay in groups. Q21_5	75.6%	.113
It is okay to allow the Wi-Fi network being connected to my children's mobile device all the time. Q23_7	75.0%	.112
It is normal that my children own mobile devices. Q23_1	67.6%	.101
It is okay that parents do not allow their children to use mobile devices .Q23_6	54.8%	.082
Parents' Awareness	47.9%	.072
My children's language skills are progressing well. Q21_1	44.9%	.067
I talk with my children about mobile devices' risks. Q23_10	32.3%	.048
Age of Parents	31.6%	.047
My children's grammar and spelling skills are progressing well. Q21_2	27.0%	.040
My children are able to say 'No' easily when they don't want something .Q21_10	24.6%	.037
My children are able to talk with their peers and friends easily. Q21_4	23.0%	.034
I feel safe when my children share personal photos via social networks .Q23_8	19.6%	.029
My children's reaction is not slow when we start talking to them. Q21_7	19.2%	.029
It is normal that my children play online games via mobile devices. Q23_4	14.3%	.021
My children often seem to be absent -minded when we talk to them. Q21_6	11.0%	.017

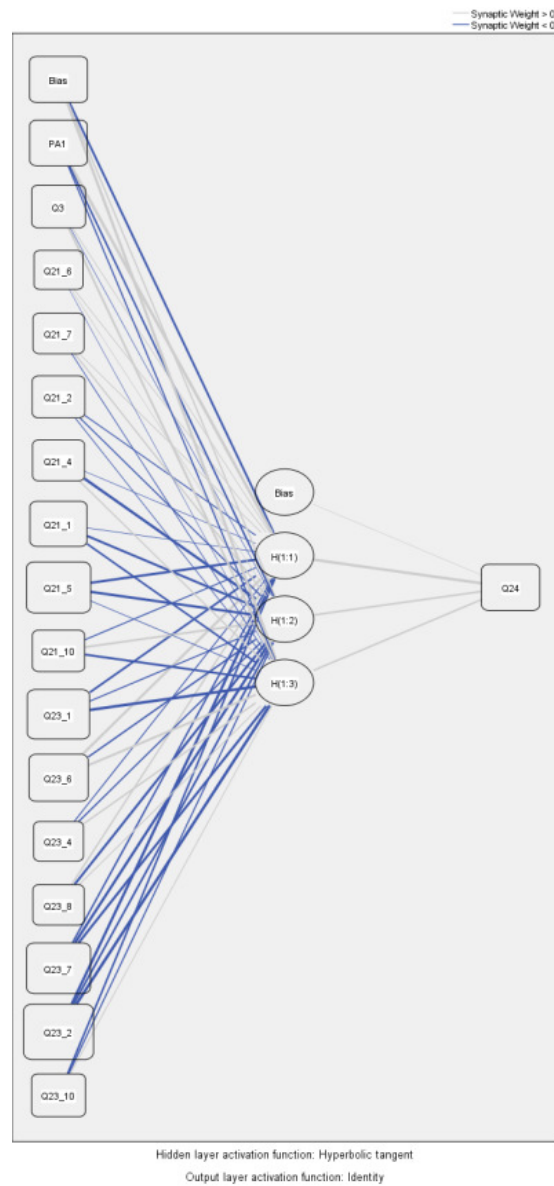


Figure 10: Relationship between (Parents' Happiness) and Independent Variables

Parents' Awareness

This section explores the variables influencing the awareness of the parents regarding the effects of mobile devices on

children. The base variable asked about parents' awareness regarding the effects of mobile devices on their children. Table 6 presents the chosen eight dependent variables.

Table 6: Parents' Awareness and Independent Variables

Dependent Variable	Independent Variables
Parents' Awareness	Children Mobile Fluency
	Age of parents
	Parent Mobile Fluency
	Number of hours spent by children while using mobile devices
	Income Level
	Education Level
	Number of hours spent by parents while using mobile devices
	Gender of parents

Table 7 illustrates the results of neural network test. The variables are in ascending order. The first variables have the highest importance among others. For this test, "the number of hours spent by parents" scored the highest percentage followed by the income level and age of parents. On the other

hand, parent mobile fluency was the least important among other variables. More details are in table 7. A comprehensive diagram for this test is provided in Figure 11, which shows the relationship between the base and dependent variables

Table 7: The Results of Neural Networks Tests (Parents' Awareness as dependent variable)

Independent Variables	Normalized Importance	Importance
Number of hours spent by parents while using mobile devices (Q13)	100.0%	.230
Income Level of Parents(Q5)	92.6%	.213
Age of parents (Q3)	78.5%	.181
Number of hours spent by children while using mobile devices (Q19)	60.0%	.138
Education Level of Parents(Q4)	38.4%	.088
Gender of parents (Q2)	26.5%	.061
Children Mobile Fluency (CMF)	20.6%	.047
Parent Mobile Fluency (PMF)	17.9%	.041

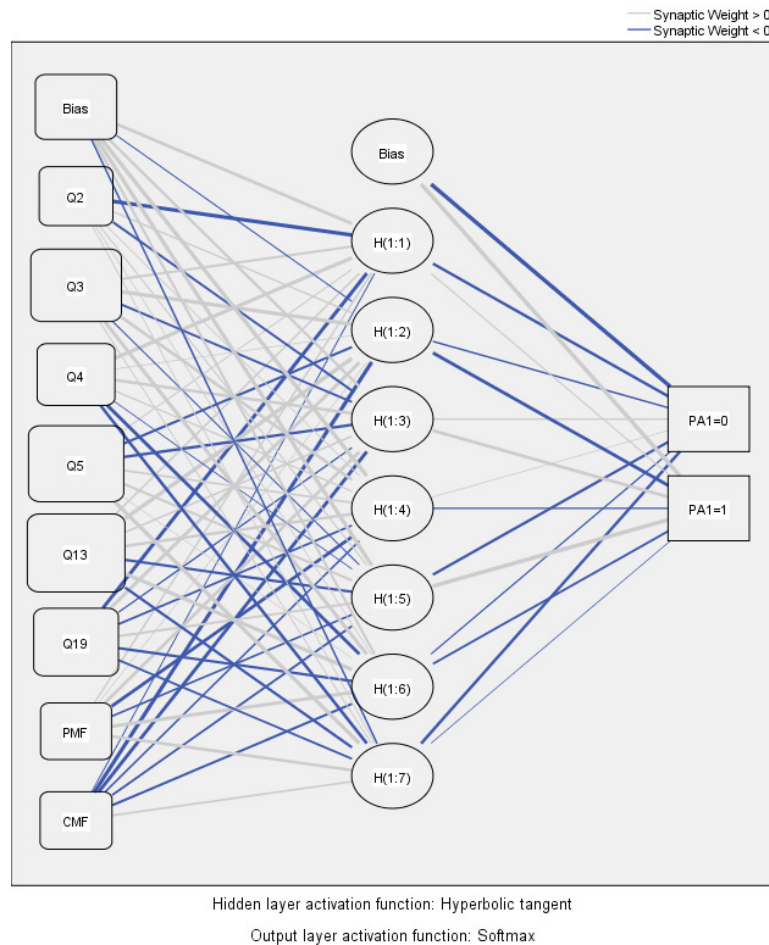


Figure 11: Relationship between (Parent Awareness) and independent variables

Discussion

The first and utmost objective of this research was to assess the happiness and awareness of parents in Oman about mobile devices' usage and impacts upon their children. Parents Happiness and Parents Awareness were analyzed previously. Figure 12 shows a comprehensive model for both variables and its predictors, and Table 8

describes each of these predictors. As observed, only one common variable affects both variables, and that is the age of parents. The change in the age of parents may have an effect on parents' happiness and awareness. In other words, the age of parents is more likely to affect their awareness and happiness of their children's usage of mobile devices.

Table 8: Each Indicator with Description

No.	predictors	Description
1	Sense of Safety	Parents feel safe when their children use mobile devices when parents are not with them
2	Loneliness	
3	Wi-Fi Approval	Parents feel safe when their children connect mobile devices to Wi-Fi Network
4	Mobile Approval	It is normal that children own mobile devices
5	Mobile Ban	It is okay that parents do not allow their children to use mobile devices
6	Language Skills	Children's language skills are progressing well
7	Talk about mobile devices risks	Parents talk with their children about mobile devices' risks
8	Grammar and spelling kills	Children's Grammar and spelling kills
9	Freedom skills	Children are able to say 'No' easily when they don't want something
10	Talking skills	Children are able to talk with their peers and friends easily
11	Sense of Safety (share personal photos)	Parents feel safe that their children share personal photos via mobile devices
12	Reaction skills	Children's reaction is not slow when we start talking to them
13	Online Games Approval	Parents feel normal that their children play online games

		via mobile devices
14	Alertness skills	Children often seem to be absent -minded when we talk to them
15	Parents' Hours	Number of hours spent by parents while using mobile devices
16	Income Level	Income level of parents
17	Children's Hours	Number of hours spent by children while using mobile devices
18	Education Level	Education level of parents
19	Gender	Gender of parents
20	CMF	Children mobile fluency
21	PMF	Parents' mobile fluency
22	Age	Age of parents

Other interpretations are as follows:

- The awareness of the parents about the effects of mobile devices' usage among children influences their happiness.
- Parents who feel safe regarding their children's use of mobile devices when they are not with them are more likely to be happy about their children using mobile phones.
- Parents whose children like to stay in groups are more likely to be happy regarding their children mobile devices' usage.
- Parents who allow their children to connect to the Wi-Fi network all the time are more likely to be happy regarding their children mobile devices' usage.
- Number of hours spent by parent has an impact upon their awareness regarding the effect of mobile devices used by their children.
- Parents' income level and age has an effect upon their awareness regarding the effect of mobile devices used by their children.

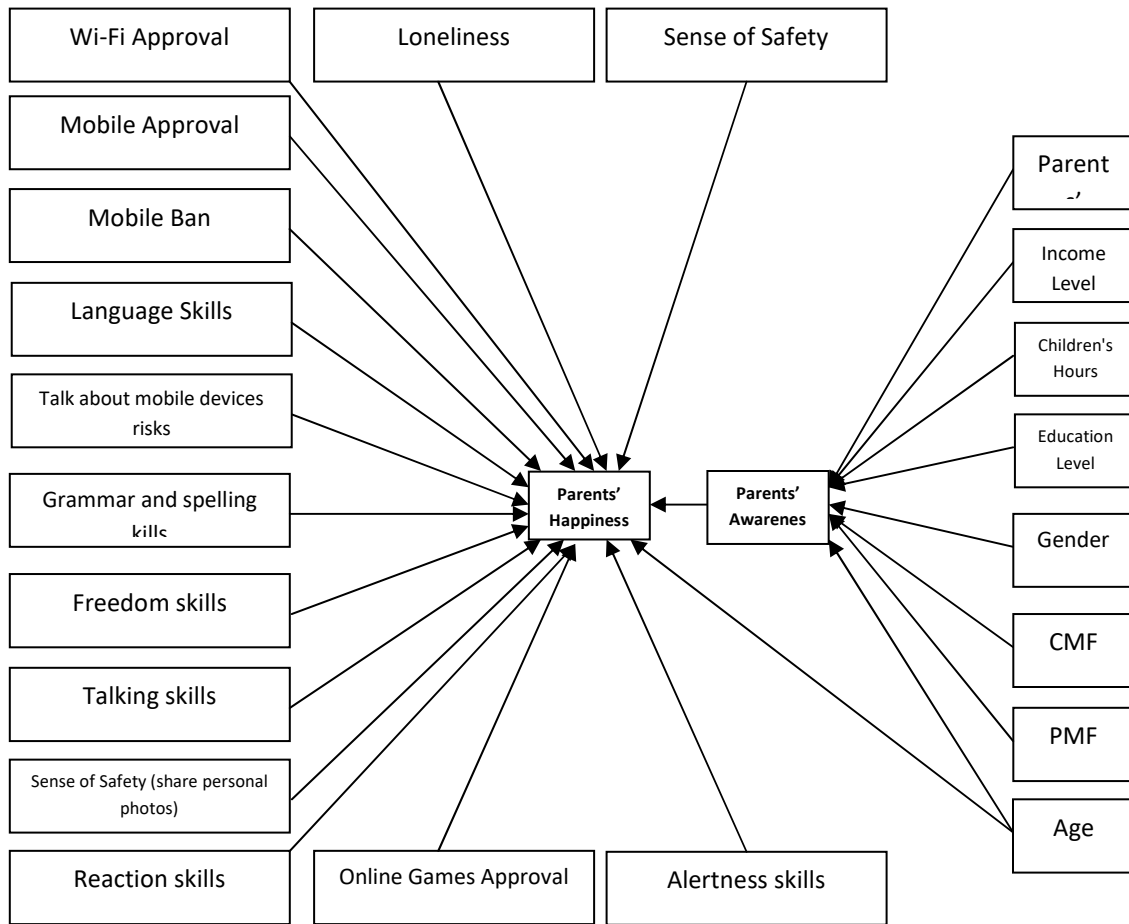


Figure 12: Parents Mobile Happiness and Awareness Model

Another related aim of the study was to identify the social communication effects of mobile devices on children in Oman. Table 8

shows the social skills that are ranked by parents.

Table 8: Ranking of social communication skills of children

No.	Statement	Rank	Percentage
1	Children Social Effect 8: Social	1	80.5%
2	Children Social Effect 9: Freedom	2	75.1%
3	Children Social Effect 4: Talking	3	69.7%
4	Children Social Effect 3: Description	4	63.2%
5	Children Social Effect 1: Language Skills	5	61.7%
6	Children Social Effect 5: Loneliness	6	60.6%
7	Children Social Effect 8: Social	7	58.3%
8	Children Social Effect 7: Reaction	8	55.6%
9	Children Social Effect 2: Grammar and Spelling	9	52.5%
10	Children Social Effect 10: Fluency	10	46.3
11	Children Social Effect 10: Fluency	11	34.5%
12	Children Social Effect 6: Alertness	12	24.5%

Recommendation

The last question in the questionnaire was a 'Yes' or 'No' question of which participants were asked if they are happy about their children usage of mobile devices. Interestingly, more than half (52.1%) of the parents have answered "Yes", while the rest (47.9%) answered "No". The parents may have a mixed opinion about their children's mobile use. Although the reaction of the parents to their children's social communication skills was positive in general, still 47.9% are not happy. The reason could be that parents might have felt reluctant to honestly answer the social communication section which may signal a failure in supervision. Another reason could be that

parents were forced to give their children mobile devices. It could also be a mean for parents to gain peace of mind, social status, or as a social pressure from their own peers and relatives. In all cases, such discrepancies in the findings urge us to treat the results carefully. It is highly recommended for future work to apply not only a quantitative but also a qualitative method in order to assess and observe parents' perception of mobile devices' usage among their children.

References

1. BAXT, W. G. & SKORA, J. 1996. Prospective validation of artificial neural network trained to identify acute myocardial infarction. *The Lancet*, 347, 12-15.
2. BENJAMIN, M. 2014. *An exploration of fashion information flow between mothers and their children*. Texas Christian University Fort Worth, Texas.
3. BERSON, I. R. & BERSON, M. J. 2002. Emerging risks of violence in the digital age: Lessons for educators from an online study of adolescent girls in the United States. *Journal of School Violence*, 1, 51-71.
4. BISHOP, D. V. & NORBURY, C. F. 2005. Executive functions in children with communication impairments, in relation to autistic symptomatology I: Generativity. *Autism*, 9, 7-27.
5. BLAU, I. 2011. Application use, online relationship types, self-disclosure, and Internet abuse among children and youth: implications for education and Internet safety programs. *Journal of Educational Computing Research*, 45, 95-116.
6. BOXER, P., GROVES, C. L. & DOCHERTY, M. 2015. Video Games Do Indeed Influence Children and Adolescents' Aggression, Prosocial Behavior, and Academic Performance A Clearer Reading of Ferguson (2015). *Perspectives on Psychological Science*, 10, 671-673.
7. BROUWER, C., DUIMEL, M., JANSEN, S., NIKKEN, P., PARDOEN, J. & PIJPERS, R. 2011. *App Noot Muis. Peuters en kleuters op het Internet: Buurtboek*: Leiden.
8. BUZZI, M. 2012. What are your children watching on youtube? *Advances in New Technologies, Interactive Interfaces and Communicability*. Springer.
9. CAMPBELL, S. W. & PARK, Y. J. 2008. Social implications of mobile telephony: The rise of personal communication society. *Sociology Compass*, 2, 371-387.
10. CHAN, S., KHADER, M., ANG, J. & TAN, E. 2012. Understanding happy slapping. *Int'l J. Police Sci. & Mgmt.*, 14, 42.
11. CHIONG, C., REE, J., TAKEUCHI, L. & ERICKSON, I. 2012. Comparing Parent-Child Co-Reading on Print, Basic, and Enhanced E-Book Platforms: A Cooney Center Quickreport. *The Joan Ganz Cooney Center*. np.
12. CHONG, L., ABBAS, M. M., FLINTSCH, A. M. & HIGGS, B. 2013. A rule-based neural network approach to model driver naturalistic behavior in traffic. *Transportation Research Part C: Emerging Technologies*, 32, 207-223.
13. CHUDÝ, Š., NEUMEISTER, P., SZOTKOWSKI, R. & BUCHTOVÁ, T. 2015. The Mutual Interrelationship between Education and ICT—in the context of Knowledge and Power in the Educational Environment. *Ciência e Técnica Vitivinícola*, 30, 12.
14. COATS, P. K. & FANT, L. F. 1993. Recognizing financial distress patterns using a neural network tool. *Financial management*, 142-155.
15. COON, K. A., GOLDBERG, J., ROGERS, B. L. & TUCKER, K. L. 2001. Relationships between use of television during meals and children's food consumption patterns. *Pediatrics*, 107, e7-e7.
16. DAVISON, C. B. & STEIN, C. H. 2014. The dangers of cyberbullying. *North American Journal of Psychology*, 16, 595.
17. DELGADO, R. & STEFANCIC, J. 2014. Hate speech in cyberspace. *Wake Forest Law Review*, 49.
18. FIESE, B. H., WINTER, M. A. & BOTTI, J. C. 2011. The ABCs of family mealtimes:

- Observational lessons for promoting healthy outcomes for children with persistent asthma. *Child development*, 82, 133-145.
19. FOREMAN, P., ARTHUR-KELLY, M., BENNETT, D., NEILANDS, J. & COLYVAS, K. 2014. Observed changes in the alertness and communicative involvement of students with multiple and severe disability following in-class mentor modelling for staff in segregated and general education classrooms. *Journal of Intellectual Disability Research*, 58, 704-720.
 20. GENC, Z. 2014. Parents' Perception about Mobile Technology Use of Preschool Aged Children. *Social and Behavioral Sciences*.
 21. GLASSMAN, M. & BURBIDGE, J. 2014. The dialectical relationship between place and space in education: How the internet is changing our perceptions of teaching and learning. *Educational Theory*, 64, 15-32.
 22. GRIGG, D. W. 2010. Cyber-Aggression: Definition and Concept of Cyberbullying. *Australian Journal of Guidance and Counselling*, 20, 143-156.
 23. GRIMSHAW, S., DUNGWORTH, N., MCKNIGHT, C. & MORRIS, A. 2007. Electronic books: Children's reading and comprehension. *British Journal of Educational Technology*, 38, 583-599.
 24. HAMMONS, A. J. & FIESE, B. H. 2011. Is frequency of shared family meals related to the nutritional health of children and adolescents? *Pediatrics*, 127, e1565-e1574.
 25. HANSEN, S. G., BLAKELY, A. W., DOLATA, J. K., RAULSTON, T. & MACHALICEK, W. 2014. Children with autism in the inclusive preschool classroom: A systematic review of single-subject design interventions on social communication skills. *Review Journal of Autism and Developmental Disorders*, 1, 192-206.
 26. HENSON, B. 2012. *Bullying beyond the schoolyard: Preventing and responding to cyberbullying*. Nature Publishing Group.
 27. HOLLOWAY, D., GREEN, L. & LIVINGSTONE, S. 2013. Zero to eight: Young children and their internet use.
 28. HOURCADE, J. P., WILLIAMS, S. R., MILLER, E. A., HUEBNER, K. E. & LIANG, L. J. Year. Evaluation of tablet apps to encourage social interaction in children with autism spectrum disorders. *In: Proceedings of the SIGCHI Conference on human factors in computing systems*, 2013. ACM, 3197-3206.
 29. JIOW, H. J. 2015. Singapore's Cybercrime Regulation based on Lessig's Modalities of Constraint.
 30. KANALA, S., NOUSIAINEN, T. & KANKAANRANTA, M. 2013. Using a mobile application to support children's writing motivation. *Interactive Technology and Smart Education*, 10, 4-14.
 31. KEMP, N., WOOD, C. & WALDRON, S. 2014. do i know its wrong: children's and adults' use of unconventional grammar in text messaging. *Reading and Writing*, 27, 1585-1602.
 32. KERSNER, M. & WRIGHT, J. A. 2013. *Supporting children with communication problems: sharing the workload*, Routledge.
 33. KIRKORIAN, H. L., WARTELLA, E. A. & ANDERSON, D. R. 2008. Media and young children's learning. *The Future of Children*, 18, 39-61.
 34. KIRWIL, L. 2011. Polskie dzieci w Internecie: Zagrożenia i bezpieczeństwo—część 21- Częściowy raport z badań EU Kids Online przeprowadzonych wśród dzieci w wieku 9-16 lat i ich rodziców.
 35. KORAT, O. & SHAMIR, A. 2007. Electronic books versus adult readers: Effects on children's emergent literacy as a function of social class. *Journal of Computer Assisted Learning*, 23, 248-259.

36. LANGE, R., OSIECKI, J. 2014. Nastolatki wobec Internetu/Teens and Internet. *Pedagogium, Warszawa*.
37. LEE, Y.-K., CHANG, C.-T., LIN, Y. & CHENG, Z.-H. 2014. The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in human behavior*, 31, 373-383.
38. LENHART, A. 2009. Teens and Sexting: How and why minor teens are sending sexually suggestive nude or nearly nude images via text messaging. Pew Internet and American Life Project. *Pew Research Center, Washington, DC*.
39. LEVY, N., CORTESI, S., GASSER, U., CROWLEY, E., BEATON, M., CASEY, J. & NOLAN, C. 2012. Bullying in a networked era: A literature review. *Berkman Center Research Publication*.
40. LI, M. & LAM, B. H. 2013. Cooperative learning.
41. LIVINGSTONE, S., HADDON, L., GÖRZIG, A., & ÓLAFSSON, K. 2011. Risks and safety on the internet: The perspective of European children. *London: LSE, EU Kids Online*.
42. MASCHERONI, G. & ÓLAFSSON, K. 2014. *Net children go mobile: risks and opportunities*, Educatt.
43. MCPAKE, J., PLOWMAN, L. & STEPHEN, C. 2010. The technologisation of childhood? Young children and technology in the home. *Children & Society*, 24, 63-74.
44. MIECZAKOWSKI, A., GOLDHABER, T. & CLARKSON, P. 2011. Culture, Communication and Change: Summary of an investigation of the use and impact of modern media and technology in our lives.
45. NAIR, A. 2006. Mobile phones and the internet: Legal issues in the protection of children. *International Review of Law Computers & Technology*, 20, 177-185.
46. NESTEROVA, A. A., AYSINA, R. M. & SUSLOVA, T. F. 2015. Recent Technologies to Improving Social and Communication Skills in Children with ASD: Systematization of Approaches and Methods. *Modern Applied Science*, 9, 38.
47. NIXON, C. L. 2014. Current perspectives: the impact of cyberbullying on adolescent health. *Adolescent health, medicine and therapeutics*, 5, 143.
48. O'NEILL, B. & DINH, T. 2015. Mobile technologies and the incidence of cyberbullying in Seven European Countries: findings from Net children go mobile. *Societies*, 5, 384-398.
49. PRZYBYLSKI, A. K. & WEINSTEIN, N. 2013. Can you connect with me now? How the presence of mobile communication technology influences face-to-face conversation quality. *Journal of Social and Personal Relationships*, 30, 237-246.
50. RADESKY, J., MILLER, A. L., ROSENBLUM, K. L., APPUGLIESE, D., KACIROTI, N. & LUMENG, J. C. 2015. Maternal mobile device use during a structured parent-child interaction task. *Academic pediatrics*, 15, 238-244.
51. RAVICHANDRAN, S. V. 2009. Mobile phones and Teenagers: Impact, Consequences and Concerns- Parents/Caregivers Perspectives. *Unitec Institute of Technology*.
52. ROSENBERG, S. 2013. Cell phones and children: Follow the precautionary road. *Pediatric nursing*, 39, 65.
53. SCHROCK, A. & BOYD, D. 2008. Online threats to youth: Solicitation, harassment, and problematic content: Literature review prepared for the Internet Safety Technical Task Force. *Retrieved March, 25, 2009*.
54. SHUKLA-MEHTA, S., MILLER, T. & CALLAHAN, K. J. 2009. Evaluating the

- effectiveness of video instruction on social and communication skills training for children with autism spectrum disorders: A review of the literature. *Focus on Autism and Other Developmental Disabilities*.
55. SHULER, C. 2009. Pockets of potential: Using mobile technology to promote children's learning.
56. SIECI, D. 2012. kompetencje komunikacyjne najmłodszych: raport z badań/[red. Nauk. Piotr Siuda, Grzegorz D. Stunzaj]. *Gdansk: Instytut Kultury Miejskiej*.
57. SKEER, M. R. & BALLARD, E. L. 2013. Are family meals as good for youth as we think they are? A review of the literature on family meals as they pertain to adolescent risk prevention. *Journal of youth and adolescence*, 42, 943-963.
58. STATISTA. 2016. *Number of mobile phone users worldwide from 2013 to 2019* [Online]. Available: <http://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide/> [Accessed].
59. STATS, I. W. 2015. *INTERNET USER on November 30, 2015* [Online]. Miniwatts Marketing Group. Available: <http://www.internetworldstats.com/stats.htm> [Accessed].
60. TOMCZYK, Ł. & KOPECKÝ, K. 2016. Children and youth safety on the Internet: Experiences from Czech Republic and Poland. *Telematics and Informatics*, 33, 822-833.
61. TOMCZYK, Ł. & WĄSIŃSKI, A. 2014. The factors and conditions of netoholism in the perspective of the diagnostic research. *Media, Culture and Public Relations*, 5, 4-16.
62. TURKLE, S. 2012. *Alone together: Why we expect more from technology and less from each other*, Basic books.
63. TWYMAN, K., SAYLOR, C., TAYLOR, L. A. & COMEAUX, C. 2010. Comparing children and adolescents engaged in cyberbullying to matched peers. *Cyberpsychology, Behavior, and Social Networking*, 13, 195-199.
64. WAGNER, U. 2013. *Zwischen Anspruch und Alltagsbewältigung: Medienerziehung in der Familie*, Vistas.