The effect of Facebook use, self-discipline and parenting styles on the academic achievement of high school and university students

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ABSTRACT

While Facebook is primarily used as a means to communicate with friends, it may serve as a distractor from study. Laptops and tablets with Internet access are almost ubiquitous among primary, secondary and tertiary students in New Zealand. Research on the effects of Facebook use on students' academic achievement appears inconclusive and there was no New Zealand based research to date. The aim of this study was to investigate the effects of Facebook use, self-discipline and parenting styles on academic achievement through an online study. High school ($n = 106$) and university students ($n = 211$) and their parents were recruited from a variety of locations around New Zealand.

Facebook use only affected academic achievement for high school students and the strength of the relationship between Facebook use and academic outcomes was weak. Furthermore, the regression model found that overall Facebook use did not predict academic achievement. It is argued that Facebook use does *not* directly affect academic grades of students as it is an amalgamation of behaviours and/or the expression of traits (e.g., low self-discipline) that lead to non-task related activities.

Self-discipline and parenting style, on the other hand, were the strongest predictors of academic achievement. High school and university students who were more able to manage distractions and procrastinating activities had higher grade point average (GPA) scores and overall pass rates. Students with authoritative parents were *more likely* to achieve high academic grades. In contrast, students whose parents had a permissive parenting style were at *high risk* of low academic achievement. Teaching students to delay an immediate reward in order to achieve a long-term goal is an important skill that needs to be socialised early in life as it is a pathway to better academic outcomes. While the study does not support the idea that Facebook has a direct effect on academic outcomes, further studies on other social networking sites are needed for replication.

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<center>**CHAPTER ONE – INTRODUCTION**</center>

1.1 Background

Social networking sites have become extremely popular (Hargittai, 2007; Jones & Fox, 2009) and they have changed the way people communicate, socialise and interact with each other (Ross et al., 2009). Social networking sites are mostly used by individuals aged 16 to 24 (Livingstone, 2008) and are an important factor not often considered in the study of adolescent social, emotional, and cognitive development. While research on this area is still in its infancy, existing research indicates that the use of such sites may have adverse impacts on romantic relationships, mental health as well as the academic achievement of teens and adults (Fox & Warber, 2013; Rosen, Carrier, & Cheever, 2013; Rosen, Lim, Carrier, & Cheever, 2011).

One popular social networking site that has generated over one billion active users per month is Facebook (Kiss, 2012, 2014; Whittaker, 2012). The site allows users to connect with friends, family, colleagues and others who share common interests or backgrounds. Lenhard and Madden (2007) studied teens aged 12 to 17 years and found that Facebook was primarily used to create new friendships. Similarly, university students (*M* age = 20.59, *SD* = 1.07) primarily use Facebook to facilitate existing social relationships (Pempek, Yermolayeva, & Calvert, 2009). In New Zealand, a telephone survey conducted by Smith, Gibson, Crothers, Billot and Bell (2011) revealed that 87% of 1225 participants under the age of 30 belong to a social networking site (typically Facebook), a similar rate to those reported internationally. In 2010, Facebook was the most visited site in the US and on Christmas day the most visited site in the UK (Daily Mail Reporter, 2011; Singer, 2011). To further illustrate Facebook dominating the online landscape, a large scale (*N* = 2,255) representative survey of US citizens aged 18 to 65 found that 975 people (43.2%) in the sample used social networking sites, with the majority of these (92%) reporting they used Facebook (Hampton, Sessions,

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Rainie, & Purcell, 2011). Ninety-five per cent of users reported that they used Facebook at

least once a day (Hampton et al., 2011). Women (58%) and young adults aged 18 to 35 (49%)

have been found to the most common Facebook users (Hampton et al., 2011). Other social

networking sites such as My Space and Twitter were used much less frequently (refer to Table

1 below) (Hampton et al., 2011). US based studies by Ellison, Steinfield and Lampe (2007)

and Pempek et al. (2009) have revealed that university students spend, on average, 30

minutes per day on Facebook. In contrast, Junco (2011) found that university students spend

even *longer* periods of time on Facebook, with an average time of 101.09 minutes. In terms

of frequency, Junco (2011) found that university students, on average, check Facebook 5.75

times a day ($SD = 6.78$). Although a different measurement scale was used to gauge

Facebook length, Junco's (2011) findings are congruent with Pempek et al.'s (2009) results.

Junco (2011) also found a significant correlation ($r = .49$, $p < .001$) between the extent of

time and length spent on Facebook and specified that these two key variables compose

Facebook usage. Incidentally, Junco's (2011) results suggest that Facebook is addictive.

Overall, the Facebook rates above demonstrate that Facebook is integrated into the daily lives

of young adults across the world.

Table 1
Amount of time adults aged 18 to 65 spend on Facebook

	My Space	Facebook	LinkedIn	Twitter	Other
Several times a day	3%	31%	3%	20%	15%
About once a day	5%	21%	3%	3%	17%
3 – 5 times a day	2%	15%	4%	6%	14%
1 – 2 times a day	17%	17%	18%	9%	16%
Every few weeks	12%	11%	12%	28%	19%
Less often	33%	5%	35%	23%	14%
Never	29%	1%	9%	18%	5%

Note. Adapted from Hampton et al. (2011).

The use of the Internet in New Zealand has been enhanced through the Government's

Ultra-Fast Broadband Initiative, which promises fully funded fibre drops that connect schools

with existing fibre in the street (Ministry of Education, 2013b). By 2016, the Government is committed to providing 97.7% of schools and 99.9% of students with access to ultra-fast broadband (Ministry of Education, 2013b). The Ministry of Education recognises that technology is key to education delivery and believes that implementing ultra-fast broadband access to schools will result in better educational outcomes for learners, giving learners instant access to information from around the world (Foss, 2012). To take full advantage of ultra-fast broadband, an increasing number of schools have enforced the rule that students bring their laptop, iPad, or notebook to school ("School makes electronic kit compulsory," 2013, "Schools back move to personal laptops," 2011; Tasman-Jones, 2012). As a result of the Government's Ultra-Fast Broadband Initiative and the emergence of the information age, the use of Internet as a resource for learning is almost ubiquitous among primary, secondary and tertiary students in New Zealand. However, while access to the Internet on laptops, iPad's and notebooks may be beneficial for many students, the presence of social networking sites such as Facebook may serve as a distraction from study.

Research examining the effects of Facebook on key developmental outcomes is scarce, largely because this social networking site has only been accessible to the public since 2004 (Bumgarner, 2007). Moreover, of the few studies that have explored the implications of Facebook use, most are limited to university students and to date there has been no New Zealand-based research. The primary aim of this thesis is to examine the effect of Facebook use on educational outcomes among New Zealand adolescents aged 16 – 17 and 18 - 21, particularly in relation high school and university grades. A further aim is to investigate the extent this relation may be mediated by an individual's level of self-discipline, parenting styles and socio-familial factors.

1.2 Thesis Outline

The delay of gratification framework provides a perspective for analysing how Facebook may effect academic achievement. Following the literature review, other factors influencing academic success (intellectual quotient (IQ) and socio-economic status) are then considered and hypotheses are developed. Chapter Two contains the methodology, research design, sample characteristics, and general data collection procedures. The specific research aims are detailed in Chapter Three together with the empirical components of this research. The interpretation of the empirical findings, limitations, strengths and theoretical relevance of the current research are discussed in Chapter Four.

1.3 Theoretical Framework - Delay of Gratification

Delay of gratification is the ability to control impulses in order to achieve a personal goal (Mischel, Ebbesen, & Zeiss, 1972; Mischel, Shoda, & Rodriguez, 1989). The delay of gratification paradigm, originally proposed by Mischel and his colleagues in the late 1960s, offers a useful tool for understanding the potential effects that Facebook use may have on students. In an academic setting, successful delay of gratification is when a student postpones opportunities that offer instant gratification or reward (e.g., going out to a party with friends or talking to friends on Facebook) in favour of pursuing a long-term academic goal (e.g., achieving an A+ grade for a subject) (Bembenutty, 1998). Delaying gratification, or in other words successfully employing self-control, has been shown to predict a range of positive academic and social outcomes later in life. For example, a 30 year longitudinal study by Schlam, Wilson, Shoda, Mischel and Ayduk (2012) found that four-year-olds who were able to delay gratification had significantly lower body mass index in adulthood than those who did not. Bembenutty (1998) found that university students ($N = 369$) who employed delay tendencies through cognitive strategies such as planning, comprehension monitoring, and regulating study time and effort found positive effects on expected and obtained academic

performance. Students who managed their time and study environment effectively were better positioned to resist temptations as students as delay tendencies were implemented (Bembenutty, 1998). The ability to delay instant gratification in pursuit of long-term goals increases the likelihood of successfully completing academic objectives throughout the year and achieving higher grades overall than students who are unable to engage in such self-control (Bembenutty, 1998; Mischel et al., 1989). A longitudinal study by Ayduk et al. (2000) of four-year-olds who participated in a delay of gratification paradigm found that 20 years later, children who were able to delay gratification were rated by their parents to cope better with frustration, stress and peer rejection than those who did not employ delay of gratification. The finding that the ability to delay gratification among students has a positive impact on academic and social outcomes has been replicated by studies in the USA, Oman, China, Australia and New Zealand (Ayduk et al., 2000; Denson, Capper, Oaten, Friese, & Schofield, 2011; Duckworth & Seligman, 2005; Moffitt et al., 2011; Schlam et al., 2012; Zhang, Karabenick, Maruno, & Lauermann, 2011).

Two distinct perspectives have emerged within the psychological field to help understand delay of gratification (Bembenutty, 1998). The first holds that delay of gratification may be conceived as an ability, skill or competence that can be *learned* through specific use of delay-relevant cognitive and/or motivational strategies. Parents are believed to play an important role in the development of these strategies as they can reinforce their child's behaviour accordingly. The second postulates that delay of gratification is an *instinctive* consequence of a person's innate personality and inherent impulsivity. These two seemingly opposing ideologies are brought together by Matcalfe and Mischel's (1999) "hot"/"cool" system analysis of delay of gratification. The hot system develops early and is involved in impulsive responses (Matcalfe & Mischel, 1999). It is emotion-focused based in the amygdala and biologically programmed to react to experiences such as threats, death or

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hunger (Matcalfe & Mischel, 1999). Moreover, stress heightens or accentuates this cognitive process. In contrast, the cool system develops later which is related to behaviours that are more complex, slow and reflective. It is based in the hippocampal and frontal cortex, and is primarily involved in self-control (Matcalfe & Mischel, 1999). This can be attenuated by stress and as a consequence becomes dysfunctional leaving the hot system to dominate processing (Table 2 below displays the characteristics of the hot and cool system). The development of the cool system with age is reflected by increasingly goal-centred and strategic behaviours (Matcalfe & Mischel, 1999). A study by Mischel and Mischel (as cited in Matcalfe & Mischel, 1999) imposed a delay of gratification paradigm to three to eight-year-old children. The researchers asked the children whether they would prefer their reward exposed or covered. Those under four showed no preference but by the age of five most children preferred to wait for the rewards hidden from view. In other words, children above this age were beginning to use cool mental operations as a means to delay gratification. They also used abstract ideation (i.e., thinking about marshmallows as clouds) and were able to provide a rationale for their decision. Furthermore, the group of children who hid the marshmallows from view reported that they understood that obscuring the desired rewards decreased frustration and stress while waiting. The findings suggests that in the course of development most children become increasingly aware of the strategies needed to sustain self-imposed delay of gratification in pursuit of desired but delayed contingent goal.

Table 2
Characteristics of the Two Systems

Hot System	Cool System
Emotional	Cognitive
"Go"	"Know"
Simple	Complex
Reflexive	Reflective
Fast	Slow
Develops early	Develops late
Accentuated by stress	Attenuated by stress
Stimulus control	Self-control

Note. Reprinted from Matcalfe and Mischel (1999).

Motivation. The ability to delay gratification is considered a controllable and malleable occurrence that is not always consciously experienced by students (Moffitt et al., 2011). It is important to consider cognition (such as planning, monitoring, self-regulation) and motivation as these factors are key determinants of academic goals being accomplished (Bembenutty, 1998; Cantor & Langston, 1989; Pressley & McCormick, 1995). Motivational factors that influence students to succumb or not to distractors are dependent on: a) the perceived value of the reward, b) the expectation that engaging in a studious activity will be successful, and c) the level of interest that the student has in being successful (Bembenutty, 1998; Mischel, 1996). Motivational research postulates that the choice to delay gratification occurs after evaluating the incentives, benefits or rewards of the current task and available options surrounding the person (Bembenutty, 1998; Hofer et al., 2007). For example, a student who postpones immediately gratifying opportunities to pursue a long-term academic goal has successfully evaluated a sequence of factors. The student in this case is likely to have delayed gratification over procrastination or distracting themselves from study because the student: a) understands that persisting in the academic task will provide more time to spend with friends when he/she completes it, b) believes that he/she can successfully complete the academic task, and c) is interested in the activity they are engaging in.

Intrinsic and Extrinsic. Intrinsic motivation refers to the act of partaking in an activity because of inherent pleasure and satisfaction derived from participation (Ryan & Deci, 2000). Intrinsically well-motivated students often willingly complete a subject or assignment because of the challenge entailed rather than external prods, pressures or rewards (Ryan & Deci, 2000). Intrinsic motivation has been strongly related to use of cognitive strategies and self-regulation in the class-room setting. A study by Pintrich and de Groot (1990) found that high school students who valued and were interested in a subject, and thus motivated to learn class material, were more cognitively engaged in trying to learn and

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comprehend the material. Intrinsically motivated students were more able to self-regulate and apply cognitive strategies such as planning, monitoring, elaboration and organisational strategies whilst studying. These factors were found to foster active cognitive engagement in learning resulting in higher academic achievement. Pintrich and de Groot (1990) suggested that it is important for parents and teachers to promote and socialise students to be intrinsically rewarded within the classroom setting. Intrinsic motivation can be enhanced by increasing a student's sense of competence through positive performance feedback and a sense of autonomy (Deci, Koestner, & Ryan, 1999; Deci, 1971; Ryan & Deci, 2000). The natural tendency to be interested and curious is a crucial element for cognitive, social and physical development as acting on one's interests effectively increases knowledge and skills (Ryan & Deci, 2000).

On the other hand, extrinsic motivation pertains to a wide variety of behaviours which are engaged as a means to an end and not because of pleasure or satisfaction (Ryan & Deci, 2000). Students who are extrinsically motivated often complete tasks with resentment, resistance and disinterest as behaviour is being regulated externally (Ryan & Deci, 2000). A student may state: "I studied for my exam last night because my parents gave me money". In this case, the behaviour of studying is regulated by an external reward specified by the parent. A meta-analysis of 128 studies by Deci, Koesner and Ryan (1999) found that expected tangible rewards made contingent on task performance undermined intrinsic motivation. Interestingly, tangible rewards were more detrimental for pre-school, primary and high school students than university students. Furthermore, only university students were responsive to positive feedback than high students. The findings suggest that university students may be more intrinsically motivated which may be due to personally choosing to attend tertiary education. University students are also self-reliant because they are often away from home (Deci et al., 1999). In comparison to pre-school, primary and high school

students, university students typically do not require consistent encouragement and reminders to complete a task.

Distractibility and Procrastination. Students who are unable to successfully resist temptations distract themselves are more likely to procrastinate (Bembenutty & Karabenick, 2004; van Eerde, 2003). Several studies have linked procrastination and distractibility behaviours with greater difficulty concentrating on assignments, performing poorly overall on academic tasks and withdrawing from a course (Levine, Waite, & Bowman, 2007; Semb, Glick, & Spencer, 1979; Wesley, 1994). Previous research have also found that university students who scored high on procrastination measures reported difficulty concentrating when eventually performing the academic task, obtaining poorer course grades and lower self-esteem (Dewitte & Lens, 2000; Harriott, Ferrari, & Dovidio, 1996; van Eerde, 2003). Students who procrastinate and distract themselves from academic work are more likely to experience subjective discomfort about their academic performance, higher stress and more illnesses towards the end of the semester (Kuhnle, Hofer, & Kilian, 2011). The negative relationship between procrastination, distractibility and academic achievement has been replicated in studies based in Germany, Korea, Nigeria, Canada and Singapore (Akinsola, Tella, & Tella, 2007; Klassen et al., 2009; Kuhnle et al., 2011; Seo, 2012). An exploratory study conducted by Briody (1980) found that 257 university students who engaged in procrastination often described themselves as bad, harmful and foolish when engaging in these behaviours. Despite this, procrastination and distractibility are on-going problems for many students within schools and universities.

Self-discipline. Students who postpone or completely avoid study by distracting themselves with an alternative activity score lower on self-discipline measures (Watson, 2001). Self-discipline is closely related to self-control and delay of gratification (Duckworth & Seligman, 2005). The latter factors have been found to positively influence academic

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outcomes and are all related to overriding an incipient pattern of task irrelevant responses, supressing unwanted thoughts, regulating emotions, regulating impulses (i.e., resisting temptations such as Facebook) and persistence (Baumeister, 2002; Duckworth, Tsukayama, & May, 2011).

Two studies demonstrate the positive impact of self-discipline on a wide range of consequential life outcomes. Both studies emphasised the importance of having and being taught self-discipline. The first study by Duckworth and Selignman (2005) conducted a longitudinal study on 140 eighth-grade students (12 to 13 years old) from a US public school. They quantified self-discipline using a multi-method approach including self-report ratings, school attendance, parent and teacher reports and a questionnaire on study habits. The authors also used the Delay-Discounting Rate Monetary Choice questionnaire, standardised achievement test scores and selection into a competitive high school program to determine the impact of self-discipline on academic outcomes. Self-discipline accounted for more than twice as much variance as IQ in final grades, high school selection, school attendance and hours spent on homework (Duckworth & Seligman, 2005). Even after controlling for first semester grade point average (GPA), achievement scores and IQ, the effect of self-discipline on final grades persisted. The authors suggest that self-discipline is the key reason why students fall short of their intellectual potential.

The second study was a large representative sample of New Zealanders conducted by Moffitt et al. (2011). Similar to Duckworth and Seligman (2005), self-discipline was obtained using a multiple-informant approach. Self-report ratings and interviews from observers, parents and teachers were used. Moffitt et al. (2011) found that self-discipline, during the first decade of life, predicts a wide range of life outcomes such as income, savings behaviour, financial security, occupational prestige and mental health. Self-discipline's beneficial effect was partially mediated by decision making during the adolescent years. Because a full

mediation analysis was not presented, the results indicate that self-discipline was not the sole predictor of life outcomes. The partial mediation and the non-experimental nature of Duckworth and Seligman's (2005) and Moffitt et al.'s (2011) studies suggest that other factors are relevant. These possibilities include an interpersonal relationship with a parent/caregiver. A child's choice to either put off instantly gratifying activities in favour of a long-term goal or to procrastinate is often influenced by the environment he/she is exposed to. Self-control is often invoked or supported by parents/caregivers through interactions with the child. A typical delay of gratification paradigm emphasises solely the child's ability to wait for a period of time to receive a reward. It often does not take into account the influence of parents/caregivers while their children complete the delay of gratification task and provides little information regarding how parents/caregivers shape their children's behaviour.

Training Programmes. Although impulse control is first established in childhood, it is also required in adolescents and adulthood for socially appropriate relationships, occupational stability and success (Arnett, 1995). Most research has shown that the capacity for self-discipline continues to be strengthened well beyond childhood (Strayhorn, 2002; Tangney, Baumeister, & Boone, 2004). Furthermore, students who benefit the most from these school-based interventions are those who are initially poor at self-regulatory skills (Diamond & Lee, 2011). Learning to cultivate the trait of self-discipline is therefore one of the most important life skills that a child/adolescent or adult can learn. If students take time to master this skill by employing delay tendencies such as planning, comprehension monitoring, and self-regulation and considering motivational drive, they are likely to observe positive educational outcomes. The Money Savvy Generation (Beacham, 2013), a foundation which helps youths *and* their parents to enhance skills in general financing and delaying gratification, highlights the potential for delay of gratification training programmes to emerge. The programme revolves around a piggy bank and gives youth four options of

expenditure – spend, save, invest or donate. The idea is to provide the child the necessary forethought needed to weigh the rewards and consequences before a child spends money.

Although empirical research examining the benefits of self-regulatory programmes with youth and their parents has not been conducted, there is an insurmountable amount of evidence within the socialisation and delay of gratification literature suggesting that children and adults may benefit from school-based self-discipline interventions (Lakes & Hoyt, 2004; Osher, Bear, Sprague, & Doyle, 2010; Riggs, Greenberg, Kusché, & Pentz, 2006; Strayhorn, 2002). For example, Abd-el-fattah and Al-nabhani (2012) revealed that high school students ($N = 193$) who had incremental beliefs that intelligence is *malleable* were more likely to consider factors that the student had control over during the completion of a challenging task than students who believed that intelligence is fixed and unchangeable (entity beliefs). In other words, high school students who believed they had control over their academic ability facilitated their ability to resist distractors or temptations, than those who think their ability is uncontrollable. Abd-el-fattah and Al-nabhani (2012) also found that the exertion of persistence, effort or emotional management were more likely to be those with incremental beliefs (Abd-el-fattah & Al-nabhani, 2012). Although Abd-el-fattah and Al-nabhani (2012) research was conducted in Egypt and may not be generalisable to the New Zealand population, the study provides a rationale for challenging students who believe that their intelligence is fixed and informing them about the positive impact of delay gratification strategies on academic outcomes.

Two studies will be outlined to show the potential for self-regulatory programmes to positively impact on academic outcomes of students. Rigg et al. (2006) implemented a programme that increased self-regulation of 329 students aged 7 to 11 years. The Promoting Alternative Thinking Strategies (PATHS) programme teaches primary school students competencies in self-control, recognising and managing emotions and interpersonal problem-

solving. Children often react to emotions before they can verbalise them and act impulsively. The PATHS training allowed children to verbalise their feelings and practice conscious self-control strategies (e.g., waiting before being reactive towards a situation and self-talk) which could be generalised to other contexts during school life (e.g., being frustrated with homework). Training was delivered via teachers who attended a 3-day training work shop. The staff involved also had continuous access to project staff. The PATHS programme occurred three times a week for 20 – 30 minutes per session and students attended a mean total number of 53 sessions. The programme was successful at reducing teacher reports of externalising behaviours.

The second study is a large scale meta-analysis conducted by Durlak, Weissberg, Dymnicki, Taylor and Schellinger (2011) who found that students who were exposed to a school-based social and emotional programme had significant improvements on social and emotional skills, attitudes, performance and academic achievement compared to controls. The findings were based on 213 school-based programmes delivered by teachers on 270,034 kindergarten and high school students aged 5 to 18. The psychosocial interventions taught children a number of skills which included emotional recognition, stress-management, problem-solving and decision making. The two studies described above highlight the potential for self-regulatory programmes to impact on a student's ability to delay gratification, social behaviours in class and test scores/grades.

Parenting Style and Socialisation. Parenting style will be examined within this study as it is deemed to be an important aspect of self-discipline which is not typically observed in delay of gratification research (Dlugokinski, 1994). Baumrind (1991; 1971) and Maccoby and Martin (1983) postulated that parenting style consists of two main dimensions (see *Figure 1*, page 15). Demandingness refers to the extent to which parents/caregivers exert

control, maturity demands and supervision in their parenting and responsiveness refers to the extent to which parents/caregivers show affective warmth, acceptance and involvement.

Baumrind (1971) conceptualised three main parenting styles that are conducive to a child's socialisation. These parenting styles were the authoritative parenting style which is characterised by high acceptance and involvement, adaptive control techniques; the authoritarian parenting style characterised by low acceptance and involvement, and high in coercive control; and the permissive parenting style characterised by being high in warmth and acceptance but low in involvement (Diana Baumrind, 1971; Lamborn, Mounts, Steinberg, & Dornbusch, 1991). Further research on parenting styles included an additional fourth parenting style termed neglectful characterised by neither being responsive to their children's needs nor being demanding (Baumrind, 1991). Parents who use a neglectful parenting style often do not support their child's self-regulation and also fail to monitor or supervise their child (Aunola, Stattin, & Nurmi, 2000b). In addition to the non-controlling attitude, there is overall un-involvement from parents where, in its extreme form, children are forced to fend for themselves (Baumrind, 1991). Both Baumrind (1983) and Maccoby and Martin (1983) acknowledged that parenting styles reflect two specific underlying processes that influence the socialisation of children: a) the amount and type of demands made; and b) the contingency of parental reinforcement. For example, parental demandingness can be regarded as the expectations placed on the child as a means to positively integrate children into society and the family system. Parental responsiveness, on the other hand, can be viewed as a means to shape children's behaviour through responding differentially to desired and undesired behaviour. Parental responsiveness also refers to the parent's recognition of individuality and maintaining the child's integrity. Baumrind (1991; 1971) discussed that parental demandingness and responsiveness reflect the balance of demands by society (as directed through the parent) and the individual.

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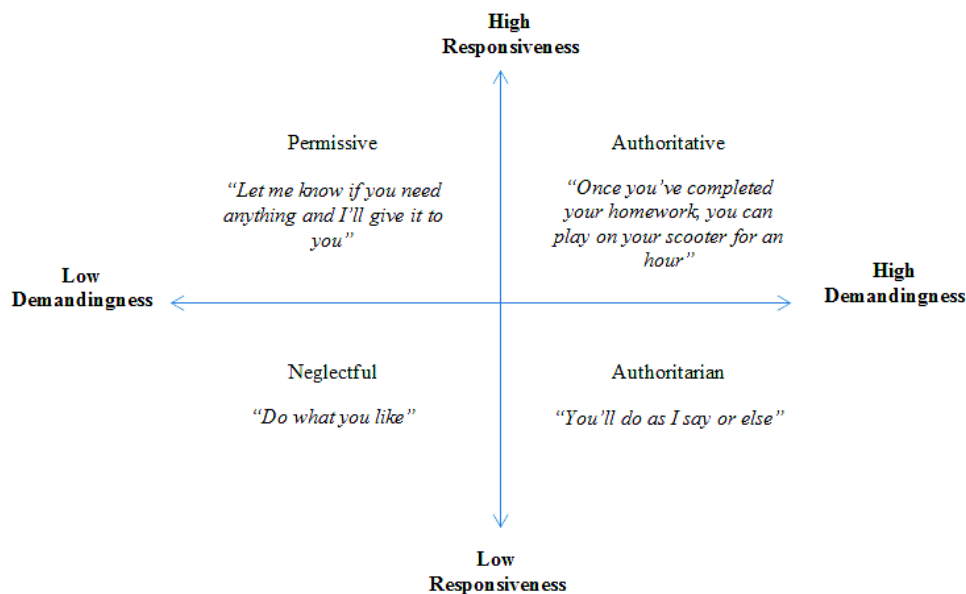
Figure 1. Conceptualisation of parenting styles based on Baumrind (1991) and Maccoby and Martin's (1983) two dimensions: demandingness and responsiveness.

Baumrind's (1971) typology of authoritative, authoritarian and permissive parenting styles will be specifically examined in this thesis and Robinson et al.'s (1995) questionnaire was employed to do this. These three parenting styles have differing effects on academic achievement, overall psycho-social well-being, and social development which are discussed in further detail below. It is important to note that Robinson et al.'s (1995) questionnaire does not include the neglectful parenting style and therefore this typology was not examined in this thesis.

Authoritative. Several studies have shown that adolescents who were raised in authoritative homes perform better than their peers raised in permissive or authoritarian homes on a wide variety of measures of academic achievement, competence, social development and mental health (Cohen & Rice, 1997; Radziszewska, Richardson, Dent, & Flay, 1996; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). This finding has been replicated across different conceptualisation and operationalisation of the authoritative style (Hill & Tyson, 2009; Steinberg, Lamborn, Dornbusch, & Darling, 1992). Authoritative parenting also has psycho-social benefits for children such optimism, better self-control,

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more willing to help, greater task persistence, high self-esteem, responsiveness to parents' views and moral maturity (Amato & Fowler, 2002; Arnold, Pratt, & Hicks, 2004; Aunola et al., 2000b; Gonzalez & Wolters, 2006). Lastly, authoritative parenting style has also been positively related to academic adjustment in university students aged 17 to 19-years-old (Hickman, Bartholomae, & McKenry, 2000). The research clearly shows that authoritative parenting fosters the most successful life outcomes.

Parenting attributes that facilitate positive outcomes include a bi-directional communication with the parent and child (which allows boundaries to be discussed openly), emotional support, high standards and allowing the child autonomy within those boundaries (Darling & Steinberg, 1993; Gonzalez & Wolters, 2006). Children from authoritative homes have been described to be socialised, well-behaved, emotionally stable and friendly (Darling & Steinberg, 1993) which is deemed to be not due to external consequences or rewards (Grusec & Goodnow, 1994). Instead, it likely to be due to the child internalising the beliefs and values held by their parents (Darling & Steinberg, 1993).

Authoritarian. By contrast, research on authoritarian parents ($N = 382$) from Australian, American, and Chinese cultures has found that children exposed to this parenting style typically do not perform as well academically as children with authoritative parents (Leung, Lau, & Lam, 1998). This is because authoritarian parents frequently demoralise their children by mocking and criticizing them (Leung et al., 1998). To exert control, authoritarian parents typically shout at, command, and disparage their children (Leung et al., 1998). Authoritarian parents typically discipline their child after misbehaving by making them feel rejected and act hostile towards them.

Authoritarian parenting has also been found to negatively impact on a child's overall well-being. Children have been found to be overly anxious, unhappy, have lower self-esteem

and less self-reliant (Ferrari & Olivette, 1993; Shucksmith, Hendry, & Glendinning, 1995). The main difference between authoritative and authoritarian parenting is the dimension of psychological control. Both parenting styles expect their child to behave appropriately and obey parental rules. Authoritarian parents, however, also place high demands for the child to accept their parents judgements, decisions, values and beliefs without questioning or explanation (Baumrind, 1991). It is likely that the values and beliefs held by parents are *not* internalised by their children because authoritarian parents typically are not open to give and take with their children and make less use of explanations (Abar, Carter, & Winsler, 2009).

Permissive. Parents who use a permissive style encourage autonomy but provide minimal direction and consequences when their children misbehave (Baumrind, 1991). Permissive parents do not require their children to behave maturely and avoid confrontation. Parents typically take the status of a friend more than a parent. The values and beliefs of the parents are often not internalised as socially acceptable behaviours are often dependent on external consequences such as being rewarded with money and receiving attention for completing something (Grusec & Goodnow, 1994; Locke & Prinz, 2002). Children who are raised with a permissive parenting style have poorer behavioural and cognitive outcomes. They are often impulsive, disobedient, and rebellious, and perform poorer academically than authoritative and authoritarian parents (McBride-Chang & Chang, 1998). A study conducted by Abar, Carter and Winsler (2009) found that maternal permissiveness was negatively associated with study skills and academic self-regulation. More specifically, university students with permissive parenting were less likely to structure their environment for study (e.g., go to the library to quietly study) and have lower GPAs (Abar et al., 2009). Research has also found a gender difference, where the negative link between permissive parenting style and academic outcomes is stronger for boys than girls (Barber & Olsen, 2004; Baumrind, 1971; Lamborn et al., 1991).

Process of influence. The term socialisation describes the process of children learning how to suppress immediately gratifying impulses to do the best for themselves and society (Arnett, 1995; Arnold et al., 2004). The main goal of socialisation is to foster norms, values, beliefs and behaviours for impulse control (Arnett, 1995). Bandura's (1977) social cognitive theory provides a rich explanation of the processes behind socialisation. He suggested that parental reinforcement, modelling, observation and social interaction are essential to develop self-regulatory capabilities.

Several schools of thought attempt to explain the process by which parenting style influences children's development. A contextual model offered by Darling and Steinberg (1993) identified three parenting characteristics of parents that determine the processes through which the child is influenced developmentally (see *Figure 2* on page 19). These parenting attributes include the values and goals the parents hold when socialising their children; parenting practices or *goal-directed* behaviours through which parents directly help their children attain goals; and the employed parenting style in which the parent's behaviours are expressed. The reinforcement and modelling of socially accepted behaviours is deemed to be part of the parenting practices mechanism. For example, two parents who value education and attaining a university degree socialise their children through goal-directed tasks such as homework and supervision (parenting practices). The two parents may differ in terms of their style: one parent may use clear boundaries, warmth, high standards and emotional support to convey the importance of education whereas the other may use control, punitive punishments and demandingness as a means to communicate (authoritative vs. authoritarian parenting style).
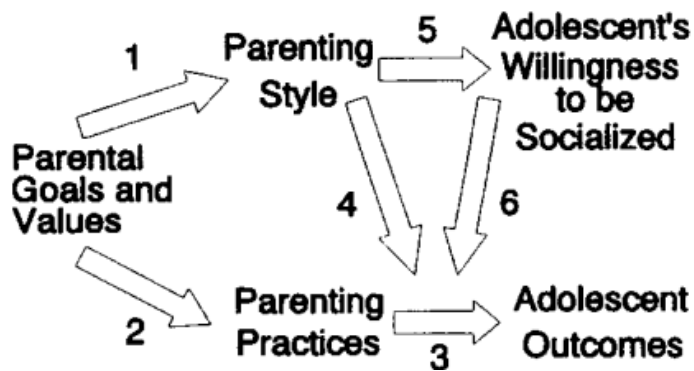
Figure 2. A contextual model of parenting style retrieved from Darling and Steinberg (1993).

Darling and Steinberger (1993) explain that parenting style and practices result from the goals and values parents hold (*Figure 2*, arrow 1 and 2). Parenting practices are deemed to directly influence an adolescent's social, emotional and academic outcomes (*Figure 2,* arrow 3). Parenting style is proposed to *moderate* or enhance the influence of parenting practices on adolescent's development by changing the nature of their environment (*Figure 2,* arrow 4) and influencing an adolescent's personality, especially their openness to parental influence (*Figure 2*, arrow 5). In contrast to previous theorising, the effect of parenting style is proposed to be *indirect*. Parenting style is deemed to be a contextual variable that alters parent's capacity to positively socialise their children. Furthermore, parenting style is proposed to enhance the effectiveness of specific parenting practices. Adolescent's openness or willingness to be socialised also moderates the relationship between parenting practices and adolescent outcomes (*Figure 2*, arrow 6).

Collectively, research on parenting style shows that children are influenced by expectations around them (particularly parents/caregivers) and internalise norms, values and beliefs to develop their conscience (Arnett, 1995). Children raised in an authoritative style of parenting score higher on measures of competence, academic achievement, social development and self-esteem than those born into authoritarian and permissive families

(Maccoby & Martin, 1983). The research clearly shows that a home that facilitates independence and provides warmth has an astonishing impact on educational outcomes.

Conceptual Framework. Research on delay of gratification highlights the importance of pursuing goals and self-discipline within the academic setting. If delaying gratification is a skill that can be enhanced and learned, then strategies should be taught in schools to increase skills that have been associated with positive academic achievement. This is of importance as distractors such as Internet capable devices are readily available for students to use during class time.

Accordingly, this study aims to examine the impact of Facebook use, self-discipline and parenting styles on academic achievement. The cohorts examined are high school and university students aged 16 to 17 and 18 to 21, respectively. In light of the delay of gratification theory, a conceptual framework was developed to provide a model that can be used for students to increase their awareness of their ability to delay immediately gratifying activities in pursuit of positive academic results (see *Figure 3*, page 21). The conceptual framework forms the foundation of this current research on Facebook use and academic achievement. Within *Figure 3* below, delaying gratification, motivational factors and self-discipline were identified to be the main contributors to academic achievement. Parents were also recognised to be an important contributor to a student's choice of either employing self-discipline. It is important to note that a student who chooses to procrastinate or distract themselves from study may not necessary have negative outcomes. They may realign their behaviour to new long-term goals that are perceived to be pragmatic, valuable and interesting. A parent/caregiver, classmate or friend may aid and influence this process or realisation.
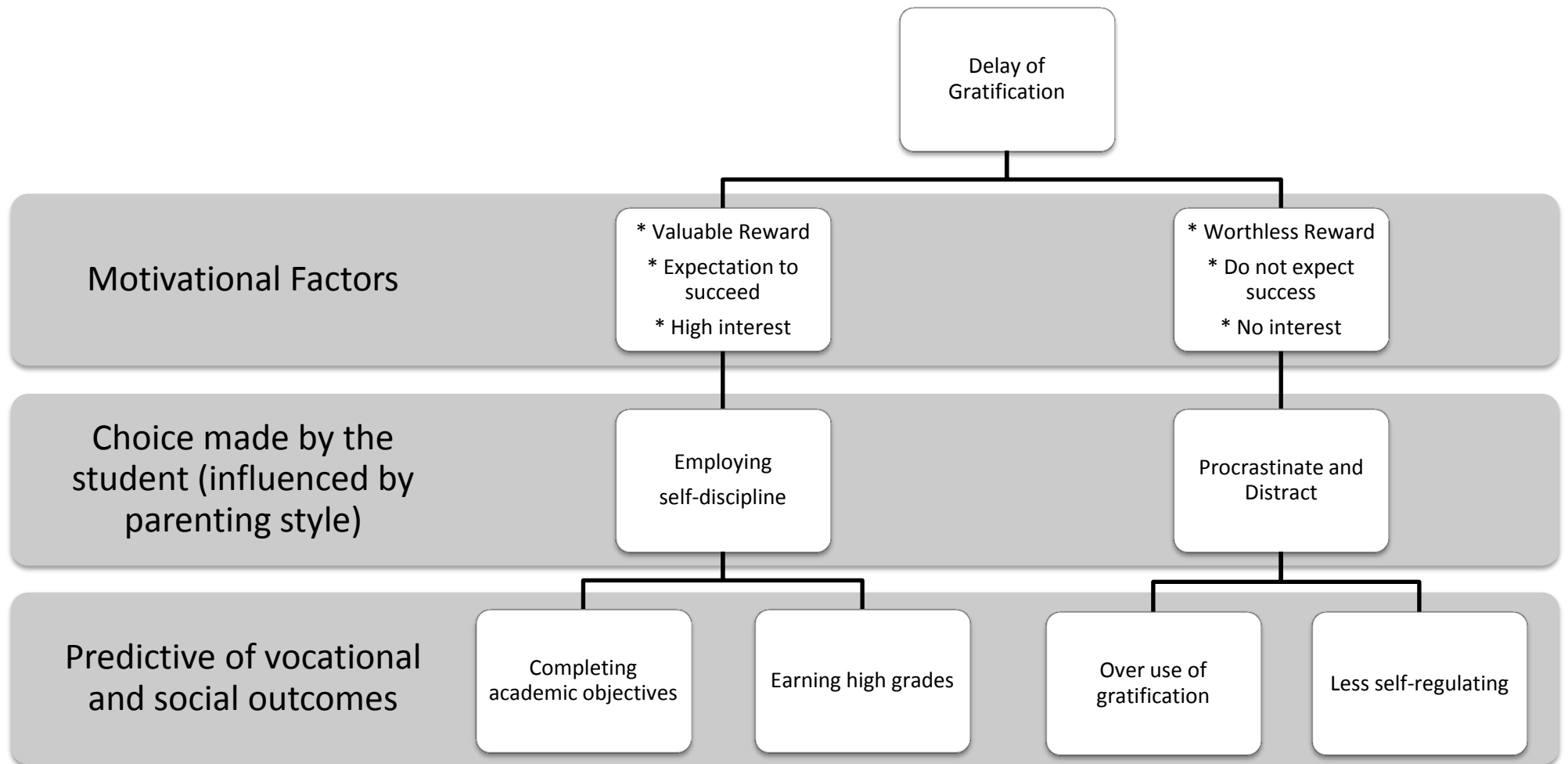
Figure 3. Conceptual framework based on the delay of gratification theory highlighting its interrelationships with self-discipline (high delay of gratification) and procrastination (low delay of gratification).

1.4 Potential Impact of Social Networking Sites on Academic Achievement

Although many scholars have identified today's generation as "technologically driven" (Junco & Cotten, 2011), few studies have specifically considered social networking sites as affecting academic outcomes. Therefore, studies examined within this review extend to those investigating technology use which may include, but is not limited to, the Internet, instant messaging, consulting Wikipedia, playing online games, maintaining and regularly updating personal blogs, checking Facebook and downloading music (Junco & Cotten, 2011). To date, studies regarding the effects of this technology usage on academic achievement (Junco & Cotten, 2011) are conflicting, though recent media reports suggest negative impacts on youth (Choney, 2010; Hamilton, 2009). Studies relating to the technology use and academic achievement are difficult to interpret and are often inconclusive due to their correlational nature, lack of control for potential confounders and differences in definitions of technology use. Furthermore, a limited number of studies examine the impact of technology usage as a pleasure pursuit (i.e., not for educational purposes) and most of these are focused on undergraduate university students (Hu & Kuh, 2001; Jones & Madden, 2002; Kirschner & Karpinski, 2010). However, there appears to be a general consensus in these studies that technology use *can* have a negative effect on students in terms of academic achievement if it is used as a tool for distraction and procrastination.

To demonstrate the above points, studies with incongruent findings about the effects of technology use are discussed in the review below. Table 3 (page 24) provides a methodological summary of all the studies selected in this review including author, country of origin, sample characteristics, key findings, strengths and limitations. Six studies were included and only one study examined high school students. The majority of the studies were also conducted via a survey in the US and very few studied academic achievement in terms of

grade point average (GPA) and Facebook usage directly. The inclusion criteria for the literature review can be seen in Appendix A (page 111).

Pasek, More and Hargittai (2009) found that Facebook use has no effect on academic grades. Three groups were compared: one with a large sample ($n = 1,060$) of undergraduate students, another with a nationally representative cross-sectional sample ($n = 1,250$) of US 14 to 22-year-olds, and the third a longitudinal panel of US youth aged 14 to 23. Facebook use and GPA were examined through students self-report on surveys or by telephone. The authors found no robust relationship between Facebook use and grades in any of the samples. This was contrary to Kirschner and Karpinski's (2010) findings, which received extensive media coverage, that informed the public that being a member of Facebook resulted in lower GPA scores ($M = 3.06$) than non-Facebook members ($M = 3.82$). Kirschner and Karpinski's (2010) also found that students who use Facebook spent less time studying (one to five hours per week) than the non-Facebook users (11 to 15 hours per week). Interestingly, the majority of the Facebook users in the sample (73.8%) reported that Facebook use had no negative impact on academic achievement which indicates that students may not be fully aware of the adverse impact of social networking sites. Kirschner and Karpinski (2010) implied that the difference between the grades may be due to students employing distinctively different study strategies to each other. For example, non-Facebook users may have used the Internet for the sole purpose of education or as a reward for a specified amount time of completing work. Facebook users on the other hand may use the Internet to procrastinate and distract themselves from academic assignments.

Table 3

Literature Review: Studies examining the impact of technology use on academic achievement

Author	Study Design/ Measures	Sample	Findings	Strengths	Limitations
Heiberger & Harper (2008) UNITED STATES	Cross-sectional Survey Self-report	377 undergraduate students from a public Midwestern university. The authors aimed to reaffirm their results from the Higher Education Institute (HERI, 2007) study which had a large sample (N = 31,500).	* The majority of high Facebook users (92.2%) rated connections with their friends and the university as high or very high in comparison to 73% of low Facebook users. * Make a connection between the use of social networking sites and student engagement. * Conclusion: students who spend *more time* on Facebook are *not* spending more or less time studying but instead spending more time socialising with the university community than low Facebook users.	+ Engagement is well defined: 1) perceived connectivity of the university students attend, 2) participation in student organisations, and 3) interaction with friends. + Although the operational definition of the comparison study was different (e.g., high Facebook use defined as > than 1 hour a day vs. > than 6 hours a day), the same trend was found.	- Low Facebook use was operationalised as < than 1 hour a day. Furthermore, high Facebook users was defined as > than 1 hour a day. The range within these two groups is extremely large. - While engagement has been shown to relate to academic success, the academic grades of the students were not obtained. - Demographic characteristics of the sample could not be accessed.
Hu and Kuh (2001) UNITED STATES	Cross-sectional College student experience questionnaire (CSEQ) Self-report	18,844 students from 74 universities who completed it from 1998 – 1999	* Students with readily available information technology (i.e., "wired" institutions) reported more engaged, active learning and cooperation than students who attended less "wired" institutions. Students at more "wired" schools reported more contact with teachers and peers whom supported their learning process. * No gender differences.	+ Sample Size + Diverse number of universities + Survey has good psychometric properties (e.g., α = .78 and has been shown to correlate with relevant achievement scores – although not specifically outlined).	- The "wired institutions" were determined by the Yahoo Internet life survey. A more precise evaluation of campus "wired-ness" could have yielded different results. - Women, "traditional students" (straight from high school to university), first year students, and students from a private university were over-represented.
Jones & Madden (2002) UNITED STATES	Cross-sectional CSEQ Self-report	Distributed paper surveys to 2,054 university students from 27 schools between March 2002 and June 2002.	* 20% of students began using the Internet very young (aged 5 to 8) * 79% of the sample reported that the Internet has enhanced their academic and social life * 72% reported that they most use the Internet to communicate with friends. * 46 % stated that e-mail enabled them to express their ideas to lecturers. * 73% of the students use the Internet more than the library for studying. * Concluded that the Internet is heavily used by university students, has enhanced education and increased social life satisfaction.	+ Sample Size + Representative population + Anonymous + Psychometric properties of the survey are good + Ethnographic data was collected examining where university students use the Internet	- Response rate was not recorded - Academic grades not specifically examined - Examines Internet use but not Facebook use - Descriptive and cannot imply causation.

Author	Study Design/ Measures	Sample	Findings	Strengths	Limitations
Pasek, More & Hargittai (2009) UNITED STATES	Cross-sectional Longitudinal Study 1: Survey Study 2 & 3: Telephone	Study 1: 1,060 undergraduate students at University of Illinois Study 2: 1,250 14 to 22-year- old recruited through random digit dialling Study 3: Examined the GPA change of the sample from study 2	* Study 1: no significant relationship between the Facebook use and GPA ($r = .010$, $p = .746$). Study 2: the relationship between Facebook use and GPA exist in a positive direction, when the controls such as gender, race, and SES are absent ($r = .122$, $p < .01$). Study 3: When controls are absent, Facebook use was negatively related to changes in grades from 2007 to 2008 ($r = - .148$, $p < .01$). * For study 1 and 3 the results remained significant even after controlling for age, gender and ethnicity. Though for study 2, the significant relationship represented only a $1/5^{th}$ of a letter grade between high and low users. * Conclusion: no robust relationship between technology use and grades in any of the samples. This is based on mixed conclusions of the data set.	+ Response rate was 82% for study 1 + Measured GPA and Facebook use through frequency	- Study 1: provided only to undergraduate students in a mandatory writing class. - Selective attrition (45% - 50% response rate for study 2 and 3) - Dropped students who could not provide GPA results (i.e., students who are home schooled). - Details about how the authors kept the participants anonymous were not provided.
Kirschner and Karpinski (2010) UNITED STATES	Self-report Survey	102 undergraduate and 117 graduate students from a Midwestern university	* Facebook users reported lower GPA and spent fewer hours per week studying than non-users * 73.8% of students expressed that being a Facebook user does *not* significantly impact their academic performance, with 26.3% acknowledging it has a negative effect. * The total time spent on the Internet *did not* differ between Facebook and non-Facebook users. Suggested that this may be due to a difference in study strategies between students. * Undergraduate and graduate students significantly differed in their mean GPA score, with the first scoring less than the latter.	+ Examined academic achievement through GPA and amount of time spent studying	- Did not measure specifically time and length spent on Facebook. - Relatively small sample and the majority (60.3%) were female. - Descriptive and cannot imply causation - Survey took 20 – 25 minutes to complete (long). - Asked to recount how often they studied during the week. Students may have provided inaccurate data.
Wainer et al. (2008) BRAZIL	Three question survey about grades obtained by students and their relationship with computer and Internet use Provided the children the National Assessment of Basic Education which measures maths and reading (also known as the SAEB in Brazil).	Assessed 4th, 8th and 11th grade 126,609 students aged 10, 14, and 17.	* Decrease in test performance associated with an increase of computer use which is more significant in younger and poorer students. * For example, 4th grade students in the poorest socioeconomic group who used computers and Internet excessively had a 15% reduction in test scores in comparison to those with lower use. * Computer ownership seemed to be correlated to a small increase in test scores for older students (11th grade).	+ Large sample size + Different grade levels examined	- Excluded schools from private schools - Their measure of academic achievement was limited (maths and reading) - Did not specify what the students mainly used the Internet/computer for. - Correlational

Other studies have demonstrated positive benefits of technology use as it increases communication with faculty staff. Hu and Kuh (2001) found that undergraduate university students who attended more "wired" institutions, or in other words a university with readily available information technology, were more likely to report active learning and cooperation than students who attended less wired institutions. Students in the sample primarily used the Internet to communicate with classmates and faculty staff to aid their learning by finding relevant material and assistance with coursework (Hu & Kuh, 2001).

Jones and Madden (2002) and Heiberger and Harper (2008) support the finding that Facebook can have a positive effect on academic support and engagement. More specifically, Jones and Madden (2002) surveyed a large group of university students ($N = 2,054$) and found that 79% of the sample reported that the Internet had a *positive* impact on their academic and social life. Similar to the students within Hu and Kuh's (2001) sample, the students used the Internet primarily as a communication tool with their professors to discuss ideas that they were unable to express in class. Heiberger and Harper (2008) revealed that the high levels of Facebook use were positively related to student engagement (a predictor of academic success). This connection was made partly due to a higher percentage of high Facebook users (92.2%) reporting that their connections with friends and the university were high or very high in comparison to low Facebook users (73%). The authors conclude that students who spend more time on Facebook are not necessarily spending more or less time studying but instead are spending more time socialising with the university student community than low Facebook users.

The three studies suggest that the use of technology for university students may have a positive impact on educational outcomes. The Internet may promote an environment that nurtures and supports intellectual development through frequent contact about course work

between classmates and faculty staff. It seems that when the Internet is used appropriately, it has the possibility to engage students in the learning process.

Conversely, there is a lack of agreement about the extent to which technology use has positive effects on academic achievement. Other studies have suggested that the Internet can have a negative impact on a student's academic progress. A large study ($n = 126{,}609$) of Brazilian students aged 10, 14 and 17 found a significant reduction in maths and reading grades for students who used computers and the Internet frequently (Wainer et al., 2008). This effect was particularly pronounced among younger and poorer students (Wainer et al., 2008). Although the study was limited to Brazil, it suggests that providing computers with Internet access to lower decile schools and younger students could negatively impact educational outcomes. While the primary reason for Internet usage was not investigated, the authors interpret their findings as students spending more time on the Internet procrastinating and distracting themselves and therefore having less time for homework or study.

Research Issues. The studies within this review are inconclusive. A comprehensive interpretation is difficult due to the correlational design employed by studies, and the general lack of control for potential confounding variables and differences in the definition of technology use (particularly studies investigating Facebook). More critically, few studies have measured academic achievement in relation to grades. It also seems necessary to analyse the purpose of an individual's Facebook use. Although Facebook and social networking sites may be categorised as a leisure activity, this may not always be the case. If students employ study strategies, the Internet may help to create an environment that facilitates fruitful academic outcomes and not necessarily increase the likelihood of putting assignments off. However, detrimental consequences can occur if Facebook is used by students as a tool to procrastinate and a distractor from study. Although this latter idea has not been explored, delay of gratification research suggests that self-discipline is an important factor to consider

when examining Facebook use. New technologies are often created and used at such a quick pace that it is difficult to capture the effects of these rapid changes; however, Facebook use has endured. Now is a good time to study its effects on academic outcomes.

1.5 The Potential Impact of Facebook on Academic Achievement

  Productivity Consumption. It is widely recognised that Facebook has become an integral part of the daily lives of many students (Junco, 2011). As mentioned earlier, a New Zealand telephone survey revealed that 87% of 1225 participants under the age of 30 belong to a social networking site (typically Facebook). A recent study conducted by Kross (2013) revealed that Facebook use decreased subjective well-being in young adults. Nevertheless, it appears that some students communicate with each other using social media sites as much as, if not more, than face-to-face communication (Kraut, Kiesler, Cummings, & Helgeson, 2001; Kujath, 2011).

  Because of the nature of these technologies, users are often connected 24/7 through phone applications which have easy access to wireless Internet. Facebook use is primarily motivated by immediate social gratification. Facebook use satisfies the need to maintain social bonds which could supersede the aspiration or goal for students to academically perform to the best of their capabilities (Lenhart & Madden, 2007). An Oxford neuroscientist, Susan Greenfield, voiced her concerns to the media that social networking sites like Facebook may infantilise the brain by shortening students' attention span and providing instant gratification (Bloomfield, 2009). While no empirical studies have been done to explore the above claims, Facebook could possibly be the most common distraction and/or procrastination tool available to students and adults to date. Evidence for this comes from the large number of companies and educational institutions that block Facebook access on their premises. For example, a newspaper article highlighted the importance of parents or authority figures at work being able to control Facebook use (Pearson, 2012). John Hyde, the developer

of the application, stated that the blocker is useful for students and adults who lacked the self-discipline to stay off Facebook (Pearson, 2012). He suggested that Facebook should be used as a reward after completing school or office work. John Hyde's idea to create an application to control Facebook use is not a new concept. Computer software that monitors Facebook use and other web "surfing" habits is increasingly becoming a profitable industry. Policies within the workplace and educational establishments that constitute permissible and unacceptable Internet use have also been developed to acknowledge the impact of Facebook on productivity (Archambault & Grudin, 2012; Axon, 2010). About half of US companies have reportedly installed computer software or have restrictive policies to monitor Facebook use (Archambault & Grudin, 2012). No studies to date have examined how many schools ban or control Facebook use while on campus. Collectively, the anecdotal and media reports presented suggest that Facebook use has become a major problem for many companies and schools due to loss of productivity.

Multitasking. Multitasking is a term that describes the phenomenon of divided attention or task switching when attending to and processing information (Fulton, Schweitzer, Scharff, & Boleng, 2011). Students using their laptops to surf the Internet during a lecture might be an example of multitasking. Attempting to execute two tasks simultaneously overloads the capacity of the human information processing system. Adverse consequences of multitasking have been extended to tasks such as driving (Drews, Pasupathi, & Strayer, 2008) and social interactions (Schlosser, 2002) as well as academic outcomes. Previous research has provided overwhelming evidence that the human information processing system is insufficient for attending to multiple input streams and simultaneously executing various tasks (Chun, Golomb, & Turk-Browne, 2011; Junco & Cotten, 2012; Koch, Lawo, Fels, & Vorländer, 2011).

Studies relating to multitasking and academic achievement are presented in Table 4 on page 31. A summary of the studies' sample characteristics, key findings, strengths and limitations are outlined. A total of six studies were included and only one study examined high school students. The majority of the studies were conducted via a survey in the US and were dominated by female populations. It is important to note that this is to some extent representative of the current Facebook population and therefore not a pressing concern (Hampton et al., 2011). The off-task multitasking activities examined within this review include MSN, Facebook, texting, emailing and AOL use. The inclusion criteria for the literature review can be seen in Appendix A (page 111).

Junco and Cotten (2012) examined a large sample of university students ($N = 4,491$) and found that using Facebook, texting and engaging in other off-task related activities while completing course work was negatively associated with overall GPA (Junco & Cotten, 2012). The majority of the students (57%) acknowledged that multitasking had a negative effect on their studies. Wood et al. (2012) tested 145 university students and found those who did not use technology during lectures performed significantly better than technology users in tests. More specifically, students who used laptops to take notes and use Facebook during lectures scored significantly *lower* on tests of lecture material than those who took notes through paper-and-pencil. Students who used Facebook during class engaged in more off-task related activities than other conditions such as MSN and texting. Rosen et al. (2011) also found that undergraduate students ($N = 185$) who received text messages during a video-taped 30 minute lecture performed worse in memory recall than those who received no texts. Students who received texts performed 10.6% lower than those who received no texts. A similar study by Ellis, Daniels and Jauregui (2010) also found that university students ($N = 62$) who did not text during a lecture performed significantly *better* than those who texted in a short test after class, despite the student's initial GPA.

Table 4

Literature Review: Studies examining the effect of multitasking on academic performance

Author	Study Design/ Measures	Sample	Findings	Strengths	Limitations
Junco & Cotten (2011) UNITED STATES	Cross-sectional Web-based survey	4,491 students from 4 medium-large universities in Midwestern, Southeastern, and Southwestern US. Contacted between 2006 and 2007.	* Instant messaging (via platforms such as AOL, MSN and Facebook) and non-academic related tasks while studying were associated with impairment in academic achievement. * The majority (57%) of the students, particularly females, acknowledged that multitasking had a subjective impact on their grades. *Conclusion: multitasking can have a negative impact on grades because students are less likely to focus on information and engage in deep meaningful thinking.	+ 2 reminders were sent 1 week apart + Measured GPA + Invited a large group of students through e-mail to participate (N = 38,345)	- Low Response rate (11.4%) - Functional analysis of instant messaging usage (i.e., type, amount, and when it is typically used) not conducted. - Although not significant, there were more female (62%) than male (38%) users of instant messaging. - Contacted to participate through e-mail accounts: students may have thought that the study was not anonymous.
Levine, Waite, & Bowman (2007) UNITED STATES	Cross-sectional Paper and pencil 55-item questionnaire	161 university students enrolled in a psychology course between the ages 17 to 20-years-old. The students received a $15 incentive or course credit for participating.	* Higher rates of distractibility were related to higher rates of instant messaging (IM; r = .190). * Students who responded to instant messages immediately were significantly more likely (r = .187) to report feeling distractible. * Distractibility was negatively predicted by the frequency of reading books for pleasure (β = -.347, p < .001) and positively predicted by the amount of IM (β = .290, p < .001).	+ Distractibility for Academic Tasks Scale was showed good convergent validity (α = .69). + The author's conclusion was inclusive of other factors. They stated that IM may interfere with academic reading because of 1) a displacement of time available for study, 2) direct interference with study, and/or 3) a development of a cognitive style of short and shifting attention.	- 71.43% of the sample was female. - Participants are a biased sample of all psychology students - Descriptive and correlational, cannot imply causation. - Academic achievement not directly measured.
Rosen, Carrier, & Cheever (2013) UNITED STATES	Cross-sectional Observational Post-studying questionnaire measuring study strategies, preference to task switching, technology attitudes, daily media usage, cell-phone usage, social networking usage and GPA.	263 students from Southern California which included 31 from middle school, 124 high school students, and 108 university students. Majority of participants were of Hispanic/Latino/ Spanish descent (43.7%).	* Students who accessed Facebook during study period reported lower GPA (β= - .225, p < .01). * Study strategies significantly predicted a higher GPA (β= .184, p < .01) and being confused while studying predicted a lower GPA (β= - .244, p < .001). *Conclusion: requiring students to concentrate on one task at a time during lectures/class or study is not beneficial. Developing educational models that teach students to apply metacognitive skills and "technology breaks" appropriately may improve learning.	+ Students were in the environment where they would typically study + Operationalisation of behaviours are clearly reported + Measures GPA + Psychometric properties of the subscales within the questionnaire were acceptable.	- Inter-rater reliability coefficient not reported - Not randomly selected - Content difficulty of study material not controlled for. - Purpose of Facebook use not controlled for. Students may have contacted friends in relation to school-work. - Specific study strategies that were predictive of GPA were not discussed.

Author	Study Design/ Measures	Sample	Findings	Strengths	Limitations
Rosen, Lim, Carrier, & Cheever (2011) UNITED STATES	Experimental Students view a 30 minute video related to their course. The groups were informed that they would be tested after the video.	185 university students recruited from 4 undergraduate psychology courses were randomly assigned into 3 groups. Group 1 received no texts, group 2 received 4 texts at timed intervals and group 3 received 8 texts timed to coincide with videotaped lecture content that was being assessed post-video. Group 2 and 3 were asked to reply promptly to texts.	* Group 3 performed significantly lower [$M = 11.71$, $SD = 3.45$] than group 1 [$M = 12.95$, $SD = 2.01$] post-test: group 3 performed 10.6% lower than group 1. * Group 2 was not significantly different from either group 1 and 3. * Post-test score was significantly related to the total words received ($r = -.158$, $p < .05$). Students who opted to respond immediately to text messages performed significantly worse than those who chose to wait 5 minutes. * Conclusion: monitoring and regulating cognitive and affective states while learning may improve academic achievement.	+ The manipulation of text messaging enables others to make causal inferences. + Measured GPA indirectly through test achievement as they are highly correlated.	- Students also responded personal messages during the experiment. - Did not discuss how they controlled for other students in the psychology course discussing the main aims of the study. - Majority of the students were a convenience sample of psychology students which may subject the study to response bias.
Ellis, Daniels, & Jauregui (2010) UNITED STATES	Experimental There were two conditions: group 1 were asked to send the professor 3 texts any time during the lecture and group 2: were asked to turn their phone off. The students were tested after the lecture.	62 undergraduate students from a Southeastern public business school.	* The non-texting group performed significantly better than the texting group ($t = 4.25$, $p < .001$). There were no gender differences between test scores. * Regardless of students low or high GPA, students who text scored lower than those who do not text. * The result indicate that multitasking (i.e., texting in class) in a learning environment may result in lower grade performance, regardless of gender and GPA.	+ Controlled for students who have already attended the class the year before (repeat students). + Even gender proportions + Randomly assigned into conditions. + Controlled for students discussing what condition they were in by asking them to not talk during class.	- Did not control for how many words were within the text. - Measure only one type of multitasking. - How GPA is measured (e.g., self-report or through transcript) was not reported.. - The study does not measure immediate recall rather than retrieval. The results may be potentially revealing if these two conditions could have been compared.
Wood et al. (2012) CANADA	Experimental Students attended 3 lectures on research methods and following each lecture were tested through 15-item multiple-choice test.	145 university students randomly assigned to 1 of 7 conditions. 4 multitasking conditions (texting, emailing, MSN and Facebook) were compared to three control conditions (paper/pencil note-taking, word-processing note taking and a natural use of technology situation).	* Students who did not use technology in class ($M = .76$) outperformed technology users ($M = .59$). Non- multitaskers ($M = .67$) outperformed low ($M = .57$), medium ($M = .58$) and high multitaskers ($M = .51$). * Students who used Facebook and MSN also engaged in more off-task multitasking activities than the other conditions (except email). * Students who ignored initial instructions in favour of another technology engaged in *more* multitasking activity when using e-mail and Facebook during class than students who took notes through paper and pencil and computers. * Conclusion: attending a lecture whilst simultaneously engaging in technology is related to off-task activities can have a detrimental impact on learning.	+ Good ecological validity: the lectures the students attended were presented during normal class time. + Clearly defined types of multitasking (low, med, and high groups). + The lecturer presenting was blind to all of the conditions. + The research relates the information to past theory to explain the occurrence.	- Majority were females (80%). - Compliance to instructions was low (only 57% fully adhered to the, 76.5% of students choosing to use an additional type of technology). - Sample size for the "natural use" condition were relatively low and unequal with only 7 students in the technology use and 14 in the non-technology use condition. - Grade equivalents could have been used by the authors in addition to the means provided to better the academic achievement measure.

A more recent study by Rosen et al. (2013) found that high school, middle school and university students who accessed Facebook while studying had lower GPA scores than those who focused on their coursework the whole time. Study strategies (such as completing one task at a time) also significantly predicted higher GPA. Higher rates of distractibility (e.g., engagement in non-related course work during study) were related to higher rates of instant messaging. Furthermore, students who stated that they replied to instant messages immediately were significantly more likely to report feeling distracted (Rosen, Carrier, et al., 2013). Distractibility predicted reading fewer academic textbooks, perhaps because of less time available for study, interference during study time and the development of a short and shifting attention span (Rosen, Carrier, & Cheever, 2013)

The effect of multitasking on GPA is likely to be due to the decreased cognitive resource a student has to focus on information (Junco & Cotten, 2012; Rosen et al., 2011; Rosen, Whaling, Rab, Carrier, & Cheever, 2013; Wood et al., 2012). The ability to engage in deeper meaningful thinking may be compromised. Facebook appears to increase the likelihood of students participating in off-task related activities which may decrease attention to course material. Rosen et al. (2011) suggested that it is important for students to be encouraged to take control of their Facebook or technology usage as this can positively reinforce socially acceptable behaviour (e.g., studying). Students could be taught metacognitive strategies that help students recognise when to take a break and focus on school-work. Enabling students to monitor and regulate cognitive and affective states while learning may improve academic achievement if they are used appropriately. The use of "technology breaks" may improve learning during class-time if students agree that text, instant messages, Internet or any other non-academic related activity is conducted only during this allocated time.

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Multitasking and engaging in off-task activities can have detrimental effects on a students' learning and is therefore an important factor to consider in the study of Facebook. While research on Facebook is conflicting, there is substantial evidence that checking Facebook, texting and using laptops while studying or in class can impact academic outcomes. No studies to date have examined possible linkages between self-discipline with the growing use of social media sites and being Facebook members. Existing research within this area is also largely focused on university students with little to no consideration of how high school students could be academically compromised. Furthermore, the potential for parenting style acting as a moderating variable in the relationship between Facebook use and grades, to date, has not been examined.

1.6 Factors Influencing School/Academic Success

Unravelling the factors involved in influencing academic success, particularly those that are controllable, allows parents and students to implement practical guidelines to studying. A range of factors affect the academic outcomes of students which include an adolescent's intellectual quotient (IQ) score and socio-economic status (SES).

Intellectual Quotient. Historically, intelligence was perceived and attributed to be a single function largely responsible for an individual's performance on all mental tasks (Lezak, Howieson, Bigler, & Tranel, 2012; Spearman, 1904; Wechsler, Coalson, & Raiford, 2008). The concept was treated as a unitary attribute, to some extent akin to physical strength. IQ was believed to increase at a consistent and regular rate in the course of normal childhood development. However, there is a large amount of research supporting the contention that intelligence is not a unitary concept and cognitive functioning is dependent on a number of discrete functions that work together. Specifically, factors that have been shown to contribute towards intelligence have been biological (e.g., genetic factors), cognitive (e.g., metacognition – awareness of personal skills and abilities), motivational (e.g., interests and

drive) and behavioural (e.g., what an individual does academically) (Herrmann, Call, Hernàndez-Lloreda, Hare, & Tomasello, 2007; C. M. Mueller & Dweck, 1998; Sternberg, Kaufman, & Grigorenko, 2011; Turner, 1996; Veenman & Spaans, 2005).

Intellectual strengths such as verbal comprehension and perceptual reasoning specifically measured by IQ tests contribute to a student's overall academic performance and occupational status (McCall, 1977; Parker & Benedict, 2002; Watkins, Lei, & Canivez, 2007). IQ tests refer to a test battery designed to measure a hypothesised general ability. IQ scores are obtained from tests through a composite score of performances on different abilities. Academic achievement has been a criterion for validating IQ tests since the early 20th century (McCall, 1977; Naglieri & Bornstein, 2003). However, IQ tests rarely account for more than 50% of the variance in academic performance (Chamorro-Premuzic, Furnham, & Lewis, 2007; Turkheimer, Haley, Waldron, Onofrio, & Gottesman, 2003). Thus, factors other than intellectual ability contribute to the individual differences in academic performance (Chamorro-Premuzic et al., 2007). The concept that intelligence is ruled by one single factor has therefore been discarded. It is now widely acknowledged that determiners of academic success are multidimensional.

Socio-Economic Status (SES). SES is a multidimensional construct which is generally conceptualised as the relative position of an individual or families within a hierarchical social structure (Mueller & Parcel, 1981). This is a social standing or class and is based on access to, or control over, wealth, prestige and power (C. Mueller & Parcel, 1981). Family SES sets the stage for academic performance both indirectly (by providing the social capital that is needed to succeed in school) and directly (by providing resources at home). From a large scale meta-analysis, three components were found that are often involved in the operationalisation of SES. They are parental income, education and occupation (Sirin, 2005). Measuring SES through multiple components is important because

if only a single component is chosen the results are more likely to under account for the effect of SES (Sirin, 2005). Extensive research on the link between SES and education offers conclusive evidence of a positive relationship (Caro, Mcdonald, & Willms, 2009; Sirin, 2005). This relationship is commonly referred to as a socio-economic gradient in the literature because it gradually increases across the range of SES and suggests a gap in academic achievement of high and low SES families (Caro et al., 2009). The socio-economic gap in early school years has lasting effects. Children of low SES background are more likely to leave school early, less likely to enter the employment market successfully or pursue post-secondary education (Alexander, Entwisle, & Kabbani, 2001; Bartley & Owen, 1996). Research on university students in America with a low SES background are less likely to attend university, more likely to attend less selective institutions if they do enrol, and less likely to persist or to attend post-graduate programmes (Paulsen & St. John, 2002; Walpole, 2003). In contrast, high SES students are more likely to enrol in advanced courses leading to tertiary education (Alexander, Entwisle, & Olson, 2007). The difference could be explained through parental expectations and thus the students motivation to succeed, as research has shown that parents of high SES are more likely to view a bachelor's degree or advanced degree as a norm, whereas parents of low SES tend to view a high school diploma as a norm (Walpole, 2003). The effects of SES on academic achievement in America appear to be more prominent for European Americans than African Americans. Sirin (2005) suggests that this could be due to minority samples having less variance in SES than European Americans.

Although the relationship between SES and academic achievement exists, it accounts for only a small portion of student's success (Fuligni, 1997). Weak and moderate correlations are frequently reported (Fuligni, 1997; Sirin, 2005; White, 1982). A large meta-analytic review ($N = 101, 157$) found that the relationship between SES and academic outcomes depends on variables such as student characteristics, school location, minority status and

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grade level act, as they have been identified as moderators (Sirin, 2005). Fuligni (1997) also identified that the student's emphasis of educational attainment, parents and peers are *stronger* predictors of academic achievement than SES. This may due to the student being more intrinsically motivated to achieve better academic outcomes.

Research suggests that those from low SES background have poorer academic outcomes, lower parental expectations and worse psychosocial outcomes than students with high SES. However, the relationship is not simple, and other variables are relevant. Stronger predictors of academic achievement are the student's emphasis on educational attainment, parental views and style, peers and the student's ability to self-discipline (Duckworth & Seligman, 2005; Fuligni, 1997).

1.7 Summary of Factors Influencing School/Academic Success

It is clear that academic achievement is predicted by many variables. Delay of gratification research highlights the importance of parents/caregivers in children's development of self-discipline. The ability to supress immediately gratifying impulses for a long-term goal is *largely* influenced by the environment (i.e., parental values and style). There is little empirical research on the differences between parenting styles across various developmental stages and the results from this thesis will provide further information the role of parenting styles in the development of self-discipline. An important additional variable that is not often examined is Facebook use. The upsurge of social networking sites being used during class time and while studying can distract students from course material, preclude their ability for deeper thinking and decrease amount of time spent studying. It is essential to consider many factors when investigating the academic outcomes of students.

An online survey was implemented as this was the common method used in the studies reviewed investigating the effect of Facebook and technology use on academic

performance. Questionnaires were preferred over behavioural observation as these methods were considered the most resource effective and time efficient. A methodological strength of this study is its cross-sectional design with high school and university students and their parents being examined.

1.8 Aims and Hypotheses

Against this general background, the specific aims of this study are as follows:

1) To assess the relation between Facebook use and academic outcomes among high school and university students, while also examining the impact of self-discipline. **Hypothesis one:** Students with low self-discipline and high Facebook usage are hypothesised to have lower academic grades than students with high self-discipline and low Facebook use.

2) To determine whether academic performance varies by the extent and type of Facebook use. **Hypothesis two:** Students who check Facebook regularly (high frequency group) and those who leave Facebook open all day (continuous usage type) are hypothesised to have lower academic grades than those who are in the "low" and "medium" Facebook frequency groups and the intermittent vs. continuous type.

3) To examine the impact of parenting style on the academic performance of high school and university students. **Hypothesis three:** Students who are exposed to an authoritative parenting style are expected to have higher academic grades than those exposed to permissive and authoritarian parenting styles.

4) To determine the extent to which Facebook use contributes to academic outcomes over and above self-discipline, parenting styles and socio-familial factors. **Hypothesis four:** It is hypothesised that the relationship between Facebook usage and poorer academic grades will weaken when higher authoritative and permissive parenting styles, self-discipline and socio-familial factors are accounted for.

2.1 Participants

A total of 737 high school and university students aged between 16 and 21 years, as well as 644 of their parents, were recruited using an online survey. All procedures and measures were approved by the University of Canterbury Educational Research Human Ethics Committee (reference number: 2012/25/ERHEC) (Appendix B, page 112). All participants were informed that completion was voluntary and could "withdraw at any time". Involvement in the study qualified the participants to go into a draw to win one of four $100 Westfield vouchers. Because only complete student-parent sets were included for the final analysis, the student total was reduced to 317 due to 420 of parental/caregiver questionnaires not being returned. Participants forming complete parent-student sets were stratified into two groups based on level of education: one group of high school students ($n = 106$) and their parents ($n = 106$) and one group of university students ($n = 211$) and their parents ($n = 211$). The response rate for high school students were 62.10%[1] and 37.08%[2] for university students. Further details on participant groups and recruitment strategies are provided below.

High School Group. A total of 106 parent-student sets were included in this group. Of the high school students included, there were 43 males (40.6%) and 63 females (59.4 %), ranging in age from 16 to 17 years with a mean age of 16.73 ($SD = 0.45$). A stratified sampling technique was used to ensure that the high schools were representative of a range of deciles. Potential schools and decile information was sought through a governmental website (http://www.educationcounts.govt.nz/find-a-school). Invitations to participate in the study were sent to 100 secondary schools representative of all decile rankings in New Zealand (see Appendix C, page 113). Ten schools per decile ranking were approached and as an incentive

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[1] 168 overall respondents and 106 completed student-parent pairs
[2] 569 overall respondents and 211 completed student-parent pairs

to participate and were informed that a copy of the results would be forwarded once the study concluded. The first four schools (per decile ranking) who agreed to participate in the study were sent 10 recruitment posters to place around campus (Appendix D, page 115). When a school within one decile ranking declined the invitation to participate, another school within the same ranking was chosen to keep the total number of participating high schools per rank at ten. School decile ratings in New Zealand, measure the extent to which a school draws its students from low socio-economic communities (Ministry of Education, 2013a). Five factors are used to calculate school decile ratings which are household income, occupation, household crowding, educational qualifications and income support levels of houses in the areas a school draws its students from (Agnew, 2011). Schools are ranked and then divided into ten groups, called deciles. Schools grouped into decile one are vested in areas with the lowest socioeconomic status whereas schools classified as decile ten are situated in the highest socioeconomic backgrounds (Agnew, 2011). The decile ratings for each of the participating high schools within this study were calculated. Four schools were from decile one to three, nine schools from decile four to seven and eight schools from a decile eight to ten (refer to Table 5 below). While 40 high schools overall was anticipated, a total of 21 schools accepted the invitation to participate. After gaining consent from the principals, the 21 schools were asked to place posters around campus. The posters provided students a link to a Facebook recruitment page (Appendix D, page 116) which had information about the study and a Qualtrics link to the survey. The Facebook recruitment page was also advertised on the webpage of participating high schools.

Table 5
Decile ratings of the 21 high schools that participated

Qualitative Decile Indicator	Socio-economic Indicator	Number of Schools (Frequency/%)
Low	Decile 1 - 3	4 (19.05%)
Medium	Decile 4 - 7	9 (42.86%)
High	Decile 8 - 10	8 (38.09%)

Of the 106 high school parent/caregivers, 39 (36.8%) were male and 67 (63.2%) were female. Furthermore, their mean age was 43.60 (SD = 6.33). Parents/caregivers were recruited by high school students: a link to the parent/caregiver survey was supplied to the students at the end of their questionnaire. One week after students completed the questionnaire, an e-mail was sent (Appendix E, page 116) to remind students to send the Qualtrics link to their parents/caregivers. To protect against students falsifying their parent's response, an e-mail (see Appendix F, page 117) was sent to a sample of parents who completed the survey. Out of the 20 e-mails sent to high school parents, 15 stated that they completed the survey personally and five did not reply.

University Group. A total of 212 parent-student sets were included in this group. Of the university students included, there were 68 male (32.2%) and 143 female (67.8%). They ranged in age from 18 to 21 years with a mean age of 19.27 (SD = 1.06). University students were recruited via advertising posters (Appendix G, page 118) posted by the principal researcher or assistants involved around the campuses of the four main New Zealand universities (Universities of Canterbury, Victoria, Auckland and Otago). Similar to high school students, the posters provided students a link to a Facebook recruitment page and included a Qualtrics link to the survey. The Facebook recruitment page was also advertised through a link on official university Facebook channels such as the University of Canterbury Students' Association, Victoria University of Wellington Students' Association and Otago University Students' Association[3].

Of the 211 university students' parents/caregivers, 52 respondents were males (24.6%) and 159 were females (75.4%). The respondent parents/caregivers were recruited by university students upon completion of their survey. A link to the parent/caregiver survey was

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[3] Out of the eight state-funded universities in New Zealand, these four universities in this study were chosen because they are oldest universities in New Zealand.

supplied to the university students at the end of their questionnaire. One week after the university students completed the questionnaire, a reminder e-mail was sent (Appendix E, 116) to send the separate questionnaire link to their parents/caregivers. As with the high school group, a sample of university parents who completed the survey was sent an e-mail to check for falsification. All of the respondents e-mailed ($n = 20$) reported that they personally completed the survey.

2.2 Measures

Data was collected through an online survey using Qualtrics Survey Software. There was one questionnaire for students and one questionnaire for parents to complete.

High School and University Student Questionnaire. The questionnaire was developed to obtain information on demographic and social background, academic achievement, Facebook usage (i.e., frequency and intensity), academic distractibility and procrastination (a copy of the questionnaire completed by a high school and university student can be found in Appendix H and I, respectively). Within the questionnaire there were five sections of closed-response (e.g., Yes/No and Likert-type scale) and open response items. The measures included in the student questionnaire are described in more detail below.

Demographic information. Section 1 of the questionnaires asked participants to provide demographic information such as age, gender, ethnicity and current year level at school/university.

Facebook usage. Section 2 asked students to provide information about their current Facebook usage in terms of frequency (e.g., "how often do you check Facebook each day") and intensity (e.g., "how long do you spend on Facebook each time you check it"). There were no missing data for this section. Three distinctive usage categories were created from Facebook frequency to measure the extent of Facebook use (Table 6). Furthermore, two

categories were created from Facebook intensity based on the students' type of use (Table 7). The intermittent and continuous intensity groups were distinguished as it was deemed, to some extent, related to multitasking. Empirical research has indicated that students who multitask are less likely to listen to the lecturer, have greater difficulty understanding what they are reading and answer in-class questions incorrectly, and achieve lower academic grades (Tombu et al., 2011). The Facebook frequency and intensity categories allow cross comparison between groups and across university and high school students.

Table 6
Four distinctive categories for Facebook frequency

	Low	Moderate	High
Frequency Conversion	1 – Not daily: less than twice a week 2 – Not daily: every couple of days 3 – Once a day 4 – 2 to 4 times a day	5 – 4 to 7 times a day 6 – 8 to 10 times a day 7 – 11 to 13 times a day 8 – 14 to 16 times a day 9 – 17 to 20 times a day	10 – 21 to 24 times a day 11 – 25 to 27 times a day 12 – 28 to 30 times a day 13 – 31+ times a day

Table 7
Two categories for Facebook intensity

	Intensity Conversion
Intermittent	1 – Less than 5 minutes: I find what I want to check and then stop 2 – 5 to 15 minutes: I check notifications, my friends' walls etc 3 – 15 minutes to 1 hour: I wait for replies, play games and use it as a messaging programme 4 – 1 to 3 hours: I play multiple games and take part in multiple conversations each time I check it
Continuous	5 – All day: I leave it on even when not using it

Academic distractibility. To provide a measure of academic distractibility, the Distractibility for Academic Tasks Scale (DATS; Levine, Waite, & Bowman, 2007) was used and included in Section 3 of the questionnaire. The DATS (Levine et al., 2007) contains 4-items (e.g., "I find it easy to focus on my assigned readings" and "I feel impatient when I read my textbooks") and participants are required to rate on a 5-point Likert-scale the extent to which they agreed with four statements on distractibility relating to academic work. Level

of distractibility was calculated by summing participant's scores across the four items to create a total academic distractibility score. Scores on the DATS ranged from five to 20 with high distractibility scores signifying a higher level of distractibility and vice versa. There were no missing cases for this scale for either university or high school students.

The DATS (Levine et al., 2007) has been shown to have good internal consistency and construct validity (Barrat, 1994; Patton, Stanford, & Barratt, 1995; Weyandt et al., 2003). Participant's scores on the DATs also correlate well with standard measures of distractibility and impulsiveness, specifically the Barratt Impulsiveness Scale (Barrat, 1994; Patton et al., 1995) and the Internal Restlessness Scale (Weyandt et al., 2003). Pearson correlations on the DATS with the above scale were .521 ($p < .001$) and .479 ($p < .001$), respectively, indicating there is acceptable construct validity (Levine et al., 2007). In the current study, the Cronbach's alpha coefficient for the DATS was 0.86 indicating strong internal consistency.

Academic procrastination. To provide a measure of procrastination, the Procrastination Scale (PS; Tuckman, 1991) was used. Included in Section 4 of the questionnaire, the PS required participants to rate on a 5-point Likert scale the extent to which students agreed with 10 statements (e.g., "I'm a time waster now but I can't seem to do anything about it" and "I promise myself I'll do something and then drag my feet"). The original PS (Tuckman, 1991) was administered through a 4-point Likert scale; however, the modified PS used in this study had a 5-point Likert scale to allow direct comparison with the DATs (Levine et al., 2007). The scale measures a person's predisposition to delay or completely evade academic work, by distracting themselves with an alternative activity, under one's control (Tuckman, 1991). Level of procrastination was calculated by summing the participant's total score on the 10 items. The PS scores ranged from 10 to 50 with higher scores signifying a higher level of procrastination and vice versa. There were no missing cases for this scale for any university or high school student.

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For this study, a shortened version of the PS was used, which includes 10 items with the highest factor loadings from the scale in place of the full 35 item scale. The short version of the PS was chosen to decrease the likelihood of participants losing interest and subsequently responding with a long string of answers that are the same. High internal reliability ($\alpha = 0.90$) and discriminant and construct validity have been documented for the PS (Stöber & Joormann, 2001; Tuckman, 1991). More specifically, the PS has correlated negatively ($r = -.47$) with the General Self-Efficacy Scale (Tuckman, 1991) and positively correlated ($r = .41$) with the Worry Domains Questionnaire (Stöber & Joormann, 2001). The DATS and PS within this study were correlated ($r = 0.72$, $p < .001$) and the Cronbach's alpha coefficient for the PS was 0.95. The analyses confirm that overall validity and reliability of the scale was not affected by the modification of the original PS.

Self-discipline. To provide a measure of self-discipline, academic distractibility and procrastination were combined into a composite variable. Justification for this was guided by theoretical and empirical research on delay of gratification. This variable was created in order to directly assess the impact of self-discipline on academic performance for high school and university groups. Self-discipline was also examined as a function of Facebook use as a negative relationship between the two variables was expected. For ease of interpretation, high academic distractibility and procrastination scores were reverse coded so that *higher* scores on the DATS and PS measures indicate *lower* levels of self-discipline. Lower scores on the DATS and PS suggests that a student has successfully employed self-discipline and exhibit high levels of this trait. To assess the impact of level of self-discipline on academic grades, self-discipline was stratified into three groups using uniform distribution. The numeric cut-off points were used to evenly distribute the grade categories. The self-discipline scores ranged from 15 to 70. Depending on the numeric score on the DATS and PS, students were stratified into low, moderate and high self-discipline groups (see Table 8 below).

Table 8

Three categories to measure extent of self-discipline in high school and university students

	Students' level of self-discipline		
	Low	Moderate	High
Self-discipline			
Numeric Conversion	54 – 70	27 - 53	15 - 26

Academic achievement. To create a measure of academic achievement, *S*ection 5 of

the questionnaire asked students to provide information about their grades achieved in the last

academic year for each subject/paper/course they have taken. A retrospective approach was

taken due to the study being conducted part-way through participant's current academic year.

High school: Levels of academic achievement. High school students were asked to list

the grades they received in 2011 from their National Certificate Educational Achievement

(NCEA) results. The main national qualification for secondary students in New Zealand is

through NCEA which has three levels. At each level, students must attain a certain number of

credits to be accredited with an NCEA certificate. Credits are gained through achievement

standards (graded with achieve, merit or excellence) or subjects that have unit standards (pass

or fail). Some of the standards are assessed internally throughout the year, by teachers, and

some standards are assessed externally by the New Zealand Qualifications Authority

(NZQA). High achievement is recognised through endorsing the student's certificate and/or

subject. This is when students consistently perform above the "achieved" level in an

achievement standard. During the school year students receive results of how well they

performed in internally assessed work with final grades (which include external assessments

and NCEA endorsements) released the following January. The most recent version of a

finalised NZQA transcript was available from 2011 and therefore retrospective data was

required within the study. Students overall certificate results and endorsements were desired

(e.g., Level three NCEA endorsed with Merit). However, some students provided their

achievement standards results *specifically* from the subjects they were enrolled in. For

example, one student noted that in 2011 that he received three achieved English grades, three achieved results for Science and for Maths received three merits and one excellence. For the purposes of this study, results (i.e., both NCEA endorsements and achievement standards) were converted to a numeric scale to allow for a direct comparison with grades obtained by university students (see Table 9, page 48). For high school students, no evidence was converted to a zero, not achieved was converted to a two, achieved was converted to four, merit was converted to a six, and excellence was converted to an eight. Students who had provided specific achievement standard results in place of NCEA endorsements, had their grades averaged to create an estimated overall NCEA certificate grade (e.g., a student reporting that they received three achieved, two merits and one excellence grade numerically convert to an academic score of 5.6 or a Merit endorsement).

University: Levels of academic achievement. University students were asked to list the grades received from courses completed in semester one[4] (2012). Typical courses at university assess students through a mixture of internal assignments, essays, reports, tests and end of semester exams. Retrospective rather than current semester two grades were collected given that data collection took place during semester two (2012) with only grades for semester one (2012) finalised and available by that stage. All academic achievement results provided by university students were converted to the numeric scale to allow for direct comparison with high school results. University students' grades were arranged on a numeric scale that ranged from 0 to 8, where 0 was an E/F or a NCEA equivalent of no evidence, 3 a C or achieved, 5 a B-/B or merit, and a 7 an A-/A grade or excellence (Table 9).

For the purposes of analysis, students in the high school and university groups were also categorised into three groups (low, medium, and high achievers) based on grade and

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[4] The university year in NZ (February - November) is categorised into two main semesters: semester 1 (February to June) and semester 2 (July to November).

numeric conversion scores. For high school students, grades below an achieved were classified as low, grades below merit were classified as medium and grades over a merit were categorised as high. A similar classification system was followed for university students. Grades that were below a C+ grade were classified as low, grades below a B+ but above a C+ were classified as medium and grades that were a B+ and above were classified as high.

Table 9

Academic Grades Scale Conversion and Achievement Categories for both university and high school students

Achievement category	High school NCEA levels	University estimated grade equivalent	Numeric Conversion
Low	No Evidence	E/F	0
	Not Achieved (NA) 2	D	1
	Not Achieved 3	C-	2
Medium	Achieved (A) 1	C	3
	Achieved (A) 2	C+	4
High	Merit (M) 1	B-/B	5
	Merit (M) 2	B+	6
	Excellence (E) 1	A-/A	7
	Excellence (E) 2	A+	8

Note. Students who fall within the NCEA NA, A, M and E categories represent, respectively, those who; 1) did not meet the academic criteria of the standard, 2) performed at an acceptable level, 3) performed very well, or 3) performed exceptionally well.

To determine rates of academic underachievement among both groups, students were also categorised using a pass or fail criterion[5] (refer to Table 10, page 49). Testing for potential group differences in the students' pass/fail rates was completed to provide information on the representativeness of the samples involved. Furthermore, if no significant differences were found in the pass/fail rates between high school and university students, this provides further rationale to combine the academic achievement data for the high school and university groups in the final regression analyses.

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[5] Those within the pass category represented university students who had received an overall grade of C or a numeric score between three and eight and high school students who had received an achieved or above NCEA grade or a score between three and eight. A fail represented university students receiving a C- or below or a score of two and high school students receiving a not achieved or a score of two.

Table 10

Pass or fail categories for high school and university students

	Pass	Fail
High School Students		
Numeric Conversion	3 – 8	0 – 2
Grade Conversion	Achieved and above	Not achieved
University Students		
Numeric Conversion	3 – 8	0 – 2
Grade Conversion	C or above	C – and below

Parent/caregiver Questionnaire. The questionnaire comprised two sections that included measures using closed-response (e.g., Yes/No and Likert-type scale) items and open response items and was created through Qualtrics Survey Software. Specific details on the measures included in the parent/caregiver questionnaire are provided below. A copy of the questionnaire is also provided in Appendix J.

Parenting style. The Parenting Practices Questionnaire (PPQ; Robinson, Mandleco, Olsen, & Hart, 1995) was used to provide a measure of parenting style. The PPQ is a 62-item instrument which gauges parent's attitudes and values about parenting, their beliefs about the nature of their children as well as specific practices they employ to socialise their children. The original PPQ questionnaire was originally tested on a large sample of 1,251 parents (534 fathers and 717 mothers) of preschool and school-aged children and is based on Baumrind's (1971) three primary parenting style typologies (refer to Table 11, page 50): authoritative (27-items), authoritarian (20-items) and permissive (15-items). The participants used in the standardisation sample were predominantly Caucasian, from two-parent families and had a median family income of approximately $US30,000.The parents who completed Robinson's (1995) questionnaire had a mean age of 35.6 for mother's and 37.9 for father's. Robinson et al.'s (1995) normative data was also compared to the current sample to ensure that the two parent/caregiver groups were representative (Table 12).

Table 11

Description of Baumrind's (1971) three parental style typologies measured by the PPQ

Parenting Style	Description and example
Authoritative	This is characterised by parents who manifest high levels of control and high warmth.
Authoritarian	This is characterised by parents who manifest high levels of control and low warmth.
Permissive	This is characterised by parents who manifest low levels of control and high warmth.

Table 12

Norms for the three PPQ subscales from Robinson et al.'s (1995) *study*

Parenting Style	Mean	Standard Deviation
Authoritative	3.84	0.87
Authoritarian	2.09	0.81
Permissive	2.09	0.83

Parents rate on a 5-point scale (1 being "never", 2 being "occasionally", 3 being "half of the time", 4 being "quite often", and 5 being "always") questions such as "I know the names of my child's friends" and "I am responsive to my child's feelings and needs". The PPQ measure yields a separate subscale score for each dimension of parenting (i.e., authoritative, authoritarian and permissive) with larger numbers indicating increased use of parenting practices associated with a particular style. This measure is frequently used in multiple cultural settings, including Russia, China and African-American communities (Hart, Nelson, Robinson, Olsen, & McNeilly-Choque, 1998; Wu et al., 2002). Furthermore, convergent, concurrent, predictive and discriminant validity have been found for this scale (Locke & Prinz, 2002; Simons & Conger, 2007; Su & Hynie, 2010). Internal consistency for mothers' and fathers' reports in Robinson et al.'s (1995) study found high Cronbach's alphas for authoritative ($\alpha = 0.91$), authoritarian ($\alpha = 0.86$), and permissive ($\alpha = 0.75$) meaning high internal reliability. In the current study, high Cronbach's alphas were also found (authoritative $\alpha = .94$, authoritarian $\alpha = .87$ and permissive $\alpha = .77$).

The PPQ scores were calculated by averaging the scores relating to the items within each of the three parenting subscales. The scores within each PPQ subscale were compared across the three styles to identify which parenting style best characterises the student's parents. For example, participant number 29 had a total score of 135 for authoritative, 60 for authoritarian and 30 for permissive. To account for the uneven amount of items, these three scores were divided by the number of items within each subscale (i.e., the total score of 135 for the authoritative subscale was divided by 27 which obtained a mean of five, the total score of 60 for the authoritarian subscale was divided by 20 which resulted with a mean of 3 and lastly the permissive total score of 30 was divided by 15 which produced a mean of 2). The authoritative parenting style was chosen for this participant because it had the highest mean subscale score compared to authoritarian and permissive parenting styles. This process was completed for all high school and university student-parent sets.

Covariates. To examine the extent to which any potential relations between Facebook use, procrastination, academic distractibility and academic outcomes might persist after control for family demographic and social background factors, a range of measures including parental income and education level were measured for inclusion in subsequent analyses.

Parental income. This was assessed by requesting parents/caregivers total household annual income (the combined income of key earners within the household). Parental income was coded as high if income was more than $70,000 - $79,000 and low if income was less than $70,000 - $79,000 given that $78,876 was the average annual household income in New Zealand the year 2008/2009 (Statistics New Zealand, 2009) (see Table 13). This analysis was conducted to compare how closely the annual income of the students' parent/caregiver respondents matched New Zealand statistics. One high school and three university parents/caregivers did not complete this section of the questionnaire. These cases were totally excluded from analyses relating to parental income.

Table 13

Parental income categories and coding for high school and university students' parents

	Combined Household Annual Income	
	Low	High
Less than $30,000	✓	
$30,000 - $39,999	✓	
$40,000 - $49,999	✓	
$50,000 - $59,999	✓	
$60,000 - $69,999	✓	
$70,000 - $79,999		✓
$80,000 - $89,999		✓
$90,000 - $99,999		✓
$100,000 or more		✓

Note: All income statistics measures are reported in NZ dollars

Parental education. Parental education was coded according to the highest level of education achieved by the parent/caregiver respondent. To provide a measure of rates of academic underachievement among the parents/caregivers of both university and high school parents/caregivers, respondents were coded as having (1) or not having a Year 13 or above qualification (see Table 14). This coding practice was adopted to provide an additional measure of parental education and to determine sample representativeness.

Table 14

Parental education categories and coding for high school and university students' parents

	Did not complete secondary education	Completed secondary education
No high school qualification	✓	
Year 11	✓	
Year 12	✓	
Year 13		✓
Overseas secondary qualification [a]		✓
1st year undergraduate		✓
2nd year undergraduate		✓
3rd year undergraduate		✓
4th year undergraduate		✓
Diploma/Certificate [b]		✓
Bachelor's Degree		✓
Honours/Masters		✓
PhD		✓

[a] A secondary qualification that was attained outside of New Zealand; [b] Qualification either attained at university/polytechnic or equivalent.

2.3 Procedure

The parent/caregiver and student questionnaires were online from 1st July 2012 to October 1st 2012. Schools, universities and parents that were invited to participate were able to access and complete the survey. Because existing pre-conceptions about the relationship between Facebook use and academic achievement may subject the study to a confirmatory bias (i.e., students providing information that confirms their beliefs) the real title of the study was not shown the participants. Instead, for students, the survey was titled "student questionnaire" and for parents the survey was titled "parent questionnaire". However, at the end of the questionnaire the students and their parents were informed about the aim of the study. All of the participants were informed that the study was anonymous: meaning they were not required to give their full name and responses were strictly confidential. The last 5 digits of the student's mobile and/or home number was required at the beginning of the survey in order to match the students and parents for data entry and analysis. This was implemented to eliminate the participants feeling pressured to provide socially desirable responses (e.g., really high grades). Respondent parents/caregivers were also asked to provide the last five numbers of their child's mobile and/or home number.

2.4 Data entry

Data collected via Qualtrics was first imported into Statistical Package for Social Sciences (SPSS) 19.0 for Windows 7 for data analysis. The data set was screened to check for missing and/or incorrect entries before data analyses commenced. Participants who did not complete more than half the questionnaire were removed. Furthermore, all analyses were conducted using the "excluded case listwise" option meaning that a case was totally excluded from all the analyses if it is missing one piece of information. This stringent criterion was justified as only a very small number of high school ($n = 10$) and university parents ($n = 3$) did not complete the whole questionnaire.

CHAPTER THREE – RESULTS

3.1 Statistical analysis

Data analysis was completed in four steps. First, the sample characteristics of the students and parents in both the high school and university groups and measure outcomes were described. Second, to examine group differences on measures of Facebook use, self-discipline and parenting variables (with and without covariate adjustment for family demographic and social variables), a one-way analysis of variance (ANOVA) for continuously distributed variables and a one-way chi-square test of independence were used. Third, to examine relations between academic achievement scores and measures of academic distractibility and procrastination, and parenting style, a Pearson's Product Moment correlational analysis was conducted for each group separately. Following this, participants in each group were stratified into low, moderate and high academic achievement performance groups, to determine the extent to which each of the measured variables influenced the academic achievement outcomes of both high school and university students after covariate control. These analyses were undertaken using analysis of covariance (ANCOVA) for continuously distributed variables, chi-square test of independence and logistic regression for dichotomous variables. Effect sizes and odds ratios (OR) with 95% confidence intervals was also calculated. Finally, the two groups were combined and a hierarchical regression analysis was performed to determine the relative contribution of total Facebook use, self-discipline and parenting style scores to academic performance outcomes after covariate control. An alpha level of .05 was used to detect significance for all analyses.

3.2 Sample Characteristics

Family demographic and social background characteristics of high school ($n = 106$) and university students ($n = 211$) and their parents ($n = 106$ and $n = 211$, respectively) are

outlined in Table 15 (page 57) and summarised in text below. Chi-square and t tests were conducted to assess whether two variables are related to each other.

High School and University Students. High school students ($M = 16.73$ $SD = .45$, *range* = 16 to 17) were younger than the university students ($M = 19.27$, $SD = 1.06$, *range* = 18 to 21). Most of the high school students were in Year 12 (47.17%) and university students were mostly 1st year undergraduates (43.13%). The high school and university group had more females (59.4% and 67.8%, respectively) than males overall (χ^2 (1, $n = 317$) = 5.14, $p < .05$). The disproportionate number of females in the student groups was expected. The 2006 NZ census revealed that more women (57%) than men (43%) were represented in the educational sector and previous research has also indicated that the majority of Facebook users are female (Hampton et al., 2011; Statistics New Zealand, 2006b). In relation to ethnicity, the majority of the high school (64.29%) and university students (78.29%) were NZ European. The second largest ethnic group were Asian for both high school (13.49%) and university students (10.71%) followed closely by NZ Māori. The higher proportion of Asians in the current sample is expected given that in the 2006 NZ census, Asians had the highest rates of participation in study (Statistics New Zealand, 2006a). This is further validated by the Tertiary Education Commission (2012) who revealed that Asians were the second largest ethnic group studying, after NZ European, at the Universities of Auckland, Victoria, Canterbury and Otago.

Parents/Caregivers of High School and University Students. There were significantly more females than males in both high school and university parent/caregiver groups (χ^2 (2, $n = 317$) = 8.81, $p < .01$). This was anticipated as the normative data on the Parenting Practices Questionnaire (PPQ) also included more women (57.31%) than men (42.69%). The mean age for the high school and university parents/caregivers were similar ($M = 43.60$ years, $SD = 6.33$ and $M = 44.14$, $SD = 5.17$), respectively, and appeared older

than the PPQ normative data (mothers $M = 35.6$ and fathers $M = 37.9$). This age difference may be due to the current generation starting families later than the 1995 PPQ normative data. There also appear to be significantly more NZ European parents/caregivers in both high school and university samples (71.70% and 78.28%, respectively) than Asian, NZ Māori and Pacific Islanders (χ^2 (5, $n = 317$) = 172.32, $p < .001$). This is expected and representative of the New Zealand 2006 census. A comparison of the social background information of students and parents (i.e., ethnicity and gender) within this study and the New Zealand 2006 census indicates that the sample is highly representative of the New Zealand population.

Parents/caregivers in both student groups, however, appeared to be more educated and have a higher income than the average New Zealander. The largest group of high school and university students' parents earned a combined household annual income of $100,000 or more (30.19% and 30.80%, respectively). In relation to parental education, the largest group for high school students were those who had completed a diploma or certificate in university and/or polytechnic (16.98%). For university students' parents/caregivers, the largest group were those who had completed a bachelor's degree (26.54%). A chi-square analysis revealed that a disproportionate number of high socio-economic status families had students at university whereas a disproportionate number of low socio-economic status families had their children at high school (χ^2 (8, $n = 313$) = 14.92, $p < .001$ and χ^2 (8, $n = 313$) =22.79 $p < .001$). This may be due to lower socio-economic families not believing that it is affordable to attend university. Regardless of the reason, socio-economic status may confound any analysis of differences between high school and university students. Income and education will be controlled for in all subsequent analyses, with adjusted and unadjusted p vales reported.

Table 15

Family demographic and social background characteristics for both high school and university groups

	HS Students	University Students	HS Respondent Parent/Caregiver	University Respondent Parent/Caregiver
N	106	211	106	211
Age Years				
M (SD)	16.73 (.45)	19.27 (1.06)	43.60 (6.33)	44.14 (5.17)
Range (years)	16 – 17	18-21	29 – 56	34 – 60
Sex (N/%)				
Male	43 (40.6)	68 (32.2)	39 (36.8)	52 (24.6)
Female	63 (59.4)	143 (67.8)	67 (63.2)	159 (75.4)
Ethnicity (N/%)				
NZ European	81 (64.29)	170 (75.89)	76 (71.70)	173 (78.28)
Māori	15 (11.90)	8 (3.57)	9 (8.49)	2 (0.90)
Asian	17 (13.49)	24 (10.71)	17 (16.04)	29 (13.12)
Pacific Islander	4 (3.17)	4 (1.79)		4 (1.81)
European	5 (3.97)	7 (3.13)	2 (1.89)	1 (0.45)
Other	4 (3.17)	11 (4.91)	2 (1.89)	12 (5.43)
Income (N/%)	- [a]	-		
Less than $30,000			8 (7.55)	13 (6.16)
$30,000 - $39,000			10 (9.43)	8 (3.79)
$40,000 - $49,000			17 (16.04)	19 (9.00)
$50,000 - $59,000			12 (11.32)	25 (11.85)
$60,000 – $69,000			3 (2.83)	17 (8.06)
$70,000 – $79,000			5 (4.72)	14 (6.64)

	HS Students	University Students	HS Respondent Parent/Caregiver	University Respondent Parent/Caregiver
$80,000 - $89,000			6 (5.66)	28 (13.27)
$90,000 – $99,000			12 (11.32)	19 (9.00)
$100,000 or more			32 (30.19)	65 (30.80)
Missing Data			1 (0.94)	3 (1.42)
Education [b] (N/%)				
No qualification [c]			3 (2.83)	7 (3.30)
Year 11	7 (6.60)		16 (15.09)	16 (7.58)
Year 12	50 (47.17)		11 (10.38)	16 (7.58)
Year 13	49 (46.23)		11 (10.38)	26 (12.32)
Overseas secondary qualification			3 (2.38)	11 (5.21)
Foundation year		2 (0.95)		
1st year undergraduate		91 (43.13)		
2nd year undergraduate		72(34.12)		
3rd year undergraduate		26 (12.32)		
4th year undergraduate		15 (7.11)		
Diploma/Certificate [d]			18 (16.98)	43 (20.38)
Bachelor's Degree		5 (2.37)	16 (15.09)	56 (26.54)
Honours and/or Masters			14 (13.21)	30 (14.22)
PhD			14 (13.21)	6 (2.84)

[a] This information was not required from the students ; [b] For students, education represents their current year level at school/university, for the parents education signifies their highest level of educational attainment [c] Represents parents that do not have neither a high school and/or a tertiary qualification; [d] Qualification from university/polytechnic or both.

3.3 Scales and subscales of the Facebook use, DATS and PS measures

A factor analysis was conducted to investigate the reliability of the Facebook, DATS and PS measures. As expected, Facebook intensity and frequency loaded onto component 1. Therefore, a composite variable "Facebook use" was created for ease of interpretation which will be used in the Hierarchical Regression analysis on page 78. The DATS and PS also distinctively loaded onto component 2 and 3, respectively (see Table 16, page 60). In line with previous research distractibility and procrastination were highly correlated ($p = .627$). Because this would cause problems in further analyses, a "self-discipline" composite variable was created and will be used in all subsequent analyses.

3.4 Facebook use, self-discipline and academic achievement outcomes of high school and university students

The first aim of this study was to assess the relation between Facebook use during study hours and academic outcomes among high school and university students. The impact of self-discipline was also examined. Group differences between high school and university students in Facebook use and academic performance were determined through a chi-square test.

There were more high school students in the "high" Facebook frequency category (21.70%) than university students (7.58%) (see Table 17, page 61). University students typically belonged to the "moderate" Facebook frequency group (54.98%) than high school students (33.96%). There was also a significant difference in the type of Facebook usage between high school and university students (χ^2 (2, $n = 317$) = 18.77 $p < .001$). Furthermore, few students kept their Facebook open all day in either the high school (10.38%) or university (9.48%) groups. High school students are generally spread out throughout the three groups of self-discipline and vastly more university students describe themselves as moderately self-disciplined (refer to Table 18, page 61).

Table 16

Summary of Factor Analysis Results for the Facebook Use, DATS and PS Measures

Items	Component		
	1	2	3
Facebook Frequency: How often do you check Facebook each day?	.797		
Facebook Intensity: How long do you spend on Facebook each time you check it?	.688		
DATS 1: I find it easy to focus on assigned readings (RECODED)		.877	
DATS 2: I feel impatient when I read my textbooks		.762	
DATS 3: I rarely do the assigned readings for class (RECODED)		.759	
DATS 4: I get distracted easily when reading class assignments		.700	
PS 1: When I have a deadline, I wait till the last minute			.942
PS 2: I promise myself I'll do something and then drag my feet			.873
PS 3: I get stuck in neutral even though I know how important it is to get started			.869
PS 4: Even though I hate myself if I don't get started, it doesn't get me doing			.850
PS 5: I needlessly delay finishing jobs, even when they are important			.807
PS 6: I'm a time waster now but I can't seem to do anything about it			.749
PS 7: I manage to find an excuse for not doing something			.748
PS 8: I am an incurable time waster			.680
PS 9: I keep putting off improving my study habits			.639
PS 10: Putting something off until tomorrow is not the way I do it (RECODED)			.610

Note: DATS = Distractibility for Academic Tasks Scale; PS = Procrastination Scale; N = 317; Factors were extracted using PCA analysis and the direct Oblimin rotation method because distractibility is highly correlated with procrastination.

Table 17

Facebook usage outcomes for high school and university students

	Extent and type of Facebook use			χ²	p
	Low	Moderate	High		
High School Students					
N (%)	47 (44.34)	36 (33.96)	23 (21.70)		
University Students					
N (%)	79 (37.44)	116 (54.98)	16 (7.58)	18.77	< .001***
	Intermittent	Continuous			
High School Students					
N (%)	95 (89.62)	11 (10.38)			
University Students					
N (%)	191 (90.52)	20 (9.48)		.065	.842

Table 18

Number of high school and university students within self-discipline groups

	Students' level of self-discipline			χ²	p
	Low	Moderate	High		
High School Students					
N (%)	32 (30.19)	46 (43.40)	28 (26.42)		
University Students					
N (%)	41 (19.43)	152 (72.04)	18 (8.53)	28.36	< .001***

Note: Table 8 page 46 summarises how self-discipline was stratified into three groups, *** *p* < .001

Table 19

Level of academic achievement of high school and university students

	Academic Performance Level			χ²	p
	Low	Medium	High		
High School Students					
N (%)	22 (20.75)	27 (25.47)	57 (53.77)		
University Students					
N (%)	64 (30.33)	50 (23.70)	97 (45.97)	3.36	.074

Note: Table 9 (page 48) explains how academic performance levels were stratified.

Academic performance level was similar for the high school and university students and their pass/fail rates did not differ significantly (χ^2 (1, n = 317) = .826, p > .10) (Table 20). The majority of the high school and university students' passed (88.69% and 9.57%, respectively) which is consistent with 2011 NCEA Level Two and Three and university pass

rates (NZQA, 2011; Tertiary Education Commission, 2013). The 2011 NCEA pass rates were

82% for Level Two and 75% for Level Three (NZQA, 2011). Comparisons were made using

the Year 12 and Year 13 rates as the majority of the students from this sample belonged to

this group. For university students, pass rates are as follows: Auckland (89%), Victoria

(86%), Canterbury (87%) and Otago (89%) in the year 2012 (Tertiary Education

Commission, 2013).

Table 20
Academic achievement of high school and university students by pass/fail rates

	Pass	Fail	χ^2	p
High School Students				
N (%)	93 (87.74)	13 (12.26)		
University Students				
N (%)	192 (91.00)	19 (9.00)	.826	.430

Note: Table 10 (page 49) outlines how pass/fail rates were stratified.

3.5 Parenting style outcomes of the high school and university students

Table 21 and Table 22 below illustrate the Parenting Practices Questionnaire (PPQ)

outcomes for the two parent/caregiver groups. To test for group differences between mean

PPQ scores, an independent-samples *t*-test and an ANCOVA was conducted. To ensure that

the PPQ data within this study were representative, results were also compared with

normative PPQ data (Robinson et al., 1995).

There was no evidence of statistical differences between high school and university

PPQ scores on any of the three sub-measures (refer to Table 21). High school and university

parent/caregiver groups, however, differed in terms of the percentages within each parenting

subscale type (χ^2 (2, 317) = 7.16, p < .001) with the university group characterised by a larger

proportion of authoritative parenting styles than the high school group (see Table 22).

Table 21

PPQ normative data for high school and university parent/caregiver group

Measure: PPQ	PPQ Normative Data	High School (N = 106)	University (N = 211)	t	p^a	Adjusted p^b
	M (SD)	*M (SD)*	*M (SD)*			
Authoritative	3.84 (.87)	3.09 (.95)	3.19 (.61)	1.06	.292	.217
Authoritarian	2.09 (.81)	2.64 (.69)	2.75 (.54)	1.36	.177	.101
Permissive	2.09 (.83)	3.04 (.69)	2.96 (.49)	-1.08	.280	.149

Note: [a] t-test for equality of means*;* [b] Adjusted for parental income and education through ANCOVA

Table 22

Proportions of parents/caregivers of high school and university students within each parenting style subscale category

	Parent/caregiver group		χ^2	p
	High School	University Students'		
	N (%)	N (%)		
Authoritative	67 (63.21)	162 (76.78)		
Authoritarian	12 (11.32)	19 (9.00)		
Permissive	27 (25.47)	30 (14.22)	7.16	.005**

Note: Refer to Table 11 on page 51 for an explanation of the three parenting style typologies and how these three groups were stratified; ** $p < .01$

The majority of parents/caregivers belonged to the "high" income group for both high school and university groups (52.38% and 60.58%, respectively) (see Table 23). After comparisons were made between high school and university students' parent/caregivers, no statistical difference was found in the number of participants in the 'high' and 'low' income bracket (χ^2 (1, $n = 313$) = 1.46, $p > .10$). Nevertheless, parental income was controlled for as a covariate in all subsequent analyses.

Table 23

Parental income categories and coding for high school and university students' parents

Parents/Caregivers	Combined Household Annual Income		χ^2	p
	Low	High		
High School Students				
N (%)	51 (47.62)	55 (52.38)		
University Students				
N (%)	82 (39.42)	126 (60.58)	1.46	.188

Note: Table 13 page 52 explains how low and high groups were stratified.

The majority of the high school (71.70%) and university parents/caregivers (81.52%) had completed a secondary qualification (see Table 24). While there was no statistical difference between high school and university parent/caregivers education level, (χ^2 (1, n = 317) = 3.44, p = .06) the 2006 NZ census found that 44% of New Zealander's have not completed a secondary qualification. Therefore, education was controlled as a covariate in all subsequent analyses.

Table 24

Parental education categories and coding for high school and university students' parents

Parent/Caregivers	Education Level		χ^2	p
	Did not complete secondary education	Completed secondary education		
High School Students				
N (%)	30 (28.30)	76 (71.70)		
University Students				
N (%)	39 (18.48)	172 (81.52)	3.44	.064

*Note: R*efer to Table 14 page 52 for an explanation of how education level was stratified.

3.6 Group differences in academic achievement as a function of Facebook use

To determine group differences between high school and university students' scores on measures of academic underachievement, self-discipline and Facebook use (i.e., frequency and intensity), a one way ANOVA was used. Table 25 below illustrates students' outcomes

on Facebook use and self-discipline before and after adjustment for family income and parental education. Effect sizes using Cohen's *d* are also reported.

High school students (*M* = 6.37, *SD* = 3.42) used Facebook more often than university students (*M* = 5.56, *SD* = 2.46), *F* (1,315) = 5.84, *p* < .05). While the effect size of this relationship was small (Cohen's *d* = - .27), the difference persisted after controlling for parental income and education (*p* = .01). High school and university students also differed in relation to how long they spent on Facebook. High school students (*M* = 2.72, *SD* = 1.18) used Facebook for longer periods of time than university students (*M* = 2.32, *SD* = 1.09; *F* (1,315) = 8.80, *p* < .05). The effect size of this relationship was medium (Cohen's *d* = - .35). This difference also persisted after controlling for parental income and education, the difference between the groups persisted (*p* = .01). In relation to self-discipline, high school students (*M* = 41.82, *SD* = 16.36) appeared to have more variability in their ratings than university students (*M* = 42.38, *SD* = 11.80), but there was no significant difference between high school and university student's self-discipline (*F* (1,313) = .119, *p* > .10). This remained unchanged after accounting for parental income and education (*p* > .10).

Table 25
Facebook use and self-discipline outcomes of high school and university students

Measures	High School (*N* = 106)	University (*N* = 211)	*F* (1, 315)	*p*[a]	Adjusted p[b]	Effect Size
	M (SD)	*M (SD)*				
Facebook use						
Frequency	6.37 (3.42)	5.56 (2.46)	5.84	.02*	.01**	- .27
Intensity	2.72 (1.18)	2.32 (1.09)	8.80	.003**	.01**	- .35
Self-discipline	41.82 (16.36)	42.38 (11.80)	.119	.731	> .10	

Note. Effect size calculated using Cohen's *d*; [a] Statistical significance of tests for linear trend for one-way analysis of variance; [b]Adjusted for parental income and education; *** *p* < .001, ** *p* < .01, * *p* < .05.

To determine whether academic performance varies by the extent and type of Facebook use, a one-way between-groups analysis of covariance and a chi-square test of

independence were conducted. Students were stratified into low, medium and high frequency groups and intermittent versus continuous Facebook groups. Results for high school and university students are reported in Table 26 (page 67) and Table 27 (page 67), respectively.

The extent of time spent on Facebook was not a predictor of grades for either high school or university students (F (2, 104) = .426, p > .10 and F (2, 208) = .12, p >.10, respectively). The pass/fail rates of high school students, however, significantly differed by extent of Facebook use (χ^2 (2, N = 106) = 5.64, p < .01). The majority of students who failed were in the high Facebook usage category (46.20%) whereas students who passed were mostly in the low (47.30%) and medium Facebook frequency group (34.40%). However, the strength of the relationship between time spent on Facebook and grades was small (Cramer's V = .23). In contrast, the pass/fail rates of university students did not significantly differ by extent of Facebook use (χ^2 (2, N = 211) = 4.10, p > .10). The results suggests that extent of time spent on Facebook does not necessarily increase or decrease overall grades for students, but may increase high school students' likelihood to pass or fail.

In relation to intensity of Facebook use, high school students were the only group whose grades were significantly affected. High school students who checked their Facebook for intermittent periods of time (M = 5.60, SD = 1.90) had a significantly better grade score than students who kept their Facebook open all day (M = 4.13, SD = 2.19). Although the effect size was small (*eta squared* = .04), being in the intermittent group was responsible for an increase in grade score in high school students (refer to Table 26). Students who did not leave Facebook all day on average received a grade equivalent of a merit (or B-/B) and students who continuously kept Facebook open all day had a grade equivalent of an achieved (or C+). In contrast, university students' grade score were not affected by the intensity of their Facebook use (F (2, 208) = .12, p > .10). The intensity of Facebook use (i.e., intermittent vs. continuous users) did not affect pass/fail rates for high school and university

students (χ^2 (2, $N = 106$) = 2.57, $p > .10$ and χ^2 (2, $N = 211$) = 9.69, $p > .10$, respectively). The results indicate that the intensity of Facebook use may affect high school students grade score but cannot predict a high school or university student's likelihood to pass or fail.

Table 26
Impact of extent and type of Facebook use on high school students' academic performance

| Academic Outcomes | Extent and type of Facebook use | | | F/χ^2 | p | Effect Size |
	Low ($N = 47$)	Moderate ($N = 36$)	High ($N = 23$)			
M (SD) Grade Score	5.30 (1.60)	5.70 (2.13)	5.45 (1.97)	.426	.654	
% (n) pass	47.30 (44)	34.40 (32)	18.30 (17)			
% (n) fail	23.10 (3)	30.8 (4)	46.20 (6)	5.64	.013**	.23
	Intermittent ($N = 95$)	Continuous ($N = 11$)				
M (SD) Grade Score	5.60 (1.90)	4.31 (2.19)		4.39	.039*	.04
% (n) pass	91.40 (85)	8.60 (8)				
% (n) fail	76.90 (10)	23.10 (3)		2.57	.133	

Note: Effect size was calculated with *eta* squared for grade scores and Cramer's V for the pass/fail rates; ** $p < .01$, * $p < .05$

Table 27
Impact of extent and type of Facebook use on university students' academic performance

| Academic Outcomes | Extent and type of Facebook use | | | F/χ^2 | p |
	Low ($N = 79$)	Moderate ($N = 116$)	High ($N = 16$)		
M (SD) Grade Score	5.50 (1.69)	5.42 (1.47)	5.30 (2.24)	.12	.884
% (n) pass	37.0 (71)	56.3 (108)	6.8 (13)		
% (n) fail	44.4 (8)	38.9 (7)	16.7 (3)	4.10	.117
	Intermittent ($N = 95$)	Continuous ($N = 11$)			
M (SD) Grade Score	5.48 (1.58)	5.11 (1.93)		.92	.339
% (n) pass	91.1 (175)	8.9 (17)			
% (n) fail	88.9 (16)	11.1 (2)		9.69	.095

3.7 Group differences in self-discipline as a function of extent of Facebook use

To examine the impact of student's level of self-discipline on academic performance, a one-way between-groups analysis of variance was conducted (see Table 28 and Table 29, page 69). Self-discipline was also examined as a function of Facebook use as the relationship between these two variables is somewhat implied in the literature.

There was a statistically significant relationship between academic performance and self-discipline for high school (F (2,103) = 61.07, $p < .001$) and university students (F (2,208) = 18.62, $p < .001$). The strength of the relationship was calculated as large (*eta squared* = .54) and small (*eta squared* = .23) for high school and university groups, respectively. Post-hoc comparisons using the Tukey HSD test for high school students indicated that the mean score for low ($M = 3.42$, $SD = 1.40$), moderate ($M = 5.84$, $SD = 1.48$) and high ($M = 7.14$, $SD = 1.01$) self-discipline groups were all significantly different from each other ($p < .001$). For university students, the mean score for the low self-discipline group ($M = 3.42$, $SD = 1.40$) was significantly different ($p < .001$) from the moderate ($M = 5.87$, $SD = 1.48$) and high self-discipline groups ($M = 7.14$, $SD = 1.01$). Only the moderate self-discipline group did not significantly differ from the high self-discipline group. However, the mean difference between these two groups were just shy from reaching statistical significance ($p = .06$). Interestingly, the NCEA and university grade equivalent scores for both the high school and university sample are *identical*. Students who had low self-discipline had a NCEA grade equivalent score of an achieved (or a university grade of 'C'). Students who had medium to high self-discipline on the other hand had a NCEA grade equivalent of merit (or a 'B-/B grade) or excellence (or an 'A-/A' grade), respectively. Overall, self-discipline was responsible for a grade difference in grade scores. A student's ability to manage distractions and procrastinating tasks is an important skill to have to increase their chances of achieving higher academic achievement.

A significant difference was found in high school (χ^2 (2, $N = 106$) = 34.27, $p < .001$) and university students (χ^2 (2, $N = 211$) = 47.38, $p < .001$) level of self-discipline and pass/fail rates. The relationship between extent of self-discipline and grades was strong (Cramer's V high school= .57 and Cramer's V university = .47). High school and university students who were in the low self-discipline groups had lower pass rates (59.38% and 63.41% respectively) than those who were in the medium and high self-discipline groups. For example, all of the high school students who employed medium or high self-discipline passed. For university students the majority of students who employed moderate self-discipline passed (97.37%) and all of the students in the high self-discipline group passed (100%). The results suggest that higher levels of self-discipline increase overall pass rates.

Table 28
Impact of self-discipline on academic achievement outcomes of high school student's

	Level of self-discipline			F/χ^2	p	Effect Size
Academic Outcomes	Low ($n = 32$)	Moderate ($n = 46$)	High ($n = 28$)			
M (SD) Grade Score	3.42 (1.40)	5.87 (1.48)	7.14 (1.01)	61.07	< .000***	.54
% (n) pass	59.38 (19)	100 (46)	100 (28)			
% (n) fail	30.62 (13)	0 (0)	0 (0)	34.27	< .000***	.57

Note: Effect size was calculated with *eta* squared for grade score and Cramer's V for the pass/fail rates

Table 29
Impact of self-discipline on academic achievement outcomes of university student's

	Level of self-discipline			F/χ^2	p	Effect Size
Academic Outcomes	Low ($n = 41$)	Moderate ($n = 152$)	High ($n = 18$)			
M (SD) Grade Score	4.12 (2.23)	5.67 (1.23)	6.50 (1.02)	18.62	< .000***	.23
% (n) pass	63.41 (26)	97.37 (148)	100 (18)			
% (n) fail	36.59 (15)	2.63 (4)	0 (0)	47.38	< .000***	.47

Note: Effect size was calculated with *eta* squared for grade score and Cramer's V for the pass/fail rates; The Brown-Forsythe test was conducted to account for the unequal variance between groups.

3.8 Associations between academic performance and primary outcomes variables

To assess the degree to which group differences in academic achievement were associated with self-discipline, parenting style, and parental income and education in addition to frequency and intensity of Facebook use, a Pearson's product-moment correlational analysis was performed for each group separately (refer Table 30 and Table 31 on page 72 and 73, respectively). The strength and direction for variables that significantly correlate with each other are presented and discussed below.

There was no relationship between Facebook frequency and intensity for both high school and university students. The frequency of Facebook use, however, had a small negative relationship with university students' self-discipline scores ($r = -.22$, $N = 211$, $p < .001$). This suggests that as university students' Facebook checking increases, self-discipline decreases. Facebook intensity was found to have a small negative correlation with academic achievement for high school students ($r = -.23$, $N = 106$, $p < .001$) which indicates that as the amount of Facebook time increases, academic achievement decreases. High school students' intensity of Facebook use was also found to have small relationships with the three parenting styles (authoritative $r = -.21$, $n = 67$, $p < .05$, authoritarian $r = -.29$, $n = 12$, $p < .01$ and permissive $r = .25$, $n = 27$, $p < .01$). The results indicate that as authoritative and authoritarian PPQ subscales increase, intensity of Facebook use decreases. However, as permissive PPQ scores increase, the intensity of Facebook user also increases. Interestingly, university students' self-discipline and grade scores did not correlated with Facebook intensity. Furthermore, the authoritative and authoritarian parenting subtypes were not associated with the frequency and intensity of Facebook use for both groups. Permissive parenting, on the other hand, had a small positive relationship with Facebook frequency for university students ($r = .15$, $n = 30$, $p < .05$), which was not present for the high school group.

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Self-discipline and academic achievement had a large positive relationship indicating that high school ($r = .79$, $N = 106$, $p < .001$) and university students ($r = .43$, $N = 211$, $p < .001$) who were more prone to employ self-discipline achieved higher grades. Parenting styles were also found to have moderate to large correlations with the self-discipline for both high school and university students. The results signify that as authoritative and authoritarian scores increase, self-discipline increases. In contrast, as scores on the permissive PPQ scale increase, self-discipline scores decrease. Moderate to large relationships were also found between academic achievement and parenting for both high school and university students. More specifically, authoritative and authoritarian parenting styles had a positive relationship with academic achievement scores. In contrast, a negative relationship was found for permissive parenting style. Parents/caregivers who scored higher on the authoritative and authoritarian PPQ subscales were more likely to have a daughter/son with higher academic grades. Parents/caregivers who scored higher on the permissive PPQ subscale were more likely to have a daughter/son with lower academic grades.

Finally, a number of other significant relations were observed between measures. Parental income and education were found to have a strong positive relationship with each other for both high school ($r = .57$, $n = 106$, $p < .001$) and university students ($r = .35$, $N = 211$, $p < .001$) which suggests that as parental income increases, so does education. High school students' parental income ($r = .21$, $N = 106$, $p < .05$) and education ($r = .23$, $N = 106$, $p < .05$) had a positive relationship with academic achievement. This relationship implies that as income and education increases, so does academic achievement scores.

Table 30

Pearson product-moment correlations for the high school group between measures of Facebook frequency and intensity, self-discipline, parenting styles and social background characteristics

	Facebook Frequency	Facebook Intensity	Self-discipline	Academic Score	Authoritative PPQ	Authoritarian PPQ	Permissive PPQ	Parental Income	Parental Education
Facebook Frequency	1.00	.10	.06	.04	.15	- .11	.05	.04	.08
Facebook Intensity		1.00	- .17	- .23*	- .21*	- .29**	.25**	- .09	.11
Self-discipline			1.00	.79***	.50***	.49***	- .71***	.09	.05
Academic Score				1.00	.66***	.43***	- .63***	.21*	.23*
Authoritative					1.00	.14	- .46***	.00	.02
Authoritarian						1.00	- .69***	- .03	- .08
Permissive							1.00	.06	- .04
Parental Income								1.00	.57***
Parental Education									1.00

Note: Self-discipline was measured through the Distractibility for Academic Tasks and Procrastination Scale; PPQ = Parenting Practices Questionnaire; *** $p < .001$, **$p < .01$, * $p < .05$

Table 31

Pearson product-moment correlations for the university group between measures of Facebook frequency and intensity, self-discipline, parenting styles and social background characteristics

	Facebook Frequency	Facebook Intensity	Self-discipline	Academic Score	Authoritative PPQ	Authoritarian PPQ	Permissive PPQ	Parental Income	Parental Education
Facebook Frequency	1.00	.13	- .22***	- .02	.00	- .05	.15*	- .06	- .04
Facebook Intensity		1.00	- .13	- .08	.00	- .03	.10	- .17*	.02
Self-discipline			1.00	.43***	.35***	.28***	- .38***	- .01	.08
Academic Score				1.00	.57***	.28***	- .51***	.09	.16*
Authoritative					1.00	.11	- .32***	.09	.10
Authoritarian						1.00	- .57***	- .09	.07
Permissive							1.00	- .01	- .14*
Parental Income								1.00	.35***
Parental Education									1.00

Note: Self-discipline was measured through the Distractibility for Academic Tasks and Procrastination Scale; PPQ = Parenting Practices Questionnaire; *** $p < .001$, **$p < .01$, * $p < .05$

Only parental education was positively associated with university student's grades ($r = .16$, $N = 211$, $p < .05$) and not parental income. A small negative relationship was found between parental income and the intensity of Facebook use. This implies that as income increases, Facebook intensity decreases. Additionally, the university students/caregivers education had a small negative relationship with the permissive parenting subscale. This signifies that as parental education increases, scores on the permissive subscale decrease. No relationships were found between self-discipline and parental income and education for both groups.

To examine the impact of parenting styles on the academic achievement levels obtained by high school and university students, a chi-square test for independence was conducted. Unadjusted and adjusted odds ratios (and 95% confidence intervals) from chi-square analyses are also reported as measures of the strength of the associations between parenting styles and subsequent academic achievement outcomes. The results are shown in Table 32 (page 76) and Table 33 (page 77).

A significant association was found between authoritative (χ^2 (1, $N = 106$) = 13.98, $p < .001$) and permissive (χ^2 (1, $N = 106$) = 22.14, $p < .001$) parenting styles and high school students' level of academic achievement. The magnitude of the relationship was calculated by odds ratio which indicated that high school students subject to authoritative parenting had 0.14 times *the risk* of low academic achievement outcomes than those who were not parented by this style. Odds ratios that are less than one represent a "protective effect" which means that an increase in the predictor variable (i.e., parenting style) leads to a drop in the odds of the outcome variable occurring (i.e., low academic achievement). The results show that authoritative parenting style decreases the likelihood of low academic achievement. In order to interpret the odds ratios less than one further, they can be inverted (Davies, Crombie, & Tavakoli, 1998). In this case, those subject to an authoritative parenting style were 7.14 times

more likely to have medium or high academic grades than those who were not parented by this style. Correspondingly, odds ratios that exceed one indicate an "increased risk" effect which means that an outcome is more likely to occur (Davies et al., 1998). For high school students those subject to a permissive parenting style were 9.52 times *the risk* of having low academic achievement than those were not parented by this style. No association was evident between students who were subject to authoritarian parenting and level of academic achievement ($p = .46$).

Similar to high school students, significant associations between authoritative ($\chi^2(1, N = 211) = 25.89$, $p < .001$) and permissive ($\chi^2(1, N = 211) = 34.56$, $p < .001$) parenting styles and level of academic achievement was also found for university students. Odds ratios indicated that students in the authoritative group were 0.19 times the risk of low academic achievement. In other words, students with authoritative parents were 5.26 times *more likely* to have medium to high academic grades. In contrast, university students subject to permissive parenting had 9.73 times the risk of having low academic achievement. No association was found for students in the authoritarian group and level of academic achievement ($p = .79$). All the findings reported above were robust to the statistical control for the effects of parental income and education.

3.9 Predictors of academic achievement outcomes

Finally, to test whether Facebook use can predict levels of academic performance, after controlling for the influence of self-discipline and parenting styles a hierarchical multiple regression was performed. The primary outcome variable was the numeric conversion score of students' grades. No colinearity was found among the primary outcome variables during the multiple regression procedure.

Table 32

Relations between parenting styles and level of academic achievement among high school students

Parenting Styles	Academic Achievement Performance Level Groups			χ^2	Unadjusted p^a	Unadjusted OR (95% CI) Low Achievement[c]	Adjusted OR (95% CI)	Adjusted p^b
	Low (N = 22)	Medium (N = 27)	High (N = 57)					
% Authoritative	27.3	66.7	75.4	13.98	< .001***	0.14 (0.05 – 0.41)	.12 (.04 – .37)	< .001***
% Authoritarian	9.1	7.4	14.0	.061	.46	0.740 (.149 – 3.65)	.77 (.15 – 3.85)	.71
% Permissive	63.6	25.9	10.5	23.59	< .001***	9.52 (3.34 - 27.03)	12.50 (3.83 – 40.82)	< .001***

[a]Unadjusted *p* value tests for the Mantel Haenszel chi-squared test of linear association, [b]Adjusted for parental income and education, [c] This is the odds that a student who belongs to particular parenting style receives low academic achievement as opposed to "not low" achievement (neither medium or high grades), *** *p* < .001, ** *p* < .01, * *p* < .05

Table 33

Relations between parenting styles and level of academic achievement among university students

Parenting Styles	Academic Achievement			χ^2	Unadjusted p^a	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted p^b
	Performance Level Groups							
	Low	Medium	High			Low Achievement[c]		
	(N = 64)	(N = 50)	(N = 97)					
% Authoritative	54.7	80	89.7	25.89	< .001***	0.19 (.10 – 0.38)	.21 (.10 – .42)	< .001***
% Authoritarian	9.4	10	8.2	.07	.79	1.07 (.39 – 2.94)	1.03 (.361 – 2.93)	.15
% Permissive	35.9	10	2.1	34.56	< .001***	11.23 (4.48 – 27.78)	9.73 (3.88 – 24.60)	< .001***

[a]Unadjusted *p* value tests for the Mantel Haenszel chi-squared test of linear association, [b]Adjusted for parental income and education, [c] This is the odds that a student who belongs to particular parenting style receives low academic achievement as opposed to "not low" achievement (neither medium or high grades), *** *p* < .001, ** *p* < .01, * *p* < .05

The covariates; self-discipline and authoritative and permissive parenting were entered first into the regression equation to predict academic achievement. Facebook use was then added in the next step. All covariates were significant as predictors of academic achievement as hypothesised ($R^2 = .550$, $p < .001$). Facebook use, however, was not a significant predictor of academic achievement when added after the covariates nor did its inclusion significantly improve the model ($\Delta R^2 = .001$, $F(1,312) = 0.376$, $\beta = 0.024$, $p = .540$). In other words, Facebook use does not predict academic achievement above and beyond a model containing self-discipline, authoritative and permissive parenting styles. Parental income ($\Delta R^2 = .013$, $F(1,308) = 9.38$, $\beta = .166$, $p = .002$) and education ($\Delta R^2 = .007$, $F(1,307) = 4.95$, $\beta = .093$, $p = .027$) were also found to be significant predictors of academic achievement when added to the model.

Table 34
Summary of Hierarchical Regression: Predictors of high school and university students' academic performance (n = 313)

			Current Block				Final Model	
	R^2	ΔR^2	F	p	β	p	β	p
Block 1	.550			.000				
Self-discipline					.296	.000	.292	.000
Authoritative					.379	.000	.372	.000
Permissive					-.255	.000	-.252	.000
Block 2	.551	.001	0.38	.540				
Facebook Use					.024	.540		
Block 3	.564	.013	9.38	.002				
Parental Income					.116	.002	.074	.076
Block 4	.571	.007	4.95	.027				
Parental Education					.093	.027	.093	.027

Note: Dependent variable: academic performance.

CHAPTER FOUR – DISCUSSION

The aims of this study were to examine whether Facebook use and self-discipline impact on academic performance and whether academic performance varies by the extent and type of Facebook use. The influence of parenting style on academic performance was also analysed and the extent to which self-discipline and parenting style contribute to academic outcomes over and above Facebook use and socio-familial outcomes. The key findings presented in Chapter Three are reviewed below in relation to the delay of gratification conceptual framework proposed in Chapter One. Limitations, methodological issues, future research, practical implications and strength of the study are also discussed.

4.1 Interpretation of Findings

The hypothesis that self-discipline, parenting styles and socio-familial factors would be mediating variables in the relationship between Facebook use and academic achievement was not supported. More specifically, Facebook use overall was *not* a predictor of academic achievement. On the other hand, self-discipline and parenting style were the strongest predictors of academic achievement. Parental income and education were also found to have a small effect on academic outcomes of students.

The results from the multiple regression analysis are inconsistent with the findings outlined earlier: that the extent and type of Facebook use has an effect on high school students' pass/fail rates and grade scores (see Table 26, page 67). The impact of Facebook use on grades observed in high school students may be due to a false positive (i.e., incorrectly providing support for the hypothesis), particularly because the effect size was small. It may be the case that there is no developmental difference in the impact of Facebook use on high school and university students. The inconsistency in the results leads to the conclusion that Facebook use does not directly affect grades. Facebook use may be an amalgamation of

behaviours and/or a component of a trait (e.g., low self-discipline) that leads students to engage in non-task related activities. This argument is based on findings within this study along with previous research which found that a student's choice to delay gratification is largely influenced by their level of self-discipline and their parent's style of parenting (Duckworth & Seligman, 2005; Fuligni, 1997; Gonzalez & Wolters, 2006; Moffitt et al., 2011). A simple example could be that a struggling and less self-disciplined student may use distractions such as Facebook to avoid the negative affect generated from attempting to study (e.g., being frustrated). Furthermore, the student's parent or caregiver may provide minimal direction when their child is procrastinating, thus perpetuating the child's behavioural pattern. On the other hand, a capable, more self-disciplined student may, after a sufficient amount of study time, relax and socialise with friends through Facebook. In this case, parents have probably taught their child to effectively utilise rewards after successfully completing academic tasks and to independently self-regulate impulses. For the first group, Facebook has a detrimental effect but so would other external (e.g., a friend's birthday party) or internal (e.g., day dreaming) distractors. For the second group, Facebook use had no effect. Facebook use competed with neutral behaviours (i.e., activities that the student enjoys such as tennis, gardening, relaxation or socialising) which did not jeopardise academic goals and study.

This proposed pattern outlined above is supported to some extent by the current sample of participants. High school students with low self-discipline did not check Facebook significantly more often than students with high self-discipline. However, both high and low self-discipline groups had a significantly higher average rate of Facebook checking than students whose scores fell in the middle of the self-discipline scale[6]. University students followed the same trend with low and high self-discipline students checking Facebook more

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[6] These results were presented in the discussion section as they were subsequently tested in light of the reasoning presented above.

frequently than students in the moderate self-discipline group. No differences were found in the rates of checking between the low and high self-discipline university groups. It should be noted that for both analyses, there was very little difference in Facebook checking between groups with low and high self-discipline and those with moderate self-discipline. For example, the difference in high school students Facebook checking for the low and moderate self-discipline groups was by an extra one to five times a day: a behaviour which is unlikely to provide substantial competition to reduce productive study behaviours.

The self-discipline scale measures its construct through questions about the frequency of distraction and procrastination behaviours. Facebook use was anticipated to be higher for students with low self-discipline and lower for students with high self-discipline, particularly because this relationship has been implied in the literature. More specifically, previous research has suggested that Facebook is used for procrastination and can be detrimental to a student's or a worker's productivity (Archambault & Grudin, 2012; Bloomfield, 2009; Pearson, 2012). Furthermore, previous research has found that students who use Facebook spent less time studying (one to five hours per week) than non-Facebook users (11 to 15 hours per week). If Facebook is used solely for distraction, the pattern that low and high self-discipline groups have similar Facebook checking is unlikely to have occurred. The results indicate that Facebook is likely to be used for two purposes: as a distraction and as a non-competing study behaviour that is not harmful to academic outcomes. This conflict of purpose could prevent the ability to detect the effects of Facebook use on pro-academic behaviours and therefore grades. The importance of defining the purpose of Facebook use had already been established; for example, Hu and Kuh (2001) found that students enrolled in a university that were more connected or wired were able to immediately ask their teachers and peers questions related to study which aided engagement in class. Heiberger and Harper (2008) also found that university students who spent more time on Facebook were not

spending more or less time studying but instead spent more time socialising at university. Unfortunately the participants in this study were not asked about the purpose of their Facebook use.

Self-discipline, parenting styles and socio-familial factors predicted 57.1% of the variance in the academic achievement of high school and university students. Overall, self-discipline and parenting style emerged as the most important predictors of academic achievement. Students who are able to manage distractions and procrastination (i.e., high self-discipline) will have better academic grades than those who have low self-discipline. There was a strong, positive relationship between self-discipline and academic grades for both high school and university students. More specifically, students with medium to high self-discipline achieved a merit (or a B-/B grade) and excellence (or an A-/A grade), respectively. In contrast, students with low levels of self-discipline attained an achieved (or a C grade). High school and university students were also more likely to pass and achieve better grades when self-discipline was high.

The findings support Duckworth and Seligman's (2005) and Moffitt et al.'s (2011) research that self-discipline is a strong predictor of academic achievement. Postponing immediately gratifying opportunities in favour of pursuing academic goals (that are ostensibly more valuable) has a strong impact on academic grades. Students who had high academic grades, in this study, were likely to have set academic goals, self-regulate their emotions, and manage their stress and approach to study (Duckworth & Seligman, 2005). These characteristics facilitate the student's ability to be cognitively engaged to learn, and remember and comprehend class material, which results in higher grades (Bembenutty, 1998). The positive reinforcement and feedback from parents, peers and teachers are likely to maintain the student's ability to successfully avoid task irrelevant activities (e.g., going to a party with friends) in pursuit of a long-term goal (Bembenutty, 1998).

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Students with low self-discipline, on the other hand, are likely to undervalue the reward of studying, have lower self-efficacy and have little interest in their studies (Pintrich & de Groot, 1990). Students with low self-discipline also typically experience difficulty in persistence and concentration during completion of an academic task, and struggle to regulate emotions and to suppress unwanted thoughts (Baumeister, 2002; Duckworth et al., 2011). Previous research has shown that distractibility (a component of low self-discipline) predicts the amount of academic textbooks read (e.g., high distractibility results in fewer books read) due to the decreased amount of time available for study and the development of a short and shifting attention span (Rosen, Carrier, et al., 2013). This in turn leads students to obtain poorer course grades and to have lower self-esteem, perpetuating distraction and procrastinating behaviours (Dewitte & Lens, 2000; Rosen, Carrier, & Cheever, 2013).

Parents who were responsive to the child's needs but set high expectations and standards decreased the risk of low academic achievement. Parenting style primarily influences self-discipline as this skill is nurtured through being in a long-term, positive relationship with a parent/caregiver who communicates the value of this goal (Strayhorn, 2002). Authoritative parents use adaptive control techniques such as bi-directional communication, emotional support and autonomy within boundaries (Darling & Steinberg, 1993; Gonzalez & Wolters, 2006). These techniques allow children to reach their full academic potential as well as having other psycho-social benefits such as optimism, better task persistence, higher self-esteem, responsiveness to parents' views and moral maturity (Amato & Fowler, 2002; Arnold et al., 2004; Aunola, Stattin, & Nurmi, 2000a).

Darling and Steinberger (1993) use their contextual model in *Figure 2* (page 19) to further explain that parenting style is a result of goals and values that parents hold which enhance the effectiveness of parenting practices (i.e., the content of the socialisation process). Parenting styles serves as the context for the development of emotional regulation, an

important aspect of self-discipline. Parents who are kind yet firmly demanding on their child (an authoritative parenting style) foster the trait of self-discipline more effectively than parents who are permissive in nature (Strayhorn, 2002). Authoritative parents transfer their own values and beliefs (e.g., that education and self-discipline are important) to the child which are internalised through reinforcement, modelling and observation (Bandura, 1977). The student as a result becomes motivated to do well in school based on internal instead of external factors (Schunk, 1991). Positive reinforcement is also provided contingent to completing an academic task. Within this study, authoritative parenting and self-discipline had a strong positive correlation. This further supports the conceptualisation that the effect of parenting style on academic achievement is due to the child's internalisation of the value of self-discipline.

While an authoritarian parenting style had a moderate positive correlation with academic grades, there was no impact on academic achievement level. Authoritarian parenting style also had a positive relationship with self-discipline. Previous research in Australia, the US and China indicated that authoritarian parenting would have a negative effect on academic grades (Leung et al., 1998). However, authoritarian parenting lead to better outcomes in Asian Americans compared to European Americans (Leung et al., 1998). Thus, ethnicity may be an important factor to consider when determining the effects of parenting style on academic outcomes. Whilst outside of the brief of this study, an examination of parenting styles favoured by Māori (both traditionally and currently), and those favoured by New Zealand Europeans may provide some insight into children's educational outcomes and explain why authoritarian parents did not decrease academic achievement level. Comparative research in the New Zealand context would be relevant and potentially revealing. Moreover, authoritarian parents within this study may have been under-

represented (high school $n = 12$ and university $n = 19$). Descriptive statistics further indicate that authoritarian parenting style was uncommon in this study.

Parents who used a permissive parenting style increased the risk of low academic achievement, consistent with the initial hypothesis. A strong negative correlation between permissive parenting and self-discipline suggests that permissive parents may not model or undervalue self-discipline. Previous research has shown that children with permissive parents are often dependent on external rewards to complete a socially acceptable behaviour (e.g., cleaning room or studying for an exam) (Grusec & Goodnow, 1994; Locke & Prinz, 2002). The findings within this study validate Abar et al.'s (2009) findings that permissiveness is negatively associated with study skills and self-regulation. More specifically, the student is less likely to structure their environment for study appropriately (e.g., study in a quiet location) and resist temptations and/or distractions available (Abar et al., 2009). This is primarily due to permissive parents providing minimal direction and consequences for misbehaviour as this style of parenting tends to avoid confrontation (Baumrind, 1991). In turn, children with permissive parents are reinforced to be impulsive, disobedient and rebellious, performing poorer academically than students with authoritative parents (McBride-Chang & Chang, 1998).

Small correlations were found between socio-familial factors (such as parental income and education) and academic scores of high school students. Parental education had a small positive correlation with academic score for university students. There was no association between parental income and academic scores for university students. This may be due to the availability of student loans and allowances to students who choose to enter university and therefore income does not affect university grades. Overall, the findings are consistent with previous studies that socio-familial income has an effect on academic grades of students (Fuligni, 1997). While this relationship exists, socio-familial factors in this study accounted

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for only a small portion of students' academic achievement: parental income and education explained 2% of the variance in academic achievement above and beyond Facebook, self-discipline and parenting styles. This supports Fuligni's (1997) findings that only a small portion of academic grades in adolescence could be explained by socio-economic status and that the most important predictors of academic achievement is the student's determination to attain an education and having a supportive group of peers (Fuligni, 1997). Furthermore, research has consistently indicated that the difference between low and high socio-economic students can be explained by the expectations placed on the child and the style in which these are communicated (Alexander et al., 2007; Walpole, 2003). Walpole (2003), for example, found that parents of high socio-economic status were more likely to view a bachelor's degree as a norm, whereas parents of low socio-economic status tended to view a high school diploma as a norm.

The positive relationship between self-discipline and academic achievement is a well-recognised phenomenon which has been found in many countries (Akinsola et al., 2007; Klassen et al., 2009). The findings of this study may be linked to different aspects of the delay of gratification conceptual framework proposed in *Figure 3* (page 15). For example, students who procrastinate often feel irrational and foolish when engaging in these behaviours (Briody, 1980). Despite this, students struggle to successfully delay gratification to pursue a long term goal. It is important to promote and facilitate the development of self-discipline in students. Furthermore, previous research and findings within this study clearly show that authoritative parents foster the best educational outcomes. Permissive parents, on the other hand, increase the risk of low academic achievement. More studies need to be conducted on parents with an authoritarian parenting style in New Zealand to determine its true effect on academic outcomes.

4.2 Limitations

Several limitations and methodological considerations arise within the current

research, particularly concerning the use of self-report and questionnaires, low response rates

and confounding variables that were not accounted for.

Self-report and Questionnaires. The data was collected through self-reports and

questionnaires. A memory bias could have been present for students who, for example, had to

remember their grades from the *previous semester* as well as how many times they checked

Facebook. Participants could have remembered their grades and frequency and intensity of

Facebook use inaccurately as retrospective data was required within the study. The scale that

assessed Facebook use was a composite of only two items. These items may have led to an

under or over estimate of actual Facebook use. The use of a measure that has been previously

tested for convergent and predictive validity would have increased the confidence of the

findings within this study (Coolican, 2013).Future research could use school records of

grades and standardised achievement test scores as measures of academic performance to

increase validity. Self-report also places heavy reliance on participants to provide honest and

introspective responses (Coolican, 2013). The degree to which students and parents were able

to accurately report information about Facebook use, self-discipline, parenting styles and

parental income and education is unclear.

It is essential for the questionnaires to be updated and investigated within the context

of New Zealand society as the measures used were US-based (i.e., DATS, PS, and the PPQ).

Social desirability could have also biased the results: participants could have provided

answers that were more socially acceptable or favourable. For example, parents may have

been reluctant to answer question six (i.e., "I smack my child when s/he is naughty") in the

PPQ truthfully because this form of physical discipline is illegal in New Zealand (New

Zealand Legislation., 2007). The smacking example supports the argument that the PPQ is

outdated (1995) and US-based. The current study also could not examine the relationship between neglectful parenting style and academic outcomes because the PPQ did not include the neglectful parenting typology. Exploration of this relationship could further provide evidence that neglectful parenting can have a detrimental effect on educational outcomes in childhood. This is relevant as New Zealand has one of the highest rates of child maltreatment (Every Child Counts., 2010). In relation to social desirability potentially biasing the results, the consistency of the research findings within this study collectively suggests that parenting style has a clear influence on educational achievement and other aspects of child development. On the other hand, conducting a behavioural observation of parenting practices is subject to other limitations. These include reactivity (when a participant changes their behaviour as a result of being aware that their behaviour is being assessed) and low inter-rater reliability (Spiegler & Guevremont, 2010).

Overall, the limitations mentioned above were considered by creating a questionnaire that was easy to understand and anonymous so participants were encouraged to answer truthfully without being identified. The questionnaire had reverse coded items, and participant's responses were screened for missing entries to ensure validity. Furthermore, the participants were not told the study concerned Facebook use so existing pre-conceptions about the relationship between Facebook use and academic achievement could not have biased the results of the study.

Response Rate. Despite repeated reminder e-mails to students who did not have a parent-caregiver match, the response rates for both high school (62.10%) and, particularly, university students (37.08%) were low which suggests that findings within this study may have been biased. The sample used within this study was a subgroup ($n = 634$) of the overall recruited participants ($N = 1,381$) based on whether the student had a parent-caregiver match. The sample selection bias may have reduced the heterogeneity in parenting style (e.g., fewer

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authoritarian parents may have replied) thereby limiting the ability to detect associations with academic grades. Furthermore, students with parent-caregiver matches who successfully recruited their parents to complete the questionnaire may be higher in self-discipline than those who did not have a parent-caregiver match.

The inclusion of students who did not have a parent-caregiver match in this study could have decreased the strength of the relationship of self-discipline and academic outcomes. However, descriptive analysis showed that self-discipline scores were not negatively skewed. Specifically, high school students were spread out evenly across the three self-discipline groups and the majority of university students described themselves as being moderately self-disciplined. Nevertheless, future research on students who did not have a parent-caregiver pair would be necessary to detect whether there is a change in associations between Facebook use, self-discipline and academic grades. This would maximise validity and generalisability of the current findings.

Confounding Variables. IQ is a potential confounder variable in this study, as it has been shown to be a direct predictor of academic achievement. However, a large scale study conducted by Duckworth and Selignman (2005) has shown that it rarely accounts for more than 50% of the variance in the academic success of students. Duckworth and Selignman (2005) provided evidence that self-discipline is a more accurate predictor of academic grades than IQ. They suggested that the major reason for students falling short of their intellectual abilities is their failure to exercise self-discipline. A latter study conducted by Duckworth et al. (2011) further validated Duckworth and Selignman's (2005) findings and found that IQ *did not* moderate the impact of self-discipline on academic achievement. This suggests that non-intellectual strengths such as the ability to be distracted or resist procrastination are variables that are as important as, if not *more important,* than IQ.

Socio-economic status was another confounding variable identified. One of the best established associations in educational research is the relationship between measures of social stratification (family income, education, social class) and measures of academic achievement (Sirin, 2005; White, 1982). Young people who are from less advantaged families are more likely to gain poorer academic grades and attend a school with limited financial resources than young people from advantaged families (Sirin, 2005). The higher proportion of parents completing a secondary qualification and parents within the high income bracket in this study suggest that academic achievement scores from this study are skewed and may be difficult to generalise to the overall New Zealand population. For university students, generalising to the New Zealand population is not necessary as the application of this research is to higher education. Young people whose parents are from a professional/managerial socio-economic background are five times more likely to enter university than young people from unskilled/skilled socioeconomic family backgrounds (Fergusson & Woodward, 2000). This suggests that the university students within this study reflect the general student university population. While the family demographic characteristics for high school students' parents/caregivers show a larger proportion of high socio-economic families, the schools were chosen from representative decile groups (see Table 5 on page 40). Grades were also similar for both high school and university students and were consistent with NCEA and university pass rates.

As mentioned earlier, students' purpose for using Facebook was not assessed. This is a limitation as previous research has shown that the Internet can facilitate a productive learning environment if it is not used as a distraction or a procrastinating tool. For example, students who predominantly use the Internet to communicate to classmates and faculty staff about course work gain positive educational outcomes (Heiberger & Harper, 2008).

4.3 Future Research

Although the findings within this study raise numerous future research questions, three ideas are presented as they are seen to be the most pressing.

It would be interesting to examine whether the effects are generalisable to other social networking sites such as Twitter and My Space which have exponentially grown in recent years. Limited research to date has been conducted to investigate the effects of these former social networking sites on academic achievement. Generalisability to additional age groups, particularly mature students, could also be valuable as the effects of Facebook may be more or less present within this generation as they may or may not have established strategies to deal with such distractions.

One attribute that was not included in Darling and Steinberg's (1993) contextual model is perceived parenting style which has further important implications in children's outcomes, particularly students' motivation to succeed (Abar et al., 2009; Gonzalez-DeHass, Willems, & Holbein, 2005; Trusty & Lampe, 1997; van der Horst et al., 2007). Perceived parental involvement is related to motivational constructs such as school engagement, intrinsic/extrinsic motivation, autonomy and self-regulation (Gonzalez-DeHass et al., 2005). For example, a large study conducted on over 100,000 high school students found parental involvement had the strongest positive relationship to high school students' belief that they controlled events that affected them (Trusty & Lampe, 1997). This is especially true when the adolescent high school students perceived more parental control, which is typically accompanied by parental involvement (Trusty & Lampe, 1997). Future research could administer the PPQ measure to students and ask them to rate statements about their parent's level of involvement. It would be interesting to examine whether there is a difference between student and parent/caregiver reports of parenting style.

Future research could also use experience sampling to measure Facebook use as it was not measured directly or objectively in the current study. Junco (2013) found a significant discrepancy in university students' self-report of Facebook time and the actual amount of time spent on Facebook. More specifically, students self-report of Facebook use per day ($M = 145$ minutes, $SD = 111$) was higher than actual time spent on Facebook ($M = 26$ minutes, $SD = 30$). This is a further limitation of the current study as self-report data collected appear to be only an *approximate* rather than an *accurate* measure of Facebook use. To address this issue, future research could send students texts at random times of the day to report whether or not they are using Facebook during that time. Texts could continue to be sent over a period of seven consecutive days. Further information such as who they are with, how long they have been on and reason for Facebook use could be gauged for qualitative data. This form of self-report allows responses to be obtained within context which would contribute to the ecological validity of research findings, particularly because the availability of smartphones has made Facebook just a finger tap away (Pew Research, 2013). Information gained through experienced sampling can also be used alongside questionnaires for cross checking of self-report because it is less influenced by the unreliability of relying on memory. Recent critiques of the psychological literature express their support for this form of methodology as experience sampling investigates what people do (i.e., examining behaviour directly) rather than what they say they do (Baumeister, Vohs, & Funder, 2007; Junco, 2013).

4.4 Practical Implications

Two main practical implications are drawn which are relevant to educational settings and governmental agencies supporting parents.

Self-regulation Training. The impact of self-discipline could be relevant to educational providers and parents/caregivers to support and facilitate academic performance.

While impulse control is typically first established in childhood, it has the capacity to be strengthened well beyond these years, even in adulthood (Tangney et al., 2004). During adolescence, students are provided a large range of learning opportunities and therefore, it is vital for students to be taught a repertoire of strategies that regulate the occurrence of gratifying activities in order to achieve academically. Self-discipline is like a physical muscle which can be strengthened and enhanced (Lakes & Hoyt, 2004). Unfortunately, many students who struggle at school do not understand or have not been taught how to manage their time effectively. Students should be empowered to exert control over their education. Some schools have training programmes that allow students to review the rewards and consequences before deciding on certain behaviour. Research has shown that students who participate in self-regulation programmes are better equipped at facing challenging situations, feel more connected at school and have better social and emotional competence; consequently, they have benefited: their academic achievement and their motivation are high (Abd-el-fattah & Al-nabhani, 2012; Beacham, 2013; Durlak et al., 2011; Riggs et al., 2006).

Self-regulatory skills can also be used when using the Internet for study. For instance, being able to apply strategies such as planning, comprehension monitoring, stress-management problem-solving and inhibitory control can dramatically affect a student's ability to manage the wealth of information found on the Internet. Students are also arguably more equipped to take advantage of Facebook as a way to appropriately reward themselves after completing a pre-proposed time of study. Rosen et al. (2013) suggested that students are encouraged to take control of their Facebook or technology use to positive reinforce socially acceptable behaviour. One potential strategy for students could be completing 50 minutes of study followed by a 10 minute break (e.g., Facebook, stretching or talking to a friend). Allowing students to take control of their cognitive and affective states while learning may increase students' sense of autonomy and responsibility, which has been shown to predict

better educational outcomes (Rosen et al., 2011). The use of "technology breaks" at appropriate times could also be incorporated into an educational system as this could enhance a student's motivation to learn and provide an interesting learning environment (Rosen et al., 2011). Some schools and universities have opted to ban Facebook on campus and/or make it compulsory for students to hand in their cell-phones during class-time (Archambault & Grudin, 2012; Axon, 2010). However, Rosen et al. (2011) explained that this extreme measure may not increase attention span during class-time: just because the technology is "out of sight" it may not necessarily be "out of mind". Removing technology from students is likely to be a temporary solution. Teaching students self-regulatory skills could be a more successful long-term strategy.

Other strategies to improve self-discipline were offered by Strayhorn (2002) which include goal-setting with parents/caregivers; being part of a community or school-group that highly values productivity, self-care and loyalty; incorporating proximal milestones in order to achieve distal goals; consuming gratification as a form of reinforcement contingent on accomplishing goal-related tasks; and lastly, being surrounded by fellow students who also model delay tendencies. Students who have great difficulty resisting temptations and who are easily distracted may be able to plan their study and behaviour more effectively if they apply the strategies outlined by Strayhorn (2002). As technology and social networking sites expand in general, students are likely to find other ways to distract themselves and multitask whilst studying. Future research may also benefit from gauging other activities or tasks that are typically used by students to procrastinate and distract themselves from study.

Previous research on self-regulation training programmes have demonstrated that those initially poorest at applying delay of gratification tendencies gain the most. Therefore, there is an opportunity for the achievement-gap to decrease (Diamond & Lee, 2011). Mischel et al. (1989) strongly emphasised that delay of gratification is a skill that can be enhanced and

learned if proper training of self-regulatory strategies (such as academic goal setting, self-efficacy beliefs, and self-reflection) are provided. It is vital for policy makers, educators and the public to support and diffuse evidence-based self-regulation training programmes into standard education practice as this promotes social and emotional competency, a good attitude and behaviour, and academic development.

  Psychoeducation on Parenting Style. Self-discipline stems from and is largely facilitated by parents/caregivers of the child. Developing a psycho-educational parenting group that teaches parents strategies that are effective in developing delay of gratification strategies may be the key to improving their children's educational outcomes. Interventions addressing parenting strategies to improve the academic outcomes of their children may also reduce societal costs as obtaining a qualification increases the likelihood of employment into higher paid jobs (Earle, 2010). Strayhorn (2002) has provided several ways for parents to increase their child's ability to apply self-discipline. Parents can be good role models for promoting desired habits. They can provide the child with repeated practice of receiving promised delayed rewards and use praise as reinforcement to shape and teach delay of gratification. They can teach techniques of stimulus control such as turning the Internet off so the student will not be tempted to procrastinate on sites that are not goal directed. They can coach their children to effectively self-monitor their work (Strayhorn, 2002). Training parents/caregivers in the principles and strategies listed above is likely to improve the academic outcomes of their children. Furthermore, if parents are educated about adapting a parenting style that is authoritative in nature (i.e., with high expectations and high responsiveness to the child's needs), the delivery of delay tendency strategies will be enhanced (Darling & Steinberg, 1993). Intrinsic motivation can also be improved through positive feedback and a sense of autonomy as it increases the student's feelings of competence (Deci et al., 1999). It is important to bear in mind that the child's personality,

especially his/her openness to parental influence, will directly affect the parent's ability to teach delay of gratification strategies (Darling & Steinberg, 1993). The academic outcomes of the child are dependent on his/her willingness to be socialised by their parent/caregiver. It is essential for the child and the parent to work together towards shared goals and values to increase the likelihood of better educational outcomes.

4.5 Strength of the Study

To the best of the author's knowledge, this study is the first of its kind within New Zealand. It lays the foundations for future research on establishing the relationship between social networking sites and academic achievement. The research extends previous research on delay of gratification by examining the role and impact of parenting styles on self-discipline and academic outcomes. This study also clearly demonstrates that the effect of self-discipline and parenting styles on academic achievement is a replicable and developmentally consistent effect.

4.6 Conclusion

This research highlights the integral role that parents play in the process of instilling values and guiding their children towards academic success. A child's environment has a large influence on levels of self-discipline. Students who have internalised the value of delaying immediately distracting activities in favour of pursuing academic goals that are ostensibly more valuable are on the right pathway to better educational outcomes. The positive impact of self-discipline and parenting styles can also be extended to broader aspects of human success and well-being, which highlights the importance of providing support in these areas. While Facebook use was found to *not* directly affect academic grades, examining the effect of other social networking site's effect on educational outcomes of students remains an important task for future research.

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Zhang, L., Karabenick, S. A., Maruno, S., & Lauermann, F. (2011). Academic delay of gratification and children's study time allocation as a function of proximity to consequential academic goals. *Learning and Instruction*, *21*(1), 77–94. doi:10.1016/j.learninstruc.2009.11.003

Inclusion criteria for Facebook Literature Search

Search for original articles was undertaken through electronic data bases (e.g., PsycINFO and google scholar) from the period January 2013 to May 2013. The following subheadings and key words were used: Facebook, grades, academic achievement, technology use, Internet, and students. Studies were included in the current review if the sample size was large (> than 100 participants), the effects of technology use were examined and if the study was published less than 15 years ago in English. Studies that did not meet criteria were excluded. Six studies were included in this review and only one study examined high school students. The majority of the studies were also conducted via a survey in the US and very few studied academic achievement in terms of grade point average (GPA) and Facebook usage directly.

Inclusion criteria for Multitasking Literature Search

The same criteria were used as for the review of the technology use literature (see above for details). Search for original articles was undertaken through electronic data bases such as Psych Info and Google Scholar from the period February 2013 through to May 2013. The following subheadings and key words were used: multitasking, Facebook, grades, and academic achievement.

APPENDIX B

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
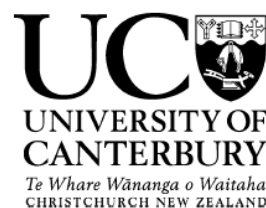
HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen
Email: human-ethics@canterbury.ac.nz

Ref: 2012/25/ERHEC

16 July 2012

Milesa Cepe
Department of Psychology
UNIVERSITY OF CANTERBURY

Dear Milesa

Thank you for providing the revised documents in support of your application to the Educational Research Human Ethics Committee. I am very pleased to inform you that your research proposal "Impacts of Facebook use on academic achievement: relations with distractibility, procrastination and and parenting style" has been granted ethical approval.

Please note that should circumstances relevant to this current application change you are required to reapply for ethical approval.

If you have any questions regarding this approval, please let me know.

We wish you well for your research.

Yours sincerely

Nicola Surtees
Chair
Educational Research Human Ethics Committee

Department of Psychology

University of Canterbury

Private Bag 4800

Christchurch

New Zealand
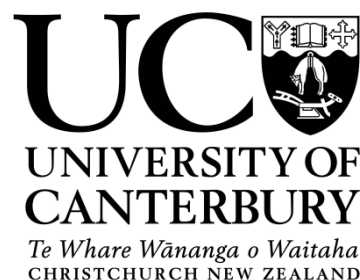
1 July 2012

Impacts of Facebook use and academic achievement:

Relations with self-discipline and parenting styles

Dear Principal,

My name is Milesa Cepe and I am studying towards my Masters of Arts in Psychology. I am writing to ask your permission to recruit students from your school to partake in an online national questionnaire about Facebook usage and academic outcomes. The study requires the involvement of high school students who are between the ages of 16– 17 and their parents. The students will be recruited through A4 posters placed around your school. Parents will be recruited by the students who partake in the study. As part of this project I will require your cooperation to place six A4 posters around the campus' noticeboards. These posters will be sent to you (via mail) should you agree to partake. The posters will be asking students to take a link to a questionnaire. After the questionnaire is complete, there will be another link for the student's parent/caregiver to complete. The questionnaire will take the students and parents about 10 minutes to complete each. Parents and students will be entered separately in a draw to win one of three $100 Westfield Shopping voucher after completing their respective questionnaires.

This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee (reference number: 2012/25/ERHEC). Participants who have any complaints should address their concerns to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

 Please feel free to look at the questionnaires that students and parents will take on http://ucfacebookstudy.blogspot.co.nz for you interest.

Participating in this study is completely voluntary and anonymous. If students do participate, they have the right to withdraw from the study at any time without penalty.

Thank you for taking the time to consider my request. Please e-mail me back if you are interested and I will send the recruitment posters to you. If you have any queries regarding the study or the procedures, please do not hesitate to contact either my supervisors or myself.

Milesa Cepe	Dr. Verena Pritchard	Professor Kim Dolgin
(03) 364 2987 ext. 7500	(03) 364 2987 ext. 4201	(03) 364 2987 ext. 4979
milesa.cepe@pg.canterbury.ac.nz	verena.pritchard@canterbury.ac.nz	kim.dolgin@canterbury.ac.nz
STUDENT	PRIMARY SUPERVISOR	SECONDARY SUPERVISOR

Telephone: +64 364 29 87 ext. 7500

Email: milesa.cepe@pg.canterbury.ac.nz

UC

UNIVERSITY OF CANTERBURY

Te Whare Wānanga o Waitaha

CHRISTCHURCH NEW ZEALAND

Impacts of Facebook use on academic achievement: Relations with self-discipline and parenting styles

Consent Form for schools

This study will examine the effects of Facebook use on academic achievement among 16 to 17-year-old high

school students. I, _____, principal of _____school,

understand:

- the study and what is required of the staff, students, and parents in my school,
- that I have been given an opportunity to ask questions,
- that the study is completely voluntary and that the students may withdraw at any stage without penalty,
- that any information or opinions the students provide will be kept confidential to the researcher (Milesa Cepe) and her supervisors (Dr. Verena Pritchard and Professor Kim Dolgin),
- that any published or reported results will not identify the participants including the school name,
- that all data collected for the study will be kept securely on Qualtrics with password protection and will destroyed after five years,
- the risks associated with taking part and how they will be managed,
- that I have the right to receive a report on the findings of the study through my e-mail address,
- that I can contact the researcher (or supervisors) for further information,
- that I can contact the Chair, University of Canterbury Educational Human Ethics Committee, if I have any complaints,

_____   _____   _____

(Signature)   (Date)   (E-mail address)

Head Principal

Please return this signed consent form or e-mail Milesa Cepe by the 31st of July 2012.

Do you use facebook?

Are you a high school student between the ages of 16 -17?
Want to win 1 of 4 $100 Westfield Voucher?
Take a survey link below

Please go to:
www.facebook.com/UCStudy

Please go to:
www.facebook.com/UCStudy

Please go to:
www.facebook.com/UCStudy

Please go to:
www.facebook.com/UCStudy

Please go to:
www.facebook.com/UCStudy

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www.facebook.com/UCStudy

Please go to:
www.facebook.com/UCStudy

APPENDIX E

Hello,

Thank you for taking part in my study. This e-mail is a friendly reminder to forward the following link to your parent/caregiver. The survey will take 10 minutes (max) to complete.

http://canterbury.qualtrics.com/SE/?SID=SV_eEPVJeUsa9Kcy6o

In order to be in the draw to win 1 of 4 $100 Westfield vouchers, this process/survey has to be completed by one of your parents/caregivers.

Again, I thank you for taking part in my study.

Kind Regards,

Milesa Cepe

Postgraduate Student
Department of Psychology
University of Canterbury
Tel: +64 3 3642987 ext. 7500

APPENDIX F

Hello,

My name is Milesa and I am a Master's thesis studying the effects of Facebook use on academic achievement. The studies further examine the effect of parenting styles on these measures. My records inform me that you have completed a parenting survey online which would have been forwarded to you through an online link by your child.

In order to check for student's falsifying parental response, it is important that I validate whether you personally completed the questionnaire. Your response will be greatly appreciated.

Kind Regards,

Milesa Cepe

Postgraduate Student
Department of Psychology
University of Canterbury
Tel: +64 3 3642987 ext. 7500

Do you use facebook ?

Are you a high school student between the ages of 18 - 21?
Want to win 1 of 4 $100 Westfield Voucher?
Take a survey link below

Please go to: www.facebook.com/UoCStudy

Please go to: www.facebook.com/UoCStudy

Please go to: www.facebook.com/UoCStudy

Please go to: www.facebook.com/UoCStudy

Please go to: www.facebook.com/UoCStudy

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Please go to: www.facebook.com/UoCStudy

Please go to: www.facebook.com/UoCStudy

Please go to: www.facebook.com/UoCStudy

Student Questionnaire (16 – 17 years old)

You are being invited to participate in a research study about Facebook. This study is being conducted by Milesa Cepe from the University of Canterbury for the degree of Masters of Arts. This study has been approved and reviewed by the Human Ethics committee (reference: 2012/25/ERHEC). There are no foreseen or known risks about participating in this research study. The questionnaire will take about 10 - 15 minutes to complete. After you have completed this survey, there will be a link to a 10 - 15 minute survey for your parent/caregiver to complete.

This survey is <u>anonymous</u> as you will not be required to give your full name. You have the right to withdraw at any time without penalty. However, in order that we may match the answers that you give us with the information supplied by your parents please list the last 5 digits of your mobile phone number or you home phone number when prompted at the beginning of the questionnaire. You will not be able to proceed without first providing that information. All the information supplied will be kept in the strictest confidence. The data will be destroyed after 5 years. Should the data be published, no individual information will be disclosed. Your participation in this study is voluntary. By completing the questionnaire, you are voluntarily agreeing to participate. If you have any questions about this study, please contact Milesa Cepe on <u>milesa.cepe@pg.canterbury.ac.nz</u>.

Please write the last 5 digits of your cell phone number. If you do not have a cell phone number, please write the last 5 digits of your home number (please do not include the area code).

❑ Cell Phone _____
❑ Home Number _____

What is your gender?

○ Male
○ Female

How old are you?

○ 16 years old
○ 17 years old

What is your ethnicity?

❑ NZ European
❑ NZ Māori
❑ Hispanic
❑ Asian
❑ Pacific Islander
❑ Other _____

What is your year in high school?

○ Year 11
○ Year 12
○ Year 13

Do you have a Facebook account?

○ Yes
○ No

How often do you check Facebook each day?

○ Not daily; less than twice a week
○ Not daily; every couple of days
○ Once a day
○ 2 - 4 times a day

- ❍ 5 - 7 times a day
- ❍ 8 - 10 times a day
- ❍ 11 - 13 times a day
- ❍ 14 - 16 times day
- ❍ 17 - 20 times a day
- ❍ 21 - 24 times a day
- ❍ 25 - 27 times a day
- ❍ 28 - 30 times a day
- ❍ 31+ times a day

How long do you spend on Facebook each time you check it?

- ❍ Less than 5 minutes - I find what I want to check and then stop
- ❍ 5-15 minutes - I check notifications, my friend's walls etc.
- ❍ 15 minutes -1 hours - I wait for replies, play games and use it as a messaging program.
- ❍ 1-3 hours - I play multiple games and take part in multiple conversations each time I check it.
- ❍ All day - I leave it up even when not using it

Rate the extent to which you agree to the following questions

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I find it easy to focus on assigned readings	❍	❍	❍	❍	❍
I feel impatient when I read my textbooks	❍	❍	❍	❍	❍
I get distracted easily when reading class assignments	❍	❍	❍	❍	❍
I rarely do the assigned homework for my classes	❍	❍	❍	❍	❍

Rate the extent to which you agree to the following questions

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I'm a time waster now but I can't seem to do anything about it	○	○	○	○	○
I promise myself I'll do something and then drag my feet	○	○	○	○	○
I am an incurable time waster	○	○	○	○	○
I get stuck in neutral even though even though I know how important it is to get started	○	○	○	○	○
When I have a deadline, I wait till the last minute	○	○	○	○	○
I needlessly delay finishing jobs, even when they are important	○	○	○	○	○
Putting off something off until tomorrow is not the way I do it	○	○	○	○	○
Even though I hate myself if I don't get start, it doesn't get me going	○	○	○	○	○
I keep putting off improving my study habits	○	○	○	○	○
I manage to find an excuse for not doing something	○	○	○	○	○

Last year (2011), list the grades you got for each subject that you were enrolled in (e.g., NCEA Level 1 – endorsed with Excellence)

———————————————

If you would like to go in the draw to win a $100 Westfield Voucher please submit your e-mail address.

_____

Debriefing

Thank you for your participation in this study. This research aims to examine the relationship between Facebook use and academic performance by considering how people perform on distraction and procrastination (definition: putting off or delaying something requiring immediate attention) tests. A further aim of this study is to examine the effects of Facebook usage on grades are determined by parenting styles.   In order for this research to be complete, you will need to provide the below survey link to a parent/caregiver.

http://canterbury.qualtrics.com/SE/?SID=SV_eEPVJeUsa9Kcy6o

As a reminder, your information will not be seen by anyone (apart from my supervisors and I). This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Participants who have any complaints should address their concerns to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz). Thank you for your participation in this experiment. If you have any further questions and/or you would like to get a copy of the results please feel free to contact me (milesa.cepe@pg.canterbury.ac.nz) or my supervisors (verena.pritchard@canterbury.ac.nz and/or kim.dolgin@canterbury.ac.nz) for more information.

Student Questionnaire (18 – 21 years old)

You are being invited to participate in a research study about Facebook. This study is being conducted by Milesa Cepe from the University of Canterbury for the degree of Masters of Arts. This study has been approved and reviewed by the Human Ethics committee (reference: 2012/25/ERHEC). There are no foreseen or known risks about participating in this research study. The questionnaire will take about 10 - 15 minutes to complete. After you have completed this survey, there will be a link to a 10 - 15 minute survey for your parent/caregiver to complete. This survey is anonymous as you will not be required to give your full name. You have the right to withdraw at any time without penalty. However, in order that we may match the answers that you give us with the information supplied by your parents please list the last 5 digits of your mobile phone number or you home phone number when prompted at the beginning of the questionnaire. You will not be able to proceed without first providing that information. All the information supplied will be kept in the strictest confidence. The data will be destroyed after 5 years. Should the data be published, no individual information will be disclosed. Your participation in this study is voluntary. By completing the questionnaire, you are voluntarily agreeing to participate. If you have any questions about this study, please contact Milesa Cepe on milesa.cepe@pg.canterbury.ac.nz.

Please write the last 5 digits of your cell phone number. If you do not have a cell phone number, please write the last 5 digits of your home number (please do not include the area code).

❑ Cell Phone _____

Home Number _____

What is your gender?

○ Male
○ Female

How old are you?

○ 18 years old
○ 19 years old
○ 20 years old
○ 21 years old

What is your ethnicity?

❑ NZ European
❑ NZ Māori
❑ Hispanic
❑ Asian
❑ Pacific Islander
❑ Other _____

What is your year in university?

○ 1st year Undergraduate Student
○ 2nd year Undergraduate Student
○ 3rd year Undergraduate Student
○ 4th year Undergraduate Student
○ 5th or more year(s) Undergraduate Student
○ Graduate Student
○ Other _____

Do you have a Facebook account?

○ Yes
○ No

How often do you check Facebook each day?

- ○ Not daily; less than twice a week
- ○ Not daily; every couple of days
- ○ Once a day
- ○ 2 - 4 times a day
- ○ 5 - 7 times a day
- ○ 8 - 10 times a day
- ○ 11 - 13 times a day
- ○ 14 - 16 times day
- ○ 17 - 20 times a day
- ○ 21 - 24 times a day
- ○ 25 - 27 times a day
- ○ 28 - 30 times a day
- ○ 31+ times a day

How long do you spend on Facebook each time you check it?

- ○ Less than 5 minutes - I find what I want to check and then stop
- ○ 5-15 minutes - I check notifications, my friend's walls etc.
- ○ 15 minutes -1 hours - I wait for replies, play games and use it as a messaging program.
- ○ 1-3 hours - I play multiple games and take part in multiple conversations each time I check it.
- ○ All day - I leave it up even when not using it

Rate the extent to which you agree to the following questions

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I find it easy to focus on assigned readings	○	○	○	○	○
I feel impatient when I read my textbooks	○	○	○	○	○
I get distracted easily when reading class assignments	○	○	○	○	○
I rarely do the assigned homework for my classes	○	○	○	○	○

Rate the extent to which you agree to the following questions

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I'm a time waster now but I can't seem to do anything about it	❍	❍	❍	❍	❍
I promise myself I'll do something and then drag my feet	❍	❍	❍	❍	❍
I am an incurable time waster	❍	❍	❍	❍	❍
I get stuck in neutral even though even though I know how important it is to get started	❍	❍	❍	❍	❍
When I have a deadline, I wait till the last minute	❍	❍	❍	❍	❍
I needlessly delay finishing jobs, even when they are important	❍	❍	❍	❍	❍
Putting something off until tomorrow is not the way I do it	❍	❍	❍	❍	❍
Even though I hate myself if I don't get start, it doesn't get me going	❍	❍	❍	❍	❍
I keep putting off improving my study habits	❍	❍	❍	❍	❍
I manage to find an excuse for not doing something	❍	❍	❍	❍	❍

Last semester, list the grades you got for each paper that you were enrolled in (e.g., MGMT100 – A, PSYC 106 – B, BIO103 – C …)

_____

If you would like to go in the draw to win a $100 Westfield Voucher please submit your e-mail address.

_____

Debriefing

"Impacts of Facebook use on academic grades:
Relations with self-discipline and parenting styles"

Thank you for your participation in the above study. This research aims to examine the relationship between Facebook use and academic performance by considering how people perform on distraction and procrastination (definition: putting off or delaying something requiring immediate attention) tests. A further aim of this study is to examine the effects of Facebook usage on grades are determined by parenting styles. In order for this research to be complete, you will need to provide the below survey link to a parent/caregiver.

http://canterbury.qualtrics.com/SE/?SID=SV_eEPVJeUsa9Kcy6o

As a reminder, your information will not be seen by anyone (apart from my supervisors and I). This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Participants who have any complaints should address their concerns to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz). Thank you for your participation in this experiment. If you have any further questions and/or you would like to get a copy of the results please feel free to contact me (milesa.cepe@pg.canterbury.ac.nz) or my supervisors (verena.pritchard@canterbury.ac.nz and/or kim.dolgin@canterbury.ac.nz) for more information.

Parent Questionnaire

You are being invited to participate in a research study about Facebook and parenting styles. Your child would have completed a previous survey about their Facebook use and academic achievement. Furthermore, they would have answered a set of questions that measure their level of distractibility and procrastination. As a further aim of the study, parenting styles are required in order to examine the effect Facebook has on academic achievement.

This study is being conducted by Milesa Cepe from the University of Canterbury for the degree of Masters of Arts under the supervision of Dr. Verena Pritchard and Professor Kim Dolgin. There are no known risks if you decide to participate in this research study. This study has been approved and reviewed by the Human Ethics committee (reference number: 2012/25/ERHEC). The questionnaire will take about 10 - 15 minutes to complete. This survey is <u>anonymous</u> as you will not be required to give your full name. You have the right to withdraw at any time without penalty. However, in order that we may match the answers that you give us with the information supplied by your child please list the last 5 digits of their mobile phone number or your home phone number when prompted at the beginning of the questionnaire. You will not be able to proceed without first providing that information. All the information supplied will be kept in the strictest confidence. Should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. By completing the questionnaire, you are voluntarily agreeing to participate. If you have any questions about this study, please contact Milesa Cepe on milesa.cepe@pg.canterbury.ac.nz

Please write the last 5 digits of your child's cell phone number. If they do not have a cell phone number, please write the last 5 digits of your home number (please do not include the area code).

❑ Cell Phone _____
❑ Home Number _____

What is your gender?

○ Male
○ Female

What is your ethnicity?

❑ NZ European
❑ NZ Māori
❑ Hispanic
❑ Asian
❑ Pacific Islander
❑ Other _____

Rate the following statements….

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I am responsive to my child's feelings and needs	○	○	○	○	○
I take my child's wishes into consideration before I ask him/her to do something	○	○	○	○	○
I explain to my child how I feel about his/her good/bad behaviour	○	○	○	○	○
I encourage my child to talk about his/her feelings and problems	○	○	○	○	○
I encourage my child to freely "speak his/her mind", even if he/she disagrees with me	○	○	○	○	○

I explain the reasons behind my expectations	❍	❍	❍	❍	❍
I provide comfort and understanding when my child is upset	❍	❍	❍	❍	❍
I compliment my child	❍	❍	❍	❍	❍
I consider my child's preferences when I make plans for the family (e.g., weekends away and holidays)	❍	❍	❍	❍	❍
I respect my child's opinion and encourage him/her to express them	❍	❍	❍	❍	❍
I treat my child as an equal member of the family	❍	❍	❍	❍	❍
I provide my child reasons for the expectations I have for him/her	❍	❍	❍	❍	❍
I have warm and intimate times together with my child	❍	❍	❍	❍	❍
When my child asks me why he/she has to do something I tell him/her it is because I said so, I am your parent, or because that is what I want	❍	❍	❍	❍	❍
I punish my child by taking privileges away from him/her (e.g., TV, games, visiting friends)	❍	❍	❍	❍	❍
I yell when I disapprove of my child's behaviour	❍	❍	❍	❍	❍

I explode in anger towards my child	○	○	○	○	○
I spank my child when I don't like what he/she does or says	○	○	○	○	○
I use criticism to make my child improve his/her behaviour	○	○	○	○	○
I use threats as a form of punishment with little or no justification	○	○	○	○	○
I punish my child by withholding emotional expressions (e.g., kisses and cuddles)	○	○	○	○	○
I openly criticise my child when his/her behaviour does not meet my expectations	○	○	○	○	○
I find myself struggling to try to change how my child thinks or feels about thing	○	○	○	○	○
I feel the need to point out my child's past behavioural problems to make sure he/she will not do them again	○	○	○	○	○
I remind my child that I am his/her parent	○	○	○	○	○
I remind my child of all the things I am doing and I have done for him/her	○	○	○	○	○
I find it difficult to	○	○	○	○	○

discipline my child					
I give into my child when he/she causes a commotion about something	○	○	○	○	○
I spoil my child	○	○	○	○	○
I ignore my child's bad behaviour	○	○	○	○	○

What is the highest level of education you have completed?

○ No qualification
○ Level 1 (fifth form qualification)
○ Level 2 (sixth form qualification)
○ Level 3 (seventh form qualification)
○ Overseas secondary school qualification
○ Diploma/Certificate
○ Bachelor's Degree
○ Postgraduate and/or Honours degree
○ Masters Degree
○ Doctoral Degree

What is your combined annual household income?

○ Less than 30,000
○ 30,000 – 39,999
○ 40,000 – 49,999
○ 50,000 – 59,999
○ 60,000 – 69,999
○ 70,000 – 79,999
○ 80,000 – 89,999
○ 90,000 – 99,999
○ 100,000 or more

If you would like to be in the draw to win a $100 Westfield voucher please submit your e-mail address below.

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Debriefing

"Impacts of Facebook use on academic grades:

Relations with self-discipline and parenting styles"

Thank you for your participation in the above study. This research aims to examine the relationship between Facebook use and academic performance by considering how people perform on distraction and procrastination tests. A further aim of this study is to examine the effects of Facebook usage on grades are determined by parenting styles.

As a reminder, your information will not be seen by anyone (apart from my supervisors and I). This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Participants who have any complaints should address their concerns to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Thank you for your participation in this experiment. If you have any further questions and/or you would like to get a copy of the results please feel free to contact me (milesa.cepe@pg.canterbury.ac.nz) or my supervisors (verena.pritchard@canterbury.ac.nz and/or kim.dolgin@canterbury.ac.nz) for more information.

APPENDIX K

The process of completing a student-parent pair

A frequency count was conducted on all variables to check that the values do not fall outside the range of possible values for that variable. The students responses within the academic grade section were examined for unnecessary information (i.e., anything other than grade information would be deleted). The self-disciple and parenting style measures were also reviewed for response bias and for incorrect responses due to fatigue. Items that were reverse coded for a sample of 50 participants were evaluated. Problems were not apparent with the sample reviewed (i.e., the reverse coded responses appeared to consistent with their overall responses); however if response bias or fatigue error was suspected or identified during the screening and cleaning process, the student or parent would have been removed from the data set.

Student and parent responses were paired through the last 5 digits of the student's mobile or home number. This was completed through Microsoft Office Excel 2007 using the VLOOKUP function. This function contains a logical argument called range_lookup that finds the exact or approximate match to the look up value. The exact match was first entered into the function followed by the approximate match as some students did not follow instructions. For example, some students reported their full cell phone number and their parents reported the last 5 digits. While this may not be paired through the 'exact match' function it can be with the 'approximate match' function. Specifically, exact and approximate matching was completed in one excel sheet. A case number was provided in column A and mobile/home numbers provided by the students and parents was on column B and C (the lookup value), respectively. A coloured cut-off point was included in the excel sheet to indicate whether the student was from high school or university. The overall student (i.e. high school and university) and parent questionnaire responses were placed into 3 separate excel sheets with case numbers. Once an exact or approximate match was found by the excel function, the parent responses were pasted next to the student responses. Overall, the number of high school student-parent pairs was 106 and 211for university student-parent pairs.