ADOLESCENTS' SAFE ONLINE BEHAVIOUR: A MULTI-FACTOR ANALYSIS BASED ON SOCIAL COGNITIVE THEORY

Sameera Mubarak, School of Information Technology and Mathematical Sciences, University of South Australia, Adelaide, Australia, sameera.mubarak@unisa.edu.au

Deepa Mani, School of Information Technology and Mathematical Sciences, University of South Australia, Adelaide, Australia, deepa.mani@mymail.unisa.edu.au

Abstract

This study sought to prove six hypotheses about the correlation between adolescents' online use and parental behaviour, adolescents' self-efficacy and adolescents' self-regulation. Social Cognitive Theory (SCT) underpinned a survey of 340 respondents (182 males and 158 females) in the 12-17 year age group from 2 high schools in metropolitan South Australia. Structural Equation Modeling was used to test the significance of the hypotheses. The survey results revealed that environmental factors such as parental monitoring and guidance had a significant impact on adolescents' online use. They also indicated that adolescents' self-regulatory behaviour concerning online use may be influenced by other factors such as self-knowledge and self-determination. Personal factors such as instinct and motivation were found to influence the outcomes of online misuse, and encourage adolescents to adopt moderate and safe use patterns. The results demonstrated that self-efficacy – namely confidence, motivation and personality – has a positive impact on self-regulatory behaviour. A theoretical framework adapted from SCT specifically for this study generated new knowledge about factors that support a preventative approach to risky online use among adolescents.

Keywords: Adolescents' Online Behaviour, Parental Behaviour, Social Cognitive Theory, Multi-factor Analysis

1   INTRODUCTION

Internet technology has significantly transformed the world since its introduction nearly two decades ago. It has impacted individuals and organisations to a point where they depend on it for education, recreation, research and business. Most importantly, the Internet has opened up global communication at unprecedented levels, crossing geographical, cultural and physical boundaries to connect millions of people in cyber space[1]. The Australian Bureau of Statistics (ABS) indicates an upward trend in Internet access in Australia, with 83 per cent of all households (7.3 million people) having an Internet connection in 2012-2013 compared with 79 per cent in 2010-2011 (ABS 2014). In addition, according to the Australian Media and Communications Authority (ACMA), mobile Internet use rose 33 per cent in the twelve months from June 2012-June 2013, and a phenomenal 510 per cent from June 2008-June 2013 (Polites 2013), with children identified as major users.

1.1   Known Impacts of Adolescents' Unsafe Online Use

Online use differs from person to person, however adolescents generally go online for entertainment or education. In an alarming finding for parents and teachers, Hawi (2012) states that entertainment outweighs educational or academic pursuits in terms of the proportion of online use. This prompts a warning that online use may compromise children's academic achievement. It also signals a greater need for knowledge about the undesirable impact of online use on adolescents' social, psychological and physical health. Cyber-bullying or harassment are known to have dangerous outcomes in the form of psychological and emotional turmoil, and even suicide. Ryan and Curwen (2013), for example, list various instances where cyber-bullying has led to embarrassment, fear, low self-esteem, humiliation and poor academic achievement; negative experiences that can adversely impact emotional growth. Alvarez (2013) highlights the extreme damage that cyber-bullying can inflict, citing the example of a twelve year-old Florida girl who committed suicide to escape online and face-to-face bullying.

Sexual predators and financial scammers are known to target adolescent online users. Adolescents who fall prey to these criminals may experience depression, anxiety and shame. Stefanescu et al. (2009) warn about risky online behaviour, such as chatting frequently with unknown people and visiting age-inappropriate websites, which breaks the rules of safe online use and leaves adolescents open to the afore-mentioned impacts. Young (2009) identifies instances of the dangerous consequences of adolescents becoming addicted to online systems and Moran (2012) describes a case in which a teenager in Taiwan died after a forty-hour 'Diablo III' gaming marathon. The reason given for her death was that long hours in a sedentary position created cardiovascular problems.

Addiction can lead to living in the cyber world at the expense of understanding the realities behind it; the hidden real-world risks. Addicted adolescents provide easy prey for cyber criminals, as illustrated in the following incidents from around the world:

- In August 2013, an online blackmail scam[2] in the UK, in which scammers portrayed themselves as young girls, lured thousands of teenagers through social media (Bagot 2013).
- A fifteen year-old girl fell prey to an online sexual predator nearly three times her age who murdered her in January 2010 in South Australia (Fewster 2010).
- An eighteen year-old Australian girl became the victim of a job advertisement on Facebook. She accepted a fake job offer and was murdered (Oliver 2010).
- A seventeen year-old girl from Canada committed suicide following months of sustained harassment, including lewd photographs posted online. Cell phone pictures were circulated and

---

[1] Cyber space is 'the notional environment in which communication over computer networks occurs' (http://www.oxforddictionaries.com/definition/english/cyberspace)
[2] A 'scam' is 'a dishonest scheme; a fraud'. 'Scammers' carry out the scam http://www.oxforddictionaries.com/definition/english/scam

posted on social media (New York Times 2013).

- A seventeen year-old girl in the UK was kidnapped, raped and killed by a predator posing as a teenager (Stokes 2010).

1.2   Factors Known to Reduce Adolescents' Unsafe Online Use

A sound knowledge of the social and technological dangers of online use may prevent the type of incidents mentioned above. Studies have shown that parental influence in shaping children's online behaviour, largely through educating them about privacy protection and risk reduction behaviours, may result in safer online use among adolescents (Liu et al. 2013). O'Neill et al. (2011) found that parental supervision can make adolescents' online security issues easier to manage, while Davis (2013) found that mothers and friends play an important role in adolescents' lives, forming relationships with them that contribute positively to their 'self-concept', which in turn assists them in developing safe online behaviour. Such adolescents have a reduced risk of seeking attention or self-affirmation from online strangers, or falling prey to scams. Similarly, in relation to Internet addiction, a study of Hong Kong adolescents suggests that strengthening family functioning and promoting positive youth development may help to reduce adolescents' online vulnerability (Yu & Shek 2013). Lereya et al. (2013), discussing intervention programs to overcome cyber-bullying, conclude that such programs should extend beyond schools to include families and should start before children enter school.

Intervention programs may only succeed, however, if parents are aware of the extent of their children's online use. Konstantinos et al. (2012) found that parents tend to underestimate the level of their children's online use; they do not match their children's estimates. Hence, according to Liau et al. (2008), parents' regular communication with their children is an essential factor in monitoring children's online behaviour. Gunuc and Dogan (2013) support this with their finding that adolescents who spend time with their mothers have a higher level of perceived social support and a lower level of online addiction than those who do not spend time with their mothers. Thus, parental bonding appears to play a more important role than parental security practices in influencing children's online behaviour.

While the above studies show that parents' involvement influences children's online behaviour, there is a need to find out what other factors lead adolescents to develop safe online behaviour. This study sought to fill this gap by investigating not only the relationship between adolescents' online use patterns and parental factors, but also the impact of personal factors such as individual adolescents' instincts, drives, traits and other motivational forces, particularly self-efficacy and self-regulatory habits, on their online behaviour. It aimed to identify combinations of factors that shape healthy online behaviour and reduce risky online behaviour, with the purpose of understanding the theoretical concepts that underpin adolescents' online behaviour. The study was grounded in Albert Bandura's 1986 work on Social Cognitive Theory (SCT).

2   THEORETICAL FOUNDATION

Several theories can be used to explain deviant behaviour during childhood and adolescence. These include Problem Behaviour Theory, the Transtheoretical Model of Change, Deterrence Theory and Social Cognitive Theory. Problem Behaviour Theory (PBT), developed by Jessor (1987), explains dysfunction and maladaptation in adolescence. Problem behaviour is defined as any behaviour that deviates from social and legal norms, or that those in authority deem socially unacceptable. PBT is quite complex. It consists of three independent but related systems of psychosocial components: the personality system; the perceived environmental system; and the behaviour system. PBT proposes that maladaptation or deviance occurs when these components interact. For example, behavioural problems become apparent when there is a clash between the personality system and the perceived environmental system (Jessor 1987).

The Transtheoretical Model of Change (Prochaska & DiClemente 1983; Prochaskaet al. 1992; Prochaska & Velicer 1997) is an integrative model of intentional behaviour change that is used to develop effective interventions to promote changes in health behaviour. The model, which focusses on individual decision making, describes how people modify a problem behaviour or acquire a positive behaviour. Its central organising construct is the 'Stages of Change', which incorporates a series of change processes and outcome measures in response to an existing problem.

Cesare Beccaria's Deterrence Theory of 1764 rests on the belief that people choose to obey or violate the law after calculating the consequences of their actions. It is difficult to prove the effectiveness of deterrence because only those offenders who are not deterred by the possible consequences come to the notice of law enforcement (Beccaria 1963).

Neither PBT, the Transtheoretical Model of Change nor Deterrence Theory were considered viable options for grounding this study. PBT analyses the root cause of deviant behaviour whereas this study's objective was to identify factors that lead to safe online behaviour. The Transtheoretical Model of Change is reactive in nature (responding to remedy an already active problem), whereas this study had a preventative rather than a reactive focus. Deterrence Theory was not chosen for the current study due to the difficulty of measuring its effectiveness.

2.1   Social Cognitive Theory

Social Cognitive Theory (SCT) developed by Bandura in 1986, on the other hand, provided a viable option. This psychological model of behaviour primarily emphasizes that learning is influenced by observing others' behaviour in the external environment. Bandura proposes that personal, behavioural and environmental factors interact with one another to produce human behaviour (Bandura & McClelland 1977; Bandura 1986). That is, a person's ongoing functioning is a product of continuous interaction between the cognitive, behavioural and contextual factors within that person's learning and the influence of parental and other external environmental factors.

Bandura et al. (1988) state that behavioural factors such as self-efficacy reflect individuals' beliefs about whether they can achieve a given level of success at a particular task, whereas self-regulation is dependent on goal setting. SCT considers that individuals are capable of managing their thoughts and actions to achieve specific outcomes. Self-reaction occurs as a result of the rigours of self-efficacy and self-regulation. This is a stage at which individuals decide whether to modify, reject or continue the outcomes.

Thus, SCT provides a framework for understanding, predicting and changing human behaviour (Bandura 2001). As such, it can be used to develop a general theoretical framework for analyzing adolescents' online behaviour to discover whether there is any correlation between adolescents' online use, parental behaviour, and adolescents' self-efficacy and self-regulation.

3   RESEARCH MODEL AND HYPOTHESES

The SCT research model developed specifically for this study from the general SCT framework is depicted in Figure 1. It was designed to examine whether parents' supervision of adolescents and monitoring of their online use (external factors) can enhance adolescents' safe online use, and whether adolescents' knowledge and attitudes to cyber safety (internal factors – self-efficacy and self-regulation) have a direct impact on their online behaviour. Six hypotheses were proposed to test and justify the model.
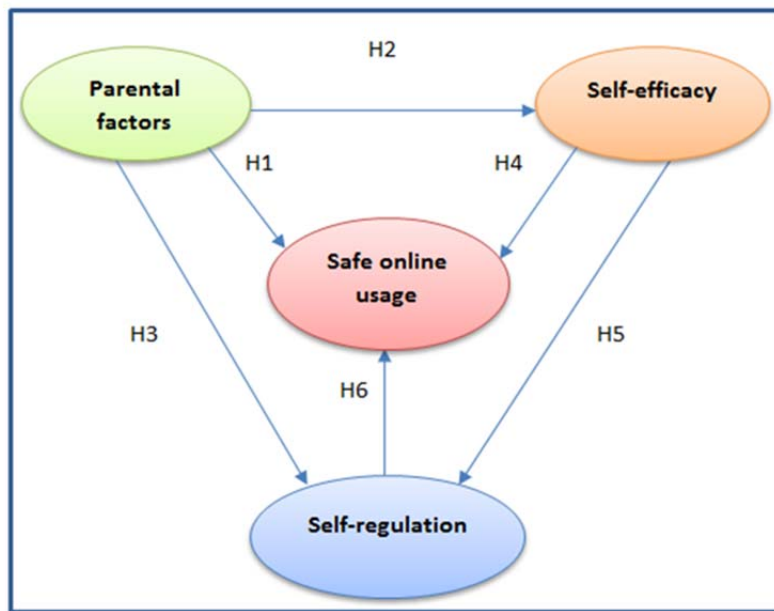
Figure 1.   Research model of SCT theory.

3.1   Parental Factors

Parental guidance and sanctions influence the socialization process. 'Successful socialization, therefore, requires the gradual substitution of internal controls and direction for external sanctions and mandates' (Bandura 1989, p. 46). Parental factors in this study were parental supervision, monitoring and controlling of adolescents' online behaviour. Parental monitoring or involvement is perceived as a positive indicator in child development. A strong link has been found between poor parental attachment, antisocial behaviour (Patterson & Stouthamer-Loeber 1984; Ericson 2001; Pettit et al. 2001) and delinquent behaviour (Steinberg 2000). Ybarra and Mitchell (2004), who conducted a study investigating the link between online harassment and the caregiver-child relationship, conclude that there is a significant relationship between poor parenting or caregiving and children indulging in wasteful or abusive online activity. Youth reporting low emotional closeness with their parents were almost 3 times more likely than others to engage in online harassment, which indicates that disturbed relationships between parents and children may result in problematic online behaviour.

Parents' online behaviour and their educational backgrounds are known to significantly predict children's internet use at home (Valcke et al. 2010). As role models, parents who have a good knowledge of information security and internet safety have a positive influence on their children's safe online behaviour. Livingstone and Helsper (2008) argue that parental restriction of online peer-to-peer interactions is associated with reduced risk. However, it has been proposed that parental monitoring of children's internet use points to the need to study family rules from both parents' and children's perspectives (Wang et al. 2005).

In this study, the following three hypotheses were proposed to test whether parents' guidance is really a positive factor in adolescents' online use:

H1: Parental factors have a positive impact on adolescents' safe online use.

H2: Parental factors have a positive impact on adolescents' self-efficacy.

H3: Parental factors have a positive impact on adolescents' self-regulatory behaviours.

3.2 Self-efficacy

Self-efficacy is defined as a person's belief in their abilities to perform a task. Personal factors include instincts, drives, traits and other motivational factors that decide the consequences of an individual's behaviour (Pajares 1996). Hence, a person with good awareness and intentions is cautious about his or her actions and their consequences. Self-efficacy beliefs affect the quality of human functioning through cognitive, motivational, affective and decisional processes (Bandura 2012). Zimmerman (2000, p. 83) proposes that self-efficacy consists of 'personal judgements of one's own capabilities to organise and execute courses of action to attain designated goals'. It motivates self-regulatory behaviours such as self-monitoring, self-evaluation and developing future strategies (Zimmerman et al. 1992). It is important to note that higher self-efficacy influences emotional wellbeing by reducing stress, anxiety and depression (Bandura, 1997); a hypothesis that tries to justify a direct correlation between self-efficacy and self-regulation.

Working from the assumption that there is a relationship between self-efficacy and safe online use, and between self-efficacy and self-regulation, this study sought to test the hypotheses that:

H4: Self-efficacy has a positive effect on adolescents' safe online use.

H5: Self-efficacy has a positive impact on self-regulation.

3.3 Self-regulatory (Behavioural) Control

According to SCT, self-regulation allows a person to control his or her responses or behaviour when confronted with externally imposed stimuli. Schunk and Ertmer (2000) state that self-regulation refers to the degree to which learners are cognitively, motivationally and behaviourally active in their learning. Self-regulation takes the form of self-discipline, impulse control and the management of short-term desires. It comprises self-monitoring, self-evaluation and self-reinforcement (Kanfer 1970; 1971). Oppezzo and Schwartz (2013) propose that self-regulatory learning leads to desired behavioural change, while Wills et al. (2011) state that poor self-regulation leads adolescents to engage in problematic behaviours. Hence, this study's final hypothesis for testing was that:

H6: Self-regulation has a positive impact on adolescents' safe online use.

4 METHOD

4.1 Survey Development

A survey questionnaire based on SCT was developed from published studies and previous surveys as a measurement tool to test adolescents' cyber safety awareness and behaviour. The survey's four key constructs were 'parental factors', 'self-efficacy', 'self-regulation' and 'safe online use'.

Parental factors questions were developed on the basis of human agency in Bandura's (1989) work on SCT in terms of restriction, monitoring and guiding.

Questions on Restriction
- Restricting software (filters) used by the parents – RES1
- Restricting software (filters) used by the Internet Service Provider – RES2
- Rules imposed by parents and caregivers on online use – RES3

Questions on Monitoring
- Parent/s are friends in the child's social networking sites – MON1
- Parents checking the screen from time-to-time when the child is online – MON2
- Parents monitoring the social network, chat sites and emails – MON3

Questions on Guiding
- Parents' guide online surfing/activities – GUI1

- Parents discuss harmful effects – GUI2

Self-efficacy questions were constructed on the basis of the work of Bandura (1997) and Pajares (1997).

Questions
- Knowing how to set privacy settings in social networking and other online activities – SE1
- Knowing basic technological measures; virus updates, not opening scam emails or posts, not sharing passwords – SE2

Self-regulation questions were based on the work of Bandura (1991) and Kanfer (1970; 1971).

Questions
- Not establishing contacts with strangers – SR1
- Using chat rooms, social networking and online games for only a limited time and limited number of people that I know – SR2

Safe online use questions related to time spent online for academic work and other browsing activities.
- Knowledge about privacy
- Knowledge about technical protection like virus updates, knowing what scams are, strangers participating in chatting, etc.

The questionnaire was refined with input from various professionals and teachers in the participating schools. Their feedback was incorporated into the survey, with questions modified accordingly.

4.2   Data Collection

Three hundred and forty respondents (182 males, 158 females) undertook the refined survey to test the theoretical model developed for this study. The majority were in the 12-17 year age group. All were studying in two South Australian metropolitan high schools that had been selected through the researcher's personal contacts. The schools' principals approved and supported the study. They allocated a specific class time for students to participate in the online survey. Class teachers gave the students the required instructions and provided them with the online survey link. Any students who did not have their parents' consent to participate were excluded from the study.

4.3   Data Analysis

4.3.1   Assessment of the Measurement Tool

It is essential to assess the accuracy of any measurement tool prior to testing hypotheses. In this study, the survey's four key constructs' psychometric properties were assessed by examining their reliability, convergent validity and discriminant validity. Reliability and validity refer to measuring the relationship between a scale's individual items. Reliability, or internal consistency, is assessed most commonly using Cronbach's alpha. Hence, Cronbach's alpha was used to test the internal consistency of the survey's key constructs. As shown in Table 1, the reliability measures ranged from 0.70 to 0.91, equal to or exceeding the 0.70 cut-off values and thus indicating an acceptable level of internal consistency (Nunnally 1978).

Construct	No of Items	Cronbach's Alpha
Parental factors (PF)	8	0.91
Self-efficacy (SE)	2	0.71
Self-regulation (SR)	2	0.70
Safe online use (SOU)	2	0.71

Table 1.   Reliability of Constructs

Convergent validity was assessed to find whether items within the same constructs correlated highly among themselves. As shown in Table 2, standardized factor loadings are above .50, which indicates an adequate level of convergent validity (Anderson et al. 1998). The parental factors are also highly correlated, indicating a likely relationship between the three aspects (restriction, monitoring and guiding). Convergent validity was also tested by calculating the Average Variance Extracted (AVE), which is 'the amount of variance that a latent variable component captures from its indicators in relation to the amount due to measurement error' (Crossler 2010, p. 7). The AVE was above the recommended 0.5 level (Fornell & Larcker 1981), as shown in Table 3. Composite reliability (CR) was calculated to confirm the scale's reliability. The CR of all constructs was also above 0.6 (see Table 3), thus indicating adequate convergent validity of the items in each construct (Bagozzi & Yi 1988).

Construct	Item	PF	SE	SR	SOU
Parental factors (PF)	RES1	**0.832**	-0.047	-0.094	0.094
	RES2	**0.721**	-0.010	-0.045	0.080
	RES3	**0.829**	-0.042	-0.073	0.113
	MON1	**0.706**	-0.025	0.002	0.068
	MON2	**0.859**	-0.004	-0.044	0.116
	MON3	**0.749**	-0.015	-0.001	0.096
	GUI1	**0.839**	-0.037	-0.002	0.091
	GUI2	**0.754**	-0.040	-0.037	0.090
Self-efficacy (SE)	SE1	-0.016	**0.895**	0.222	0.255
	SE2	-0.050	**0.860**	0.300	0.041
Self-regulation (SR)	SR1	-0.056	0.263	**0.886**	0.176
	SR2	-0.040	0.255	**0.877**	0.173
Safe online use (SOU)	SOU1	0.076	0.222	0.175	**0.901**
	SOU2	0.143	0.078	0.174	**0.860**

Table 2.   Factor Loadings

Discriminant validity specifies the degree to which a construct is not correlated with other constructs and can be assessed by comparing the correlation of each construct with the square root of the Average Variance Extracted (AVE) (Fornell & Larcker 1981). As illustrated in Table 3, the square root of the AVE (diagonal elements in Table 3) of each construct is larger than the recommended threshold of .50 (Fornell & Larcker 1981). Therefore, this satisfies the discriminant validity of the constructs. Since all the items had adequate reliability and validity, all the measurement items were used for testing the research model.

Construct	CR	AVE	PF	SE	SR	SOU
Parental factors (PF)	0.928	0.621	**0.788**			
Self-efficacy (SE)	0.870	0.770	-.034	**0.877**		
Self-regulation (SR)	0.874	0.776	-.040	.297	**0.880**	
Safe online use (SOU)	0.873	0.775	.114	.165	.198	**0.880**

Table 3.   Composite Reliability (CR), AVE, and Inter-construct Correlations

4.3.2   Assessment of the Research Model

SPSS software version 22 and SmartPLS 3.0 (Ringle et al. 2005) software package were used to analyse the data. SmartPLS 3.0 was used to test the hypotheses using Structural Equation Modeling (Anderson & Gerbing 1988). This method estimates the path coffiecients that calculate the strength of the relationships between independent and dependent variables. The Partial Least Squares (PLS) and bootstrapping test were used to evaluate the research model. PLS determines the hypothesized path and bootstrapping estimates the path's significance (t-value).

5   RESULTS

Figure 2 and Table 4 show that testing proved H1 – that parental factors have a positive impact on adolescents' safe online use – with significant results of $P< 0.05$ and a t-value of 3.061. However, the results showed no significant values to support H2 (that parental factors have a positive impact on adolescents' self-efficacy) (P=NS, t-value of 0.791) or H3 (that parental factors have a positive impact on adolescents' self-regulatory behaviours) (P=NS, t-value of 0.845). These results infer that parental factors may not be the only influence on adolescents' self-efficacy or self-regulatory behaviours in relation to online use. Self-knowledge and self-determination may play a greater role than parental influences.
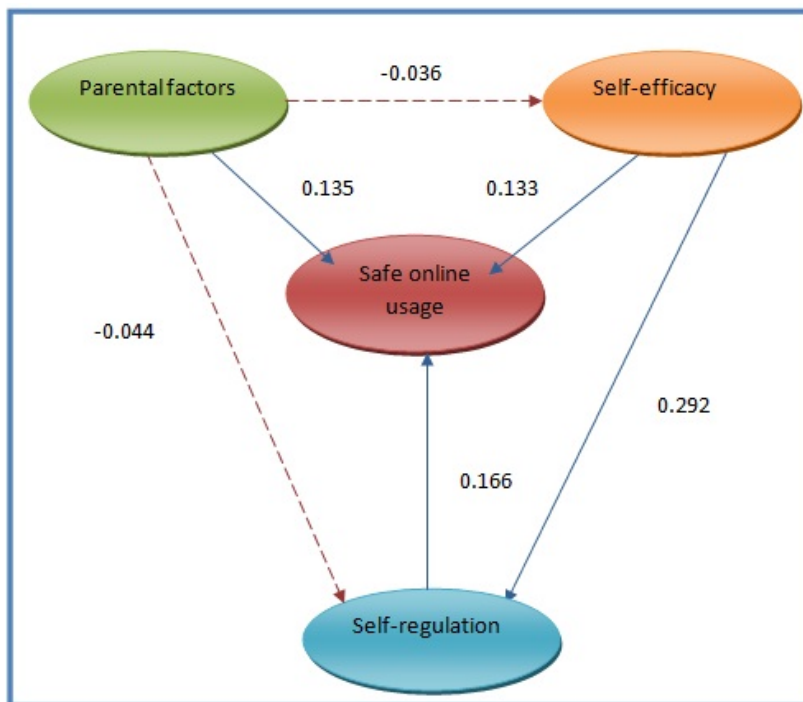

Figure 2.   SCT research model, with justification (⟶ hypothesis supported; ---▶ hypothesis not supported).

Testing of hypotheses H4, H5 and H6 returned significant results for all three. H4 – that self-efficacy has a positive effect on adolescents' safe online use – returned results of $P< 0.01$ and a t-value of 2.240. This provides evidence to support the theory that personal factors, including instincts, drives, traits and other motivational factors will encourage adolescents to adopt moderate, safe online use patterns and decide the consequences of online misuse. Justification of H5 – that self-efficacy has a positive impact on self-regulation – was demonstrated with results of $P< 0.01$ and a t-value of 7.273. H6 – that self-regulatory controls have a positive impact on adolescents' online use – was supported by findings of $P< 0.01$ and a t-value of 3.378. The results show a low R-square value of 0.07 for safe online usage. These figures imply that adolescents' self-regulatory behaviours, such as being cautious, results in safe online use.

Hypothesis	Hypothesized path	Path coefficient (β)	P-value	t-value	Result
H1	PF → SOU	0.135	P<0.05	3.061	Supported
H2	PF → SE	-0.036	NS	0.791	Not Supported
H3	PF → SR	-0.044	NS	0.845	Not

					Supported
H4	SE → SOU	0.133	P<0.01	2.240	Supported
H5	SE → SR	0.292	P<0.01	7.273	Supported
H6	SR → SOU	0.166	P<0.01	3.378	Supported

Table 4.   *Summary of Findings*

6   DISCUSSION

The results of this study have validated the investigative research model, based on Bandura's (1988) SCT, which was developed to explore the relationship between adolescents' cognitive learning factors and their online behaviour. The model is able to explain that parental factors, such as parental guidance and monitoring (P< 0.05), have a significant, positive impact on adolescents' attitudes and behaviours concerning safe online use (H1) but do not have any significant impact on adolescents' self-efficacy (H2) or self-regulation (H3). It reinforces the point that parents must be vigilant in monitoring their children's online behaviour to prevent negative impacts on children's personal and social development, and career prospects. Such impacts include depression, low self-esteem or even death, which can arise from excessive online use or indulging in age-inappropriate activities (Schunk 1989; Valcke et al. 2011).

Items in the parental factors construct that justify the first hypothesis (H1) suggest that support by observant parents in addition to questioning their children about their online activities is worthwhile (Wolak et al. 2010). This need not be structured or time-consuming. Parental monitoring can take the form of being friends with their child's social media network, discussing online dangers such as predators' activities, and teaching important details about privacy such as not sharing personal information or passwords. In relation to the issue of 'restriction', while several online tools are available to monitor children's online movement, good communication between parents and adolescents is known to be more effective (Law et al. 2010). Therefore, parents conversing with their children about online safety may create new insights into adolescents' online activities, and in turn create good and safe online use patterns. These parental factors' items imply that parents must be careful not to over-intrude, or be punitive or non-responsive when monitoring, however, because these are seen as negative parental behaviours that can lead to adolescents' unsafe online use and a higher probability of addiction (Xiuqin et al. 2010). Kwon et al.'s (2011) finding of a correlation between parental behaviour and online abuse supports this study's results. Moreover, Parent Solicitation (parents ask what their child is looking at online) and Child Disclosure (child naturally tells parents what they are doing) can reduce aggressive online behaviour according to Law, Shapka and Olson (2010). Hence, parental support and monitoring are equally important in building healthy online practices (Padilla-Walker & Coyne 2011).

Parents need to be aware of the extent of adolescent engagement in risky online behaviour and be realistic about the amount of parental monitoring that occurs at home, both of which have been identified as largely underestimated (Konstantinos et al. 2012), if they are to positively influence their children's online behaviour. The results for parental factors in this study suggest that parental monitoring needs to be reconceptualised and that parents need to improve their communication in relation to the topic of their adolescent children's online access (Liau et al. 2008).

With reference to the fourth hypothesis (H4) on self-efficacy and its results of P< 0.01 and a t-value of 2.240, it has been stated that 'self-efficacy is not a trait but rather a perception of capability that is developed through both observations of others as well as personal experiences' (Turner 2011, p. 431). Adolescent self-efficacy means judging one's own behaviour to decide safe and unsafe online use. It is created by establishing privacy settings for one's personal information and applying appropriate security measures. This study proves that higher self-efficacy leads to healthy online use.

Results for the fifth hypothesis (H5) on self-efficacy and its positive impact on self-regulation (P< 0.01 and a t-value of 7.273) provide evidence that adolescents with self-efficacy can manage a highly

demanding assignment or task because their previous success in accomplishing similar tasks reinforces positive self-regulatory behaviour (Barak 2010). In any learning process, self-efficacy and self-regulation are reciprocal; a pattern observed by Kuntz and Gomes (2012) in their work on the social learning process where self-efficacy and self-regulating mechanisms led to subsequent behavioural outcomes, which aligns with this study's results. Adolescents who are confident and well informed about the dangers of online practices can adopt good online self-regulatory behaviours. Consequently, self-regulatory practices can assist children to refrain from abusing online access and limit their online use to safe, originally intended activities such as education.

In relation to the sixth hypothesis (H6), this study's results (P< 0.01 and a t-value of 3.378) demonstrate that self-regulatory controls have a positive impact on adolescents' online behaviour. These figures support the contention that adolescents' self-regulatory behaviours, such as cautiousness and a sense of responsibility, will have a positive association with safe online use. Self-regulatory behaviours in the online world are indicated by use of appropriate technological protection (virus updates), deleting spam emails and creating adequate privacy settings, for example. During adolescence, neurobiological changes and physical changes occur that lead to risk taking behaviour (Steinberg 2005). These changes can lead to experimenting in cyber space with dangerous consequences. A number of studies have concluded that poor self-regulation is also associated with problem behaviour in general (Wills et al. 2011) and poor academic achievement (Zimmerman & Schunk 2013; Lerner et al. 2011). Hence, instilling self-regulatory online behaviour can assist adolescents not only to differentiate between acceptable and unacceptable online situations but also to practice self-regulatory behaviour in all areas of their lives.

The two hypotheses this study's results did not support were whether parents have any influence on their adolescent children's self-efficacy (H2) or self-regulatory (H3) behaviour. The data analysis suggests that environmental factors other than parental factors influence adolescents' self-efficacy and self-regulatory behaviours. Personality factors and knowledge gained from external sources such as school and friendships may be contributing factors to self-regulatory behaviours.

Thus, the major finding from this study that parental and family factors, self-efficacy factors and self-regulatory factors all play key roles in building adolescents' safe online use patterns demonstrates the need for a balanced approach to nurturing adolescents' positive online behaviour, based on a sound knowledge of SCT. Such an approach recognises that parental factors are not the only influence on adolescents' online behaviour. Future research focusing on the influence of friends, which was not surveyed in this study, will complement the study's findings.

6.1   Implications for research

The theoretical basis (SCT) for this empirical study facilitates a preventative approach to adolescent online safety, resulting in positive behavioural outcomes. It demonstrates that parental supervision has a direct impact on adolescents' online behaviour. Its use of SCT to understand aspects of adolescent behaviour marks an important addition to the knowledge base. The SCT research model developed specifically for this study from the general SCT framework, as well as the survey, provides a platform for further research into the factors influencing adolescents' safe online behaviour. It can be adapted for research into preventative strategies for other behavioural issues.

6.2   Implications for practice

This study's findings have practical implications for safe online use training programs in schools and the wider community. The fact that parents' involvement in the form of monitoring and restriction is proven to have a direct influence on adolescents' behaviour can be used to encourage parents to become actively engaged in their children's online learning. More specifically, educational programs offered in schools must consider involving parents by getting them to share their experiences of monitoring their children's online activities.

7   CONCLUSION

The results prove that parental factors such as monitoring and guidance directly influence adolescents' online use. They also show that adolescents' self-efficacy and self-regulatory behaviours can act to self-monitor online behaviour. The literature reviewed and the study results point to positive parental-child communication and relationships as a key factor in effective outcomes from parental guidance and monitoring of adolescents' online use. Parents and those designing programs to encourage adolescents' safe online use need heightened awareness of the correlation between parental behaviour and adolescent behaviour; that is, the impact of both positive and negative parental behaviour on adolescent behaviour.

References

ABS (2014). 8146.0 - Household use of information technology, Australia, 2012-13. Retrieved April 01 2014, from http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/8146.0Chapter12012-13

Alvarez, L. (2013). Felony counts for two in suicide of bullied 12-year-old. Retrieved April 02, 2014, from http://www.nytimes.com/2013/10/16/us/felony-charges-for-2-girls-in-suicide-of-bullied-12-year-old-rebecca-sedwick.html?_r=2&

Anderson, J.C. and Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103 (3), 411-423.

Anderson, R.E., Black, W.C., Hair, J.F. and Tatham, R.L. (1998). Multivariate data analysis. Prentice-Hall, London.

Bagot, M. (2013). Online blackmail scam: Thousands of British teenagers targeted by con artists. Retrieved March 30, 2013, from http://www.mirror.co.uk/new s/uk-news/online-blackmail-scam-thousands-british-2176956#.Uubfo9Je601

Bagozzi, R.P. and Yi, Y. (1988). On the evaluation of structural equation models. Journal of the Academy of Marketing Science, 16 (1), 74-94.

Bandura, A. (1986). Social foundations of thought and action: A cognitive social theory. Prentice Hall, Englewood Cliffs, New York.

Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), Annals of Child Development, 6. Six theories of child development (pp. 1-60). JAI Press, Greenwich, CT.

Bandura, A. (1991). Social cognitive theory of self-regulation. Organizational Behavior and Human Decision Processes. 50 (2), 248-287.

Bandura, A. (1997). Self-efficacy: The exercise of control. W.H. Freeman, New York.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52 (1), 1-26.

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. Journal of Management, 38 (1), 9-44.

Bandura, A. and McClelland, D.C. (1977). Social learning theory. Prentice-Hall, Englewood Cliffs, N.J.

Bandura, A., Cioffi, D., Taylor, C. B. and Brouillard, M.E. (1988). Perceived self-efficacy in coping with cognitive stressors and opioid activation. Journal of Personality and Social Psychology, 55, 479-488.

Barak, M. (2010). Motivating self-regulated learning in technology education. International Journal of Technology and Design Education, 20 (4), 381-401.

Beccaria, C. (1963). On crimes and punishments (introduction by H. Paolucci, Trans.). Macmillan, New York (original work published 1764).

Crossler, R.E. (2010). Protection motivation theory: Understanding determinants to backing up personal data. In Proceedings of the 43rd Hawaii International Conference on System Sciences (HICSS), IEEE 2010, pp. 1-10.

Davis, K. (2013). Young people's digital lives: The impact of interpersonal relationships and digital media use on adolescents' sense of identity. Computers in Human Behavior, 29, 2281–2293.

Ericson, N. (2001). Addressing the problem of juvenile bullying: US Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention. US Government Printing Office, Washington DC.

Fewster, S. (2010). Carly Ryan: A loving girl who fell prey to an online predator. Retrieved April 03, 2014, from http://www.adelaidenow.com.au/news/south-australia/carly-ryan-a-loving-girl-who-fell-prey-to-an-online-predator/story-e6frea83-1225822697469

Fornell, C. and Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18 (2), 39-50.

Gunuc, S. and Dogan, A. (2013). The relationships between Turkish adolescents' Internet addiction, their perceived social support and family activities. Computers in Human Behavior, 29 (6) 2197–2207

Hawi, N.S. (2012). Internet addiction among adolescents in Lebanon. Computers in Human Behavior, 28 (3), 1044-1053.

Jessor, R. (1987). Problem-Behavior Theory, Psychosocial Development, and Adolescent Problem Drinking. British Journal of Addiction, 82, 331-342.

Kanfer, F.H. (1970). Self-monitoring: Methodological limitations and clinical applications. Journal of Consulting & Clinical Psychology, 35, 148-152.

Kanfer, F.H. (1971). The maintenance of behavior by self-generated stimuli and reinforcement: The psychology of private events. Academic Press, New York.

Kuntz J.R.C. and Gomes J.F.S, (2012) Transformational change in organisations: A self-regulation approach. Journal of Organizational Change Management, 25 (1), pp.143-162.

Kwon, J.-H., Chung, C.-S. and Lee, J. (2011). The effects of escape from self and interpersonal relationships on the pathological use of internet games. Community Mental Health Journal, 47 (1), 113-121.

Law, D.M., Shapka, J.D. and Olson, B.F. (2010). To control or not to control? Parenting behaviours and adolescent online aggression. Computers in Human Behavior, 26 (6), 1651-1656.

Lereya, ST, Samara, M. and Wolke, D. (2013). Parenting behavior and the risk of becoming a victim and a bully/victim: A meta-analysis study. Child Abuse & Neglect, 37, 1091-1108.

Lerner, R.M., Lerner, J.V., Bowers, E.P., Lewin-Bizan, S., Gestsdottir, S. and Urban, J.B. (2011). Self-regulation processes and thriving in childhood and adolescence: A view of the issues. New Directions for Child and Adolescent Development, 133, 1-9.

Liau, A.K., Khoo, A. and Ang, P. H. (2008). Parental awareness and monitoring of adolescent Internet use. Current Psychology, 27 (4), 217-233.

Liu, C., Ang, R.P. and Lwin, M.O. (2013). Cognitive, personality, and social factors associated with adolescents' online personal information disclosure. Journal of Adolescents, 36, 629–638.

Livingstone, S. and Helsper, E.J. (2008). Parental mediation of children's internet use. Journal of Broadcasting & Electronic Media, 52 (4), 581-599.

Moran, A. (2012). Taiwanese teen dies at Internet cafe after 40-hour game marathon. Retrieved April 02, 2014, from http://digitaljournal.com/article/328947#ixzz2rdsLcuJ9

New York Times (2013). Canada: Arrests Made in Girl's Suicide. Retrieved 03/04/2014, from http://www.nytimes.com/2013/08/09/world/americas/canada-arrests-made-in-girls-suicide.html?ref=cyberbullying&_r=0

Nunnally, J.C. (1978). Psychometric theory. McGraw-Hill, New York.

O'Neill, B., Livingstone, S. and McLaughlin, S. (2011). Final recommendations for policy, methodology and research. Retrieved April 02, 2014, from LSE Media and Communications website: http://www2.lse.ac.uk/media@lse/research/EUKidsOnline/D7.pdf

Oliver, K. (2010). Facebook fake lures teen Nona Belomes off in to death trap, say cops: Job offer ends in murder. Retrieved April 02, 2014, from http://www.cbsnews.com/news/facebook-fake-lures-teen-nona-belomesoff-into-death-trap-say-cops-job-offer-ends-in-murder/

Oppezzo, M. and Schwartz, D.L. (2013). A behavior change perspective on self-regulated learning with teachable agents. International Handbook of Metacognition and Learning Technologies: Springer, New York, 28, 485-500.

Padilla-Walker, L.M. and Coyne, S.M. (2011). 'Turn that thing off!' Parent and adolescent predictors of proactive media monitoring. Journal of Adolescence, 34 (4), 705-715.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. Review of Educational Research, 66 (4), 543-578.

Pajares, F. (1997). Current directions in self-efficacy research. In: M. Maehr and P.R. Pintrich (Eds), Advances in Motivation and Achievement. JAI Press, New York, (10), 1-49.

Patterson, G.R. and Stouthamer-Loeber, M. (1984). The correlation of family management practices and delinquency. Child Development, (55), 1299-1307.

Pettit, G.S., Laird, R.D., Dodge, K.A., Bates, J.E. and Criss, M.M. (2001). Antecedents and behavior-problem outcomes of parental monitoring and psychological control in early adolescence. Child Development, 72 (2), 583-598.

Polites, H. (2013). Australian internet use skyrockets: ACMA. Retrieved April 01, 2014, from http://www.businessspectator.com.au/news/2013/12/12/technology/australian-internet-use-skyrockets-acma

Prochaska, J.O. and DiClemente, C.C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. Journal of Consulting and Clinical Psychology, 51, 390-395.

Prochaska, J. O. and Velicer, W.F. (1997). The Transtheoretical Model of health behavior change. American Journal of Health Promotion, 12, 38-48.

Prochaska, J.O., DiClemente, C.C. and Norcross, J.C. (1992). In search of how people change: Applications to addictive behavior. American Psychologist, 47, 1102-1114.

Ringle, C.M., Wende, S. and Will, S. (2005). SmartPLS 2.0 (M3) Beta, Hamburg 2005, http://www.smartpls.de.

Ryan, K.N. and Curwen, T. (2013). Cyber-victimized students: incidence, impact and intervention. SAGE Open, 3(4).

Schunk, D.H. (1989). Social cognitive theory and self-regulated learning. Self-regulated learning and academic achievement. Springer, New York, 83-110.

Schunk, D.H. and Ertmer, P.A. (2000). Self-regulation and academic learning: Self-efficacy enhancing interventions. Handbook of Self-Regulation. Academic Press, San Diego, CA, US, 19, 631-649.

Siomos, K., Floros, G., Fisoun, V., Evaggelia, D., Farkonas, N., Sergentani, E., Lamprou, M. and Geroukalis, D. (2012). Evolution of Internet addiction in Greek adolescent students over a two-year period: The impact of parental bonding. European Child & Adolescent Psychiatry, 21 (4), 211-219.

Stefanescu, C., Chirita, V., Chirita, R. and Chele, G.E. (2009). The factors that influence adolescents' engagement in risky internet behavior: An observational study in Romanian adolescents. Paper presented at the Proceedings of the 6th WSEAS International Conference on Engineering Education, 178-182.

Steinberg, L. (2000). Youth violence: Do parents and families make a difference? National Institute of Justice Journal, 243, 31-38.

Steinberg, L. (2005). Cognitive and affective development in adolescence. Trends in Cognitive Sciences, 9 (2), 69-74.

Stokes, P. (2010). Ashleigh Hall: 'One mistake' cost teenager her life. Retrieved April 03, 2014, from http://www.telegraph.co.uk/news/uknews/crime/7398085/Ashleigh-Hall-one-mistake-cost-teenager-her-life.html

Turner, F.J. (2011). Social work treatment: Interlocking theoretical approaches: Oxford University Press, New York.

Valcke, M., Bonte, S., De Wever, B. and Rots, I. (2010). Internet parenting styles and the impact on Internet use of primary school children. Computers & Education, 55 (2), 454-464.

Valcke, M., De Wever, B., Van Keer, H. and Schellens, T. (2011). Long-term study of safe Internet use of young children. Computers & Education, 57 (1), 1292-1305.

Wang, R., Bianchi, S.M. and Raley, S.B. (2005). Teenagers' Internet use and family rules: A research note. Journal of Marriage and Family, 67 (5), 1249-1258.

Wills, T.A., Pokhrel, P., Morehouse, E. and Fenster, B. (2011). Behavioral and emotional regulation and adolescent substance use problems: A test of moderation effects in a dual-process model. Psychology of Addictive Behaviors, 25 (2), 279.

Wolak, J., Finkelhor, D., Mitchell, K.J. and Ybarra, M.L. (2010). Online 'predators' and their victims. Psychology of Violence, 1, 13-35.

Xiuqin, H., Huimin, Z., Mengchen, L., Jinan, W., Ying, Z. and Ran, T. (2010). Mental health, personality, and parental rearing styles of adolescents with Internet addiction disorder. Cyberpsychology, Behavior, and Social Networking, 13 (4), 401-406.

Ybarra, M.L. and Mitchell, K.J. (2004). Youth engaging in online harassment: Associations with caregiver–child relationships, Internet use, and personal characteristics. Journal of Adolescence, 27 (3), 319-336.

Young, K. (2009). Understanding online gaming addiction and treatment issues for adolescents. American Journal of Family Therapy, 37 (5), 355-372.

Yu, L. and Shek, D.T. (2013) Internet addiction in Hong Kong adolescents: A three-year longitudinal study. Journal of Pediatric and Adolescent Gynecology, 26 (3), Supplement, June 2013, S10-S17.

Zimmerman, B.J. (2000). Self-efficacy: An essential motive to learn. Contemporary Educational Psychology, 25 (1), 82-91.

Zimmerman, B.J. and Schunk, D.H. (2013). Self-regulated learning and academic achievement: Theoretical perspectives. Routledge, Lawrence Erlbaum Associates, New Jersey.

Zimmerman, B.J., Bandura, A. and Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. American Educational Research Journal, 29 (3), 663-676.