ABSTRACT

The United Nations Convention on the Rights of Persons with Disabilities came into force in 2008. The ICT Opportunity for a Disability-Inclusive Development Framework produced by UNESCO in 2013 formulated a development agenda for these rights, highlighting the importance of mobile devices in this development effort. This study examines the perceived usefulness of mobile phones for persons with disabilities. A survey was conducted. The structural equation model developed showed the latent variable Perceived Usefulness, manifested as Social Function, Emergency Help, Sense of Security, positively affected user satisfaction. Implications for enhancing mobile phone perceived usefulness for users with disabilities are discussed.

KEYWORDS: Perceived usefulness, Social function, Sense of security, Emergency help, Persons with disabilities

INTRODUCTION

Mobile traffic has been growing rapidly. In 2013 it was 18 times the size of the entire Internet in 2000 (Cisco, 2014). In 2013, the total mobile subscriptions was 6.7 billion (Ericsson, 2014). With a world population of 7.15 billion (Census Bureau, 2014), the global mobile penetration was 92% while the actual number of subscribers is around 4.5 billion as many have multiple subscriptions. Mobile devices have offered avenues for social engagement, particularly for persons of disability.

More than a billion of the world population live with some form of disability. In the United States, about 36 million people, or 12% of the US population, have a disability, including vision, hearing, and mobility impairments (Disabled World, 2011). For many persons with disabilities, the mobile phone is an innovation that provides them with much opportunities for development (ITU report, 2013). The use of the mobile phone is instrumental in allowing the independent living of persons with disabilities. Feature phones provide a means of communication for people with disabilities, allowing social networking, providing sense of security and ensuring emergency help.

Nations to protect the rights of persons with disabilities in all aspects of development. Of particular importance is the accessibility of Information and Communication Technologies (ICT). To contribute to the efforts leading to the formulation of a development agenda, the ICT Opportunity for a Disability-Inclusive Development Framework was produced in 2013 by the United Nations, International Telecommunication Union (ITU), Microsoft and the International Disability Alliance. This framework identifies best practices and challenges to which ICTs and mobile devices can enable and accelerate social and economic inclusion of persons with disabilities. The Framework outlined the importance of research and development efforts to understand the needs and concerns of users with disabilities for incorporating universal design in communication devices. The government was also recommended to play an active role to promote communication technologies adapted to the needs of persons with disabilities through revision of disability legislations. In light of these regulatory changes, research is required for the industry and practitioners to understand the needs of the disability market segments, and find out the elements affecting the usefulness and satisfaction of the mobile phone to users with disabilities.

**Research Problem**

For most persons with disabilities, the mobile phone is an innovation. Studies have been conducted on the adoption of innovations. Rogers (1995) suggested an individual's decision to adopt an innovation is a process that occurs over time. An innovation is adopted more easily if the number of relative advantages is high. Davis et. al (1989) proposed the Technology Acceptance Model (TAM), suggesting that a person's attitude towards the technology will affect his or her satisfaction and intention to use it, while this attitude toward the technology is in turn affected by the perceived usefulness and perceived ease of use of the technology.

The mobile phone provides opportunities for social participation for persons with disabilities (ITU, 2013). Social function is an important aspect of the perceived usefulness of the mobile phone. For persons with disabilities, improvements in technology have enabled people with disabilities to participate in social activities through the mobile devices anywhere anytime (Burton, 2011). A second important aspect of perceived usefulness is the emergency help the mobile phone provides. The mobile devices can enable independent living by providing emergency services to the person with disabilities. Family members, agencies, or friends can be contacted with the emergency call placed by a subscriber. A third aspect of perceived usefulness of the mobile phone is the sense of security provided. Researchers have found that mobile phones provide sense of security for weak and frail individuals, allowing them to be reached anytime and anywhere (Kurniawan et al. 2006, Kurniawan 2008).

The purpose of this research is to study the relationships between the perceived usefulness of mobile phones and user satisfaction for persons with disabilities. Perceived usefulness is assessed as a latent construct measured in terms of perceived social function, emergency help, and sense of security provided by the mobile phone. To investigate these relationships, a survey was conducted among mobile phone users with disabilities in the San Francisco Bay Area.

From an academic point of view, this study enriches our understanding of mobile phone perceived usefulness and their relationships to user satisfaction, and further our insight on how the technology acceptance model can be applied to understand the needs of users with disabilities. From a practical point of view, the study helps us understand the elements involved in perceived usefulness for people with disabilities. Providers and manufacturers can design features to enhance user satisfaction, supporting the implementation of the ICT Opportunity for a Disability-Inclusive Development Framework to meet the needs of users with disabilities.

**LITERATURE REVIEW**
Perceived Usefulness Factors: Social Function

Perceived social function is an important aspect of the perceived usefulness of the mobile phone for users with disabilities. Information and communication technologies enable and accelerate the social economic inclusion of persons with disabilities (ITU, 2013). Of particular importance is the mobile device which allows instantaneous access to all aspects of society and development. Opportunities for social participation also include social networking, news access, online interest groups, video, audio and text communication, cloud-based sharing and media interaction. For persons with disabilities, these services and content are made further accessible through both computer-based and web-based accessibility applications such as screen readers, speech recognition, video communication (for sign language communication and video relay interpretation), voice to text services (open and closed captioning, both real-time and embedded) and visual assistance.

Past research has demonstrated that social function of the mobile phone is an important aspect of its perceived usefulness. Aoki and Downes (2003) found that even for users who might have adopted cell phones for security or job-related reasons, the mobile phones will be increasingly be used for social interactions. Walsh et al. (2007), in investigating the psychological influences of mobile phone use, found that social factors were the strongest reason for mobile phone use. Humphreys (2008) found that the mobile phone, in comparison to the Internet, is able to create a more instantaneous public space for social relations and interaction when the mobile social network system Dodgeball was examined. Fortunati et al. (2010) found that the mobile phone is the most important instrument for social communication when compared with the Internet and other traditional media.

Research has found that social network externalities affect perceived usefulness and user satisfaction. Zhou and Lu (2011), in a study of 223 users, found that satisfaction and loyalty increase if users perceive most of their friends and classmates are using the mobile instant messaging service. Thus social function is one important aspect of perceived usefulness of the mobile phone, and users adopt mobile instant messaging to interact with peers in their social circle. Lin and Lu (2011), in a study of 402 Facebook users, found that enjoyment, number of peers and perceived usefulness were the most influential factors affecting the continued use of the social networking site. When the user believes it upgrades the user’s connecting with others, the user’s continued intention to use the site increases.

Geser (2004), in analyzing the sociological impact of the mobile phone, suggests that the mobile phone is instrumental in satisfaction the communication needs of individuals. The mobile phone allows individuals to engage in communication free from constraints of physical proximity and spatial immobility. Geser also suggests that the mobile phone bridges the gaps of communication between different social classes, freeing individuals from their immediate social surroundings by empowering them to fulfil many material and psychological needs without relating to any others in their vicinity. The mobile phone allows individuals to defend a minimal private social space and keep them connected to their close kin or friends regardless of their locations.

Thus perceived social function is a key aspect of the perceived usefulness of the mobile phone. We posit that the latent perceived usefulness of the mobile phone construct can be manifested in terms of the social function the mobile phone provides to the user.

Perceived Usefulness Factors: Emergency Help

The provision of emergence help is a second important aspect of perceived usefulness of the mobile phone. For persons with disabilities, having a mobile device increases independent living
because of the wide range of emergency services that can be accessed. In addition, the fact that the mobile phone is portable and easily carried by a user allows easy access to emergency services immediately at the time of need and from anywhere in the network (ITU, 2013).

Various researchers have studied the emergency use of mobile phones. Tennakoon and Taras (2012) conducted interviews to study how mobile phones are used during emergencies. They found out that the mobile phone provides a mode of communication to reach help anywhere anytime and acts as an emergency contact medium. They also found that the mobile phone serves as a companion when no one else was there, and reduces the threat of an attack. When there are imminent danger in the vicinity, for example in the case of a bomb blast emergency, the mobile phone allows communication of reassuring words to friends and families, and provides an informal network of information dissemination and news alert.

Holzinger et al. (2007) conducted experiments to improve the menus and usability interfaces to minimize the amount which needs to be memorized, so that the connection to emergency services is simplified in case of emergency. Ketabdar and Polzehl (2009) studied how mobile phones can be designed to monitor the physical activities of users and detect unexpected emergency situations such as a sudden fall or accident. Upon detection of such an event, the mobile phone can inform a designated center by automatically calling or sending messages about the incident and its location. Such an application can be particularly useful for elderly people or people with physical and movement disabilities.

Kurniawan (2008), in a study of the use of mobile phone by people aged 60 years and over, found that the most responded reason for using mobile phones was for emergency. In addition, respondents also indicated after having got mobile phones, they feel safer, more confident to go out by themselves, not afraid of getting lost, and know they can always call somebody for help if they are in trouble. As suggested by the ITU report (2013), mobile phones enable independent living by ensuring emergency services are readily available for the elderly and persons with disabilities. Thus emergency help is a key aspect of the perceived usefulness of the mobile phone. We posit that the latent perceived usefulness of the mobile phone construct can be manifested in terms of the emergency help the mobile phone provides to the user.

Perceived Usefulness Factors: Sense of Security

A third aspect of its perceived usefulness is the sense of security provided by the mobile phone. ITU (2013), together with UNESCO, Microsoft, G3ict, International Disability Alliance and Telecentre.org Foundation, conducted a consultation with experts including government, academic institutions, organizations of persons with disabilities, private sectors and international organizations. They found that the mobile phone is the most valued communication technologies in bringing about independent living for persons with disabilities, improving their access to various activities with peace of mind, and providing them services at the time of need.

In a focus group study with older woman, Kurniawan et al. (2006) found that the mobile phone provides sense of security for them, as individuals can be reached anytime anywhere. In a follow up study with panel experts and older men, Kurniawan (2008) found that the mobile phone enables frail older persons to engage in active social life, and provides them with a sense of safety and security. The sense of security is one primary reasons for their use of their mobile phones. He found that respondents had favorable responses towards the perceived sense of safety associated with mobile phones, and respondents thought the mobile phone had a positive role in facilitating their feelings of security.

Yoon (2007) found that the mobile phone brings peace of mind to the user with crime alerts. Aoki and Downes (2003) studied motivations for acquiring mobile phones using focus
groups and a survey, and found that sense of security was an initial motivator, and respondents felt less secure when deprived of their phones.

Tennakoon and Taras (2012) studied usage patterns and user sentiments about mobile phone technologies in Canada and Sri-Lankan. They found that respondents in both countries demonstrated a heightened sense of security with mobile phone use, with females showing significantly higher perception of security than males. When individuals had higher perceived usefulness of the mobile devices, they also had a higher sense of security associated with mobile phone use. Certain emotions and cognitive mechanisms were at work to bring about this sense of security, as respondents indicated that the mere presence of the mobile device seemed to bring comfort and peace of mind.

Thus the sense of security provided by the mobile phone is one primary factor of its perceived usefulness. We posit that the latent perceived usefulness of the mobile phone construct can be manifested in terms of the sense of security the mobile phone provides to the user.

Relationship between Perceived Usefulness and Landline Possession

As suggested by the technology acceptance model (Davis et al., 1989), perceived usefulness of a new technology is affected by external variables. Some of the external variables included demographic factors, such as age, education, income, race, gender and marital status (Porter and Donthu, 2006; Rice and Katz, 2003).

In developing a sociological theory of the mobile phone, Geser (2004) noted that the need for communication has led to the invention of the phone. Geser suggested that while the landline phone required individuals to stay at specific places, the mobile phone was an innovation that makes communication compatible with spatial mobility. The landline phone in history had been adopted for functional purposes and later were used for social purposes (Palen et al., 2000) Palen et. al (2000) interviewed new mobile phone users and found that similar to the landline phone, the early adoption of the mobile phones was for functional purposes, but eventually the mobile phones were used for social reasons. Mobile phones are part of the social world, and can be used at times when and at places where landlines were not normally used in the past.

In this research, we study how landline possession will affect perceived usefulness of mobile phone users. As suggested by previous researchers (Palen et al., 2000; Wei 2006), individuals adopting the mobile phones would perceive higher values of the mobile phone. We posit the following hypothesis:

H1: Individuals with landline possession would have higher perceived usefulness of the mobile phone.

Relationship between Perceived Usefulness and Satisfaction

Various researchers have studied the effect of perceived usefulness on user satisfaction of mobile phones. Lai, Griffin, & Babin (2009) conducted a survey of customers of a mobile communications company and found that the perceived value of mobile phones has a positive impact on user satisfaction. Chiu, Hsu, Sun, Lin, & Sun (2005) found that the perceived usefulness of e-learning service programs is positively related to user satisfaction. McDougall and Levesque (2000) found that core service quality and perceived values are the important drivers of customer satisfaction, lowering intentions to switch to competitors. Research has also found that the feelings of being accepted by others and making a good impression on other people are determinants of customers’ satisfaction with the mobile messaging service (Deng et
al., 2010) Therefore we posit that the latent construct of mobile phone perceived usefulness have important satisfaction impacts.

H2: The mobile phone perceived usefulness is positively related to user satisfaction with mobile phones. Higher perceived usefulness leads to higher user satisfaction.

The focus of this research is to explore the factors of perceived usefulness of the mobile phone for persons with disabilities, and how these factors affect user satisfaction. Specifically we posit that social function, emergency help, and sense of security are three aspects of mobile phone perceived usefulness to persons with disabilities, and perceived usefulness affects perceived satisfaction positively.

METHODS

Research Instrument

The initial survey instrument was constructed based on literature review and consultation with persons with disabilities. The scales were patterned after existing instruments, specifically the studies of Turner et al. (2008), Aoki and Downes (2003), and Wei (2006) on social function and sense of security of the mobile phone. The instrument was refined by holding interviews with mobile phone users with disabilities. The questionnaire was subsequently refined based on the feedback provided. A pilot study was conducted with a convenience sample of persons with disabilities. The pilot study helped to test and validate the scales of the instrument adopted for the final survey. Respondent perceptions were measured using a Likert scale of 6 points, with 1 for strongly agree, 2 for moderately agree, 3 for slightly agree, 4 slightly disagree, 5 for moderately disagree, and 6 for strongly disagree. Table 1 displays the items used in the questionnaire.

The Sample

The sample was obtained from a diverse population of students with disabilities served by the Disability Programs and Resource Center (DPRC) at a university in the San Francisco Bay Area. One of the top 15 universities for campus diversity according to U.S. News and World Report 2009 rankings, the university’s students represent a range of backgrounds, interests and points of view. The questionnaires were distributed to 850 students registered in the DPRC. A total of 142 usable questionnaires were collected. The response rate was about 16.71%. Hair et al. (2010) indicates that for a model with five or less latent constructs, a sample size of 100 is sufficient to produce a nearly normal sampling distribution and to provide adequate power for the estimation of the structural equation model. This sample size is sufficient for estimating the structural equation model in Figure 1.

All of the respondents have had a mobile phone for at least one year, and 68% of the respondents had mobile web access. About 55% of them did not have a landline phone. Out of the 142 respondents, 66% were female, 33% were male, and the rest preferred not to state their gender. About 45% were between the age 18 to 25, 19% were between the ages of 26 to 30, and 34% were above 30, and 2% did not state their age. About 86% of the respondents were full time students while 15% were part time students. About 8% were working full time, 33% were working part time, and 59% were not working. About 29% had completed bachelor degrees or above.

The respondents stated their types of disabilities and many of them indicated multiple disabilities. About 52% of respondents had learning disabilities, 32% had psychological
disabilities, 8% had blindness / visual disabilities, 8% had hard of hearing disabilities, 2% had speech / language disabilities, 20% had mobility / orthopedic disabilities, 23% had health disabilities. About 6% had other types of disabilities (epilepsy, traumatic brain injury, hand injuries, lupus, social behavior disabilities, functional disability, autism spectrum disorder, attention deficit hyperactivity disorder).

**Instrument Validity and Reliability**

Each of the observable variables was measured by several questions. Content validity and convergent validity checks were performed for all the scales. Content validity refers to whether the scale representatively measures the concept it is intended to measure. Content validity was established as most of the items in the questionnaire were derived through a comprehensive study of relevant literature.

Construct validity refers to whether all the items for the observable variable represent one single construct. The items for each variable were checked for construct validity and reliability using SPSS. Construct validity was established by checking the result of the factor analysis, with all the items representing one factor accounting for at least 73.7% of variance. Reliability refers to the degree of stability of the scale. Reliability of the construct is demonstrated by checking the Cronbach’s alpha for the items for each construct and the correlation among the items for the construct (Bollen, 1989, page 215). Typically, a scale is said to be reliable if Cronbach’s alpha is 0.70 or higher. Table 1 gives the validity and reliability indices for the questionnaire items for each variable. The items all had high reliability coefficients, with Cronbach’s alpha ranging from 0.81 to 0.91.

Table 1. Items within the questionnaire for Mobile Phone Perceived Usefulness and Satisfaction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
<th>Question</th>
<th>Reliability: corrected item total correlation</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Function</td>
<td>SocFun1</td>
<td>My mobile phone keeps me involved with social activities</td>
<td>0.73</td>
<td>0.84</td>
</tr>
<tr>
<td>(Cronbach’s alpha = 0.91; 1 factor 79.3% of variance)</td>
<td>SocFun2</td>
<td>My mobile phone helps me build my social network</td>
<td>0.82</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>SocFun3</td>
<td>My mobile phone serves many important social functions for me</td>
<td>0.85</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>SocFun4</td>
<td>My mobile phone saves me time to build social relationships</td>
<td>0.81</td>
<td>0.90</td>
</tr>
<tr>
<td>Emergency Help</td>
<td>Emergen1</td>
<td>My mobile phone helps me inform classmates and instructors of my emergency situations</td>
<td>0.76</td>
<td>0.89</td>
</tr>
<tr>
<td>(Cronbach’s alpha = 0.87; 1 factor 79.9% of variance)</td>
<td>Emergen2</td>
<td>My mobile phone is a big help to my friends and family in medical and other emergency needs</td>
<td>0.81</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>Emergen3</td>
<td>My mobile phone reassures me of help in case of emergencies</td>
<td>0.71</td>
<td>0.87</td>
</tr>
<tr>
<td>Sense of Security</td>
<td>Securty1</td>
<td>My mobile phone gives me a sense of security and makes me feel safer</td>
<td>0.70</td>
<td>0.87</td>
</tr>
<tr>
<td>(Cronbach’s alpha = 0.81; 1 factor 73.7% of variance)</td>
<td>Securty2</td>
<td>My mobile phone provides me with psychological comfort</td>
<td>0.67</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Securty3</td>
<td>My mobile provides me with peace of mind while traveling</td>
<td>0.65</td>
<td>0.84</td>
</tr>
<tr>
<td>Perceived Satisfaction</td>
<td>Sat1</td>
<td>I believe that I am satisfied with the service support I get for my mobile phone</td>
<td>0.79</td>
<td>0.88</td>
</tr>
<tr>
<td>(Cronbach’s alpha = 0.90;</td>
<td>Sat2</td>
<td>I believe that I am satisfied with the functions and features of my mobile phone</td>
<td>0.74</td>
<td>0.86</td>
</tr>
</tbody>
</table>
RESULTS

The data were analyzed using LISREL (Jöreskog and Sörbom, 1989), a useful tool for understanding the underlying dimension of a latent variable, such as Perceived Usefulness, and gives an accurate picture of the simultaneous effect of the factors involved. The effects of demographic variables were examined to assess their relationship with perceived usefulness and satisfaction. These variables include age, gender, number of disabilities, and the length of time the respondent has had the mobile phone, and whether the respondent has landline phone or not. These demographic variables except landline possession had no significant impact on perceived usefulness and satisfaction.

Landline possession has a positive significant impact on perceived usefulness. The final model is given in Figure 1. In the final model, "Perceived Usefulness" is made up of three significant indicators, "Social Function", "Sense of Security", and "Emergency Help". Figure 1 summarizes the parameter estimates and t-values for the model constructs. The model parameter $\lambda_{x_{11}}$ is set to unity to define the unit of measurement for the latent variable "Perceived Usefulness". As indicated, $\lambda_{x_{21}}$ ($t = 6.94$) is 0.73 and $\lambda_{x_{31}}$ ($t = 7.10$) is 0.75; both are significant at the 0.05 level. This suggests that "Social Function", together with "Sense of Security" and "Emergency Help", are observable measures of the latent variable "Perceived Usefulness". Thus H1 is supported.

Since both $\lambda_{x_{21}}$ and $\lambda_{x_{31}}$ are positive, this shows that the better are the sense of security and emergency help that the mobile phone offers to users, the more positive are the perceived usefulness of the mobile phone. Since both $\lambda_{x_{21}}$ and $\lambda_{x_{31}}$ are less than unity, this suggests that both "Sense of Security" and "Emergency Help" are less important indicators than "Social Function" in measuring "Perceived Usefulness". In addition, the magnitude of $\lambda_{x_{21}}$ is about the same as $\lambda_{x_{31}}$, suggesting that "Sense of Security" and "Emergency Help" have about the same importance in measuring "Perceived Usefulness".

Figure 1. Relationships among Perceived Usefulness, Satisfaction and Landline Possession
The effect of "Perceived Usefulness" on "Satisfaction" is positive significant, $\gamma_{11}$ is 0.76 ($t = 6.37$), indicating that the higher the perceived usefulness, the more positive the user satisfaction. Thus H2 is accepted. On the other hand, $\gamma_{21}$ is 0.33 ($t = 2.53$) and is significant at the 0.05 level. This shows that landline possession has a positive effect on "Perceived Usefulness", and respondents who possess landline tend to have higher mobile phone perceived usefulness than those who do not possess landlines. Thus H1 is accepted. In addition, landline possession has no direct effect on satisfaction (alternative model tested and found no significant relationship between landline possession and satisfaction) but landline possession has an indirect positive effect on user satisfaction through perceived usefulness.

Table 2 compares the average values and standard deviations of the indicator variables "Social Function", "Sense of Security" and "Emergency Help" for respondents with and without landline possession. As shown in Table 2, those with landline possession have significantly higher averages for social function, perceived sense of security and user satisfaction.

The adequacy of the model in Figure 1 is assessed using various measures. In testing structural equation models, the null hypothesis is set up as a priori not to be rejected, while the chi-square statistic tests whether the observed data fit the hypothesis of the proposed model, and a smaller chi-square value indicates a better fit. For small sample sizes that might have
slightly departed from normality, instead of using the chi-squares, the chi-square per degree of freedom should be used. A ratio of approximately five shows a reasonable fit while a ratio between one and two is an excellent fit (Hu and Bentler, 1999; Hoe, 2008). The ratio of the model in Figure 1 is 2.098 (chi-square = 10.49 with 5 degrees of freedom), indicating a good fit.

Table 2. Averages and standard deviations of measures for groups with and without landline possession

<table>
<thead>
<tr>
<th>Variables</th>
<th>Averages (standard deviations) for respondents without landline possession</th>
<th>Averages (standard deviations) for respondents with landline possession</th>
<th>t-statistics</th>
<th>Are the averages significant different at 0.05 significance level?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social function</td>
<td>2.093 (1.162)</td>
<td>2.712 (1.307)</td>
<td>3.1465</td>
<td>Significant (p = 0.002)</td>
</tr>
<tr>
<td>Emergency help</td>
<td>1.944 (1.055)</td>
<td>2.022 (1.287)</td>
<td>0.9419</td>
<td>Not significant</td>
</tr>
<tr>
<td>Sense of security</td>
<td>2.124 (1.216)</td>
<td>2.452 (1.039)</td>
<td>1.983</td>
<td>Significant (p = 0.049)</td>
</tr>
<tr>
<td>Perceived satisfaction</td>
<td>2.436 (1.330)</td>
<td>2.847 (1.316)</td>
<td>2.107</td>
<td>Significant (p = 0.037)</td>
</tr>
</tbody>
</table>

Other measures of fit include the goodness of fit index (GFI) and normed fit index (NFI). Both the GFI and NFI are always between zero and one, with one indicating a perfect fit while any value above 0.9 suggesting a good fit. The model has a GFI of 0.97 and a NFI of 0.95. This shows a good fit. The adjusted goodness of fit (AGFI) is 0.91. This again shows a good fit. Similarly, the non-normed fit index (NNFI) and the comparative fit index (CFI) are two additional measures ranging from 0 to 1, where values greater than 0.9 represent a good model fit. The NNFI and CFI for the model are 0.94 and 0.97 respectively. Finally, the structural equation model was assessed using the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR). The RMSEA is a measure of the discrepancy per degree of freedom for the model. A RMSEA value of 0.05 or less indicates a good model fit while a value of 0.08 or below indicates a reasonable fit. The SRMR is an absolute fit index sensitive to misspecification and a value of 0.05 or below indicates a good fit. The model has a RMSEA of 0.088 and a SRMR of 0.045, thus indicating a good model fit. Thus, GFI, AGFI, NFI, NNFI, CFI, SRMR, and RMSEA all indicate that the model has a good fit.

DISCUSSION AND CONCLUSIONS

This study examines the factors of "Perceived Usefulness" of mobile phones for persons with disabilities. The results indicate that "Social Function", "Emergency Help" and "Sense of Security" are observable aspects of "Perceived Usefulness". To improve perceived usefulness, providers need to develop better features and functionalities to enhance the role of the mobile phone in providing social function, emergency help and sense of security to persons with disabilities.

In this study LISREL was applied to analyze the underlying relationships between perceived usefulness and satisfaction. The result of this study is consistent with results from past research efforts on the technology acceptance model and has demonstrated a positive relationship between mobile phone perceived usefulness and user satisfaction for persons with disabilities. An interesting observation is that the possession of landlines has a positive impact on perceived usefulness. It may be because respondents with landlines feel that the mobile phone, when compared to the landline phone, is more instrumental in serving social functions and in providing sense of security. Our result is consistent with research results which showed
that social network has a strong positive effect on mobile user behavior (Ghose and Han, 2011). Our result also corroborates with the ones obtained by ITU (ITU, 2013), showing that the mobile phone is instrumental in allowing independent living for persons with disabilities, providing them with sense of security and emergency help, and serving as avenues for social interaction.

The respondents in this study are mostly with learning disabilities and/or psychological disabilities. Future research may include ones with other types of disabilities. A second limitation of this research is that this study focus on user satisfaction as the effect variable. Future research may assess the effect of mobile phone perceived usefulness on health and well-being for persons of disabilities.

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