J. of Family and Society Research 2 (2), December 2023, pp. 65 – 79

JFSR

Factors Associated with Parents' Intention to Adopt the Parental Control/Monitoring Application

Aluko K. E
Department of Computer Science Education,
Federal College of Education, Pankshin

Abstract

This study focused on the factors associated with parental intention to adopt parental control/monitoring applications. An online multi-item questionnaire, the Parental Control Monitoring Questionnaire (PCMQ) was used for data collection. The questionnaire was pretested on a sample of adults within the age range of 21 to 49 who had one or more teenage-aged (10 to 18) children. The assessment adopted the Technology Adoption Model and Protection Motivation Theory to assess Perceived Usefulness (PU) and Perceptions of the Ease of Use (PEU), with five (5) latent factors assessed. The quota sampling technique was used to select 150 teenagers and 150 parents in Jos, Nigeria. A total of 300 valid responses meeting the quota were received when completed, with a mean score of 3.0 and below depicting a positive attitude or response. Respondents were distributed across the country, including all five major geographical regions. Analysis followed a two-step procedure where the confirmatory factor analysis (CFA) preceded Structural Equation Modelling (SEM). Model fit, validity and reliability are assessed using a range of statistics, including parameter estimates and fit indicators including comparative fit index (CFI), the Tucker Lewis Index (TLI), root mean square error of approximation (RMSEA) and normed chi-square (CMIN). The factors that could make parents adopt parental control apps include; perceived severity, perceived usefulness, perceived vulnerability, and perceived innovativeness. It was determined that teenagers have continuous access to the Internet, without any supervision as a result of the technological illiteracy manifested by their parents as the relationships among these components are often complex with intriguing similarities and differences among the participants.

Keywords: ICT Resources, Technological, App, Parental Control, Parental Supervision

Introduction

The need for parental control and supervision of teenagers using a parental control/monitoring application (app) in this current high technology age, as well as the ubiquity of the internet and the mass proliferation of social media. This has led to growing parental concerns and the need for the aid of information and communication technology (ICT) regarding a societal issue referred to as the negative influence of using the internet (NIUI) by teens and younger adolescents (Eagle, 2020). The negative influence of using the Internet is the

"use of the Internet that creates psychological, social, school and/or work difficulties in a person's life" (Beard & Wolf, 2021:37). It has also gained behavioural scientists' attention worldwide (Twenge and Campbell, 2018). For parents, the negative influence of using the Internet is associated with the overuse of digital media and its associated negative consequences. Examples include a maladaptive drive to use the internet for a longer time than intended or exposure to inappropriate content (Aboujaoude, 2020). Numerous studies have shown the Negative Influence of Using the Internet to be associated with a wide range of problems for teenagers. These include (cyber)bullying, harassment, low self-esteem, poor grades, the propensity to be easily bored, getting "in trouble," attention deficit hyperactivity disorder, sleep disturbances and excessive daytime sleepiness, less favourable relations with parents, exposure to risky behaviours such as gambling, violence, pornography, blackmail and the disclosure of personal, private information (Nasaescu et al., 2018).

In psychology and human-computer interaction studies, findings have outlined some antecedents of The negative influence of using the Internet (NIUI). These include psychological (Caplan, 2021) and social factors, such as a higher frequency of parent conflicts and lower family functioning (Wartberg et al., 2021). Family factors have been given more attention in the past decade; however, more study is needed on how to foster or counter the negative influence of using Internet environments (Lam, 2021). Parents are faced with a large and growing threat of The negative influence of using the Internet (NIUI). In the interest of protecting teenagers, they have a wide variety of tools to combat the threat, including many types of Parental Control/Monitoring apps (PCMA).

The National Cybersecurity Alliance of Jos, Nigeria, suggests that PCMA programs are technological products that can be skillfully used to keep internet use among teenagers safe and productive while simultaneously leaving parents assured. These Parental Control/Monitoring apps (PCMA) products allow parents to set controls on their teenager's internet use (Gomez et al., 2020). There is a gap in extant studies on how parents act as key decision-makers to protect teenagers from the negative influence of using the Internet (NIUI). The current study addresses this gap by examining what motivates parents' decision to adopt the parental control monitoring application (PCMA) and whether some parents are better able to make the right choice than others. This study furthers our understanding of parent and teenage consumer behaviour and contributes to marketing theory on technology adoption by examining a unique context in which technology is adopted to benefit another, i.e. a person other than the adopter. From protection motivation theory (PMT), we first consider contextual factors for adopting a new technology, which, in this case, is to protect teenagers from a serious threat to which they are

vulnerable. Teenagers refer to young adolescents between the ages of 10 and 18 years. From the technology adoption model (TAM), considered factors that address the consumers' expectancies of parental control monitoring application (PCMA) were their perceptions of functionality and the usefulness of the model. Finally, the model considers a key personal factor, self-efficacy and its influence on parents' likelihood of adopting PCMA to address the problem of the negative influence of using the Internet (NIUI). These theories are combined because together they help to understand more clearly what makes parents adopt or not adopt technology to deter (NIUI) better than they could on their own.

The study proposes a model (Figure 1) that combines the elements of two theoretical frameworks illustrating how they complement one another to present a richer understanding of why and how parents may choose to adopt Parental Control/Monitoring apps (PCMA) than each could accomplish separately. The first subsection introduces the extent and problems associated with the negative influence of using the Internet (NIUI). This is followed by examples of PCMA consumers might adopt to address the negative influence of using the Internet (NIUI). Next, there is a discussion of parental motivations and the contextual elements that may lead parents to consider technical solutions to protect their teenagers. This is framed note within Parental Monitoring Technology (PMT) and introduces Parental Monitoring Technology-grounded Study hypotheses about how the threat of The negative influence of using the Internet (NIUI) and the exposure of their teenager to its negative consequences affect how useful parents perceive PCMA to be. The fourth subsection discusses the nature of the PCMA framed within the Technology Adoption Model (TAM). It puts forth a hypothesis regarding how perceptions of the usefulness of PCMA affect the likelihood of its adoption. The final section presents the literature and proposes hypotheses concerning parents' assessment of their efficacy in using control software (based on PMT) that affects their perceptions of the ease of use of the software that, according to TAM, ultimately leads to their decision to adopt it.

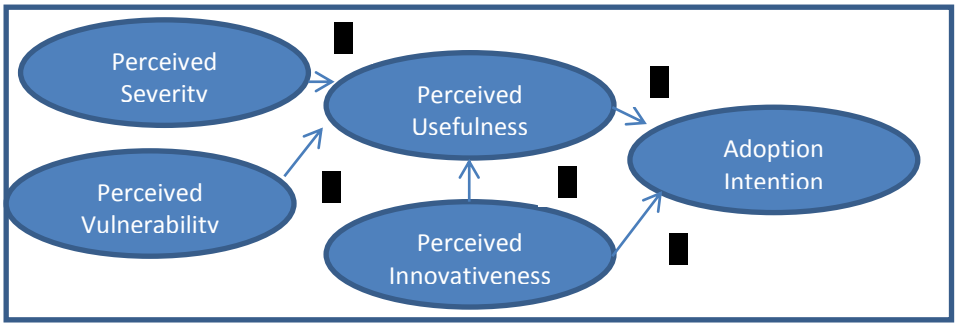

Figure 1: The Study Model

Theoretical Framework: Protection Motivation Theory

Parents' attempted mediation of teenager's media use is a global phenomenon (Sun, 2019; Shin, 2021). Parents have become increasingly concerned about their teenagers developing problematic conditions attributable to negative influences of using the Internet (NIUI) and have begun to consider methods of reducing device usage or filtering the content their teenagers can access. Adopting technology to protect one's teenager is an increasingly urgent issue today, driven by governmental agencies' warnings of spikes in cybercrimes (Sheng, 2020). A study suggests that with a balanced mediation strategy and the correct tools, parental monitoring of screen time can prove to be the most mutually beneficial experience for concerned parents and teenagers whose development can be adversely impacted by exposure to inappropriate or even dangerous content and online behaviours. According to the American Academy of Pediatrics, the consensus among parents and medical professionals seems to be to limit teenagers to about 1 to 2 hours a day of leisure screen time, not counting time spent on schoolwork (Papas, 2020). It is hoped that by doing so, there will be a revitalization of "traditional" media/entertainment (e.g. books, outdoor activities and face-to-face interaction with peers) so that teenagers will be socialized in a more balanced manner (Anderson, 2020). Protection motivation theory has been widely applied to contexts in which individuals are motivated to protect themselves and in contexts of individuals are motivated to take action to protect others. This makes protection motivation theory an appropriate framework for investigating why parents might take action to protect their teenagers from the negative influence of using the Internet (NIUI). Developing the model depicted in Figure 1 begins with contextual protection motivation theory-based hypotheses. These hypotheses describe how parents' perception of the context – the threats of The negative influence of using the Internet (NIUI) and the degree to which their teenager is vulnerable to it – coupled with their ability to act to protect their teenager influences their perceptions about how useful monitoring software PCMA will be for mitigating the threat (Hwang et al., 2021). According to protection motivation theory, both threat appraisal and coping appraisal positively predict protective action (Pechmann et al., 2021). Protection motivation theory proposes that people behave in ways to protect themselves and others based on the appraisal of threats and an appraisal of their ability to cope with those threats. In adopting a protection motivation theory, individuals appraise threats first by perceiving a threat's severity and assessing their vulnerability to that threat. The perceived severity of a threat (in the case of The negative influence of using the Internet (NIUI), the perceived likelihood that a teenager will be exposed to something online

they ought not to be) will influence the decision to enact protection behaviours (e.g. adopting parental controls) (Milne et al., 2019). Hwang et al. (2021) found a positive relationship between perceived threat and parents restricting or setting rules for teenager's internet use. Thus, parents might consider the risk that their teenagers will be negatively affected by being online. Some solutions, such as rule setting or moving the computer from a teenager's bedroom to a more central part of the house such as the living room are simple. While Hwang et al. (2021) demonstrate the role of protection motivation theory in predicting parental mediation of teenagers' internet use, they did not account for the use of technology, and thus, technological factors. As teenagers spend more time online – particularly with increases in online learning – the threat of The negative influence of using the Internet (NIUI) and their teenager's vulnerability to it increase as their ability to regularly monitor their teenager's online activity decreases. If parents perceive the risk to be high (e.g. severe threat), they will be more likely to seek out PCMA that they perceive will be useful to protect their teenager, leading to the first hypothesis:

H_1: Perceived threat severity positively influences the perceived usefulness of the parental control monitoring application (PCMA).

The second element of threat appraisal, perceived vulnerability, describes the extent to which parents perceive their teenager to be vulnerable to online threats (Rogers, 1983). Perceived vulnerability influences decisions about using protective behaviours (Prentice Dunn & Rogers, 2021). Hwang et al. (2021) found a positive relationship between perceived vulnerability and parents restricting or setting rules for teenager's internet use. Thus, parents who report a high perceived vulnerability, saying it is likely teenagers will be exposed to harmful things such as sexual content or predators, are more likely to take action to mitigate that threat. We propose that one such action is to seek out technological products such as parental control monitoring applications (PCMA) they perceive to be useful to protect their teenager, leading to the second hypothesis.

H_2: Perceived vulnerability to the negative influence of using the Internet (NIUI) positively predicts the perceived usefulness of PCMA.

The coping appraisal factors from Parental Monitoring Technology (efficacy and cost) that predict adopting a protective behaviour are aligned with the concept of innovativeness (Schillewaert et al., 2021; Sun et al., 2010). To engage in innovative behaviour, individuals must possess a strong sense of efficacy (a desire to intentionally make things happen through their actions; Bandura, 2001). The concept of innovativeness is defined as the tendency to adopt new things earlier than most members of a

social system (Rogers, 1995). One study finds that self-efficacy is positively associated with innovativeness (Ng & Lucianetti, 2016). When one has a greater level of innovativeness, she/he will possess greater self-efficacy in enacting protective behaviours. Those without such innovativeness may find it hard or effortful to adopt a parental control monitoring application (PCMA) to protect their teenager, which might colour their perceptions of PCMA's usefulness. Formally:

H_3: Personal innovativeness (PI) positively affects the perceived usefulness (PU) of Parental Control Monitoring Application (PCMA)

Parental Monitoring Technology provides a sound theoretical framework for understanding parental motivations to seek out solutions they deem useful in helping them protect their teenager. However, Parental Monitoring Technology is a useful model for all manners of protective behaviours including and beyond, technological solutions. The Technology Adoption Model (TAM) discussed in the next section specifically considers how increases in perceived usefulness influence decisions to adopt technologies.

Adoption of New Technology: The Technology Adoption Model (TAM)

The technology adoption model (TAM) is a robust and widely used theory (Mun et al., 2020) that suggests external factors affect consumers' perceptions of the ease of use (PEU) and usefulness (PU) of a technology. PEU and PU have been identified as crucial predictors of the acceptance of many technologies (King & He, 2020). According to TAM several external variables directly influence the PU of a technology (Davis, 2019:320). For example, perceptions, norms and expectations can all influence PU. Within a TAM framework, perceived severity or vulnerability to threats might increase an individual's perception of the usefulness of a technological solution. Thus, the relationships between perceived threat and vulnerability to perceived usefulness are common to both the Parental Monitoring Technology and Technology Adoption Model (TAM) frameworks. The next step in the model development links the Parental Monitoring Technology - based influences on perceived usefulness to the well-documented positive relationship between perceived usefulness and adoption intention of the TAM (Davis, 2019, p. 320). Perceived usefulness (PU) has positively impacted the adoption of new technologies in multiple contexts. These include the adoption of mobile banking apps (Raza et al., 2021); wearable healthcare technology (Zhang et al., 2021); mobile online shopping (Sohn, 2021); online reviews (Racherla & Friske, 2012; Mican et al., 2020); and driverless vehicle adoption (Diresehan & Can, 2020). The current study predicts a similar relationship between parents' perceptions of the usefulness of the parental control monitoring application (PCMA) and their intentions to adopt such technological solutions. Formally:

H_4: Perceived usefulness (PU) of parental control monitoring application will positively influence adoption intention.

Early technology adoption model (TAM) studies have shown that perceived usefulness (PU) is a consistent and strong predictor of consumer adoption of various technologies (Davis, 2019; Subramanian, 2021). However, perceived ease of use is not as strong, as it is not always a consistent predictor of adoption (Subramanian, 2021; Perangi-Engin et al., 2016; Lie´bana-Cabanillas et al., 2021; Ekonomi dan Manajemen, 2021). These studies share that the technology is intuitive or the task/situation that technology solves is complex or dangerous. Such is the case with parents adopting parental control monitoring applications (PCMA) to mitigate The negative influence of using the Internet (NIUI) on their teenager. This is such a complex issue that the perceived ease of use of the technology is likely irrelevant. Parents' decisions to protect their teenager with PCMA are more likely to be affected by their ability than how difficult the technology is to use. Consequently, perceived ease of use is not examined in this Study. Instead, we examine the parents' ability to cope per se by considering ease of use from the standpoint of their assessment of their ability to use the PCMA that links to the self-efficacy construct from parental monitoring technology.

Parental Characteristics and Technological Products

While the designer or marketer of a new technological product might believe that said product is easy to use, not every parent will perceive it to be so. Much depends upon personal factors such as the parent's efficacy in using such products. Along with threat appraisal, Parental Monitoring Technology suggests coping appraisal plays a role in predicting protection behaviour. Coping appraisal begins with consumers looking to minimize barriers or maximize the help from engaging in an intervention (Prentice-Dunn & Rogers, 2021). Coping appraisal describes parents' beliefs that they can enact a recommended behaviour to affect change (Prentice-Dunn & Rogers, 2021). For example, some individuals might have limited experience adopting technologies in the past. Thus, their ability to adopt PCMA to protect their teenager will be low or the effort will be high. On the other hand, those who often adopt new technologies will have a greater ability to adopt PCMA (e.g. one possesses the efficacy or experience to make the effort of adoption low). Self-efficacy will positively influence the likelihood of purchasing a PCMA to protect one's teenager from the negative influence of using the Internet (NIUI) (McMath & Prentice-Dunn, 2021). Intuitively, individual innovativeness should be related to the adoption of new technology. Midgley and Dowling (2020, 2021) defined individual innovativeness as the extent to which an individual can accept new

knowledge and make innovative decisions. In their view, consumer innovativeness or "consumption of newness," is the tendency to buy new products more often and more quickly than other people. They suggest two measurable categories of individual innovativeness, namely, innate innovativeness which is related to personality traits and actualized innovativeness which is related to innovative behavior. The former is a generalized personal inclination regarding innovation (Im et al., 2021). The latter is defined as how quickly individuals accept innovative things. In a marketing context, actualized innovativeness is conceptualized as purchase intentions, attitudes toward a new product, the relative time of the adoption of new products and the number of new products owned (Lassar et al., 2021). Zhang et al. (2020) applied this conceptualization in a recent study that assessed the relationship between innovativeness and the purchase of smart toys. That study verified the effect of perceived product innovativeness, consumer innovativeness and perceived value on consumers' purchase and adoption intention, which then leads to consumers' willingness to pay. Therefore, "consumer innovativeness" in this study represents individual innovativeness traits in the domain of new or smart technologies A protective behaviour is more likely to be adopted when the effort to do so is lower. Innovative people will need less effort to adopt new technologies to protect their teenagers. Studies have further demonstrated that innovativeness predicts adoption (Lin, 2021; Hirunyawipada and Paswan, 2021). For example, Donthu and Gilliland (1996) found that more innovative consumers were less risk-averse and more adventurous in their willingness to conduct in-home shopping from various sources. Therefore, the study proposes:

H_5: PI will positively predict intentions to adopt a parental control monitoring application.

Study Methodology

***Study Design*:** A cross-sectional survey was adopted for the study.

***Population of the study*:** A total population of adults aged 21 to 49 years and 10-18 years for teenagers in Jos North, Nigeria, 2023 showed 2000 parents and 1000 teenagers (JSS3-SSS3), as at the time of carrying out this research, were considered in this study (Jos North Education Board Archives, 2023).

***Sample Size Selection*:** A quota sampling technique was used to select a sample of 300 participants comprising 150 parents and 150 teenagers. Two procedures were taken to ensure participants were parents and teenagers and that the online response was robust. Sample characteristics and preliminary results were done through a survey conducted via Qualtrics Panels in September 2022. The sample was designed as a quota to yield at least 150 parents and 150 teenagers between 10 and 18 years of age. If the parent had more than one teenager in that age group, the survey asked for

responses regarding the youngest teenager. If the parent had more than one teenager in that age group, the survey asked for responses regarding the youngest teenager. A quota of 50 teenagers per age category, paired with a parent (21 to 49 years) in each of the three age categories (10 to 13, 14-15, and 17-18) gave a total number of 150 teenagers and parents respectively. Finally, the quota sampling plan yielded a minimum of 150 parents and 150 teenagers.

***Instrument of Data Collection*:** The instrument for data collection was an online multi-item questionnaire Control Monitoring Questionnaire (PCMQ). The PCMQ adopted the Technology Adoption Model (TAM) to measure five latent factors; Perceived Usefulness (PU), Perceived Severity, Perceived Vulnerability, Perceived Innovativeness (PI), and Adoption Intention. To assess the perceived severity of NIUI, the study adapted measures from Pechmann et al. (2021) to fit the context of parents' protective behaviours toward teenagers. The severity question asked subjects to rate their concerns that their teenager's online use would have five adverse outcomes. To assess perceived vulnerability, the study also adapted measures from Pechmann et al. (2021) to fit the context of parents' protective behaviours toward their teenagers. The vulnerability question asked subjects about their concern that their teenager would personally be exposed to three negative experiences highly associated with NIUI. To assess perceived usefulness (PU), the study adopted the scale from Hendrickson et al. (2021), where participants assess the functionality and applications of parental control.

***Reliability of the Instrument*:** The reliability of the instrument was established using the test-retest method. To ensure reliability, the researcher administered the questionnaires to a different set of respondents, collected them and analysed the responses. After two weeks the questionnaires were re-tested by administering them again to respondents with the same characteristics. This ensured the internal consistency of the questionnaire and affirmed the responses from the selected sample. Specifically, Cronbach's alphas are above 0.75 for all but one construct (a = 0.70) with high inter-item correlations between (0.30 and 0.80) for the items representing each construct within the model. Though the Parental Control Monitoring Questionnaire (PCMQ) has been a widely accepted measure for assessing PU and PEU, modifications were made to fit this study's context, where limited work exists.

***Validation of the Study*:** To ensure the accuracy of the data, the researcher used content validity to pre-test the questionnaires and make corrections on the questions that were not clear. The questionnaires provide accurate data due to the process of pre-testing in the selected sample to maintain validity.

Method of Data Collection: Data collection was done after pre-testing; an online survey was conducted using

a representative sample of 150 parents and 150 teenagers aged 21-49 years and 10 to 18 years, respectively. A total of 300 out of the 300 valid responses which met the quota were received when completed. Overall, the survey took approximately 9.8min on average to complete.

Data and statistical analysis: The study hypotheses were tested using Structural Equation Modelling (SEM) with AMOS (Byrne, 2018). Analysis followed a two-step procedure where the confirmatory factor analysis (CFA) preceded SEM. Where the mean score is greater than 3.0, it depicts a negative attitude or response by respondents, while the mean score of 3.0 and below depicts a positive attitude or response.

Results

Demographic characteristics of the respondents

The age range of the respondents was 21 to 49 years comprising adults who had one or more teenagers in JSS3 - SSS3, aged 10 to 18. The comprised 50% males and 50% females.

Factors associated with parental intention to adopt Parental Control/Management software

Preliminary data analysis using confirmatory factor analysis shows that the factors associated with parental intention to adopt Parental Control/Management software include Perceived Usefulness (PU), Perceived Severity, Perceived Vulnerability, and Perceived Innovativeness (PI). The CFA model has a good fit as reflected by the absolute, incremental, and parsimony fit indexes with c2 = 330.80 (df = 160, $p < 0.001$). CFI = 0.96, TLI = 0.96 CMIN = 2.01, RMSEA = 0.057. All average variance extracted values are above 0.50.

Hypotheses Testing

The structural model includes all five study constructs and five hypotheses. The fit statistics for the structural model show acceptable fit (Hair et al., 2020) with values similar to the CFA $\chi2$= 339.79, df:162, $p < 0.001$, CFI = 0.96, TLI = 0.96, CMIN = 2.10, RMSEA = 0.058). The results provided support for all five of the work hypotheses. The results support H1 and H2 concerning the positive relationships between the perceived severity of the threat of The negative influence of using the Internet (NIUI) and the perceived vulnerability of one's teenager to that threat and the perceived usefulness of a technological product that mitigates that threat. The results also support H3 which posits a positive relationship between the product's perceived usefulness and a parent's intention to adopt it. Finally, the results support H4 and H5 concerning the positive relationships between a parent's perceived level of PI and her perceived usefulness of such a product, as well as her intention to adopt it.

Table 1: Factors Influencing Parental Intention To Adopt The PCMA (N = 300)

Items	X	Decision
perceived severity of the threat of The negative influence of using the Internet (NIUI) and the perceived vulnerability of one's teenager to that threat	4.5	Negative attitude
the perceived usefulness of a technological product that mitigates that threat	2.6	Positive attitude
product's perceived usefulness and a parent's intention to adopt it	2.8	Positive attitude
parent's perceived level of Personal innovativeness (PI) and her perceived usefulness of such a product, as well as her intention to adopt it	2.9	Positive attitude

Further mediation analysis in Table 2 below was conducted to test the significance of adding perceived usefulness as a mediator in this model constructed based on Parental Monitoring Technology. The indirect effect of perceived severity, perceived vulnerability and PI on adoption, through perceived usefulness, was calculated using 200 bootstrapping samples with a 95% Bias Corrected Confidence interval. According to the analysis, perceived usefulness is a significant mediator for all three predictors.

Table 2: The Mediation Role of Perceived Usefulness And Parental Intention to Adopt The PCMA (N = 300)

Items	X	Decision
There is an indirect effect of perceived severity, on adoption, through perceived usefulness	2.5	Positive attitude
There is an indirect effect of perceived vulnerability on adoption, through perceived usefulness	2.6	Positive attitude
There is an indirect effect of Personal innovativeness (PI) on adoption, through perceived usefulness	2.8	Positive attitude

Discussion

The negative influence of using the Internet (NIUI) is a real and growing problem for adolescents and their parents worldwide. The internet poses very specific challenges, both regarding the nature of risk and for those seeking to protect teenagers and young people while supporting their online activities and privacy. This is the first study that we are aware of that examines the severity and Personal innovativeness (PI) as seen by a representative nationwide sample of parents of the important demographic of 15 to 18-year-olds. Additionally, it is also the first study to investigate the potential for personal control software solutions that may be used to help parents address this problem. A second major contribution of this work is that it examined multiple factors that predict the likelihood of parents' adoption of internet monitoring technology to safeguard their teenagers' online usage. In doing so, a more complete understanding is provided and new insights emerge. A substantial body of prior work successfully used TAM and Parental Monitoring Technology to predict technology adoption to improve personal outcomes (King and He, 2006; Menard et al., 2021). Parental Monitoring Technology has also proven helpful in predicting health-related intentions and behaviours (Floyd et al., 2020).

However, few studies have examined their efficacy in explaining software solutions' adoption to protect others. Thus, the current study suggests that the Technology Adoption Model (TAM), when combined with Parental Monitoring Technology (PMT), may be applicable across a more comprehensive array of contexts beyond those in which it is traditionally used. Incorporating perceived severity, perceived vulnerability, perceived usefulness and perceived innovativeness (PI) on adoption intention, are factors combined into Parental Monitoring Technology using the TAM model. Using a social cognitive perspective, we tie in two theories of behaviour relevant to understanding what drives parents to adopt software to protect their teenagers from The negative influence of using the Internet (NIUI). Confirming the hypotheses, perceived severity and perceived vulnerability positively predicted the perceived usefulness of a software program that would supervise teenager's online activity and direct them toward approved sites. Further, PI, which is related to self-efficacy and the belief that future technologies will require less effort to adopt, is positively related to perceived usefulness. In turn, perceived usefulness and PI positively predict parents' adoption of internet monitoring software.

The findings advance current work on technology adoption in several important ways. Problematic internet usage is linked to several negative life and health outcomes and there are genuine dangers for teenagers with unrestricted internet access, including exposure to objectionable content and online predators (Rial et al., 2018; Sheng, 2020). This work shows that parents are more likely to enact protective behaviours (intend to adopt monitoring technology) when they perceive The negative influence of using the Internet (NIUI) to present a severe threat to which their teenagers are vulnerable. However, the perception of usefulness is a mediating factor. This mediation might explain the past disconnect between the perceived severity of the problem and the actual adoption rates of software solutions (Ghosh et al., 2018). The threat appears first to inform utility judgments such that a more significant

perceived threat influences consumers to possibly overestimate or enhance the perceived utility of technology related to the threat.

Appealing to parents' perceptions of threats only addresses one of these complex situation factors. The environment (technology) must also be considered. Parents are concerned about the potential consequences of their teenager's online activity. The negative influence of using the Internet (NIUI) may hinder academic performance, inhibit physical activity and decrease interaction and communication with family members and peers. However, simply identifying a problem without being able to implement a solution is insufficient. Software developers must also direct efforts to address such software's functionality and usability and marketers must communicate the ease of use to bolster users' sense of self-efficacy. Thus, by understanding and examining the relationship between perceptual factors of the environment and technology, it may be possible to increase the adoption of technological solutions to help keep teenagers safe online.

The second contribution lies in demonstrating the importance of personal factors predicting technology adoption to help others. One's innovativeness becomes a crucial factor driving the decision to act on behalf of another while also helping one's performance as a parent.

Parental Monitoring Technology considers consumers' efficacy, though TAM focuses on the efficacy of the technology or its ease of use. This work extends previous theories on the negative influence of using the Internet (NIUI) and technology adoption by integrating personal factors of the technology used that might spill over or inform their perceptions of technology and the likelihood of adopting it.

Implications of Findings

The major implication of findings regarding the effects of The negative influence of using the Internet (NIUI) is two-fold. For parents, the desire is to protect their teenagers from harmful content and from spending excessive amounts of time online. For their teenager, there are potential psychological effects such as fear, pain, anxiety and developmental issues associated with teens/young adolescents falling prey to violent topics and unscrupulous sexual predators in the absence of parental guidance. Part of this issue is the content to which teenagers may be exposed, such as sexually explicit, violent or politically objectionable material. Another issue is online bullying and potential contact with sexual predators. Finally, parents have concerns regarding the amount of time spent online, which negatively impacts interactions, academic performance and household activity.

However, parents use various approaches to deal with this issue including monitoring and supervision. This study shows that the great majority of parents (89.7%) now actively monitor their teenager's online school performance. We also know from this study that parents do not routinely access or monitor teenagers. Some parents may try to use restrictions on activities including a ban on e-mail, social media, chat rooms, instant messaging, online games and downloading content. However, realistically, such an approach is unlikely to be successful given the widespread proliferation and availability of mobile and internet-connected devices that are available to teenagers. Indeed, this study showed that the average teenager in the Jos, Nigeria aged 15 to 18 has a wide assortment of such devices from which to

choose. This ranges from 72.4% who have their smartphone to 43.0% with their computer. In addition, many of them also have access to a family computer or tablet. As Livingstone and Helsper (2018) note, based on their study of parental regulation of teenagers and teenagers' online activities, "[. . .] the simple assumption that introducing forms of parental mediation will reduce the risks young people encounter online, especially while protecting their opportunities, is misguided" (pp. 593). In addition, some parents (such as those in lower socio-economic environments) often lack internet and computer skills, compared to their teenagers. Therefore, they are less able to consistently monitor and supervise usage and to explain their potential negative consequences. For these reasons, PCMA has a great potential social benefit for addressing The negative influence of using the Internet (NIUI) if more widely adopted.

Limitations and future directions

As with any study, this work is not without its limitations. For instance, this work included various relevant threats parents perceived such as cyber-bullying. In the study, the variable did not load on any factor and decreased the reliability of the vulnerability construct. One reason for this might be that parents do not put this in the same category as other threats. Third, in addition to the TAM and Parental Monitoring Technology, several other models may help predict adoption intention. For example, according to the theory of planned behaviour, attitude, subjective norms and perceived behavioural control, all affect intention (Ajzen, 2019). Further, the technology acceptance model has also been expanded to include trust and risk (Pavlou, 2020). Thus, future work could explore attitudes, subjective norms and behavioural control or trust and risk as they may affect parents' intention to adopt internet monitoring software.

Conclusion

The negative influence of using the Internet is a concern for parents worldwide. Positive interactions were found among the perceived severity of the threat of the negative influence of using the Internet and the perceived vulnerability of one's teenager to that threat and the perceived usefulness of a technological product that mitigates that threat. Also, positive relationship between the product's perceived usefulness and a parent's intention to adopt the product, and between a parent's perceived level of innovativeness and the perceived usefulness of such a product, as well as their intention to adopt it, respectively. Perceived usefulness is a significant mediator for all three predictors; perceived severity, perceived vulnerability and perceived innovativeness on adoption.

References

Aboujaoude, E. (2020). Problematic internet use. *An Overview of World Psychiatry, 9*, 85-90,https://pubmed.ncbi.nlm.nih.gov/20671890/

Ajzen, I. (2021). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Alt, D. and Boniel-Nissim, M. (2018). Parent–adolescent communication and problematic internet use: the mediating role of fear of missing out (FoMO). *Journal of Family Issues, 39*(13), 3391-3409.

A´lvarez, M., Torres, A., Rodrı´guez, E., Padilla, S. and Rodrigo, M.J. (2018). Attitudes and parenting dimensions in parents' regulation of internet use by primary and secondary

school teenager. C*omputers and Education, 67*; 69-78.

Anderson, M. (2020). Parents, teens and digital monitoring. https://www.pewinternet.org/2016/01/07/parents-teens-and-digital-monitoring/ accessed 15th September 2020.

Aslanbay, Y., Aslanbay, M. and C., obano_glu, E. (2019). Internet addiction among Turkish young consumers: *Young Consumers, https://www.emerald.com/insight/content/doi/10.1108/17473610910940792/full/html 10*(1).

Bagozzi, R.P. and Yi, Y. (2021). Specification, evaluation, and interpretation of structural Equation models. *Journal of the Academy of Marketing Science, 40; 8-34. https//doi.org:+10.1007/s11747-011-0278-x&hl=en&as_sdt=0&as_vis=1&oi=scholart*

Bandura, A. (2021). Social cognitive theory: An agentic perspective. A*nnual Review of Psychology, 52*(1); 1-26.

Beard, K.W. and Wolf, E.M. (2021). Modification in the proposed diagnostic criteria for Internet addiction. C*yber Psychology and Behavior, 4*(3); 377-383.

Bisen, S.S. and Deshpande, Y.M. (2018). Understanding internet addiction: A comprehensive Review. *Mental Health Review Journal, 23*(3); 165-184.

Bleakley, A., Ellithorpe, M. and Romer, D. (2018). The role of parents in problematic internet use among US adolescents. *Media and Communication*, *4*(3),https://repository.upenn.edu/items/259b0c03-340e-409e-a7c3-92415b543e1a 24.

Blum-Ross, A. and Livingstone, S. (2019). Families and screen time: Current advice and emerging work. https://www.basw.co.uk/system/files/resources/basw_64209-8_0.pdf Accessed 15 September 2020.

Boniel-Nissim, M. and Sasson, H. (2018). Bullying victimization and poor relationships with parents as risk factors of problematic internet use in adolescence. C*omputers in Human Behavior, 88*; 76-183.

Byrne, B.M. (2019). *Structural equation modeling with AMOS: Basic concepts, applications, And programming*. Routledge.

Caplan, S.E. (2020). Problematic internet use and psychosocial well-being. Development of a theory-based cognitive–behavioral measurement instrument. *Computers in Human Behavior, 18*(5); 553-575.

Caplan, S. E. (2018). Preference for online social interaction. A theory of problematic internet use and psychosocial well-being. *Communication Work, 30*(6), 625-648.

Caplan, S.E. (2020). Relations among loneliness, social anxiety, and problematic internet use. *Cyber Psychology and Behavior 10*(2); 234-242.

Carey, B. (2018). Is screen time bad for kids' brains. http://www.nytimes.com/2018/12/10/health/screen-time-kids-psychology.html Accessed 15, October 2020.

Clement, J. (2019). Internet usage for teenagers in the United States. Statista. https:// www. statista.com/topics/ 2016/teenagers-internet-usage-in-the-us/

Davis, F.D. (2019). Perceived usefulness, perceived ease of use, and user acceptance of Information technology. *MIS Quarterly, 13*(3); 319-340.

De Morentin, J. I. M., Corte, S., A., Medrano, C. and Apodaca, P. (2021). Internet use and Parental mediation. A cross-cultural study. *Computers and Education, 70;* 212-221.