

**PATHWAYS OF SCHOOL ENGAGEMENT IN PREVENTING
ADOLESCENT DELINQUENCY AND SUBSTANCE USE**

by

BEATRICE WAMUYU MUCHIRI

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SUPERVISOR:

PROFESSOR MMLF DOS SANTOS
DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF SOUTH AFRICA

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DECLARATION

Name: Beatrice Wamuyu Muchiri

Student number: 55760511

Degree: Doctor of Philosophy in Psychology

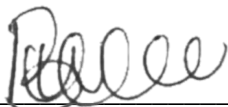
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DEDICATION

To my dear husband Patrick, daughters Micaela and Adrielle and son Leito for your love, support, encouragement and cheerfully shouldering the long hours when I was either immersed in study, writing, or away conducting interviews

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Last but not most "To Him who is seated on the throne, and to the Lamb, be ascribed all blessing and honour and glory and might, until the ages of the ages!" (Bible, Weymouth New Testament Version, Revelation 5:13).

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LIST OF ABBREVIATIONS, SYMBOLS AND TERMS

LSD: Lysergic Acid Diethylamide

SDM: Social Development Model

AODs: Alcohol and other Drugs

p-values: probability values

χ^2 : Chi-Square

SEM: structural equation model

EFA: exploratory factor analysis

CFA: confirmatory factor analysis

PMP: Peers Making Peace

BBBS: Big Brother Big Sister

CBM: Community-Based Mentoring Program

SACENDU: South African Community Epidemiology Network on Drug Use

CLMs: Cumulative link models

CLMMs: Cumulative link mixed models

CI: 95% confidence interval

NFI: Bentler-Bonett Normed Fit Index

GFI: Goodness of Fit Index

RMSEA: root mean square error of approximation

ABSTRACT

Delinquency and substance use impacts negatively on adolescent health and various facets of their individual well-being, therefore translating to negative impact on the economy of many governments irrespective of development status. There is an increasing attention on engagement due to its impact on developmental trajectories and academic success with potentially long-term consequences. Whereas many studies have investigated the impact of engagement on academic failure, limited reports explore the role of engagement in the aetiology of delinquency and health-compromising behaviours and little attention has been paid on influencers of engagement. This study explored the hypothesis that personal and contextual factors at individual and school levels may either mediate or moderate the effect of different dimensions of school engagement on delinquency and substance use. Engagement involved emotional, social and cognitive engagement. Personal factors included psychological factors namely social cognition (measured as the locus of control) and self-perception (measured as self-concept). Contextual factors included parental involvement in school activities, parental commitment to educational goals of the children, communication between parent and child, as well as supervision and monitoring of children by the parents.

Trends, distribution and univariate tests of association between socio-demographic variables, substance use, delinquency, engagement and contextual factors were analysed. A total of 898 students were selected using a multistage probability sample design from selected municipalities within Gauteng province as the primary sampling unit, schools within the primary sampling units, and students within the schools. Variability due to grade level and school level factors were analysed and used as input for multilevel cumulative link mixed models assessing the influence of parental and peer factor variables on the psychosocial factors. Correlations, exploratory factor analysis, confirmatory factor analysis, and two structural equation models (SEM) were used to test the hypothesized pathways through which personal and contextual factors influence the impact of different dimensions of engagement on the occurrence of delinquency and substance use.

A slight majority of the students were female (57%; n=492). The mean student was 16.7 (standard deviation = 2.6) and age was relatively symmetrical with a median age of 16 years and a majority (66.5%; n=560) distributed between the ages 15 and 18. The majority of the students were from grade 10 (33%; n=283) followed by grades 9 (15.7%; n=131), 11 (15.4%; n=128), 8 (13.3%; n=111) and 7 (13.1%; n=109) while respondents from grades 6 and 12 comprised less than 100 students. The most used substances included alcohol (31.3% of the students) followed by smoking (12.7%) and cannabis (11.3%) when compared with than the hard drugs including amphetamine, barbiturates, cocaine, heroin and other substances.

Significant changes in the dependent variables (substance use and delinquency) and the psychosocial variables (social cognitions and self-perceptions) with grade level and school-level were reported ($p < 0.05$). There were significant influences of parent and peer factors on psychosocial factors and psychosocial factors on student engagement ($p < 0.05$). Specific facilitators and indicators of engagement classified as psychosocial factors, social cognition and self-perceptions are presented and discussed. The results indicated that besides peer and parental factors, other factors such as behavioural protection may lead to enhanced engagement and psychosocial factors could be protective against substance use.

The study of the nomological network of each of the constructs using factor analysis distinguished two dimensions of delinquency, four of engagement, (emotional engagement, social or behavioural or participatory engagement, and cognitive engagement), two of parental involvement (parental monitoring and parental involvement), four of self-concept (self-perception, self-esteem, self-cognition and self-efficacy), two for social cognition (external and internal dimensions) and three for illicit substance use.

The statistical significance of many of the direct and indirect effects from the SEM models confirmed the hypothesis that personal and contextual factors impact the occurrence of delinquency and substance use directly and indirectly. Partial mediation was also revealed where the effects of personal and contextual factors are partially mediated by engagement. The pathways revealed in this study involving direct, indirect effects and total effects of these assets indicate that they do not confer benefits singularly but factors such as psychosocial variables including self-concept and locus of control may act as precursors of other assets such as engagement whereas parental factors may mediate to influence peer factors.

An extensive repertoire of developmental assets and liabilities including psychosocial variables and outcomes of delinquency and substance use which can be incorporated in prevention efforts are presented. These factors can be used in computing risk behaviour indices which predict the risk to support early intervention.

KEY TERMS

Engagement; delinquency; problematic behaviours; substance use; parental monitoring; parental involvement; peer pressure; psychosocial factors; locus of control; social cognition; self-concept; multilevel cumulative link mixed models; structural equation models; pathways; risk behaviour indices

CHAPTER 1 BACKGROUND

The problem behaviour theory (Crowther, Jessor, & Jessor, 1978; Donovan & Jessor, 1985) proposes that an underlying tendency to deviance is part of undesirable co-occurring behaviours during adolescence which include precocious sexuality, delinquency, smoking, and drinking. Student problem behaviour can be defined as behaviours that hinder or interfere with learning and that are injurious or enhance an individual's risk for persistent problems in school or in the society (Morgan & Sideridis, 2017). With close to half of the South African population consisting of youth who are 20 years old or younger (Census, 2012), it is important to pay attention to problematic behaviours such as delinquency and substance use in this group due to the possible effect on the country's socio-economic development. This is because delinquency and substance use among adolescents impacts negatively on their health and various facets of individual well-being, therefore, translating to negative impact on the economy of many governments irrespective of development status (Brody, Kogan, Chen, & McBride Murry, 2008; Fothergill & Ensminger, 2006; Stone, Becker, Huber, & Catalano, 2012). There is a continued rise in the incidence of problematic behaviour and use of AODs amongst South African adolescents and high school students and the age of use is constantly declining which increases the physical, social and academic negative impact (Mokwena, Mokwena, Van Der Heever, & Mokgatle, 2020; Ramlagan, Peltzer, & Matseke, 2010a). The South African Community Epidemiology Network on Drug Use (SACENDU) project reveals that the use of Alcohol and other Drugs by South African adolescents may increase the burden on the health, social wellbeing, and criminal justice apparatus of the country (Peltzer, Ramlagan, Johnson, & Phaswana-Mafuya, 2010). In South Africa, schools struggle daily with problematic behaviours from minor to violent and safety compromising behaviours such as carrying weapons and related objects to school, and violent activities such as participating in fights and incidents of stabbing in schools (Mokwena et al., 2020; Rubbi Nunan & Ntombela, 2018). Both delinquency and health-compromising behaviours such as substance use occur together, are correlated around the world and in South Africa and it is therefore advantageous that interventions targeting one are also effective on the other (ESPAD, 2015; Hirschi, 1969; Mokwena et al., 2020).

Aggravating factors and remedial measures of delinquency and substance use can be assessed using preventive science approaches. Negative health consequences are increasingly being addressed by prevention science, which involves reducing risk and enhancing promotive or protective factors in individuals and the environment surrounding them during their growth and development (Muchiri, 2015; National Research Council and Institute of Medicine, 2009). Risk and protective factors can be classified into fixed markers, individual, interpersonal and contextual factors (Kraemer, Stice,

Kazdin, Offord, & Kupfer, 2001). The risk and protective factors consist of malleable factors which can be advantageously altered when formulating interventions and less malleable characteristics such as socio-economic status, gender, and ethnic background. The malleable factors are further delineated into contextual and interpersonal factors. Contextual factors define “broad societal and cultural” factors, whereas individual factors “lie within individuals and their interpersonal environments” (Hawkins, Catalano, & Miller, 1992b).

These promotive and protective factors can be founded and understood from various theoretical backgrounds. The social development model and the associated theories, social learning theory and social control theory point out to variable factors as basis for initiation and progression of behaviour problems (Kazdin, 1990; Hawkins, Catalano, & Miller, 1992a; Jessor, Costa, Krueger, & Turbin, 2006). The social development model integrates control theory (Hirschi, 1969) and social learning theory (Bandura, 1977b), to emphasize the protective role of positive family, school, and peer experiences against the development of conduct problems, school misbehaviour, truancy, and substance use.

The developmental–ecological model, on the other hand, postulates the importance of individual and contextual factors on youth functioning as well as the reciprocal nature of interactions between individuals and their contexts over time (Bronfenbrenner, 1979; Hayes, O’Toole, & Halpenny, 2017). This developmental–ecological model elaborates the previous theoretical contributions by integrating the many sources of influences in multiple ecological contexts thereby considering the interpersonal relationships and social environments within which individuals develop as an additional consideration to the previous role of individual propensities in learning and development. Some of the numerous influences in multiple ecological contexts include parents, peers, and teachers who are important social figures in various facets of a students’ life (Brown, Mounts, Lamborn, & Steinberg, 1993; Hayes et al., 2017).

From these theoretical considerations, a couple of temperamental, relational, and contextual factors which may protect or promote delinquency and substance use have been reported (Li et al., 2011a). Whereas personality variables and demographic characteristics such as gender, family socioeconomic background, and race/ethnicity have also been found to be associated with these problem behaviours, important contextual and other malleable factors have received scant attention. A substantial body of literature has evaluated the role of school attachment and support on problematic behaviour among the young people. A low connectedness with school combined with association with delinquent peers increases the likelihood of initiation to and continued involvement in delinquency and substance use (Henry, Thornberry, & Huizinga, 2009). This connectedness has been studied as part of school emotional and behavioural engagement which outlines the extent of student participation in academic

and social activities in school, feel connected to school, and value educational goals (Fredricks, Blumenfeld, & Paris, 2004; Glanville & Wildhagen, 2007; Li et al., 2011a).

The role of student engagement continues as an important area of enquiry for families, students, educators, and researchers (Appleton, Christenson, & Furlong, 2008). There is an increasing attention on student engagement due to its impact on developmental trajectories and academic success with potentially long-term consequences (You & Sharkey, 2009a). Whereas many studies have investigated the impact of school engagement on academic failure as reviewed by You and Sharkey, 2009a, limited reports explore the role of participation in school activities in the aetiology of delinquency and health-compromising behaviours. Despite the focus of research on demonstrating the positive relationship between engagement and academic achievement, little attention has been paid to the impact of student engagement as a dependent variable (Finn & Rock, 1997) which may be influenced by other factors while playing a role as an independent variable that may influence risky behaviours. Emerging evidence points towards school engagement as protective against risky behaviours (Li et al., 2011a). However, despite the immense potential of engagement in protecting against delinquency and substance use, the mechanism behind this protective impact is scantily understood and this limits the adoption of these findings in policy and research.

Hypothesis

Personal and contextual factors at individual and school levels may either mediate or moderate the effect of different dimensions of school engagement on delinquency and substance use.

Research questions

- Does student engagement vary with individual level and school level factors?
- Is there an influence of parent and peer factors on psychosocial factors and is there an indirect influence of the changes in psychosocial factors on the different dimensions of engagement?
- What is the pathway through which personal and contextual factors influence the impact of different dimensions of engagement on the risk for and occurrence of delinquency and substance use?

Engagement variables of interest included behavioural, emotional, social and cognitive engagement measured using items selected from Monitoring the Future survey (Bachman, Johnston, & O'Malley, 2000). Personal factors included psychological factors namely social cognition (measured as the locus of control) and self-perceptions (measured as self-concept) (Birch & Ladd, 1996). Contextual factors included association with peer, parental involvement in school activities, parental commitment to educational goals of the children, communication between parent and child, as well as supervision and monitoring of children by the parents (Fan & Chen, 2001; Feuerstein, 2000).

Rationale

Poor school engagement has been associated in numerous studies with higher rates of school failure, withdrawal and problematic behaviour (Al-Alwan, 2014). Student engagement has therefore been an increasingly important area of enquiry for families, students, educators, and researchers (Appleton et al., 2008). Conceptual complexities and methodological challenges during attempts to test a comprehensive model of student engagement have contributed to the scarcity of studies on student engagement. Many of the characteristics chosen in existing studies focus on either the individual or the institution and the less malleable characteristics such as socio-economic status, gender, and ethnic (You & Sharkey, 2009a). A key methodological challenge that hinders the accurate assessment of the effect of contextual effects on individual outcomes is the lack of both individual and the macro-level data. Furthermore, analysis often overlooks the potential of hierarchical relationships between these individual and macro-level data which could be addressed using multilevel modelling. Individual-level data has the potential to allow modelling of variability in individual student which when studied simultaneous with school-level factors supports the examination of the complex theoretical perspective pertinent to the research on student engagement (You & Sharkey, 2009a). The study design should also consider that the pathways through which protective factors impact substance use and delinquency can be viewed from a general systems theory perspective where behavioural changes in a part of a system impacts behaviour in other parts of the system (Shantone & Nunan, 2018). You and Sharkey (2009) conducted a study aimed at overcoming such shortcomings where they studied the factors influencing student engagement trajectories within a developmental–ecological model. In their study, multilevel latent growth curve modelling supported an in-depth knowledge about impact of individual and contextual influences on initial status and rate of growth of student engagement more uniquely than previous studies. However, this study only applied three items to measure student engagement which restricted conclusions to limited dimensions of engagement. At least four dimensions of student engagement have been recognized including academic, behavioural, cognitive, and psychological aspects (Appleton et al., 2008). Furthermore, few studies assess the underlying explanatory aspects (such as parent, peer factors and psychosocial factors) to the association between engagement/ bonding and delinquency and majority of existing reports do not control for stable or innate propensities (Hirschfield & Gasper, 2011). Whereas an increasing number of studies have demonstrated the positive relationship between engagement and academic achievement, little attention has been paid to the dependent variable student engagement (Finn & Rock, 1997).

Therefore, this study seeks to investigate the influence and pathway through which personal and contextual factors impact the influence of behavioural and emotional engagement on the risk for and occurrence of delinquency and substance use. Individual and contextual influences are considered as

underlying explanatory aspects to the association between multiple levels of student engagement and problematic behaviour including delinquency and substance use. Specifically, the study examines this mechanism in adolescents as they progress between “further education and training” (grades 10-12). These school and age intervals are accompanied by a peak increase in the prevalence of delinquency and substance use in South Africa (Muchiri, 2015; Peltzer et al., 2010; van Heerden et al., 2009) and globally (Farrington, 2013; Fothergill & Ensminger, 2006; Stone et al., 2012). A developmental-ecological model forms the basis of studying the aspects that may moderate engagement including psychological factors, family practices, peer influences, teacher-student relationships, and school influences (Birch & Ladd, 1996; You & Sharkey, 2009a). An understanding of the scantily studied mechanism behind the increasing evidence which points towards school engagement as protective against risky behaviours (Li et al., 2011a) such as substance use and delinquency will enhance the adoption of these findings in research and policy to reduce their negative impact on the developmental trajectories of students and the country’s socio-economic development.

Outline of the Study

Chapter 2 discusses the literature which has been reviewed during the study, the theoretical frameworks, the potential impact of the study and the alignment to national strategies. Chapter 3 describes the research design, methodology applied in the study, exploratory data analysis, modelling and interpretation. Chapter 4 outlines the main findings of the study. Chapter 5 discusses the results of this study, relates them to existing studies and reports, and proposes plausible theoretical background to consider when interpreting important trends presented in the results section. Statistically significant factors and processes are presented and discussed. Chapter 6 highlights the major conclusions from the study, its limitations, recommendations from the findings, and perspectives for future research. Reflections from the study are also outlined.

Chapter Summary

Chapter 1 consists of a brief introduction to the study, the research question, hypothesis and rationale of the study. Challenges posed by delinquency and substance among adolescents and possible negative impact on society are initially highlighted. Prevention science and associated theories are then introduced. The developmental–ecological model and its extension of the previous theoretical contributions by integrating the many sources of influences in multiple ecological contexts is discussed. The protective potential of engagement against risky behaviours, challenges faced by previous research and potential solutions are discussed which is followed by an outline of research questions, hypothesis and study rationale.

CHAPTER 2 LITERATURE REVIEW AND THEORETICAL FRAMEWORKS

Adolescence

This study focuses on the adolescent phase of the youth. Adolescence is a life period whereby most of the biological, cognitive, psychological, and social characteristics are in rapid transition from a child to a young adult (Lerner & Spanier, 1978). This is also a period where the adolescent tries to adjust to individual changes in the self, in the family, in the peer group as well as institutional changes (Lerner & Spanier, 1978). The institutional change will encompass the movement from for instance; one academic level to another, into the career world or into child-rearing (Lerner & Spanier, 1978). Adolescence phase has therefore been regarded as a period of anxiety and uncertainty as a result of general biological among other factors (Mueller et al., 2011). The adolescence period is characterized by a tendency to experimentation, risk, and opportunity taking (Schwartz et al., 2010). A myriad of risky behaviours such as delinquency, substance use, and risky sexuality are acquired during adolescence. This forms a foundation for lifelong engagement in delinquency and health-compromising behaviour for an increasing proportion of the adolescents (Li et al., 2011).

Aetiology of Delinquency and Substance Use among Adolescents

Developmental systems theories form a useful theoretical foundation towards understanding adolescent development and developmental issues such as initiation into deviant behavioural tendencies (Mueller et al., 2011). This group of developmental systems theories propose that adolescent behaviour should not be viewed in isolation but, instead, as a function of both the individual and their environment (Mueller et al., 2011).

Contemporary human development research constitutes relational developmental systems models (Overton, 2010), where human development is viewed as fundamentally involving mutually-influential relations between the individual and several levels of the human development ecology characterized by individual/context relations. These relational developmental systems models propose that developmental outcomes emanate from all levels of organization within human development ecology including biological, cultural and historical (Overton, 2010). The theoretical frameworks are discussed in the following sections.

Theoretical background

The social development model and the associated theories, social learning theory and social control theories point out to various factors as a basis for initiation and progression of behavioural problems (Kazdin, 1990; Hawkins et al., 1992a; Jessor et al., 2006). The social development model through an integration of control theory (Hirschi, 1969) and social learning theory (Bandura, 1977b), emphasizes

the protective role of positive family, school, and peer experiences against the development of conduct problems, school misbehaviour, truancy, and substance use.

Social learning theory which was proposed by Bandura emphasizes the role of prosocial modelling of the youth to peers, teachers, and/or family members which encourages engagement in positive instead of negative behaviours (Akers, 1973; Bandura, 1977b, 1986a). Social control theory on the other hand attributes prevention against delinquency to an attachment that youths develop with others through school, social relationships, prosocial activities, and adherence to prosocial beliefs (Hirschi, 1969). Such social control theory associated bonds can be categorized as protective factors. Protective factors against deviant behaviour among youths have been categorized into five domains, namely, individual, family, peer, school, and community-related factors (Foshee et al., 2011). Prevention approaches aimed at proactively addressing the cause of problem behaviour among the youth are focused within these five domains (Catalano, Oesterle, Fleming, & Hawkins, 2004).

The social control theory supports most of the literature in the research field of preventive efforts that apply risk/protective factors (Catalano et al., 2004; Stone et al., 2012) which integrate intervention characteristics including bonding, resilience, social competence, emotional competence, cognitive competence, behavioural competence, moral competence, self-determination, spirituality, self-efficacy, clear and positive identity, belief in the future, (recognition for) positive behaviour, (opportunities for) prosocial involvement, and prosocial norms (You & Sharkey, 2009a).

In contrast to protective factors, risk factors for delinquency are established upon the social-ecological development model, social learning theory, social bond-social control theory, and social disorganization theory. The social-ecological model of development (Bronfenbrenner, 2005; Bronfenbrenner, 1979), outlines multiple levels of influence on child development including:

- i. the microsystem which consists of the immediate environment surrounding the young such as family and school;
- ii. the exosystem consisting of the environment not directly involving a child, but whose influence may impact upon the child, for instance, parental working environment; and
- iii. the macrosystem which consists of a larger cultural context.

With respect to risk factors, social learning theory (Akers, 1973; Bandura, 1977b, 1986b) outlines the role of social surroundings including families, schools, peers, and communities on delinquent behaviour (Reingle, Jennings, & Maldonado-Molina, 2012). This theory proposes the linkage between risk factors and delinquent behaviour as the situation where the young are exposed to negative stimuli and antisocial environments such as pressure from antisocial peers which leads to initiation of substance use and delinquent behaviour (You & Sharkey, 2009a).

Social bond–social control theory (Hirschi, 1969) associates the lack of or weak prosocial bonds to increased likelihood of delinquency (Church, Wharton, & Taylor, 2009; Vaughn, DeLisi, Beaver, & Wright, 2009) ranging from early life years to throughout the life course (Murray & Farrington, 2010). Such prosocial bonds can be categorized as institutions (family or school), beliefs (laws and normative standards) and prosocial others (teachers, parents, peers) (You & Sharkey, 2009a).

A variant of the social learning theory is the social disorganization theory which lays emphasis upon external influences from communities where youths live (Reingle et al., 2012; Shaw & McKay, 1942). Examples include the increased risk of delinquency among disadvantaged youths who grow up in surroundings characterized by high crime rates and gang activity, availability of drugs and alcohol, as well as poverty rates (Murray & Farrington, 2010).

The developmental-ecological model, on the other hand, postulates the importance of individual and contextual factors on youth functioning as well as the reciprocal nature of interactions between individuals and their contexts over time (Bronfenbrenner, 1979). Numerous influences in multiple ecological contexts include parents, peers, and teachers who are important social figures in various facets of an individual's life (Brown et al., 1993).

Risk and Protective factors

Both the biology and social settings surrounding a youth are dynamic depending on the phase of development (Canadian Centre on Substance Abuse, 2014). Risks and opportunities that may foster resilience therefore emanate from changes in a youth's biology and social settings in a manner which is dependent upon each developmental stage. Even though inception of delinquency and substance use has commonly been associated with early adolescent years (Canadian Centre on Substance Abuse, 2014), elementary school period presents a unique prevention phase for timely prevention and intervention efforts (Canadian Centre on Substance Abuse, 2014).

Research efforts have, therefore, been focused on highlighting the potential role of parents, caregivers, educators and health professionals in early identification and addressing of risk factors. These individuals could also incorporate the research knowledge in identifying these precursors and at risk groups and factors (Canadian Centre on Substance Abuse, 2014). Geneticists and neurobiologists propose that vulnerability to delinquency and/or substance abuse may be inherited. On the other hand, early experiences such as family life, stress, peer pressure or their interactions may impose the lack of or poor learning of coping skills (Cadoret, Yates, Troughton, Woodworth, & Stewart, 1995; Marks, Miller, Schulz, Newcorn, & Halperin, 2007; Smith & Pollak, 2020). This is because the expression of a given gene could be impacted by the environment especially stressors encountered early in life such as maltreatment, neglect and physical or emotional abuse (Afifi,

Henriksen, Asmundson, & Sareen, 2012; Choi & Oh, 2014; Jaffee, Caspi, Moffitt, & Taylor, 2004; Nelson et al., 2006). Contrariwise, school connectedness and parental nurturing promotes resilience and acts as a deterrence to involvement in substance abuse and delinquency (Sloboda, Glantz, & Tarter, 2012). This section, therefore, reviews concepts of risk and protective factors affecting aetiology and development of substance use and delinquency in early life years and adolescence. An excellent review and listing of risk and protective factors influencing substance use among the youth was previously made by Stone et al. (2012) while Kennedy, Detullio, and Millen, 2020 reviewed the risk and protective Factors for delinquency.

Protective factors consist of those attributes related to the child, family, and surrounding environment that attenuate the possibility of adverse conditions that may lead to negative child outcomes and behaviours, including delinquency and later life deviance behaviour (Brodowski, Fischman, Floor, & Group, 2013; Vanderbilt-Adriance & Shaw, 2008). In contrast to risk factors, protective factors represent those characteristics or conditions that may lessen the impact of risk factors on the aetiology of delinquent behaviour (Garmezy, 1991; Rutter, 1987). Protective factors are conceptualized in the research field of resilience as a broader set of characteristics and environmental provisions that foster the capability among the young to triumph in the face of risks imposed by the environment where they subsist (Garmezy, 1991; Kennedy et al., 2020; Masten, 1989, 2007; Rutter, 1987, 1999; Werner, 1990).

As previously discussed in the theoretical framework section, based on Hirschi's social control theory, these factors can be categorized into five domains, including, individual, family, peer, school, and community-related factors (Brodowski et al., 2013; Foshee et al., 2011) and are therefore discussed below according to these categories.

Individual-Level Factors

Individual-level protective factors consist of personal characteristics influencing the risk and engagement in delinquency, substance use and other problematic behaviours (You & Sharkey, 2009b). These factors include biological and psychological dispositions, attitudes, values, knowledge and skills. Genetic risk factors include aspects such as cognitive deficiencies, conduct disorders, and mental illness (De Vries, Hovee, Assink, Stams, & Asscher, 2015) while non-genetic factors include antisocial behaviours, substance use and history of substance abuse (Hovee et al., 2009; Wasserman, McReynolds, Schwalbe, Keating, & Jones, 2010). Self-efficacy, represents an individual's self-assurance that they can adequately exert control over their own behaviour (Bandura, 1977a) which promotes resilience, achievement, and coping skills in youths (Logan-Greene et al., 2011; You & Sharkey, 2009b). Self-efficacy acts protectively by enhancing engagement in prosocial relationships and against peer pressure (Reilly, 2012).

Family-Level Factors

The family context which includes parent–child and sibling interactions are important components of risk and protective factors (Logan-Greene et al., 2011). Family management and relation aspects such as family structure, bonding, support, culture, and functioning, play a big role in influencing the behaviour of its members. Good family relationships provide a robust buffering environment against problem behaviours during the developmental phase of a child (Lösel & Farrington, 2012; Reingle et al., 2012). A family characterized by responsive and involved parents, consistent discipline, attachment to parents, positive parenting style, low family conflict and parents who do not engage in substance abuse supports positive social adjustment and is protective against problematic behaviours in children (Murray & Farrington, 2010; Vanderbilt-Adriance & Shaw, 2008). An example of programmes towards such interventions includes Families and Schools Together (FAST). FAST is a multifamily group intervention programme aimed at equipping parents with skills to prevent problem behaviours in at-risk children between ages four to twelve and their families. Students in FAST programs were found to have less short-term and long-term behaviour problems (Kratochwill, McDonald, Levin, Bear-Tibbetts, & Demaray, 2004; McDonald et al., 2006).

Peer-Related Factors

Engagement with non-deviant and non-delinquent peers has been associated with a positive and buffering effect against the risk of delinquent and problem behaviours (Osgood et al., 2013). Positive peer-norms, attachment, socialization, and interaction processes act as protective factors against adverse peer influence (Hoeve et al., 2009; Lösel & Farrington, 2012). Examples of peer-related risk factors include qualities of social relationships with peers such as association with delinquent friends and involvement in gangs (Wong, Slotboom, & Bijleveld, 2010). Odgers et al. (2008) in their study where respondents were followed up at ages 5, 7, 9, 11, 13, 15, 18, 21, 26, and 32 years of age found out that the age of exposure affects the risk level such that earlier exposure increases the negative peer influences. Additionally, negative peer influence also acts in synergy with other risk factors including antisocial behaviours and failure to attend school (Odgers et al., 2008). Programmes that aim to prevent or reduce adolescent problem behaviours often target peer influence. An example of peer related interventions is the Peers Making Peace (PMP) targeted at equipping students starting from pre-kindergarten to the 12th grade with coping skills. Landry (2003) reported fewer school related problem behaviour incidences, improved academic performance and higher self-efficacy in the PMP participating group when compared with the control group. Another programme, First Step to Success, is aimed at fostering effective teacher- and peer-related social-behavioural adjustments. Youths engaged in this programme also demonstrated better behavioural adaptation, academic engagement, fewer problem behaviours and less functional impairment (Walker, Greene, & Mansell, 2006).

School-Related Factors

A positive school climate has been associated with improved learning motivation amongst students. The support from both teachers and peers has been linked to positive behaviours in addition to other positive outcomes such as school attendance, performance, and attachment (Logan-Greene et al., 2011; Quint 2006; Wong et al., 2010). A potential link has also been reported between the classroom management programmes used by teachers with the emergence and persistence of aggressive behaviours in students (Oliver, Wehby, & Reschly, 2011). Youths who do not attend school may be disadvantaged due to less chances for the development of supportive social relationships which in turn initiates or propagates cumulative risk of engagement in problematic behaviour (Draper & Hancock, 2011). School based protective programmes have been established such as the Career Academies which are schools within schools involving the interaction between students and peers, teachers, and community partners. Students engaged in the Career Academy were found to have higher high school completion rates, higher education enrolment and were more likely to secure employment (Kemple & Scott-Clayton, 2004). Another programme, the Eisenhower Quantum Opportunities (or the Eisenhower Foundation's Quantum Opportunities Program) targets disadvantaged high school teens in inner-city neighbourhoods. When evaluated at multiple sites, participating youths achieved significantly higher final grade point average, higher graduation rate, and higher college acceptance rate than the controls (Curtis & Bandy, 2015).

Community-Level Factors

The upbringing environment may impact tremendously upon the development of adolescents (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993). The institutions and social settings within neighbourhoods affect developmental outcomes (Jain, Buka, Subramanian, & Molnar, 2015). Community associated protective factors are linked to the physical environment, economic and recreational prospects, social support options, and other attributes influencing proper community functioning (Reingle et al., 2012). Due to the high number of risk factors in some minority communities, particularly in urban contexts, research suggests that adolescents in such neighbourhoods would benefit from bolstered protective factors (Vanderbilt-Adriance & Shaw, 2008). An example of community-level factors is the Big Brother Big Sister (BBBS) Community-Based Mentoring Program (CBM). BBBS-CBM focuses on enhancing protective factors and reducing risk factors for problem behaviour in youths between the ages of 6 and 18 from low-income neighbourhoods and single-parent households. The BBBS-CBM programme participants were associated with less substance use initiation and involvement in violence, better school behavioural outcomes, academic performance, relationships and trust from parents (Tierney & Grossman, 2000).

Protective and Risk Factors: Conclusion

From the foregoing, protective factors may play an important role in alleviating the possibility of delinquency and problem behaviours such as substance use and delinquency. Risk and protective factors play contrasting roles. However, this relationship is not exactly opposite in that risk factors focus on negative characteristics, exposures, and influences affecting behaviour, whereas protective factors may enhance resilience against negative behaviours even in the presence of adverse circumstances (Brodowski et al., 2013; Lee, 2006). Programmes enhancing protective factors in the early life years have been designed, implemented and their impact has been reported in the different domains including family, peer, school and community. While research emphasis has been laid upon impact of risk factors on problem behaviours, there is scarcity in comparable research on protective factors and their interaction with risk factors.

Risk Factors for Delinquency

Risk factors have a cumulative effect with more risk factors increasing the chances of a youth's engagement in delinquent behaviours (Mmari, Blum, & Teufel-Shone, 2010; Reingle et al., 2012). A longer exposure duration and a younger age at exposure also enhance the influence of risk factors on delinquent behaviour (Hoeve et al., 2009). However, it has been reported that in addition to cumulative risk effect, multiple exposures may enhance the risk to the high-risk category in at-risk youths especially at younger age groups (De Vries et al., 2015; Odgers et al., 2008).

Many studies have investigated the impact of school engagement on academic failure (for a review, see You & Sharkey, 2009b). Limited reports explore the role of participation in school activities on the aetiology of delinquency and health-compromising behaviours. Emerging evidence points towards school engagement as protective against risky behaviours (Li et al., 2011b). However, the mechanism behind this protective impact is scantily understood and this limits the adoption of these findings in policy and research. A review of school engagement as a protective factor against risky behaviours is presented in the section below.

School engagement

School engagement is an essential product of motivation and higher student engagement in school promotes self-satisfaction, academic self-efficacy, high goals, and incentive to volunteer in learning activities which also, in turn, is a predictor of high academic achievement (Al-Alwan, 2014). School engagement has also been reported to improve academic achievement, higher school completion rates, leads to an enhanced student attachment to schools and other social institutions (Finn, 1989; Marks, 2000; Pearson, Muller, & Wilkinson, 2007; Willms, 2003). Additionally, students with a higher attachment to schools tend to demonstrate more positive behaviours and attitudes whereas the

converse situation results in students who demonstrate more antisocial, uncivilized, and violent tendencies (Finn, 2006; Whitlock, 2006).

Fredricks et al. (2004) laid out a theoretical proposition that school engagement is a multidimensional construct consisting of the three components: behaviour, emotion, and cognition. Behavioural engagement represents those actions and practices that students show concerning school and learning including positive conduct, active participation in classes, and/or involvement in extracurricular activities (Al-Alwan, 2014; Harris, 2011; Wang, Willett, & Eccles, 2011). Emotional engagement is concerned with student feelings, interests, and attitudes to learning and school (Skinner & Belmont, 1993). Cognitive engagement is an indicator of the quality of the cognitive processes and learning approaches that students use with respect to school assignments and homework (Walker et al., 2006), such as goal-setting, intrinsic-motivation, self-regulation, and application of learning strategies (Al-Alwan, 2014; Harris, 2011). Behavioural, emotional, and cognitive school engagement aspects define both short and long-term academic achievement by students (Fredricks et al., 2004; Wang et al., 2011) which in a feedback may influence changes in all three aspects of school engagement (Wang et al., 2011). These components of engagement are dynamic in their interaction with each other where, for instance, one component might be protective against early drop out from school while, another one leads to improved academic performance (Glanville & Wildhagen, 2007).

More engagement in school is associated with increased school attendance and fewer problematic behaviours (Martin & Marsh, 2006) while less engagement has been shown to result in demonstration of inappropriate behaviour, school failure, and dropout (Appleton, Christenson, Kim, & Reschly, 2006; Finn & Rock, 1997).

Parents play an enabling role in their children's school involvement and whenever parental support to efforts by schools is low; this is also reflected in low achievement and higher problematic behaviour rates among students (Scribner J., Young, & Pedroza A., 1999). The engagement of parents in the education of their children is therefore facilitative of a student's enhanced social and academic performance through modulation of behaviour (Epstein, 2018; Hill & Craft, 2003; McWayne et al., 2004).

Due to this positive influence on developmental trajectories and academic success, educational researchers and practitioners have increasingly paid attention to methods for increasing student engagement in school (You & Sharkey, 2009b). This is because, despite the numerous gains from school engagement across many different age groups (Ryan, 2000; Skinner, Wellborn, & Connell, 1990), many adolescents still do not get adequately involved in activities targeted at school learning (Epstein & Sheldon, 2002). The adolescent period, therefore, presents a challenge hindering school

engagement for many students and adolescence has been reported as a period of decline in school engagement (Fredericks & Eccles, 2002).

Finn (1989) conceptualized the idea of student engagement and the closely related terms including school connectedness, engagement, bonding, involvement, attachment, and commitment, as the steps starting from involvement with school-related activities which eventually results in attachment or identification with school. However, research has focused on and demonstrated the positive relationship between engagement and academic achievement, but little attention has been paid to the dependent variable student engagement (Finn & Rock, 1997). The key step towards this will involve the identification of contextual factors which may be controlled to increase student engagement (Christenson, Sinclair, Lehr, & Hurley, 2000) and which may influence the supportive role that parents, teachers and school personnel have on academic achievement (You & Sharkey, 2009b). To discuss this further, a theoretical basis is presented below about aspects influencing changes in student engagement.

Theoretical basis of student engagement

An increase in the multifaceted aspects affecting the youth development continues to increase the sophistication in theoretical basis of student engagement. The initial studies in the field of student engagement were founded upon Hirschi's (1969) social bonding theory and the resulting arguments concerning engagement including attachment, involvement, commitment, and beliefs. Other linked theories such as attachment theory, suggest an influence of later life relationships by early interactions between the child and its caregivers (Sroufe, 2005) which also encompasses bonds with teachers and social institutions such as schools (Cernkovich & Giordano, 1992). The social-learning theory by Bandura (1977a) supports the role of reinforcement in social bonding and behaviour. The social development model attempts to account for the distinct processes affecting the development of school engagement at different stages in a child's development such as skills, opportunities and the reinforcement resulting from involvement (Catalano & Hawkins, 1996).

Despite the theoretical foundation concerning school engagement that these theories have made possible, they do not adequately explain the intricate, shared and dynamic relationships between the individuals and contexts over time (You & Sharkey, 2009b). The developmental-ecological model incorporates both the individual and contextual factors affecting the functioning of a youth together with the dynamic interdependence between individuals and their contexts (Bronfenbrenner, 1986). This model expounds upon existing theoretical contributions by capturing various ecological contexts that acknowledge the influence of the individual, interpersonal relationships and social environments wherein the individual develops (You & Sharkey, 2009b). The developmental-ecological model in this case implies that the impact of various entities on a youth's life are not static throughout the

different developmental stages and particularly through the transitional phase of adolescence (You & Sharkey, 2009b).

Factors influencing student engagement

Birch and Ladd (1996) proposed a conceptual framework for evaluating engagement in adolescents which includes the role played by individual characteristics and interpersonal relationships with parents, peers, and teachers. Five categories of individual and contextual variables namely psychological factors, family practices, peer influences, teacher-student relationships, and school influences can be recognised as the foundation of modern developmental-ecological model of student engagement (You & Sharkey, 2009b). These variables form the foundation of the current study.

Psychological factors

Psychosocial factors are attributes influencing an individual psychologically and/or socially (Thomas et al., 2020). Psychosocial factors may be used to define individuals with respect to their social environment and the impact of this environment on an individual's physical and mental health. Psychological factors include cognitions and self-perceptions influencing school adjustment (Birch & Ladd, 1996). Locus of control reflects on social cognitions while self-control reflects upon self-perceptions (You & Sharkey, 2009b). These key psychological factors can be measured using locus of control for social cognition and self-concept for self-perceptions (Birch & Ladd, 1996). Self-perception is a multidimensional construct that includes factors such as self-esteem, self-cognition and self-efficacy.

Family practices

A student's academic achievement may be influenced by different family relations and management practices such as parental involvement in school activities, parental commitment to educational goals of the children, communication between parent and child, as well as supervision and monitoring by parents (Fan & Chen, 2001; Feuerstein, 2000).

The commitment and support by parents were found to be more important to the academic goals of a student than parental income and education (Hossler, Schmit, & Vesper, 1999). Such influence of parental commitment and support indirectly impact on the students' social, emotional, cognitive competence, and attitudes (You & Sharkey, 2009b). Communication and educational goals by parents were reported to indirectly influence an adolescents' academic achievement through mediation the effect of locus of control (Hong & Ho, 2005). The mediatory influence of an adolescents' educational goals with respect to the initial achievement and subsequent academic growth was also reported (Hong & Ho, 2005). However, the question, if these impacts of parental involvement are dynamic over time, is scarcely understood.

Peer relationships

The relationships with peers may affect adjustment and motivation to academics in addition to other developmental outcomes (Berndt & Keefe, 1995; Ryan, 2000). However, more research attention has been focused on the influence of teachers and parents on student engagement than that of peers (Eccles, Wigfield, & Ulrich, 1998). Many reports focus on the impact of peer influence on substance use and problematic behaviours while a few studies point out to the notable influence of peers on school adjustment, attitudes, and behaviours (You & Sharkey, 2009b). Various levels of peer impact have been reported on academic goals (Ide, Parkerson, Haertel, & Walberg, 1981), school engagement (Finn & Rock, 1997), positive behaviour in school (Ide et al., 1981), academic achievement (Berndt & Keefe, 1995), and commitment to school assignments, activities and homework (Cohen, 1977).

Relationships between the teacher and student

Teachers have been reported to considerably influence the academic outcomes of students due to their influence on motivational as well as educational aspirations, prosocial behaviour and self-concept (Croninger & Lee, 2001; Turner & Patrick, 2004). Stronger bonds between the teachers and students resulted in higher academic achievement and less involvement in problematic behaviour in school (Crosnoe, Johnson, & Elder, 2004). Such interpersonal and institutional contexts of education constitute an ecological perspective where further studies are needed (You & Sharkey, 2009b).

Influence of school

Although research efforts have focused on the relationships between the students and teachers, a couple of researchers report the influence of schools on student engagement. A study by (Lee & Smith, 1993) indicated that schools with a less bureaucratic structure fostered higher academic achievement and more engagement. Restructuring of high school also impacted positively on academic achievement and engagement (Lee & Smith, 1993). However, Johnson, Crosnoe and Elder (2001) reported a higher influence of the individual level factors such as gender, family structure, parental expectations, ethnicity, and social economic background on engagement and attachment while school effects were minor. A longitudinal analysis of school-level effects on student engagement is however required to draw further conclusions.

Research gaps concerning school engagement

You and Sharkey (2009b) made proposals on the direction of future research efforts applying the developmental-ecological model for student engagement research and the importance of research exploring social and contextual influences on school-related outcomes.

The scarcity of research on student engagement is due, in part, to the challenge of addressing the complex conceptual and methodological challenges inherent in testing a comprehensive model of student engagement. While longitudinal studies on student engagement are scarce, overreliance has been made on cross-sectional studies often with relatively small sample sizes (Fredricks et al., 2004). Such cross-sectional studies are important in suggesting relationships between variables but fail to capture the directionality of these associations.

The complex shared and dynamic relationships between the individuals and contexts over time should be studied while investigating the school-level factors affecting engagement. You and Sharkey (2009b) proposed methodological considerations towards such as study. The individual, as well as macro-level data, are needed to elucidate macro-level influences over individual outcomes. A multilevel analytic modelling technique will facilitate modelling of the hierarchical relationship whereby students are nested within schools which avoids the problem where individual-level data is aggregated while macro-level data is disaggregated. Neglecting such a consideration leads to inference that does not capture individual variability and the clustering effects at the macro-level. Multilevel study design and modelling approaches will facilitate the study of the influences of student engagement trajectories within the developmental–ecological model.

Adolescent Delinquency and Substance Abuse in South Africa

With close to half of the South African population consisting of youth 20 years old or younger (Census, 2012), it is important to pay attention to delinquency and substance use by this group due to the possible effect on the country's socio-economic development. This is because delinquency and substance use among adolescents impacts negatively on their health and various facets of individual well-being, therefore, translating to a negative impact on the economy of many governments irrespective of development status (Brody et al., 2008; Fothergill & Ensminger, 2006; Stone et al., 2012). Delinquency and health-compromising behaviours such as substance use occur together and are correlated and interventions targeting one are also effective on the other (ESPAD, 2015; Hirschi, 1969).

Substance abuse is a global problem that affects and is influenced by socio-economic and developmental factors (Ramlagan, Peltzer, & Matseke, 2010b). Studies point to a gradual increase since the late 1990s in drug-related problems and substance abuse in South Africa (Ramlagan et al., 2010b). The SACENDU project indicated that Alcohol and other Drugs AOD use by South African adolescents may increase the burden on the health, social wellbeing, and criminal justice apparatus of the country (Peltzer et al., 2010). Indeed the former late President Nelson Mandela in his opening address to Parliament in 1994 highlighted substance use as a problem among the social pathologies

that needed attention in South Africa (Ramlagan et al., 2010b). Subsequently, there was a mushrooming of both licensed and unlicensed treatment services (Department of Welfare, 1997).

Problematic behaviours in students have been an important challenge among educators in South Africa (Marais & Meier, 2010). Such behaviours include disrupting lessons, posing psychological or physical threat to other students and destruction of property such as vandalism (Marais & Meier, 2010). The concern has increased due to the increasingly violent nature of problematic behaviours where students carry weapons and other harmful objects to school which increases the instances of violence in school including stabbing (Nunan & Ntombela, 2018). Schools experiencing such issues provide a less safe learning and working environments for students and teachers respectively (Nunan & Ntombela, 2018).

Potential Impact of the Research

Engagement in delinquency and health compromising behaviour could potentially prevent youth from undertaking a positive and prosperous journey across adolescence and instead place them on a developmental path marked by negative trajectories and pathways that could lead to less-than-optimal functioning. Thus, identifying factors that prevent problematic behaviours may play an important role in enhancing positive youth development. Various forms of delinquency occur between the beginning of the second decade and before the youth graduate (or fail to graduate) from high school. Research has found that an early onset of delinquency in the teenage years predicts a long and serious antisocial path (Loeber & Le Blanc, 1990).

Many studies have investigated the impact of school engagement on academic failure (for a review, see You & Sharkey, 2009b). However, limited reports in South Africa and globally explore the role of factors affecting participation in school activities on the aetiology of delinquency and health-compromising behaviours. Emerging evidence points towards school engagement as protective against risky behaviours (Li et al., 2011b). However, the mechanism behind this protective impact is scantily understood and this limits the adoption of these findings in policy and research.

This study therefore outlines the influence and pathway through which personal and contextual factors impact on the association between behavioural and emotional engagement on the risk for and occurrence of delinquency and substance use. The study examines this mechanism in adolescents between “further education and training” (grades 10-12) and secondary (grades 7-9) school which are age intervals accompanied by increased prevalence of delinquency and substance use in South Africa and globally.

Designing effective interventions against substance use and delinquency based on student’s engagement in school activities should begin with a search for the factors and mechanisms that

influence student engagement. These factors provide practical resources for policy makers in education, educators, parents and others working to promote student engagement-based solutions for the development of more evidence-based solutions to behavioural problems. Results from this study will therefore be an important contribution towards enhancing positive youth development through identification of factors that counteract problematic behaviour.

Alignment to National Strategies and Conclusion

There is a continuous rise in problematic behaviour and use of AODs amongst South African adolescents and high school students (Ramlagan et al., 2010a). The SACENDU project reveals that AOD use by South African adolescents may increase the burden on the health, social wellbeing, and criminal justice apparatus of the country. With close to half of the South African population consisting of youth 20 years old or younger (Census, 2012), it is important to pay attention to the use of AODs by this group due to the possible effect on the country's socio-economic development (Parry & Bennetts, 1998). This problem has been directly linked to academic difficulties, absenteeism, and drop-out and myriads of associated high-risk behaviours, including unprotected sex, crime and violence, traffic accidents, and mental and physical health problems.

The South African government in 2010, established an Inter-Ministerial Committee (IMC) to combat alcohol and drug abuse in South Africa (Department of Basic Education, 2013). Indeed, the Department of Basic Education has developed a National Strategy for the Prevention and Management of Alcohol and Drug Use amongst Learners in Schools that focuses largely on prevention. This was in recognition of the rapid increase in prevalence of alcohol and drug abuse among youth in South Africa leading to disruption of families, the community and the society. This National Strategy for the Prevention and Management of Alcohol and Drug use amongst learners in schools (Department of Basic Education, 2013) was established to create an enabling environment for those learners who have become addicted to alcohol and drugs to access treatment, care and support services. Indeed, the schooling sector has been recognized for its pivotal role in combating alcohol and drug use.

This study aims to offer innovative insights which will lead to a generic structure for derivation of practical solutions within the youth environment namely school and family-based steps towards achievement of the goals and objectives of these national efforts. The results are expected to offer substantial insight into risk factors and protective factors toward lowering of substance use and the associated issue of delinquency.

CHAPTER 3 METHODS

This section outlines the methodological approach used to answer the three research questions. Sampling, measures, ethical issues, student access procedure and consent considerations are initially presented followed by a presentation of the data analysis approaches including exploratory and inferential data analysis. The theoretical foundations and relationships tested using the hypothesized models which form the basis of the structural equation model building and diagnostic processes are presented.

Sampling and Procedure

A multistage probability sample design consisting of three stages was applied. Selected municipalities within Gauteng province composed the primary sampling unit, (2) schools within the primary sampling units, and (3) students within sampled schools. A total of 898 students between grades 7-12 from 10 schools (4 private and 6 public schools) were interviewed from a planned sample size was 800 students. All consenting students who were present during the interview or follow up dates were interviewed by the researcher for between thirty and forty-five minutes as described in Annex 2. Two schools refusing participation were replaced with schools from similar geographic location, size, and type of school i.e., public or private.

Measures

Various aspects of delinquency, substance use, engagement, psycho-social characteristics, parental involvement and peer associations were measured. Behavioural, emotional, social and cognitive engagement, delinquency and substance use were assessed using selected items from Monitoring the Future survey (Bachman, Johnston, & O'Malley, 2000). This measures eight main aspects including support, empowerment, boundaries and expectations, constructive use of time, commitment to learning, positive values, social competencies, and positive identity (Annex 2).

The factors with potential influence on engagement which were measured included:

- Key psychological factors including social cognition (measured as the locus of control) and self-perceptions (measured as self-concept) (Birch & Ladd, 1996).
- Parental involvement in school activities, parental commitment to educational goals of the children, communication between parent and child, as well as supervision and monitoring of children by the parents (Fan & Chen, 2001; Feuerstein, 2000).

Substance abuse and age group specific indicators of delinquency were measured using items from included the Monitoring the Future survey (Bachman et al., 2000). The frequency of substance use in

adolescents was recorded in the past 12 months and parental use was reported by the adolescents. Substances such as cigarettes, alcohol, cannabis, and other common illicit substances reported in other studies on South African adolescents such as amphetamines, ecstasy and cocaine (Peltzer et al., 2010) were recorded. Delinquency and problematic behaviours were measured using items from Monitoring the Future survey (Bachman et al., 2000) including intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, involvement in serious fight in the last one year, damage to school property in the past year, suspension or expulsion from school at least once, bringing a weapon to school in the past one month, running away from home for more than 24 hours in the past year, involvement in group fights in the past year, hurting someone badly enough in the past year to need bandages or a doctor, taking other student's belongings in the past year, unauthorized entry into a building in the past year, and the sale of an illegal drug in the past one year. Bullying, vandalism, stealing, fighting, associating with substance using peers, disruption of classes, carrying weapons and related objects to school, incidents of stabbing in schools are among challenging behaviours reported in South African schools (Gagnon, Sylvester, & Marsh, 2021; Mokwena et al., 2020; Nunan & Ntombela, 2018). Contextual data including socio-economic and demographic data were also collected (Annex 2).

Research Questions

This research was based on the hypothesis that personal and contextual factors at individual and school levels may either mediate or moderate the effect of different dimensions of school engagement on delinquency and substance use. The study sought to investigate the following research questions:

- Does student engagement vary with individual level and school level factors?
- Is there an influence of parent and peer factors on psychosocial factors and is there an indirect influence of the changes in psychosocial factors on the different dimensions of engagement?
- From the foregoing, what is the pathway through which personal and contextual factors influence the impact of different dimensions of engagement on the risk for and occurrence of delinquency and substance use?

Ethical, access and consent considerations

Ethical review of the study was first sought from the University of South Africa, Research Ethical Review Board and was granted under Ethical Clearance Ref. No: PERC- 17029 of October 2017. Secondly, permission was sought and granted in May 2018 to conduct the research from Gauteng Department of Education which was followed by requests to school principals. Informed consent was

then sought from parents or caregivers and students. A final consideration was given to the data and data acquisition privacy and confidentiality. All information was treated confidential and no names or identifying particulars were recorded. Only the investigator had access to the questionnaires once they were completed. The parents or caregivers when obtaining the consent and participants during the interview were informed of the right to refuse to be interviewed, to withdraw from the interview at any time, or to refuse to fill in a particular question or set of questions.

Data Analysis

Exploratory Data Analysis

A comprehensive exploration of the data is a crucial initial step to statistical modelling. This is an initial step towards understanding the data at hand while guiding both the subsequent statistical modelling and contextualization of the statistical modelling results. The exploratory data analyses approach depends on the nature of the data and the planned statistical modelling. Components such as frequencies, percentages, measures of central tendency, and graphs were computed and interpreted during the exploratory data analyses.

Inferential Modelling

Research questions one and two

Dependent variables were categorical and ordinal data coded numerically as 1, 2, 3 etc. in increasing level (Annex 2: Questionnaires). Ordinal observations are those that fall in an ordered finite set of categories i.e. categorical variables with natural ordering. Cumulative link models (CLMs) are an appropriate model class for ordinal data because CLMs rightly treats the data as categorical while also exploiting their ordered nature to provide a regression framework that supports in-depth analyses.

Cumulative odds ordinal regression with proportional odds were used for the ordinal data to assess if there was an influence of parent and peer factors on psychosocial factors and if there was an influence of the changes in psychosocial factors on the different dimensions of engagement. In this regression model class, cumulative probabilities are utilized until a threshold, which makes the whole range of ordinal categories binary at that threshold for naturally ordered responses (Agresti, 2002; Christensen, 2018; Molenberghs & Verbeke, 2005). These models describe the log-odds of two cumulative probabilities, one less-than and the other greater-than type. We can, therefore, measure how likely the response is to be in category j or below versus in a category higher than j using a CLM in the form: $G^{-1}[P(Y \leq j)] = \alpha_j - X\beta$ where X is a matrix of regression variables, β is the vector of true regression coefficients and the intercept α_j is the threshold for level j , $j = 1, \dots, J$ for ordinal variable with J levels and $J \geq 2$ and G^{-1} is the link function. The thresholds α_j demarcates cut-off points or intercepts that separate the levels of the ordinal response such that $Y = j$ if $\alpha_{j-1} < Y \leq \alpha_j$ with strict

ordering $-\infty \equiv \alpha_0 \leq \alpha_1 \leq \dots \leq \alpha_{j-1} \leq \alpha_j \equiv \infty$. The output obtained enabled to describe the log-odds of falling into or below category j and the odds of falling above an outcome level as compared to another (Agresti, 2002; Christensen, 2018; Molenberghs & Verbeke, 2005). A fundamental assumption of ordinal regression models is the presence of proportional odds. The assumption of proportional odds means that each independent variable has an identical effect at each cumulative split of the ordinal dependent variable. This was tested using a full likelihood ratio test comparing the fitted location model to a model with varying location parameters.

A multilevel analytic modelling technique was used to facilitate modelling of the hierarchical relationship in student engagement with individual level and school level factors. This permits use of multiple units of analysis to investigate data nested within hierarchical structures while at the same time modelling the covariance structure (You & Sharkey, 2009a). For instance, the case of repeated observations nested within students and nested within schools in this study. This study presented a three-level hierarchy with results from students (level 1), nested within classes (level 2) which are in turn nested within schools (level 3). Random effects were used to allow the parameters to vary so that the inference could capture individual variability and the clustering effects at the macro-level. Random effects were added to the CLM model presented previously to account for dependence between observations in a level to yield cumulative link mixed models (multilevel models) with the following general form: $G^{-1}[P(Y_i \leq j)] = \alpha_j - (Z_{t[i]}u_t + X_i\beta)$ where $\mu_t \sim N(0, \sigma_u^2)$ (random effects are normally distributed and centred at zero). In this model specification, u_t represents the vector of coefficients corresponding to group level predictors $Z_{t[i]}$ for observation i in cluster t . As desired, the random effect induces correlation between observations within the same cluster while supporting inference to the population from which the groups originated.

The first step in such a multilevel analysis is to perform an evaluation analysis to ascertain if multilevel models are needed else CLM would suffice. In order to determine which of the response variables to model using the multilevel approach, variation within individual level and school level factors was modelled in the first research question of this thesis. Multilevel modelling will not be needed in the absence of significant variation across the groups. The first step involved fitting baseline models containing just the intercept. Models were then fit which allowed the intercepts to vary across the two contexts: school and class levels. These two models were then compared to assess if there was a significant improvement of the fit when intercepts were allowed to vary across classes and schools. In order to assess the fit and compare multilevel models, several approaches are possible including comparing Akaike's information criterion (AIC), Schwarz's Bayesian criterion (BIC) where smaller values imply better-fitting models. A chi-square likelihood ratio test (the $-2\log$ -likelihood or $-2LL$) can also be used. It is therefore recommended to build up multilevel models

beginning with the more 'basic' models followed by the addition of appropriate random coefficients (Raudenbush & Bryk, 2002; Twisk, 2006).

This comparison was made by assessing the model's differences in -2 Log Likelihood (-2LL). The maximized log-likelihood value for the more complex model has additional parameters and should be at least as large as the maximized log likelihood of the simpler model (Agresti, 2002). Comparison of the more complex to the simpler model is therefore simply made by subtract the log-likelihood of the new model from the value for the old: $\chi^2_{change} = (-2LL_{old}) - (-2LL_{new})$ where $df_{change} = \text{Number of Parameters}_{old} - \text{Number of Parameters}_{new}$ (Unwin, 2013). Tests were statistically significant at $\alpha = 0.05$. Analyses were conducted using package ordinal in R Version 3.5.1 (R Core Development Team, 2019).

Research question 3: pathway through which personal and contextual factors influence the impact of different dimensions of engagement on the risk for and occurrence of delinquency and substance use

Factor Analysis

Factor analysis was initially used to provide valid measurement models because sets of observed variables were used to define constructs or factors.

Exploratory Factor Analysis

Exploratory factor analysis was conducted on the measures of delinquency, substance use, engagement and psycho-social factors where some of the measures could not be assigned to factors from theory. This involved a determination of the number of factors, or dimensions, to extract from the data which was followed by extraction of the factors.

An initial assessment of the number of factors was performed by plotting and examination of scree plots. The more objective parallel analysis and minimum average partial method (Velicer, 1976) was also used to select the final number of factors to be extracted. Parallel analysis uses simulations from the data to suggest cut-offs for the scree plot based on the number of number of eigenvalues greater than one. Various factors are fitted to the data in the case of minimum partial method and interest is in plot lines that are higher on the y-axis. The factor intercorrelation matrix was examined to assess the extent of the correlation between each pair of the factors and oblique rotation was used for cases where correlation between any two factors was large, otherwise an orthogonal solution was used (Kabacoff, 2011). Analysis was performed using psych package in R statistical computing software Version 3.5.1 (R Core Development Team, 2019).

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was performed to test the hypothesized theoretical models in order to specify which variables loaded on to which factors on the basis on theory and previous studies (Schumacker & Lomax, 2010). CFA formed the foundation for creating specified measurement models that yielded latent scores to be used in the structural model for testing relations amongst the latent variables. Modification indices were computed to assess cases where modifications were needed to improve the model fit based on theoretical criteria outlined in the section below to perform theoretically justified addition of error covariance terms. The first indicator variables were set to one in order to give the factor a metric (Schumacker & Lomax, 2010). Decision was made from the output of CFA concerning performance of various items where a poor item was identified as an item that does not load highly with any factor (below 0.4) (Tabachnick & Fidell, 2014). Such items were removed, CFA repeated, and they were omitted from subsequent analysis.

CFA and EFA also were used to present the psychometric properties of the scales and the results are provided in the first section of the results. Variable were retained only when the rotated factor loading was at least $|0.3$ (meaning $\geq +.3$ or $\leq -.3$) onto the respective factors in order to be considered important.

Structural Equation Modelling

Relationships between latent variables are tested using structural models after the measurement models for both latent independent and dependent variables yield a good data versus model fit. Structural Equation Modelling (SEM) begins with model specification whereby both measurement and/or structural models are specified based on prior research and theory (Schumacker & Lomax, 2010). The literature review is used to support the choice of latent variables and the theory behind the relationships between the latent variables in the structural model. Chapter 2 presents an extensive treatise of the theoretical foundation of relationships studied in this thesis. You and Sharkey (2009a) in their assessment of the influence of personal and contextual factors on student engagement found that students' locus of control and self-concept significantly influenced student engagement. Students' locus of control and self-concept were in turn influenced by peer academic value, parental expectations and parent-child communication along with the students' socio-economic status, previous grades and friend dropout history (You & Sharkey, 2009a). However, only three items of engagement were studied in the study by You and Sharkey (2009a). Hirschfield and Gasper (2011) made a distinction between three dimensions of engagement namely emotional, behavioural, and cognitive. They further assessed if there was a bidirectional relationship between engagement and problematic behaviours while controlling for peer and family relationships (Hirschfield & Gasper, 2011). In a study of the association between school engagement and parental involvement which

included problem behaving friends as mediators, results indicated that weakened school engagement and adjustment were accompanied by increased substance use, conduct problems, and problem behaving friends and a reduction in authoritative parenting practices (Simons-Morton & Chen, 2009). From the foregoing, this study hypothesized that peer academic value, parental expectation and parent–child communication along with the students’ socio-economic status, previous grades and friend dropout history influence locus of control and self-esteem which in turn have a direct impact on different dimensions of student engagement. It was further postulated that engagement directly influences and is also influenced by delinquency. Parental involvement may either directly or indirectly influence delinquency and substance use through either locus of control or self-esteem and engagement. These relationships are illustrated in Figure 1 and using path diagrams in the results section. Analysis was therefore conducted to study the pathway through which personal and contextual factors influence the impact of different dimensions of engagement on the risk for and occurrence of delinquency and substance use. In such cases the appropriate analytical approach uses structural equation modelling (SEM) to test if this theoretical model is supported by the collected data. In this case, for instance, there are directed paths between parental involvement and delinquency or substance use. However, the influence of parental involvement may be partially mediated by locus of control or self-esteem through engagement while there is still a direct effect between parental involvement and delinquency or substance use. This example which forms part of the tested relationships is shown in Figure 1.

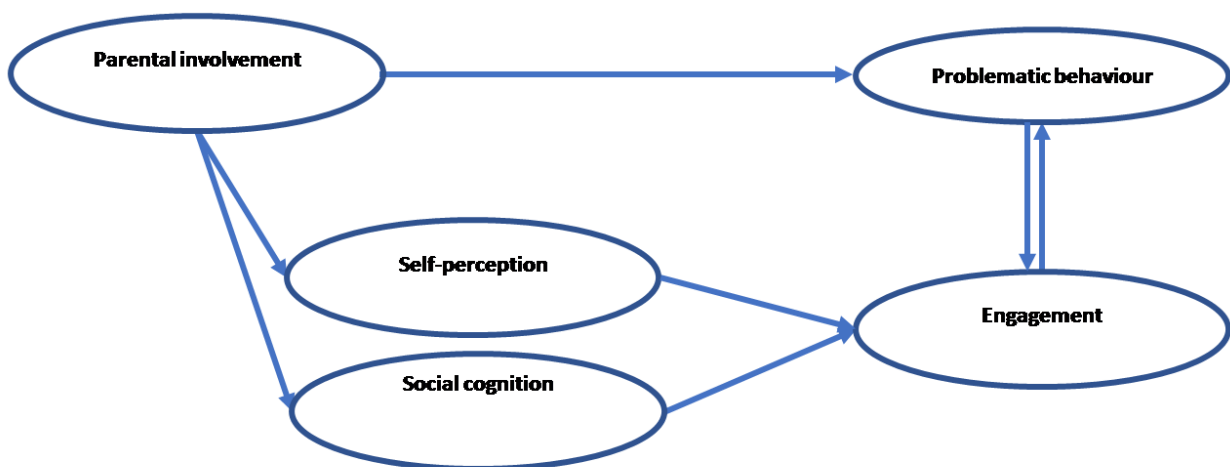


Figure 1 Hypothesized direct and indirect relationships between parental involvement, locus of control or self-esteem, engagement and delinquency

Concerning substance use, additional pathways can be envisaged. Muchiri and dos Santos (2018) studied the impact of family management factors including parental monitoring, discipline, behavioural control and parental substance use. Several risk and protective effects were reported and recommendations made for future studies to investigate interactions amongst risk or protective factors, as well as the type of substance. Parental substance use highly influenced the risk of child use while parental involvement in an adolescent's life was protective against substance use (Muchiri & dos Santos, 2018). The relationships shown in Figure 2 were tested for substance use by taking into consideration these additional relationships and the similar aspects between substance use and delinquency hypothesized in Figure 1.

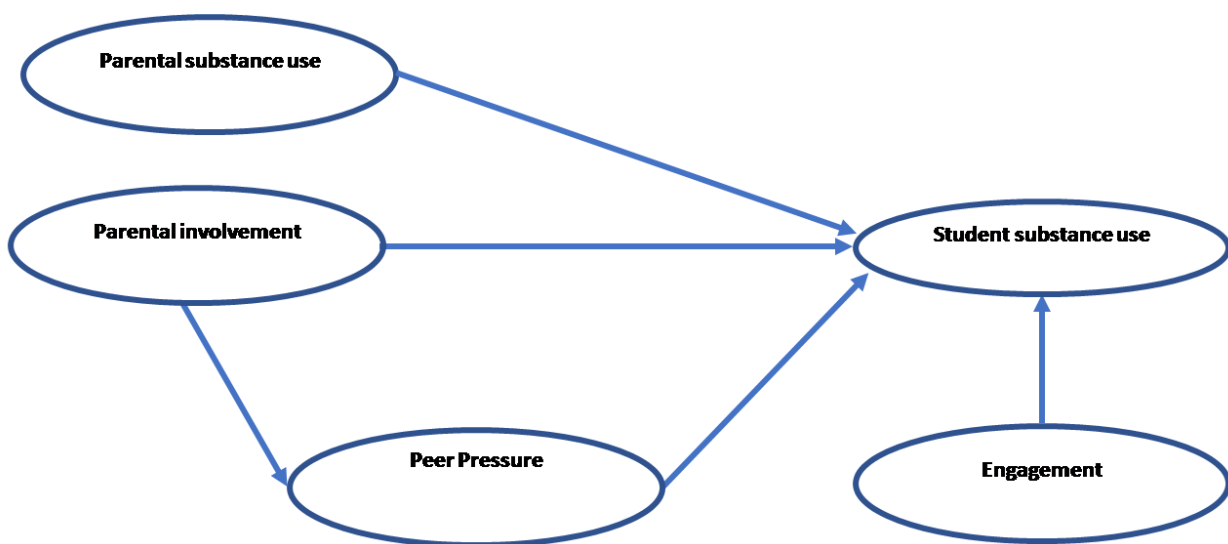


Figure 2 Hypothesized direct and indirect relationships between parental factors, peer influence, engagement and substance use

SEM is used to portray relations among observed and latent variables in theoretical models which enables to quantitatively test research hypothesis concerning these relationships (Schumacker & Lomax, 2010). SEM models help to hypothesize the definition of constructs (called latent variables in SEM) using sets of variables and the relationships between these constructs. Sets of questions were used to define each of the constructs including parental involvement, locus of control, self-esteem, engagement and delinquency or substance use. For instance, skipping classes, frequently coming to

class late, involvement in serious fight, suspension or expulsion from school, bringing weapon to school, involvement in group fights, hurting others, taking other's belongings and sale of illegal drugs were observed/ measured/ indicator variables used to define/ infer the latent variable or construct delinquency. The aim was to test if the data collected in this study supported the theoretical models using the scientific method of hypothesis testing to advance our understanding of the complex relations among the constructs (Schumacker & Lomax, 2010). The independent latent variables were - parental involvement, locus of control or self-esteem and engagement and while the dependent latent variables included delinquency and substance use. SEM was deemed the appropriate approach due to two main reasons. Firstly, there is an increasing awareness amongst scholars that multiple observed variables should be used to investigate research questions. Basic statistical methods make use of a restricted number of independent and dependent variables, and therefore fail to test theoretical relations between multiple variables (Schumacker & Lomax, 2010). Secondly, testing the validity and reliability of observed scores from measurement instruments has raised the issue of measurement error which has been ignored in basic statistical data analysis methods (Schumacker & Lomax, 2010). SEM explicitly takes measurement error into account by incorporating both latent and observed variables along with their associated measurement error (Schumacker & Lomax, 2010).

Modelling

Five steps outlined by Schumacker and Lomax (2010) were used to conduct SEM: model specification, identification, estimation, testing, and modification. Model specification was conducted to outline the measurement model and/or a structural model in Figure 1 from theory and previous studies. Two SEM models were specified for the dependent latent variables which were the delinquency and substance use as described in Figure 1 and the corresponding text. Model identification was performed by assessing if the degrees of freedom were equal to or greater than 1. Matrix features including order and rank condition were also assessed. Marker variable identification approach was used, where the loading of one of the observed variables constituting each latent variable was constrained to one.

Estimation was performed for the ordinal dependent and independent variables using maximum likelihood estimation with robust standard errors and a mean- and variance adjusted test statistic (Satterthwaite approach). Diagonally weighted least squares were used to estimate the model parameters while using the full weight matrix to compute robust standard errors, and a mean- and variance-adjusted test statistic. Model fit was made by first ascertaining if the global fit measure, the chi-square test, was non-significant ($p > 0.05$) indicating that the covariance matrix from the sample and the one reproduced from the implied model were similar. The normed chi-square was used where chi-square is divided by the degrees of freedom. The magnitude and direction of the parameter

estimates were also checked to confirm the expected sign of the coefficients. The degrees of freedom, goodness-of-fit index (GFI), normed fit index (NFI) and RMSEA were also assessed against guidelines recommended by Schumacker and Lomax (2015). The acceptable level for GFI and NFI is 0 (no fit) to 1 (perfect fit) where .90 or .95 reflects good model fit (Schumacker & Lomax, 2010). Schreiber et al. (2006) recommended a general rule for RMSEA of $< .06$ for categorical data as acceptable.

Whenever the global hypothesis test indicated that the model did not fit the data, a combination of modification indices and theory were used to build alternative models where error covariance terms were added between observed variables. The new models were then retested using above model fit assessment criteria. Final models were plotted and further interpreted.

Chapter Summary

Chapter 3 outlines the methodological approach used to answer the three research questions. Sampling, measures, ethical issues, access and consent considerations are initially presented. This is followed by a presentation of data analysis including exploratory and inferential data analysis. Multilevel proportional odds modelling approaches used in answering the first and second research questions are outlined. Assessment of the need for multilevel modelling for each of the response variables is presented followed by the regression models. Structural equation model building and diagnostics process used to answer the third research question is finally presented together with preliminary steps including factor analysis, exploratory factor analysis and model building. The theoretical foundations and relationships tested using the hypothesized models are presented.

CHAPTER 4 RESULTS

Exploratory Data Analysis

Socio-demographic and sample characteristics

Table 1 shows the distribution of sample characteristics and socio-demographic variables including the number of student respondents per school, gender, level of education, if the student repeated grades in the past, race, parental marital status, parental level of education and parental occupation. This results section reports valid percent which omits the missing cases per student for a given variable in the denominator when calculating the percentage. Percentages in text are reported in decreasing order of magnitude except where alternatively specified. A total of 898 students were interviewed. A slight majority of the students were female (57%; n=492). The mean student was 16.7 (standard deviation = 2.6) and age was relatively symmetrical with a median age of 16 years and a majority (66.5%; n=560) distributed between the ages 15 and 18. The majority of the students were from grade 10 (33%; n=283) followed by grades 9 (15.7%; n=131), 11 (15.4%; n=128), 8 (13.3%; n=111) and 7 (13.1%; n=109) while respondents from grades 6 and 12 comprised less than 100 students. The students were from black (93.4%; n=833), coloured (3.5%; n=31), white (1%; n=9) and Asian/Indian (1.5%; n=13) racial backgrounds while 12 either answered "other" or did not complete this question. Whereas a majority (64%; n=529) had not repeated grades in the past, 36% (n=298) had repeated grades at least once in the past.

Table 1 *The distribution of student, parental characteristics and socio-demographic variables*

Variable	Frequency		Valid percent	
	N=898	Percent		
*School	Dansa	49	5.5	
	Holly Trinity	6	0.7	
	PCHS	77	8.6	
	PPC	231	25.7	
	PSHS	105	11.7	
	PWHS	148	16.5	
	Queens	115	12.8	
	Seshegong	88	9.8	
	Silverton	23	2.6	
	Tshwane	56	6.2	
Gender	Male	371	41.3	43.0

	Female	492	54.8	57.0
	NA's	35	3.9	
Grade	6	3	0.3	0.4
	7	109	12.1	13.1
	8	111	12.4	13.3
	9	131	14.6	15.7
	10	283	31.5	34.0
	11	128	14.3	15.4
	12	68	7.6	8.2
	NA's	65	7.2	NA
Race	Black/African	833	92.8	93.4
	Coloured	31	3.5	3.5
	White	9	1.0	1.0
	Asian/Indian	13	1.4	1.5
	Other (Please Specify)	6	0.7	0.7
	NA's	6	0.7	
Repeated grade	No	529	58.9	64.0
	Yes, one time	251	28.0	30.4
	Yes, two or more times	47	5.2	5.7
	NA's	71	7.9	
Parent Marital Status	Married	428	47.7	49.2
	Single	246	27.4	28.3
	Separated	103	11.5	11.8
	Widowed	47	5.2	5.4
	Divorced	46	5.1	5.3
	NA's	28	3.1	
Highest Education: Mother	Completed grade school or less	20	2.2	2.7
	Some high school	42	4.7	5.6
	Completed high school	205	22.8	27.4
	Some college	29	3.2	3.9
	Completed college	347	38.6	46.4
	Graduate or professional school after college	103	11.5	13.8
	Don't know, or does not apply	2	0.2	0.3

	NA's	150	16.7	
Highest Education: Father	Completed grade school or less	11	1.2	1.7
	Some high school	34	3.8	5.1
	Completed high school	155	17.3	23.3
	Some college	21	2.3	3.2
	Completed college	292	32.5	43.8
	Graduate or professional school after college	145	16.1	21.8
	Don't know, or does not apply	8	0.9	1.2
	NA's	232	25.8	
Employ Status: Mother	Unemployed	141	15.7	16.9
	Employed part-time	76	8.5	9.1
	Employed full-time	530	59.0	63.6
	Self employed	86	9.6	10.3
	NA's	65	7.2	
Employ Status: Father	Unemployed	59	6.6	8.0
	Employed part-time	55	6.1	7.5
	Employed full-time	506	56.3	68.8
	Self employed	116	12.9	15.8
	NA's	162	18.0	

PCHS - Pretoria Central High School; PPC - Princess Park College; PSHS – Pretoria Secondary School; PWHS – Pretoria West High School

Parental factors were also considered. Most students came from married parental backgrounds (49.2%; n=428) followed by single parents (28.3%; n=246) and separated parents (11.8%; n=103) and less than a hundred students were from either divorced or widowed backgrounds. Considering maternal education, the majority of students reported that the highest proportion of parents completed college (46.4%; n=347), high school (27.4%; n=205) and graduate or professional school after college (13.8%; n=103). A similar trend was reported for paternal education where 43.8% (n=347) had completed college, 23.3% (n=155) completed high school and 21.8% (n=145) had completed graduate or professional school after college. Most of the mothers were employed on full time basis (63.6%; n=530) while 16.9% (n=141) and 10.3% (n=86) were unemployed and self-employed respectively. Concerning paternal employment, most of the fathers were employed on full time basis

(68.8%; n=506) while another 15.8% (n=116) and 8% (n=59) were self-employed and unemployed respectively.

Substance use

Legal substance use

The distribution of self-reported intensity and frequency of the use of alcohol and tobacco by student respondents and parents is shown in Table 2. A majority of the students reported that they did not smoke (87.3%; n=747) while 12.7% (n=109) reported that they smoked. Amongst the smokers, the highest proportion of 4.1% (n= 35) and 3.3% (n=28) reported smoking 2 or 3 days a month and every day or almost every day respectively. Regarding the smoking intensity amongst the students who smoked, 5.6% (48) and 3.3% (n=28) reported smoking 5 or 6 and 1 or 2 cigarettes respectively in each day that they smoked. A larger proportion of students used alcohol (31.3%; n=265) when compared with those who smoked. Amongst those who reported alcohol use, 12.4% (n=105) 8.3% (n= 70) and 6.7% (n= 57) used alcohol for 1 or 2 days in the past 12 months, once a month or less and 2 or 3 days a month respectively. Those who took alcohol most frequently took 1 or 2 (15.3%; n=129), 3 or 4 (7.5%; n=63) and 5 or 6 (6%; n=51) units in each episode.

Table 2 *The distribution of student self-reported and parental intensity and frequency of alcohol and tobacco use*

Variable	Frequency or intensity	Frequency		
		N=898	Percent	Valid Percent
Smoking frequency: Self	Never	747	83.2	87.3
	1 or 2 days in the past 12 months	18	2.0	2.1
	Once a month or less	13	1.4	1.5
	2 or 3 days a month	35	3.9	4.1
	1 or 2 days a week	9	1.0	1.1
	3 to 5 days a week	6	0.7	0.7
	Every day or almost every day	28	3.1	3.3
	NA's	42	4.7	
	Smoking intensity: Self	None	751	83.6
	1 or 2	28	3.1	3.3
	3 or 4	16	1.8	1.9
	5 or 6	48	5.3	5.6

	7 or 8	3	0.3	0.4
	9 or 10	2	0.2	0.2
	10 or more	8	0.9	0.9
	NA's	42	4.7	
Alcohol frequency: Self	Never	582	64.8	68.7
	1 or 2 days in the past			
	12 months	105	11.7	12.4
	Once a month or less	70	7.8	8.3
	2 or 3 days a month	57	6.3	6.7
	1 or 2 days a week	16	1.8	1.9
	3 to 5 days a week	8	0.9	0.9
	Every day or almost			
	every day	9	1.0	1.1
	NA's	51	5.7	
Alcohol intensity: Self	None	581	64.7	68.8
	1 or 2	129	14.4	15.3
	3 or 4	63	7.0	7.5
	5 or 6	51	5.7	6.0
	7 or 8	2	0.2	0.2
	9 or 10	2	0.2	0.2
	10 or more	17	1.9	2.0
	NA's	53	5.9	
Smoking frequency: Mother	Never	824	91.8	97.6
	1 or 2 days in the past			
	12 months	4	0.4	0.5
	2 or 3 days a month	3	0.3	0.4
	Every day or almost			
	every day	13	1.4	1.5
	NA's	54	6.0	
Smoking intensity: Mother	None	818	91.1	97.5
	1 or 2	10	1.1	1.2
	3 or 4	2	0.2	0.2
	5 or 6	2	0.2	0.2
	10 or more	7	0.8	0.8

	NA's	59	6.6		
Alcohol frequency: Mother	Never	577	64.3	68.4	
	1 or 2 days in the past 12 months	108	12.0	12.8	
	Once a month or less	92	10.2	10.9	
	2 or 3 days a month	30	3.3	3.6	
	1 or 2 days a week	23	2.6	2.7	
	3 to 5 days a week	4	0.4	0.5	
	Every day or almost every day	9	1.0	1.1	
	NA's	55	6.1		
	Alcohol intensity: Mother	None	590	65.7	70.3
		1 or 2	174	19.4	20.7
3 or 4		60	6.7	7.2	
5 or 6		7	0.8	0.8	
7 or 8		5	0.6	0.6	
9 or 10		2	0.2	0.2	
10 or more		1	0.1	0.1	
NA's		59	6.6		
Smoking frequency: Father	Never	644	71.7	83.4	
	1 or 2 days in the past 12 months	16	1.8	2.1	
	Once a month or less	6	0.7	0.8	
	2 or 3 days a month	5	0.6	0.6	
	1 or 2 days a week	4	0.4	0.5	
	3 to 5 days a week	14	1.6	1.8	
	Every day or almost every day	83	9.2	10.8	
	NA's	126	14.0		
	Smoking intensity: Father	None	645	71.8	83.7
		1 or 2	39	4.3	5.1
3 or 4		28	3.1	3.6	
5 or 6		24	2.7	3.1	
7 or 8		3	0.3	0.4	

	9 or 10	6	0.7	0.8
	10 or more	26	2.9	3.4
	NA's	127	14.1	
Alcohol frequency: Father	Never	436	48.6	57.4
	1 or 2 days in the past 12 months	76	8.5	10.0
	Once a month or less	82	9.1	10.8
	2 or 3 days a month	56	6.2	7.4
	1 or 2 days a week	51	5.7	6.7
	3 to 5 days a week	29	3.2	3.8
	Every day or almost every day	30	3.3	3.9
	NA's	138	15.4	
Alcohol intensity: Father	None	442	49.2	58.2
	1 or 2	167	18.6	22.0
	3 or 4	113	12.6	14.9
	5 or 6	12	1.3	1.6
	7 or 8	9	1.0	1.2
	9 or 10	7	0.8	0.9
	10 or more	9	1.0	1.2
	NA's	139	15.5	

Parental substance use

The distribution of student-reported intensity and frequency of the use of alcohol and tobacco by parents is shown in Table 2. A majority of the students reported that their mothers did not smoke (97.6%; n=824). The category with the highest proportion of maternal smoking was 1.5% (n= 13) which involved mothers who smoked every day or almost every day. Concerning maternal smoking intensity, the most frequently used levels reported were 1 or 2 and 10 or more cigarettes for 1.2% (10) and 0.8% (n=7) of the mothers respectively during each day that they smoked. A larger proportion of mothers used alcohol (31.6%; n=266) when compared with those who smoked an observation closely mirroring that of students. Amongst those who reported alcohol use, 12.8% (n=108), 10.9% (n= 92) and 3.6% (n= 30) used alcohol for 1 or 2 days in the past 12 months, once a month or less and 2 or 3

days a month respectively. Those who took alcohol most intensely took 1 or 2 (20.7%; n=174) and 3 or 4 (7.2%; n=60) units in each episode.

Even though most of the students reported that their fathers did not smoke (83.4%; n=644), this proportion was much higher than the reported frequency of self and maternal use. Paternal smoking was also more frequent as indicated by the results that 10.8% (n= 83) of fathers smoked every day or almost every day. The intensity of smoking was most frequent for 5.1% (n=39) and 3.6% (n=28) of the fathers who smoked 1 or 2 and 3 or 4 cigarettes respectively each day they smoked. However, another peak in paternal smoking intensity was observed where 3.4% (n=26) of the fathers smoked 10 or more cigarettes in each of the days that they smoked. A larger proportion of fathers used alcohol (42.6%; n=324) when compared with the proportion of fathers who smoked and the proportion of alcohol use amongst students and mothers. Concerning paternal alcohol use, 10% (n=76), 10.8% (n= 82) and 7.4% (n= 56) of the fathers used alcohol for 1 or 2 days in the past 12 months, once a month or less and 2 or 3 days a month respectively. Those who took alcohol most frequently took 1 or 2 (22.0%; n=167) and 3 or 4 (14.9%; n=113) units in each episode.

Illegal substance use

Table 3 **Error! Reference source not found.** shows the frequency of self-reported use of illegal substances by students and parents.

Cannabis

A majority of the students did not use cannabis (88.7%; n=728). There were extremes in higher use frequencies between those who used cannabis during 1 or 2 days in the past 12 months (3.4%; n=28) and those who use every day or almost every day (2.7%; n=22). Another peak frequency of use included those who use cannabis during 2 or 3 days a month (2.2%; n=18). The highest maternal cannabis use frequency was 1 or 2 days in the past 12 months 0.6%; n=5). Paternal use showed a similar pattern with child use with one peak use at 1 or 2 days in the past 12 months (0.8%; n=6) and another peak at those who use cannabis every day or almost every day (0.7%; n=5).

Table 3 *The distribution of student self-reported and parental intensity and frequency of illegal substance use*

Variable	Frequency	Frequency		Valid
		N= 898	Percent	Percent
Cannabis: Self	Never	728	81.1	88.7
	1 or 2 days in the past 12 months	28	3.1	3.4
	Once a month or less	10	1.1	1.2

	2 or 3 days a month	18	2.0	2.2
	1 or 2 days a week	11	1.2	1.3
	3 to 5 days a week	4	0.4	0.5
	Every day or almost every day	22	2.4	2.7
	NA's	77	8.6	
Cannabis: Mother	Never	796	88.6	99.1
	1 or 2 days in the past 12 months	5	0.6	0.6
	2 or 3 days a month	1	0.1	0.1
	Every day or almost every day	1	0.1	0.1
	NA's	95	10.6	
Cannabis: Father	Never	719	80.1	97.3
	1 or 2 days in the past 12 months	6	0.7	0.8
	Once a month or less	4	0.4	0.5
	2 or 3 days a month	2	0.2	0.3
	1 or 2 days a week	1	0.1	0.1
	3 to 5 days a week	2	0.2	0.3
	Every day or almost every day	5	0.6	0.7
	NA's	159	17.7	
Amphetamine: Self	Never	795	88.5	98.1
	1 or 2 days in the past 12 months	2	0.2	0.2
	2 or 3 days a month	3	0.3	0.4
	1 or 2 days a week	1	0.1	0.1
	3 to 5 days a week	2	0.2	0.2
	Every day or almost every day	7	0.8	0.9
	NA's	88	9.8	
Amphetamine: Mother	Never	791	88.1	99.4

	1 or 2 days in the past 12 months	2	0.2	0.3
	2 or 3 days a month	2	0.2	0.3
	Every day or almost every day	1	0.1	0.1
	NA's	102	11.4	
Amphetamine: Father	Never	728	81.1	99.5
	1 or 2 days in the past 12 months	2	0.2	0.3
	2 or 3 days a month	1	0.1	0.1
	1 or 2 days a week	1	0.1	0.1
	NA's	166	18.5	
Barbiturates: Self	Never	800	89.1	99.4
	1 or 2 days in the past 12 months	2	0.2	0.2
	2 or 3 days a month	1	0.1	0.1
	Every day or almost every day	2	0.2	0.2
	NA's	93	10.4	
Barbiturates: Mother	Never	786	87.5	99.0
	1 or 2 days in the past 12 months	5	0.6	0.6
	2 or 3 days a month	2	0.2	0.3
	Every day or almost every day	1	0.1	0.1
	NA's	104	11.6	
Barbiturates: Father	Never	725	80.7	99.5
	1 or 2 days in the past 12 months	1	0.1	0.1
	Once a month or less	1	0.1	0.1
	2 or 3 days a month	1	0.1	0.1
	Every day or almost every day	1	0.1	0.1
	NA's	169	18.8	

Cocaine: Self	Never	799	89.0	98.6
	1 or 2 days in the past 12 months	2	0.2	0.2
	Once a month or less	1	0.1	0.1
	2 or 3 days a month	2	0.2	0.2
	1 or 2 days a week	2	0.2	0.2
	3 to 5 days a week	1	0.1	0.1
	Every day or almost every day	3	0.3	0.4
	NA's	88	9.8	
Cocaine: Mother	Never	795	88.5	99.7
	1 or 2 days in the past 12 months	1	0.1	0.1
	2 or 3 days a month	1	0.1	0.1
Cocaine: Father	NA's	101	11.2	
	Never	728	81.1	99.6
	1 or 2 days in the past 12 months	1	0.1	0.1
	Once a month or less	1	0.1	0.1
	2 or 3 days a month	1	0.1	0.1
Heroin: Self	NA's	167	18.6	
	Never	800	89.1	99.1
	1 or 2 days in the past 12 months	2	0.2	0.2
	Once a month or less	2	0.2	0.2
	2 or 3 days a month	1	0.1	0.1
	Every day or almost every day	2	0.2	0.2
	NA's	91	10.1	
Heroin: Mother	Never	792	88.2	99.7
	Once a month or less	1	0.1	0.1
	2 or 3 days a month	1	0.1	0.1
Heroin: Father	NA's	104	11.6	
	Never	727	81.0	99.7

	2 or 3 days a month	2	0.2	0.3
	NA's	169	18.8	
LSD, Psychedelics and tranquillizers frequency: Self	Never	800	89.1	99.1
	1 or 2 days in the past 12 months	2	0.2	0.2
	Once a month or less	1	0.1	0.1
	2 or 3 days a month	1	0.1	0.1
	Every day or almost every day	3	0.3	0.4
	NA's	91	10.1	
LSD, Psychedelics and tranquillizers: Mother	Never	787	87.6	98.9
	1 or 2 days in the past 12 months	3	0.3	0.4
	Once a month or less	3	0.3	0.4
	2 or 3 days a month	1	0.1	0.1
	Every day or almost every day	2	0.2	0.3
	NA's	102	11.4	
LSD, Psychedelics and tranquillizers: Father	Never	726	80.8	99.5
	1 or 2 days in the past 12 months	1	0.1	0.1
	Once a month or less	1	0.1	0.1
	2 or 3 days a month	1	0.1	0.1
	1 or 2 days a week	1	0.1	0.1
	NA's	168	18.7	
Other substances: Self	Never	764	85.1	94.7
	1 or 2 days in the past 12 months	16	1.8	2.0
	Once a month or less	10	1.1	1.2
	2 or 3 days a month	8	0.9	1.0
	3 to 5 days a week	3	0.3	0.4

	Every day or almost every day	6	0.7	0.7
	NA's	91	10.1	
Other substances: Mother	Never	790	88.0	99.4
	1 or 2 days in the past 12 months	3	0.3	0.4
	2 or 3 days a month	2	0.2	0.3
	NA's	103	11.5	
Other substances: Father	Never	721	80.3	99.0

A small proportion used amphetamine (1.9%; n=15), the majority of whom reported using in 2 or 3 days a month (0.4%; n=3) and every day or almost every day (0.9%; n=7). Most of the mothers who used amphetamines (0.25%; n=2) used at frequency of 1 or 2 days in the past 12 months and 2 or 3 days a month. Most of the fathers used amphetamines during 1 or 2 days in the past 12 months (0.25%; n=2). Five students reported barbiturate use with two students (0.3%) reporting using at a frequency of 1 or 2 days in the past 12 months and every day or almost every day. Among the eight mothers who used barbiturates, 5 (0.6%) used during 1 or 2 days in the past 12 months and two (0.3%) used at 2 or 3 days a month. Four (0.13%) fathers used barbiturates each at 1 or 2 days in the past 12 months, once a month or less 2 or 3 days a month and every day or almost every day. While 98.6% (n=799) of students never use cocaine, 0.4% (n=3) use it every day or almost every day and 0.3% (n=2) use it during 1 or 2 days in the past 12 months, 2 or 3 days a month and 1 or 2 days a week. Two mothers and three fathers used cocaine and amongst these included one mother and father who used cocaine at the maximum frequency in the rating scale of 2 or 3 days a month. Seven students (0.8%) reported that they used heroin with two (0.3%) each at a frequency of 1 or 2 days in the past 12 months, once a month or less and every day or almost every day. It was reported that two mothers and fathers used heroin including at the maximum reported frequency of 2 or 3 days a month. Seven students (0.9%) used either LSD, psychedelics or tranquilisers. Majority of the seven students used these substances 1 or 2 days in the past 12 months (n=2) and every day or almost every day (n=3). Nine mothers used either LSD, psychedelics or tranquilisers with 3 (0.4%) using at frequencies of 1 or 2 days in the past 12 months and 3 (0.4%) at once a month or less. Four fathers used either of LSD, psychedelics or tranquilisers with each one (0.1%) at frequencies 1 or 2 days in the past 12 months, once a month or less, 2 or 3 days a month and 1 or 2 days a week. Other substances were used by 5.3% (n=43) of the students. The majority of those who used other substances used them during 1 or 2 days in the past 12 months (2.0%; n=16), once a month or less (1.2%; n=10) and 2 or 3 days a

month (1%; n=8). Three of the five (0.4%) mothers who used other substances used them during 1 or 2 days in the past 12 months. Three of the seven fathers (0.4%) who used other substances used them during 2 or 3 days a month.

Substance use cessation attempts and peer influence

Table 4 shows the distribution of student attempts at substance use cessation, peer use and influence. About 9.7% (n=71), 7% (n=50), 13.9% (n=104) and 4.6% (n=32) had previously attempted to stop smoking and using cannabis, alcohol and other substances respectively at least once.

Concerning peer use, 52.5% (n=433), 27.4% (n=219), 70.7% (n=578) and 25.8% (n=202) of the students reported they had at least one friend who used cannabis, smoked, used alcohol and other substances respectively. About 18.2% (n=149), 33.1% (n=270), 11.3% (n=92) and 9.8% (n=79) of the students reported that they experienced at least the lowest intensity of peer pressure from their friends to smoke, use alcohol, cannabis and other substances respectively.

Table 4 *Distribution of attempts at substance use cessation, peer use and influence*

Variable	Frequency	Frequency	Percent	Valid
				Percent
How many times one tried to stop smoking	None	661	73.6	90.3
	Once	33	3.7	4.5
	Twice	18	2.0	2.5
	3 to 5 times	8	0.9	1.1
	6 to 9 times	2	0.2	0.3
	10 or more times	10	1.1	1.4
	NA's	166	18.5	
How many times one tried to stop using cannabis	None	662	73.7	93.0
	Once	25	2.8	3.5
	Twice	7	0.8	1.0
	3 to 5 times	5	0.6	0.7
	6 to 9 times	1	0.1	0.1
	10 or more times	12	1.3	1.7

	NA's	186	20.7	
How many times one tried to stop using alcohol	None	646	71.9	86.1
	Once	52	5.8	6.9
	Twice	24	2.7	3.2
	3 to 5 times	9	1.0	1.2
	6 to 9 times	4	0.4	0.5
	10 or more times	15	1.7	2.0
	NA's	148	16.5	
How many times one tried to stop using other-substances	None	670	74.6	95.4
	Once	14	1.6	2.0
	Twice	6	0.7	0.9
	3 to 5 times	3	0.3	0.4
	6 to 9 times	1	0.1	0.1
	10 or more times	8	0.9	1.1
	NA's	196	21.8	
How many friends to use cannabis	None	392	43.7	47.5
	A Few	259	28.8	31.4
	Some	92	10.2	11.2
	Most	53	5.9	6.4
	All	29	3.2	3.5
	NA's	73	8.1	
How many friends to smoke	None	580	64.6	72.6
	A Few	107	11.9	13.4
	Some	38	4.2	4.8
	Most	43	4.8	5.4
	All	31	3.5	3.9
	NA's	99	11.0	
How many friends use alcohol	None	240	26.7	29.3
	A Few	195	21.7	23.8
	Some	132	14.7	16.1

	Most	148	16.5	18.1
	All	103	11.5	12.6
	NA's	80	8.9	
How many friends use other substances	None	581	64.7	74.2
	A Few	112	12.5	14.3
	Some	41	4.6	5.2
	Most	30	3.3	3.8
	All	19	2.1	2.4
	NA's	115	12.8	
Pressure from friends to smoke	None	670	74.6	81.8
	A little	99	11.0	12.1
	Some	22	2.5	2.7
	A lot	28	3.1	3.4
	NA's	79	8.8	
Pressure from friends to use alcohol	None	545	60.7	66.9
	A little	185	20.6	22.7
	Some	44	4.9	5.4
	A lot	41	4.6	5.0
	NA's	83	9.2	
Pressure from friends to use cannabis	None	722	80.4	88.7
	A little	54	6.0	6.6
	Some	20	2.2	2.5
	A lot	18	2.0	2.2
	NA's	84	9.4	
Pressure from friends to use other substances	None	725	80.7	90.2
	A little	46	5.1	5.7
	Some	19	2.1	2.4
	A lot	14	1.6	1.7
	NA's	94	10.5	

Delinquent Behaviour

An exploratory analysis of delinquent behaviour is presented in Table 5. A vast majority of students reported having in the past exhibited at least one of the delinquent behaviours associated with school

attendance such as intentionally missing school (98.5%; n=744) and skipping classes (97.9%; n=750). Most of the students reported missing school in the last month for 11 or more times (67.2%; n=507) and 6-10 days (13.2%; n=100). A majority also reported skipping more than 20 (75.5%; n= 578) of the classes in the last month for. Concerning the extent of class lateness, the majority reported having come to class late for 20 or more times (50.9%; n= 388), 10-19 times (27.3%; n=208) and 6-9 times (11.7%; n=89) a week on average. However, only 10.8% (n=75) reported having been suspended from school at least once and 2.5% (n=17) for two or more times in the past.

Table 5 *Exploratory analysis of student delinquent behaviour*

Variable		Frequency	Percent	Valid Percent
Missed school	None	11	1.2	1.5
	1 Day	11	1.2	1.5
	2 Days	25	2.8	3.3
	3 Days	33	3.7	4.4
	4-5 Days	68	7.6	9.0
	6-10 Day	100	11.1	13.2
	11 or More	507	56.5	67.2
	NA's	143	15.9	
Skipped class	Not at all	16	1.8	2.1
	3-5 time	17	1.9	2.2
	6-10 times	27	3.0	3.5
	11-20 times	128	14.3	16.7
	More than 20 times	578	64.4	75.5
	NA's	132	14.7	
Class lateness	Never	24	2.7	3.1
	Less than once a week	5	0.6	0.7
	1-2 times a week	12	1.3	1.6
	3-5 times a week	36	4.0	4.7
	6-9 times a week	89	9.9	11.7
	10-19 times a wee	208	23.2	27.3
	20 or more	388	43.2	50.9
	NA's	136	15.1	
Suspended or expelled from school	No	619	68.9	89.2

	Yes, one time	58	6.5	8.4
	Yes, two or more times	17	1.9	2.5
	NA's	204	22.7	
Run away from home	Not at all	624	69.5	89.4
	Once	35	3.9	5.0
	Twice	18	2.0	2.6
	3 or 4 Times	12	1.3	1.7
	5 or More Times	9	1.0	1.3
	NA's	200	22.3	
Serious fight	Not at all	573	63.8	84.0
	Once	68	7.6	10.0
	Twice	23	2.6	3.4
	3 or 4 Times	11	1.2	1.6
	5 or More Times	7	0.8	1.0
	NA's	216	24.1	
Hurt others	Not at all	550	61.2	79.4
	Once	73	8.1	10.5
	Twice	32	3.6	4.6
	3 or 4 Times	24	2.7	3.5
	5 or More Times	14	1.6	2.0
	NA's	205	22.8	
Group fights	Not at all	518	57.7	74.6
	Once	84	9.4	12.1
	Twice	44	4.9	6.3
	3 or 4 Times	16	1.8	2.3
	5 or More Times	32	3.6	4.6
	NA's	204	22.7	
Damage school property	Not at all	556	61.9	82.9
	Once	60	6.7	8.9
	Twice	28	3.1	4.2
	3 or 4 Times	11	1.2	1.6
	5 or More Times	16	1.8	2.4
	NA's	227	25.3	
Carried weapon to school	None	687	76.5	91.6

	1 Day	35	3.9	4.7
	2 Days	16	1.8	2.1
	3-5 days	8	0.9	1.1
	6-9 days	1	0.1	0.1
	10 or more days	3	0.3	0.4
	NA's	148	16.5	
Taken others' belongings	Not at all	342	38.1	51.1
	Once	154	17.1	23.0
	Twice	54	6.0	8.1
	3 or 4 Times	38	4.2	5.7
	5 or More Times	81	9.0	12.1
	NA's	229	25.5	
Gone into building not allowed	Not at all	512	57.0	75.4
	Once	80	8.9	11.8
	Twice	20	2.2	2.9
	3 or 4 Times	32	3.6	4.7
	5 or More Times	35	3.9	5.2
	NA's	219	24.4	
Sold illegal drugs	Not at all	627	69.8	91.8
	Once	21	2.3	3.1
	Twice	10	1.1	1.5
	3 or 4 Times	11	1.2	1.6
	5 or More Times	14	1.6	2.1
	NA's	215	23.9	

While 89.4% (n=624) never ran away from home for more than 24 hours, 10.6% (n=74) reported having ran away from home at least once in the past one year. The proportion of students who have been involved in a serious fight in school or away in the previous year was 16% (n=109), though a greater proportion (20.6%; n=143) reported having hurt someone badly enough in the past year to either need bandages or a doctor. A quarter of the students (25.4%; n=176) reported having been involved in group fights in the past year which was higher than those involved in serious fights. A smaller proportion (8.4%; n=63) reported carrying a weapon such as a gun, knife, or club to school for at least a day in the last one month. Among students who reported having damaged school property in the past year (17.1%; n=115), a majority did it only once (8.9%; n=60) or twice (4.2%; n=28).

About a half of the students (48.9%; n=327) reported having taken another student's belongings in the past year with two peaks in frequency at once (23%; n=154) and five or more times (12.1%; n=23). A quarter (24.6%; n=167) reported having gone into a building without authorisation in the past year with a majority having done this either once (11.8%; n=80) or five or more times (5.2%; n=35). Amongst those who reported having sold illegal drugs, (8.2%; n=56), 3.1% (n=21) and 2.1% (n=14) had done this once and five or more times respectively in the past year.

Univariate tests of association

Pairs of socio-demographic factors and other variables subsequently tested in multivariate models were assessed for association using the Chi-Square test. The null hypothesis stated that pairs of variables were independent against the alternative that the pairs are dependent. Due to the large number of pairs tested, only results showing significant associations ($p < 0.05$) are reported.

Association between socio-demographic variables and substance use

Table 6 reports the Chi-square statistics, degrees of freedom, and exact p-values from tests of association between socio-demographic variables and substance use.

Gender was significantly associated ($p < 0.05$) with the intensity and frequency of smoking and the frequency of cannabis use. There was a significant association ($p < 0.05$) between age and smoking intensity, frequency and intensity of the use of alcohol, cannabis, barbiturates and either LSD, psychedelics or tranquilizer use. Current grade was significantly associated ($p < 0.05$) with how intensely and frequently one smoked and used alcohol and how frequently they used heroin and other substances. Race was significantly associated ($p < 0.05$) with the intensity and frequency of smoking and using alcohol and how frequently one used cannabis, amphetamine, barbiturates, heroin, either LSD, psychedelics or tranquilisers, and other substances. Parental marital status was significantly associated ($p < 0.05$) with frequency of alcohol (and intensity), cannabis, and cocaine use. The highest maternal education was significantly associated ($p < 0.05$) with the intensity of smoking and the frequency of alcohol (and extent), cocaine, and heroin use. The highest paternal education was significantly associated ($p < 0.05$) with the extent of smoking and the use frequency of alcohol, barbiturates, heroin, LSD, psychedelics or tranquilisers, and other substances. There was a significant association ($p < 0.05$) between maternal employment status and how often one smoked. Having repeated grades at least once was significantly associated ($p < 0.05$) with both intensity and frequency of smoking and alcohol use and the frequency at which students used cannabis, amphetamine, barbiturates, cocaine, heroin and LSD, psychedelics or tranquilisers.

Table 6 Association between socio-demographic variables and substance use

Socio-demographic characteristic measure	Substance use frequency or intensity	Chi-Square	df	p-value
Gender	Smoke frequency	17.39	6	0.008
	Smoke intensity	15.63	6	0.016
	Alcohol intensity	14.15	6	0.028
	Cannabis frequency	17.28	6	0.008
	Stop other substances	11.86	5	0.037
Age	Smoke intensity	140.03	90	0.001
	Alcohol frequency	128.05	90	0.005
	Alcohol intensity	145.01	90	0.000
	Cannabis frequency	113.93	90	0.045
	Barbiturates frequency	84.07	45	0.000
Highest education	LSD, psychedelics or tranquilisers frequency	87.76	60	0.011
	Smoke frequency	77.28	36	0.000
	Smoke intensity	206.80	36	0.000
	Alcohol frequency	52.29	36	0.039
	Alcohol intensity	61.87	36	0.005
	Heroin frequency	68.78	24	0.000
	Other frequency	45.57	30	0.034
Race	Smoke frequency	60.33	24	0.000
	Smoke intensity	106.23	24	0.000
	Alcohol frequency	42.37	24	0.012
	Alcohol intensity	46.58	24	0.004
	Cannabis frequency	45.50	24	0.005
	Amphetamine frequency	82.39	20	0.000
	Barbiturates frequency	296.89	12	0.000
	Heroin frequency	31.85	16	0.010
	LSD, psychedelics or tranquilisers frequency	51.19	16	0.000
	Other frequency	58.19	20	0.000
Parent Marital Status	Alcohol frequency	44.55	24	0.007
	Alcohol intensity	53.30	24	0.001

	Cannabis frequency	39.66	24	0.023
	Cocaine frequency	39.44	24	0.025
Highest Education: Mother	Smoke intensity	66.57	36	0.001
	Alcohol frequency	103.37	36	0.000
	Alcohol intensity	62.39	36	0.004
	Cocaine frequency	56.81	36	0.015
	Heroin frequency	46.02	24	0.004
Highest Education: Father	Smoke intensity	88.36	36	0.000
	Alcohol frequency	63.33	36	0.003
	Barbiturates frequency	49.95	18	0.000
	Heroin frequency	41.59	24	0.014
	LSD, psychedelics or tranquilisers frequency	41.03	24	0.017
	Other frequency	44.01	30	0.048
Employ Status: Mother	Smoke frequency	34.28	18	0.012
Ethnicity	Smoke frequency	49.83	18	0.000
	Smoke intensity	76.35	18	0.000
	Alcohol intensity	30.38	18	0.034
	Barbiturates frequency	122.27	9	0.000
	LSD, psychedelics or tranquilisers frequency	25.58	12	0.012
Repeated grade	Smoke frequency	41.49	12	0.000
	Smoke intensity	59.94	12	0.000
	Alcohol frequency	46.76	12	0.000
	Alcohol intensity	51.51	12	0.000
	Cannabis frequency	39.86	12	0.000
	Amphetamine frequency	19.03	10	0.040
	Barbiturates frequency	23.22	6	0.001
	Cocaine frequency	39.90	12	0.000
	Heroin frequency	37.48	8	0.000
	LSD, psychedelics or tranquilisers frequency	21.50	8	0.006

Association between socio-demographic factors and delinquency

Table 7 reports the Chi-square statistics, degrees of freedom, and exact p-values from tests of association between socio-demographic factors and delinquency. There was a significant association ($P < 0.05$) between gender and having skipped class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, involvement in a serious fight during the last one year, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, involvement in group fights during the past year, hurting others badly enough to need bandages or a doctor in the past year, taking other student's belongings in the past year and sale of illegal drug in the past one year. Age was significantly associated ($P < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, having ran away from home for more than 24 hours in the past year and having hurt others badly enough to need bandages or a doctor in the past year.

There was a significant association ($P < 0.05$) between the current grade the student was in with intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, entry into a building without permission in the past year and the sale of an illegal drug in the past one year. Race was significantly associated ($P < 0.05$) with intentionally missing school in the past month, involvement in a serious fight in the last one year, damaging school property on purpose in the past year, suspension or expulsion from school in the past, having ran away from home for more than 24 hours in the past year and having hurt others badly enough to need bandages or a doctor in the past year. Highest paternal education was significantly associated with skipping class one was not supposed to in the past one month, involvement in a serious fight in the last one year, damaging school property on purpose in the past year, suspension or expulsion from school in the past and entry into a building without authorisation in the past year. Maternal employment status was significantly associated ($P < 0.05$) with intentionally missing school in the past month, suspension or expulsion from school in the past, intentionally missing school in the past month and involvement in serious fights in the last one year. There was a significant association ($P < 0.05$) between the school the student was enrolled in with skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapons to school in the past one month and the past one year's involvement in group fights, hurting others badly enough to need bandages or a doctor, taking other's belongings and sale of illegal drugs. Ethnicity was significantly associated ($P < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week,

involvement in serious fights in the last one year, bringing weapon to school in the past one month, having ran away from home for more than 24 hours in the past year and sale of illegal drug in the past one year. Having repeated grades at least once was significantly associated ($P < 0.05$) with intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, and the past year's involvement in serious fight, damaging school property on purpose, involvement in group fights, hurting others badly enough to need bandages or a doctor, taking other student's belonging and the sale of an illegal drug.

Table 7 Association between socio-demographic factors and delinquency

Socio-demographic measure	Delinquency measure	Chi-Square	df	p-value
School	Skipped class	127.67	36	0.000
	Class lateness	161.82	54	0.000
	Serious fight	58.32	36	0.011
	Suspended or expelled from school	34.16	18	0.012
	Weapon to school	90.13	45	0.000
	Group fights	134.51	36	0.000
	Hurt others	54.82	36	0.023
	Taken other's belonging	54.62	36	0.024
	Sold illegal drug	55.06	36	0.022
Gender	Skipped class	15.97	4	0.003
	Class lateness	26.79	6	0.000
	Serious fight	34.37	4	0.000
	Suspended or expelled from school	27.55	2	0.000
	Weapon to school	45.08	5	0.000
	Group fights	22.93	4	0.000
	Hurt others	17.59	4	0.001
	Taken other's belonging	20.24	4	0.000
	Sold illegal drug	20.03	4	0.000
Age	Skipped class	92.47	60	0.005
	Class lateness	120.20	90	0.018
	Suspended or expelled from school	52.40	30	0.007
	Weapon to school	98.31	75	0.037
	Run from home	121.88	60	0.000

	Hurt others	96.93	60	0.002	
Grade	Missed school	90.93	36	0.000	
	Skipped class	54.84	24	0.000	
	Class lateness	67.01	36	0.001	
	Suspended or expelled from school	26.18	12	0.010	
	Gone into building not allowed	60.42	24	0.000	
	Sold illegal drug	41.53	24	0.015	
Race	Missed school	39.53	24	0.024	
	Serious fight	29.91	16	0.018	
	Damage school property	63.94	16	0.000	
	Suspended or expelled from school	18.86	8	0.016	
	Run from home	44.33	16	0.000	
	Hurt others	28.63	16	0.027	
Highest Education: Father	Skipped class	36.64	24	0.048	
	Serious fight	45.48	24	0.005	
	Damage school property	51.56	24	0.001	
	Suspended or expelled from school	28.44	12	0.005	
	Gone into building not allowed	43.99	24	0.008	
	Employ Status: Mother	Missed school	30.74	18	0.031
Suspended or expelled from school		17.46	6	0.008	
Missed school		31.39	18	0.026	
Serious fight		24.04	12	0.020	
Ethnicity	Skipped class	29.27	12	0.004	
	Class lateness	28.83	18	0.050	
	Serious fight	25.06	12	0.015	
	Weapon to school	36.62	15	0.001	
	Run from home	22.55	12	0.032	
	Sold illegal drug	25.35	12	0.013	
	Repeated grade	Missed school	21.36	12	0.045
		Skipped class	51.95	8	0.000
Class lateness		25.57	12	0.012	
Serious fight		25.65	8	0.001	
Damage school property		17.26	8	0.028	
Suspended or expelled from school		44.77	4	0.000	

Weapon to school	50.17	10	0.000
Group fights	20.86	8	0.008
Hurt others	37.99	8	0.000
Taken other's belonging	20.40	8	0.009
Sold illegal drug	27.73	8	0.001

Association between engagement and delinquency

Table 8 reports the Chi-square statistics, degrees of freedom, and exact p-values from tests of association between engagement and delinquency. The average grade in the school year was significantly associated ($p < 0.05$) with class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month and the past year's involvement in group fights, entry into a building without authorisation and the sale of an illegal drug.

There was a significant association ($p < 0.05$) between a student's perception of the likelihood to graduate from high school with getting sent to the office or having to stay after school because one misbehaved, intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, and the past year's involvement in serious fights, involvement in group fights, hurting others badly enough to need bandages or a doctor and the sale of an illegal drug. The hours spent on homework in an average week in school and away from school were significantly associated ($p < 0.05$) with intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, damaging school property on purpose in the past year, suspension or expulsion from school in the past, involvement in group fights in the past year and hurting others badly enough to need bandages or a doctor in the past year. Participating in music or other performing arts was significantly associated ($p < 0.05$) with damaging school property on purpose in the past year while participating in athletic teams was significantly associated ($p < 0.05$) with intentionally missing school in the past month.

Enjoying being in school was significantly associated ($p < 0.05$) with getting sent to the office or having to stay after school because one misbehaved, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapon to school in the past one month, damaging school

property on purpose in the past one year, running away from home for more than 24 hours, involvement in group fights and hurting others badly enough to need bandages or a doctor.

Hating being in school was significantly associated ($p < 0.05$) with getting sent to the office or having to stay after school because one misbehaved, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week and entry into a building without authorisation in the past year.

Trying one's best in schoolwork was significantly associated ($p < 0.05$) with getting sent to the office or having to stay after school because one misbehaved, skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, bringing a weapon to school in the past one month and involvement in group fights in the past year.

Finding schoolwork too hard to understand was significantly associated ($p < 0.05$) with getting sent to the office or having to stay after school because one misbehaved, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, involvement in serious fight in the last one year, bringing a weapon to school in the past one month and the sale of an illegal drug in the past one year.

There was a significant association ($p < 0.05$) between failing to complete or turn in assignments with getting sent to the office or having to stay after school because one misbehaved, intentionally missing school in the past month, skipping classes without a good reason or permission in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month and the past year's involvement in serious fights, running away from home for more than 24 hours, involvement in group fights, taking other student's belongings, entry into a building without authorisation and the sale of an illegal drug, damaging school property on purpose and hurting others badly enough to need bandages or a doctor. Finding schoolwork interesting was significantly associated ($p < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past, having ran away from home for more than 24 hours in the past year, hurting others badly enough to need bandages or a doctor in the past year and sale of an illegal drug in the past one year. There was a significant association ($p < 0.05$) between how often one's friends encourage them to do things which their teachers would not like with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, involvement in a serious fight in the last one year, damaging school property on purpose in the past year, suspension or expulsion from school in the past, bringing weapons to school in the past one month, involvement in group fights in the past year and the sale of an illegal drug in the past one year. The length of time spent in extra curricula activities was significantly

associated ($p < 0.05$) in the past year with having ran away from home for more than 24 hours, involvement in group fights, hurting others badly enough to need bandages or a doctor and sale of an illegal drug.

Grades competition amongst students in the school was significantly associated ($p < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, damaging school property on purpose in the past year and bringing a weapon to school in the past one month.

How one thought others would feel if they cheated on a test was significantly associated ($p < 0.05$) with class lateness without approved excuse in an average school week, involvement in serious fights in the last one year, suspension or expulsion from school in the past and entry into a building without authorisation in the past year. How the student thought most colleagues would feel one intentionally did things to make their teachers angry was significantly associated ($p < 0.05$) with class lateness without an approved excuse in an average school week, damaging school property on purpose in the past year and entry into a building without authorisation in the past year.

The importance that a student attached to being a leader in student activities was significantly associated ($p < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week and bringing a weapon to school in the past one month. The number of times teachers interrupted class to deal with misbehaviour or “goofing off” during an average school week was significantly associated ($p < 0.05$) with class lateness without an approved excuse in an average school week, involvement in serious fights in the last one year, damaging school property on purpose in the past year, bringing a weapon to school in the past one month, involvement in group fights in the past year and taking other student’s belonging in the past year. There was a significant association ($p < 0.05$) between the number of times teachers interrupted class to deal with misbehaviour or ”goofing off” by self during an average school week and delinquency as measured by the number of times one came to class late without an approved excuse in an average school week. The extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable was significantly associated ($p < 0.05$) with class lateness without approved excuse in an average school week, involvement in a serious fight in the last one year, bringing weapons to school in the past one month, involvement in group fights in the past year and having taken other student’s belonging in the past year. There was a significant association ($p < 0.05$) between the number of one's friends who dropped out of school and intentionally missing school in the past month, skipping class one was not supposed to in the past one month, suspension or expulsion from school in the past, and the past year’s involvement in a serious fight, damaging school property on purpose, having ran away from home for more than 24 hours, hurting others badly

enough to need bandages or a doctor, entry into a building without authorisation and the sale of an illegal drug.

Table 8 Association between engagement and delinquency

Engagement measure	Delinquency measure	Chi-Square	df	p-value
Average grade	Class lateness	79.43	48	0.003
	Suspended or expelled from school	28.43	16	0.028
	Weapon to school	57.38	40	0.037
	Group fights	58.68	32	0.003
	Gone into building not allowed	64.74	32	0.001
	Sold illegal drug	47.73	32	0.036
Likely to graduate	Get sent office	26.28	12	0.010
	Missed school	30.23	18	0.035
	Skipped class	34.90	12	0.000
	Class lateness	65.67	18	0.000
	Serious fight	33.76	12	0.001
	Suspended or expelled from school	20.72	6	0.002
	Weapon to school	67.06	15	0.000
	Group fights	27.50	12	0.007
	Hurt others	25.81	12	0.011
	Sold illegal drug	26.07	12	0.010
Hours on homework week	Missed school	58.49	36	0.010
	Skipped class	43.23	24	0.009
	Class lateness	130.41	36	0.000
	Damage school property	45.12	24	0.006
	Suspended or expelled from school	24.92	12	0.015
	Group fights	50.87	24	0.001
	Hurt others	60.31	24	0.000
Participating music	Damage school property	28.23	16	0.030
Participating athletics	Missed school	36.75	24	0.046
Enjoy school	Get sent office	65.12	16	0.000

	Skipped class	29.34	16	0.022
	Class lateness	64.82	24	0.000
	Damage school property	33.69	16	0.006
	Suspended or expelled from school	22.17	8	0.005
	Weapon to school	33.93	20	0.027
	Run from home	47.12	16	0.000
	Group fights	29.10	16	0.023
	Hurt others	31.66	16	0.011
Hate school	Get sent office	29.41	16	0.021
	Skipped class	40.94	16	0.001
	Class lateness	68.56	24	0.000
	Gone into building not allowed	30.95	16	0.014
Try best in school	Get sent office	63.03	16	0.000
	Skipped class	43.38	16	0.000
	Class lateness	63.99	24	0.000
	Weapon to school	72.12	20	0.000
	Group fights	32.96	16	0.007
School work too hard	Get sent office	55.22	16	0.000
	Skipped class	33.00	16	0.007
	Class lateness	64.81	24	0.000
	Serious fight	39.71	16	0.001
	Weapon to school	54.35	20	0.000
	Sold illegal drug	26.35	16	0.049
Turn in assignments	Get sent office	110.86	16	0.000
	Missed school	74.71	24	0.000
	Skipped class	41.76	16	0.000
	Class lateness	65.86	24	0.000
	Serious fight	48.08	16	0.000
	Suspended or expelled from school	35.99	8	0.000
	Weapon to school	49.30	20	0.000
	Run from home	47.60	16	0.000
	Group fights	32.45	16	0.009

	Taken other's belonging	28.66	16	0.026
	Gone into building not allowed	27.97	16	0.032
	Sold illegal drug	41.85	16	0.000
Get sent office	Missed school	45.03	24	0.006
	Skipped class	67.02	16	0.000
	Class lateness	101.31	24	0.000
	Serious fight	76.62	16	0.000
	Damage school property	38.81	16	0.001
	Suspended or expelled from school	57.98	8	0.000
	Weapon to school	82.98	20	0.000
	Run from home	41.50	16	0.000
	Group fights	52.94	16	0.000
	Hurt others	45.24	16	0.000
	Taken other's belonging	51.64	16	0.000
	Sold illegal drug	59.23	16	0.000
School work interesting	Skipped class	34.24	16	0.005
	Class lateness	39.48	24	0.024
	Suspended or expelled from school	22.07	8	0.005
	Run from home	36.43	16	0.003
	Hurt others	30.43	16	0.016
	Sold illegal drug	32.30	16	0.009
Friends encourage to defy	Skipped class	40.79	16	0.001
	Class lateness	183.06	24	0.000
	Serious fight	63.78	16	0.000
	Damage school property	36.30	16	0.003
	Suspended or expelled from school	27.51	8	0.001
	Weapon to school	85.00	20	0.000
	Group fights	85.91	16	0.000
	Sold illegal drug	28.93	16	0.024
Time spent in extracurricular	Run from home	35.52	20	0.017
	Group fights	33.38	20	0.031

	Hurt others	36.87	20	0.012
	Sold illegal drug	36.04	20	0.015
Grades competition	Skipped class	35.83	16	0.003
	Class lateness	47.65	24	0.003
	Damage school property	26.90	16	0.043
	Weapon to school	35.41	20	0.018
How others feel if I cheated	Class lateness	42.24	24	0.012
	Serious fight	27.62	16	0.035
	Suspended or expelled from school	21.00	8	0.007
	Gone into building not allowed	27.80	16	0.033
How others feel if I defied	Class lateness	50.20	24	0.001
	Damage school property	30.61	16	0.015
	Gone into building not allowed	33.11	16	0.007
Importance activities leadership	Skipped class	33.04	16	0.007
	Class lateness	51.21	24	0.001
	Weapon to school	35.03	20	0.020
Class interruption misbehaviour	Class lateness	117.42	36	0.000
	Serious fight	38.04	24	0.034
	Damage school property	53.05	24	0.001
	Weapon to school	62.97	30	0.000
	Group fights	52.92	24	0.001
	Taken other's belonging	68.49	24	0.000
Own learning interruption misbehaviour	Class lateness	58.77	36	0.010
Misbehaviour rules fair	Class lateness	50.59	24	0.001
	Serious fight	42.53	16	0.000
	Weapon to school	35.11	20	0.020
	Group fights	39.67	16	0.001
	Taken other's belonging	27.23	16	0.039
Friends drop out of school	Missed school	74.40	18	0.000
	Skipped class	42.70	12	0.000
	Serious fight	34.45	12	0.001
	Damage school property	30.29	12	0.003

Suspended or expelled from school	24.62	6	0.000
Run from home	21.29	12	0.046
Hurt others	46.98	12	0.000
Gone into building not allowed	41.03	12	0.000
Sold illegal drug	31.33	12	0.002

Association between engagement in out of school activities and delinquency

Table 9 reports the Chi-square statistics, degrees of freedom, and exact p-values from tests of association between engagement in independent activities outside school and delinquency.

There was a significant association ($p < 0.05$) between hours spent after school without an adult present with skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, and the past year's involvement in a serious fight, involvement in group fights, taking other' students belonging and the sale of an illegal drug.

The number of times during a typical week that one went out for fun and recreation without adult supervision were significantly associated ($p < 0.05$) with intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, and the past one year's involvement in serious fights, damaging school property on purpose, having ran away from home for more than 24 hours, involvement in group fights, hurting others badly enough to need bandages or a doctor, taking other student's belongings, entry into a building without authorisation and the sale of illegal drugs in the past one year.

There was a significant association ($p < 0.05$) between the times one went out with a date and intentionally missing school in the past month, skipping a class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, damaging school property on purpose in the past year, suspension or expulsion from school in the past, bringing a weapon to school in the past one month, and the past year's involvement in a serious fight, having ran away from home for more than 24 hours, involvement in group fights, hurting others badly enough to need bandages or a doctor, taking other student's belonging and the sale of an illegal drug. There was also a significant association ($p < 0.05$) between the how often one went out for leisure with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapons

to school in the past one month, and the past year's involvement in a serious fight, damaging school property on purpose, having ran away from home for more than 24 hours, involvement in group fights, hurting others badly enough to need bandages or a doctor, entry into a building without authorisation and the sale of an illegal drug.

The frequency of religious service attendance was significantly ($p < 0.05$) associated with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, involvement in serious fights in the last one year, bringing weapons to school in the past one month and hurting others badly enough to need bandages or a doctor in the past year.

The importance that the student attached to religion in their life was significantly associated ($p < 0.05$) with skipping class that they were not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapons to school in the past one month, and the past one year's involvement in serious fights, damaging school property on purpose, involvement in group fights, taking other student's belonging and the sale of an illegal drug.

Table 9 *The association between engagement in independent activities outside school and delinquency*

Engagement outside school environment	Measures of delinquency	Chi-Square	df	p-value
Hours after school without adult	Skipped class	76.74	20	0.000
	Class lateness	254.24	30	0.000
	Serious fight	70.33	20	0.000
	Suspended or expelled from school	47.59	10	0.000
	Weapon to school	167.93	25	0.000
	Group fights	72.16	20	0.000
	Taken other's belonging	38.81	20	0.007
	Sold illegal drug	56.89	20	0.000
Evening fun and recreation	Missed school	76.02	30	0.000
	Skipped class	73.12	20	0.000
	Class lateness	133.63	30	0.000
	Serious fight	52.51	20	0.000
	Damage school property	31.76	20	0.046
	Suspended or expelled from school	49.10	10	0.000

	Weapon to school	54.15	25	0.001
	Run from home	76.35	20	0.000
	Group fights	58.40	20	0.000
	Hurt others	38.68	20	0.007
	Taken other's belonging	44.62	20	0.001
	Gone into building not allowed	34.50	20	0.023
	Sold illegal drug	39.40	20	0.006
Times out with date	Missed school	82.62	30	0.000
	Skipped class	85.39	20	0.000
	Class lateness	118.62	30	0.000
	Serious fight	86.45	20	0.000
	Damage school property	44.69	20	0.001
	Suspended or expelled from school	71.61	10	0.000
	Weapon to school	143.45	25	0.000
	Run from home	44.39	20	0.001
	Group fights	51.42	20	0.000
	Hurt others	41.83	20	0.003
	Taken other's belonging	53.09	20	0.000
	Sold illegal drug	56.87	20	0.000
Times go out leisure	Skipped class	54.15	16	0.000
	Class lateness	169.32	24	0.000
	Serious fight	33.92	16	0.006
	Damage school property	27.14	16	0.040
	Suspended or expelled from school	16.14	8	0.040
	Weapon to school	98.65	20	0.000
	Run from home	27.31	16	0.038
	Group fights	40.33	16	0.001
	Hurt others	53.21	16	0.000
	Gone into building not allowed	35.72	16	0.003
	Sold illegal drug	37.58	16	0.002

Times religious service	Skipped class	45.37	16	0.000
	Class lateness	38.32	24	0.032
	Serious fight	30.55	16	0.015
	Weapon to school	40.49	20	0.004
	Hurt others	57.63	16	0.000
Importance religion	Skipped class	82.08	12	0.000
	Class lateness	355.74	18	0.000
	Serious fight	54.57	12	0.000
	Damage school property	35.38	12	0.000
	Suspended or expelled from school	46.97	6	0.000
	Weapon to school	189.13	15	0.000
	Group fights	74.53	12	0.000
	Taken other's belonging	29.86	12	0.003
	Sold illegal drug	35.79	12	0.000

Association between engagement and substance use

Table 10 reports the Chi-square statistics, degrees of freedom, and exact p-values from tests of association between engagement and substance use. There was a significant association between ($p < 0.05$) the average grade attained in the school year with the frequency of cocaine and heroin use. There was a significant association ($p < 0.05$) between how one perceived their likelihood to graduate from high school with the intensity of smoking and alcohol consumption and the frequency of alcohol, cannabis, amphetamine, cocaine, heroin and either LSD, psychedelics or tranquilizer use. The number of hours spent in an average week on homework including both in school and away from school were significantly associated ($p < 0.05$) with how frequently a student used alcohol, amphetamine, cocaine, heroin frequency and either LSD, psychedelics or tranquilizer. The extent of participation in an athletics team was significantly associated ($p < 0.05$) with frequency of amphetamine use. There was a significant association ($p < 0.05$) between how frequently one enjoyed being in school in the past year with the frequency of smoking (and intensity), use of cannabis, barbiturates, other substances and either LSD, psychedelics or tranquilizer. There was a significant association ($p < 0.05$) between how frequently one hated being in school in the past year and the frequency of smoking (and intensity), alcohol, heroin and other substance use.

Trying one's best in school in the past year was associated ($p < 0.05$) with how frequently they used cannabis, heroin and either LSD, psychedelics or tranquilizer use. There was a significant association ($p < 0.05$) between finding schoolwork too hard in the past year and how often one used barbiturates and cocaine. There was a significant association ($p < 0.05$) between failure to complete or turn in assignments and the frequency of smoking (and intensity), alcohol (and intensity) and cannabis use. Getting sent to the office or having to stay after school because one misbehaved was significantly associated ($p < 0.05$) with how often one smoked (and how intensely), used alcohol (and how intensely), cannabis, barbiturates, heroin and other substances. Whether one found schoolwork interesting in the past year was significantly associated ($p < 0.05$) with how often they used alcohol, amphetamine, heroin and other substances.

There was a significant association ($p < 0.05$) between how often friends encouraged one to do things which teachers wouldn't like with how often one smoked, used alcohol (and how intensely), cocaine and heroin. How one thought others would feel if they cheated on a test was significantly associated ($p < 0.05$) with how often and intensely one used alcohol. How one thought most students would feel if they intentionally did things to make their teachers angry was significantly associated ($p < 0.05$) with how intensely they used alcohol. The importance attached to being a leader in student activities was significantly associated ($p < 0.05$) with how often one used alcohol (and how intensely), cannabis and heroin. Attaching importance to getting good grades was significantly associated ($p < 0.05$) with how frequently one used alcohol and other substances. The number of times teachers interrupted class to deal with misbehaviour or "goofing off" during an average school week was significantly associated ($p < 0.05$) with how often one smoked. The extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable was significantly associated ($p < 0.05$) with both the intensity and frequency of alcohol use. There was a significant association ($p < 0.05$) between grades obtained and how often one smoked (and how intensely), used alcohol (and how intensely), amphetamine, barbiturates and other substances.

Table 10 Association between engagement and substance use

Engagement	Substance use	Chi-Square	df	p-value
Average grade	Cocaine use frequency	95.78	48	0.000
	Heroin use frequency	74.54	32	0.000
Likely to graduate	Smoke use intensity	56.18	18	0.000
	Alcohol use frequency	88.20	18	0.000
	Alcohol use intensity	46.87	18	0.000
	Cannabis use frequency	64.59	18	0.000

	Amphetamine use			
	frequency	42.82	15	0.000
	Cocaine use frequency	108.93	18	0.000
	Heroin use frequency	69.03	12	0.000
	Either LSD, psychedelics,			
	tranquilisers use frequency	21.10	12	0.049
Hours on homework week	Alcohol use frequency	68.56	36	0.001
	Amphetamine use			
	frequency	49.09	30	0.015
	Cocaine use frequency	78.58	36	0.000
	Heroin use frequency	78.25	24	0.000
	Either LSD, psychedelics,			
	tranquilisers use frequency	41.12	24	0.016
	Amphetamine use			
Participating athletics	frequency	35.58	20	0.017
Enjoy school	Smoke use frequency	40.71	24	0.018
	Smoke use intensity	38.94	24	0.028
	Cannabis use frequency	51.71	24	0.001
	Barbiturates use frequency	21.75	12	0.040
	Either LSD, psychedelics,			
	tranquilisers use frequency	27.53	16	0.036
	Other use frequency	34.34	20	0.024
Hate school	Smoke use frequency	38.70	24	0.029
	Smoke use intensity	39.39	24	0.025
	Alcohol use intensity	39.87	24	0.022
	Heroin use frequency	27.14	16	0.040
	Other use frequency	39.63	20	0.006
Try best in school	Cannabis use frequency	38.12	24	0.034
	Heroin use frequency	30.07	16	0.018
	Either LSD, psychedelics,			
	tranquilisers use frequency	27.27	16	0.039
	Cocaine use frequency	36.78	24	0.046
Turn in assignments	Smoke use frequency	64.21	24	0.000
	Smoke use intensity	71.31	24	0.000

	Alcohol use frequency	45.34	24	0.005
	Alcohol use intensity	49.63	24	0.002
	Cannabis use frequency	51.26	24	0.001
Get sent office	Smoke use frequency	80.26	24	0.000
	Smoke use intensity	99.33	24	0.000
	Alcohol use frequency	136.15	24	0.000
	Alcohol use intensity	75.12	24	0.000
	Cannabis use frequency	87.69	24	0.000
	Barbiturates use frequency	38.73	12	0.000
	Heroin use frequency	45.39	16	0.000
	Other use frequency	67.58	20	0.000
School work interesting	Alcohol use frequency	39.50	24	0.024
	Amphetamine use frequency	37.23	20	0.011
	Heroin use frequency	28.96	16	0.024
	Other use frequency	38.20	20	0.008
Friends encourage to defy	Smoke use frequency	43.65	24	0.008
	Smoke use intensity	55.01	24	0.000
	Alcohol use frequency	53.67	24	0.000
	Alcohol use intensity	44.84	24	0.006
	Cocaine use frequency	66.28	24	0.000
	Heroin use frequency	48.98	16	0.000
How others feel if I cheated	Alcohol use frequency	38.37	24	0.032
	Alcohol use intensity	41.84	24	0.013
How others feel if I defied	Alcohol use intensity	37.16	24	0.042
Importance activities leadership	Smoke use frequency	36.55	24	0.048
	Smoke use intensity	38.94	24	0.028
	Alcohol use intensity	36.78	24	0.046
	Cannabis use frequency	40.03	24	0.021
	Heroin use frequency	26.74	16	0.045
Importance good grades	Alcohol use frequency	36.58	24	0.048
	Other use frequency	31.99	20	0.043

Class interruption				
misbehaviour	Smoke use frequency	54.23	36	0.026
Misbehaviour rules fair	Alcohol use frequency	45.40	24	0.005
	Alcohol use intensity	51.75	24	0.001
Friends drop out of school	Smoke use frequency	42.05	18	0.001
	Smoke use intensity	57.23	18	0.000
	Alcohol use frequency	42.80	18	0.001
	Alcohol use intensity	32.89	18	0.017
	Amphetamine use frequency	25.17	15	0.048
	Barbiturates use frequency	25.16	9	0.003
	Other use frequency	44.51	15	0.000

Association between parental monitoring and delinquency

Table 11 reports the Chi-square statistics, degrees of freedom, and exact p -values from tests of association between parental monitoring and delinquency. There was a significant association ($p < 0.05$) between having at least one other adult other than one's parents who one could talk to if they were having problems in life and skipping a class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past, bringing a weapon to school in the past one month and the past year's involvement in serious fights, having ran away from home for more than 24 hours, involvement in group fights, taken other's belonging, entry into a building without authorisation and the sale of an illegal drug. There was a significant association ($p < 0.05$) between having parents or guardians check on whether one did their homework with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past and bringing weapons to school in the past one month.

There was significant association ($p < 0.05$) between the extent to which parents or guardians allowed one to go out with friends on school nights with intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapons to school in the past one month, and the past year's involvement in serious fights, involvement in group fights, taking other student's belongings and the sale of an illegal drug. Acceptance to talk about one's problems over with one or both parents or guardians was significantly associated ($p < 0.05$) with

involvement in group fights in the past year. Knowledge of where one was after school by parents or guardians was significantly associated ($p < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapons to school in the past one month, and the past year's involvement in serious fights, damaging school property on purpose, involvement in group fights, taking other student's belonging and the sale of an illegal drug. There was a significant relationship ($p < 0.05$) between the parental knowledge of who one went out with at night (if they did go out at night) and intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, involvement in a serious fight in the last one year, suspension or expulsion from school in the past, bringing weapons to school in the past one month, having ran away from home for more than 24 hours in the past year, involvement in group fights in the past year, taking other student's belonging in the past year and the sale of an illegal drug in the past one year. The practice of coming back at a set time whenever one went out during weekend nights was significantly associated ($p < 0.05$) with skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, suspension or expulsion from school in the past, bringing weapons to school in the past one month, and the past one year's involvement in serious fights, having ran away from home for more than 24 hours and the sale of an illegal drug. There was a significant relationship ($p < 0.05$) between how often one had dinner with one or both parents or guardians during a typical week and intentionally missing school in the past month, skipping class one was not supposed to in the past one month, class lateness without an approved excuse in an average school week, damaging school property on purpose in the past year and having ran away from home for more than 24 hours in the past year.

Table 11 Association between parental monitoring and delinquency

Parental monitoring measure	Delinquency measure	Chi-Square	df	p-value
Adult confidant	Skipped class	25.77	8	0.001
	Class lateness	126.56	12	0.000
	Serious fight	19.00	8	0.015
	Suspended or expelled from school	14.84	4	0.005
	Weapon to school	58.01	10	0.000
	Run from home	24.96	8	0.002
	Group fights	31.34	8	0.000
	Taken other's belonging	16.99	8	0.030

	Gone into building not allowed	17.07	8	0.029
	Sold illegal drug	23.36	8	0.003
Parents check homework	Skipped class	53.27	12	0.000
	Class lateness	61.87	18	0.000
	Suspended or expelled from school	12.62	6	0.049
	Weapon to school	28.80	15	0.017
Parents allow out with friends	Missed school	43.62	18	0.001
	Skipped class	57.02	12	0.000
	Class lateness	242.40	18	0.000
	Serious fight	38.92	12	0.000
	Suspended or expelled from school	26.04	6	0.000
	Weapon to school	127.36	15	0.000
	Group fights	90.69	12	0.000
	Taken other's belonging	40.13	12	0.000
	Sold illegal drug	59.22	12	0.000
Talk about problems with parents	Group fights	17.21	8	0.028
	Parents know who I go out with	289.63	16	0.000
	Coming back at night at set time	166.55	16	0.000
	Dinner with parents	35.37	20	0.018
Parents know where I am afterschool	Skipped class	73.25	16	0.000
	Class lateness	123.59	24	0.000
	Serious fight	34.03	16	0.005
	Damage school property	28.32	16	0.029
	Suspended or expelled from school	16.18	8	0.040
	Weapon to school	90.91	20	0.000
	Group fights	56.82	16	0.000
	Taken other's belonging	48.59	16	0.000
	Sold illegal drug	58.37	16	0.000
Parents know who I go out with	Missed school	37.68	24	0.037
	Skipped class	62.89	16	0.000
	Class lateness	176.09	24	0.000
	Serious fight	43.76	16	0.000
	Suspended or expelled from school	31.69	8	0.000
	Weapon to school	143.50	20	0.000

	Run from home	43.65	16	0.000
	Group fights	69.73	16	0.000
	Taken other's belonging	34.62	16	0.004
	Sold illegal drug	54.58	16	0.000
Coming back at night at set time	Skipped class	61.07	16	0.000
	Class lateness	90.35	24	0.000
	Serious fight	29.65	16	0.020
	Suspended or expelled from school	24.35	8	0.002
	Weapon to school	62.70	20	0.000
	Run from home	30.39	16	0.016
	Sold illegal drug	32.33	16	0.009
Dinner with parents	Missed school	64.42	30	0.000
	Skipped class	34.26	20	0.024
	Class lateness	76.10	30	0.000
	Damage school property	50.65	20	0.000
	Run from home	66.38	20	0.000

Inferential Modelling

Research Question 1: Variability of The Dependent Variables with Individual Level and School Level Factors

The aim of the first research question was to establish if the dependent variables change with grade level and school level factors. This variation with grade level and school level factors was modelled in the first research question of this thesis to determine which of the response variables to model using multilevel models. This comparison was made by assessing the model's differences in -2 Log Likelihood (-2LL) as previously described in the data analysis section.

Tables 12-16 present the fit indices for the substance use, delinquency and psychosocial variable models which include the essential change in the -2LL (the likelihood ratio) at one degree of freedom (single parameter added) and the p -value calculated from the fact that the -2LL has a chi-square distribution. A significant p -value verifies the conjecture that it is important to model the variability in intercepts because this significantly improves the fit of the model.

Substance use

Table 12 presents the fit indices for the substance use models. The critical values for the chi-square statistics at one degree of freedom indicated that the frequency of alcohol ($\chi_1^2 = 3.87$, $p = 0.049$), heroin ($\chi_1^2 = 20.25$, $p < 0.0001$) and other substances ($\chi_1^2 = 7.39$, $p = 0.007$) use changed significantly across schools. No substance use variable changed significantly across classes.

Table 12 *Fits indices from the assessment of multilevel model appropriateness for substance use*

Variable	Level	-2LL	p-value
Alcohol Frequency	School	3.874	0.049
	Class	0.000	1.000
Alcohol Intensity	School	0.300	0.584
	Class	0.000	1.000
Alcohol Mean	School	2.681	0.102
	Class	0.000	1.000
Amphetamine Frequency	School	0.000	1.000
	Class	0.122	0.727
Barbiturates Frequency	School	0.338	0.561

	Class	0.000	1.000
Cannabis Frequency	School	0.066	0.798
	Class	0.076	0.783
Cocaine Frequency	School	-155.701	1.000
	Class	-173.372	1.000
Heroin Frequency	School	20.253	0.000
	Class	1.836	0.175
LSD, Psychedelics or Tranquilisers:			
Frequency	School	2.306	0.129
	Class	1.658	0.198
Other Frequency	School	7.390	0.007
	Class	2.281	0.131
Smoke Frequency	School	1.697	0.193
	Class	0.258	0.612
Smoke Intensity	School	3.747	0.053
	Class	0.121	0.728

Delinquency

Table 13 presents the fit indices for delinquency models. The critical values for the chi-square statistic at one degree of freedom indicated that involvement in serious fight in the last one year ($\chi_1^2 = 10.46$, $p = 0.001$), involvement in group fights in the past year ($\chi_1^2 = 41.94$, $p < 0.0001$), class lateness without an approved excuse in an average school week ($\chi_1^2 = 43.6$, $p < 0.0001$), intentionally missing school in the past month ($\chi_1^2 = 4.18$, $p = 0.041$), skipping class one was not supposed to in the past one month ($\chi_1^2 = 42.1$, $p < 0.0001$), the sale of an illegal drug in the past one year ($\chi_1^2 = 15.2$, $p < 0.0001$), suspension or expulsion from school in the past year ($\chi_1^2 = 7.2$, $p = 0.007$) and having brought a weapon to school in the past one month ($\chi_1^2 = 7.2$, $p = 0.007$) changed significantly across schools. The critical values for the chi-square statistic at one degree of freedom indicated that the involvement in group fights in the past year ($\chi_1^2 = 6.0$, $p = 0.015$), class lateness without an approved excuse in an average school week ($\chi_1^2 = 8.14$, $p = 0.004$), intentionally missing school in the past month ($\chi_1^2 = 9.7$, $p = 0.002$), skipping class one

was not supposed to in the past one month ($\chi_1^2 = 7.72, p = 0.005$) and the sale of an illegal drug in the past one year ($\chi_1^2 = 8.94, p = 0.003$), varied significantly across grades.

Table 13 *Fits indices from the assessment of multilevel model appropriateness for delinquency*

Variable	Level	-2LL	p-value
Damage School Property	School	0.902	0.342
	Class	0.000	1.000
Serious Fight	School	10.460	0.001
	Class	1.802	0.179
Get Sent to the Office	School	0.846	0.358
	Class	1.468	0.226
Gone into Building Not Allowed	School	0.081	0.776
	Class	0.000	1.000
Group Fights	School	41.942	0.000
	Class	5.961	0.015
Hurt Others	School	1.076	0.300
	Class	0.000	1.000
Class Lateness	School	43.597	0.000
	Class	8.138	0.004
Missed School	School	4.180	0.041
	Class	9.647	0.002
Run Away from Home	School	0.000	1.000
	Class	0.000	1.000
Skipped Class	School	42.078	0.000
	Class	7.716	0.005

Sold Illegal Drug	School	15.198	0.000
	Class	8.939	0.003
Suspended or Expelled from School	School	7.199	0.007
	Class	2.385	0.123
Taken Other's Belonging	School	1.958	0.162
	Class	0.823	0.364
Weapon to School	School	7.199	0.007
	Class	2.385	0.123

Engagement

Table 14 presents the fit indices for engagement models including the $-2LL$ and the p-values. The $-2LL$ test indicated that the average grade in the school year ($\chi_1^2 = 4.35, p = 0.037$), the number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week ($\chi_1^2 = 52, p < 0.0001$), enjoying being in school ($\chi_1^2 = 31.54, p < 0.0001$), the number of one's friends who dropped out of school ($\chi_1^2 = 6, p < 0.015$), competition for grades amongst students ($\chi_1^2 = 35.5, p < 0.0001$), how frequently one hated being in school in the past year ($\chi_1^2 = 26.46, p < 0.0001$), length of time spent in extra curricula activities ($\chi_1^2 = 62.4, p < 0.0001$), how a student thought others would feel if they cheated in a test ($\chi_1^2 = 17.1, p < 0.0001$), how a student thought majority of colleagues would feel if one intentionally did things to make their teachers angry ($\chi_1^2 = 32.0, p < 0.0001$), how one perceived their likelihood to graduate ($\chi_1^2 = 21.3, p < 0.0001$), the extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable ($\chi_1^2 = 13.6, p < 0.0001$), the number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week ($\chi_1^2 = 42.3, p < 0.0001$), participating in other school clubs or activities during the school ($\chi_1^2 = 13.6, p < 0.0001$) and finding school work interesting ($\chi_1^2 = 15.6, p < 0.0001$) changed significantly across schools. When class level variation was assessed, the critical values for the chi-square statistic at one degree of freedom indicated that the number of times the teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week ($\chi_1^2 =$

39.9, $p < 0.0001$), enjoying being in school ($\chi_1^2 = 31.5$, $p < 0.0001$), how frequently one hated being in school in the past year ($\chi_1^2 = 15.5$, $p < 0.0001$), how one thought most students would feel if they intentionally did things to make their teachers angry ($\chi_1^2 = 24$, $p < 0.0001$), the importance attached to being a leader in student activities ($\chi_1^2 = 9.6$, $p = 0.002$), the number of times teachers interrupted the class to deal with misbehaviour or "goofing off" by self during an average school week ($\chi_1^2 = 46.8$, $p < 0.0001$), participating in music or other performing arts ($\chi_1^2 = 17.8$, $p < 0.0001$) and finding school work interesting ($\chi_1^2 = 8.1$, $p = 0.005$) varied significantly across grades.

Table 14 *Fits indices from the assessment of multilevel model appropriateness for engagement*

Variable	Level	-2LL	p-value
Average grade	School	4.348	0.037
	Class	0.000	1.000
Class interruption due to misbehaviour	School	51.970	0.000
	Class	39.903	0.000
Enjoy school	School	31.536	0.000
	Class	19.640	0.000
Friends drop out of school	School	5.961	0.015
	Class	2.591	0.107
Friends encourage to defy	School	2.966	0.085
	Class	0.000	1.000
Competition for grades	School	35.523	0.000
	Class	2.251	0.134
Hate school	School	36.461	0.000
	Class	15.484	0.000
Time spent in extracurricular	School	62.411	0.000
	Class	2.820	0.093
How others feel if I cheated	School	17.118	0.000
	Class	2.850	0.091
How others feel if I defied	School	32.044	0.000
	Class	23.984	0.000
Importance of activities: leadership	School	2.326	0.127

	Class	9.607	0.002
Importance of good grades	School	0.127	0.722
	Class	2.976	0.084
Likelihood to graduate	School	21.232	0.000
	Class	0.000	1.000
Misbehaviour rules fair	School	13.640	0.000
	Class	2.882	0.090
		-	
Time spent homework per week	School	1427.579	1.000
		-	
	Class	1406.346	1.000
Class interruption misbehaviour by self	School	42.334	0.000
	Class	46.842	0.000
Participating athletics	School	3.710	0.054
	Class	0.000	1.000
Participating music	School	1.938	0.164
	Class	17.789	0.000
Participating other	School	13.562	0.000
	Class	0.280	0.597
Find schoolwork interesting	School	15.615	0.000
	Class	8.054	0.005
Find schoolwork too hard	School	1.038	0.308
	Class	0.000	1.000
Try best in school	School	0.000	1.000
	Class	1.904	0.168
Turn in assignments	School	0.217	0.641

Psychosocial factors

Psychosocial factors included social-cognitions and self-perceptions.

Self-perception

Table 15 presents the fit indices for self-perception including the $-2LL$ and the p-values. The $-2LL$ tests indicated that feeling that one enjoyed life like others ($\chi_1^2 = 4.0, p = 0.046$), preference for

exciting and unpredictable friends ($\chi_1^2 = 53.7, p < 0.0001$), the preference to explore strange places ($\chi_1^2 = 14.5, p < 0.0001$), liking to engage in frightening activities ($\chi_1^2 = 42.8, p < 0.0001$), feeling good to be alive ($\chi_1^2 = 34.7, p < 0.0001$), feeling happy ($\chi_1^2 = 4.0, p = 0.047$), getting excitement from doing dangerous things ($\chi_1^2 = 21.5, p < 0.0001$), perspective concerning life in next few years ($\chi_1^2 = 6.8, p < 0.0001$), feeling that life is often meaningless ($\chi_1^2 = 7.4, p < 0.0001$), liking of new and exciting experiences ($\chi_1^2 = 19.5, p < 0.0001$), sometimes feeling not good at all ($\chi_1^2 = 14.4, p < 0.0001$), feeling that there is not much to be proud of ($\chi_1^2 = 8.2, p = 0.004$), feeling that one is a person of worth equal plane with others ($\chi_1^2 = 15.0, p < 0.0001$), regular testing of oneself with risky activities ($\chi_1^2 = 7.0, p = 0.008$), the presence of someone to talk to when needed ($\chi_1^2 = 12.9, p < 0.0001$), and the presence of someone to turn to for help ($\chi_1^2 = 4.7, p = 0.03$), changed significantly across schools. When class level variation was assessed, the critical values for the chi-square statistic at one degree of freedom indicated that degree with which one liked to do frightening activities ($\chi_1^2 = 10.5, p = 0.001$), feeling good to be alive ($\chi_1^2 = 23.2, p < 0.0001$), and the feeling that life is often meaningless ($\chi_1^2 = 12.5, p < 0.0001$) varied significantly across grades.

Table 15 Fit indices from the assessment of multilevel model appropriateness for self-perception

Variable	Level	-2LL	p-value
I can do things as well as others	School	0.000	1.000
	Class	0.000	1.000
Can't do anything right	School	1.959	0.162
	Class	2.161	0.142
Enjoy life like others	School	3.998	0.046
	Class	0.000	1.000
Prefer exciting unpredictable friends	School	53.662	0.000
	Class	2.253	0.133
Like exploring strange places	School	14.497	0.000
	Class	0.000	1.000
Often feel left out	School	1.003	0.317
	Class	1.017	0.313
Feel lonely lots of times	School	0.000	1.000
	Class	1.130	0.288

Like to do frightening activities	School	42.843	0.000
	Class	10.482	0.001
Feels good to be alive	School	34.733	0.000
	Class	23.222	0.000
Feeling of happiness	School	3.956	0.047
	Class	0.000	1.000
Future seeming hopeless	School	0.000	1.000
	Class	1.409	0.235
Gets kick doing dangerous things	School	21.481	0.000
	Class	0.000	1.000
Life perspective in next few years	School	6.772	0.009
	Class	0.371	0.542
Life often meaningless	School	7.427	0.006
	Class	12.457	0.000
Feeling that life not useful	School	1.262	0.261
	Class	0.216	0.642
Like exciting new experiences	School	19.475	0.000
	Class	0.000	1.000
Sometimes feeling one not good at all	School	14.379	0.000
	Class	2.297	0.130
Feel not much to be proud of	School	8.211	0.004
	Class	2.366	0.124
Nothing to do often	School	2.264	0.132
	Class	0.008	0.927
Often feeling bored	School	0.000	1.000
	Class	0.000	1.000
Person of worth equal plane with others	School	14.912	0.000
	Class	1.917	0.166
Takes positive attitude towards self	School	0.000	1.000
	Class	0.000	1.000
Satisfied with self	School	0.005	0.941
	Class	0.000	1.000

Regular self-test with risky activities	School	6.987	0.008
	Class	0.000	1.000
Presence of someone to talk to when needed	School	12.857	0.000
	Class	0.000	1.000
Presence of someone to turn to for help	School	4.704	0.030
	Class	0.000	1.000
Wish one had more good friends	School	0.000	1.000
	Class	1.415	0.234

Social Cognition

Social cognitions were measured by how frequent certain thoughts go through the minds of the students when they are nervous or frightened. **Table 16** presents the fit indices for social-cognition models including the $-2LL$ and the p -value. The $-2LL$ tests indicated that the feeling that one would get sick ($\chi_1^2 = 11.5, p = 0.001$), feel foolish ($\chi_1^2 = 37.7, p < 0.0001$), was inadequate ($\chi_1^2 = 13.0, p < 0.0001$), was vulnerable ($\chi_1^2 = 36.0, p < 0.0001$), was weird ($\chi_1^2 = 20.9, p < 0.0001$), would go red ($\chi_1^2 = 9.1, p = 0.003$), would sweat ($\chi_1^2 = 7.5, p = 0.006$), was inferior ($\chi_1^2 = 24.6, p < 0.0001$), would be paralyzed with fear ($\chi_1^2 = 392.7, p < 0.0001$), people would not be interested in them ($\chi_1^2 = 9.6, p = 0.002$), people would note that one was nervous ($\chi_1^2 = 17.8, p < 0.0001$), people would stare at them ($\chi_1^2 = 18.5, p < 0.0001$), people would think they were boring ($\chi_1^2 = 16.0, p < 0.0001$), people would not like them ($\chi_1^2 = 17.7, p < 0.0001$) and they would be unable to write properly ($\chi_1^2 = 7.4, p = 0.006$), changed significantly across schools. When class level variation was assessed, the critical values for the chi-square statistics at one degree of freedom indicated that feeling that one would get sick ($\chi_1^2 = 4.2, p = 0.04$), feel foolish ($\chi_1^2 = 23.5, p < 0.0001$), was inadequate ($\chi_1^2 = 9.6, p = 0.003$), was vulnerable ($\chi_1^2 = 25.0, p < 0.0001$), was inferior ($\chi_1^2 = 25.2, p < 0.0001$), people would not be interested in them ($\chi_1^2 = 7.8, p = 0.005$), people would see that one was nervous ($\chi_1^2 = 8.9, p = 0.003$), people would think that one was boring ($\chi_1^2 = 6.8, p = 0.009$), and people would not like them ($\chi_1^2 = 5.6, p = 0.018$) varied significantly across grades.

Table 16 *Fit indices from the assessment of multilevel model appropriateness for social cognition*

Variable	Level	-LL2	p-value
Babble or talk in funny manner	School	0.175	0.675
	Class	1.074	0.300
Get sick	School	11.505	0.001
	Class	4.216	0.040
Drop or spill things	School	0.000	1.000
	Class	0.035	0.852
Feel foolish	School	37.736	0.000
	Class	23.524	0.000
I am inadequate	School	13.031	0.000
	Class	8.696	0.003
I am vulnerable	School	35.986	0.000
	Class	25.015	0.000
I am weird	School	20.880	0.000
	Class	3.197	0.074
I go red	School	9.053	0.003
	Class	0.038	0.846
I sweat	School	7.502	0.006
	Class	2.839	0.092
Inferior	School	24.556	0.000
	Class	25.209	0.000
Paralyzed with fear	School	392.693	0.000
	Class	0.000	1.000
People not interested in me	School	9.614	0.002
	Class	7.844	0.005
People reject me	School	0.000	1.000
	Class	2.580	0.108
People see I am nervous	School	17.813	0.000
	Class	8.884	0.003
People stare at me	School	18.507	0.000
	Class	0.227	0.634

People think I am boring	School	15.947	0.000
	Class	6.812	0.009
People won't like me	School	17.714	0.000
	Class	5.569	0.018
Tremble or shake	School	0.078	0.779
	Class	0.000	1.000
Unable to concentrate	School	1.697	0.193
	Class	1.789	0.181
Unable to speak	School	1.104	0.293
	Class	0.000	1.000
Unable to write properly	School	7.429	0.006
	Class	1.193	0.275
I am unlikeable	School	2.582	0.108
	Class	2.098	0.147

The intercepts therefore vary significantly across the different schools and classes for different variables. This is an important consideration when interpreting the results and was taken into account in the subsequent CLMs as multilevel models.

Research Question 2: The Influence of Parent and Peer Factors on Psychosocial Factors and the Influence of the Changes in Psychosocial Factors on Student Engagement

This section presents results from the multilevel CLMs assessing the influence of parental and peer factor measures on the psychosocial factor measures. The psychosocial factors included social cognition (measured as the locus of control) and self-perceptions (measured as self-concept). This is followed by an analysis of the influence of the psychosocial factors on student engagement. Due to the numerous possible combinations of the predictors and response measures, only significantly different associations or predictions are reported in the tables and interpreted in the associated text. Ordinal levels are in the order indicated in the questionnaire except for socio-demographic characteristics which were reverse coded. Key ordinal level terms distinguishing between lower or higher levels in the scale, where relevant, are italicized in the text, for instance *often*, *sometimes*, *most* of the times.

Influence of parent and peer factors on psychosocial factors

Multilevel CLMs were used to study the impact of parental involvement and monitoring on the psychosocial factors including social cognition and self-perceptions (Table 17). Parental characteristics such as employment and occupation were controlled for where a significant univariate association with social cognition or self-perceptions was previously shown in the exploratory data analysis.

Influence of parent and peer factors on self-perception

How often parents limit the amount of time spent watching TV, how often parents allow going out with friends on school nights, if one would talk problems over with one or both of their parents, how frequently one had dinner with one or both parents or guardians during a typical week, the importance attached to religion and parents or guardians checking on whether the student did their homework were significantly associated ($p < 0.05$) with the self-perception measure, happiness. The odds of an increased feeling of happiness for students whose parents *sometimes* limit the amount of time spent watching TV were 1.30 (95% CI, 1 to 1.67) times than for those whose parents never do so ($p = 0.043$). The odds of increased feeling of happiness for students whose parents *often* limit the amount of time spent watching TV were 1.36 (95% CI, 1.04 to 1.76) times than for those whose parents never do so ($p = 0.0219$). The odds of increased feeling of happiness for students whose parents *rarely*

allow them to go out with friends on school nights were 0.68 (95% CI, 0.47 to 0.95) times than for those who are never allowed ($p = 0.026$). The odds of increased feeling of happiness for students whose parents *often* allow them to go out with friends on school nights were 0.68 (95% CI, 0.51 to 0.9) times than for those who are never allowed ($p = 0.0084$). The odds of increased feeling of happiness for students who would talk problems over, for at least *some* problems, with one or both of their parents were 1.33 (95% CI, 1.07 to 1.64) times than for those who would never ($p = 0.008$). The odds of increased feeling of happiness for students who would talk problems over with one or both of their parents for *most* or all problems were 1.78 (95% CI, 1.38 to 2.28) times than those who never do so ($p = 0$). The odds of increased feeling of happiness for students who have dinner with one or both parents or guardians *6-7 days* during a typical week were 1.47 (95% CI, 1.1 to 1.96) times than for those who had dinner for less than a day per week ($p = 0.009$). The odds of increased feeling of happiness for students who rated the importance attached to religion as *very high* were 0.7 (95% CI, 0.49 to 0.98) times than for students who said religion was not important ($p = 0.0422$). The odds of increased feeling of happiness for students whose parents or guardians check on whether one did their homework but *rarely* were 1.32 (95% CI, 1 to 1.73) times than for those who reported this is never done ($p = 0.0475$).

Table 17 Summary of multilevel proportional odds logistic regression analysis for parental involvement and monitoring variables significant predicting social cognition and self-perceptions controlling for parental education and occupation

Response	Predictor	*Predictor			
		ordinal level	Estimate	SE	p-value
Unable to speak	Talk about problems with parents	3	1.388	0.090	0.001
	Parents know who I go out with	5	0.739	0.100	0.003
	Highest paternal education	1	1.057	0.020	0.022
	Times go out leisure	3	1.276	0.100	0.018
Unlikeable	Times go out leisure	4	1.377	0.120	0.013
Tremble or shake	Dinner with parents	2	1.752	0.220	0.011
	Dinner with parents	5	1.516	0.150	0.007
	Times religious service	3	1.337	0.120	0.017

People stare at me	Parents allow out with friends	2	0.617	0.170	0.005
	Parents allow out with friends	4	0.576	0.140	0.000
	Talk about problems with parents	3	1.330	0.120	0.025
Foolish	Parents allow out with friends	3	1.475	0.180	0.036
	Parents allow out with friends	4	1.611	0.140	0.001
	Talk about problems with parents	2	0.768	0.110	0.018
	Parents know who I go out with	2	1.556	0.190	0.023
	Hours after school without adult	6	1.393	0.160	0.043
	Times go out leisure	3	1.303	0.120	0.034
	Adult confidant	3	1.286	0.120	0.046
Paralyzed with fear	Parents know who I go out with	4	1.586	0.130	0.001
	Highest paternal education	1	1.062	0.020	0.014
Drop or spill things	Talk about problems with parents	3	1.276	0.090	0.011
	Importance religion	2	1.458	0.140	0.008
	Importance religion	4	1.258	0.100	0.035
Be sick	Ethnicity	1	1.169	0.070	0.036
	Parents know where I am afterschool	2	0.591	0.160	0.002
	Parents know where I am afterschool	3	0.730	0.140	0.033
	Parents know where I am afterschool	5	0.734	0.130	0.017

	Parents know who I go out with	2	1.432	0.160	0.025
	Parents know who I go out with	4	1.438	0.150	0.018
	Parents know who I go out with	5	1.427	0.110	0.002
	Importance religion	2	1.448	0.150	0.017
	Importance religion	4	1.304	0.130	0.046
I am inadequate	Parents help homework	3	1.438	0.120	0.004
	Parents help homework	4	1.508	0.130	0.002
	Parents allow out with friends	3	1.385	0.140	0.030
	Parents allow out with friends	4	1.500	0.110	0.000
	Parent Marital Status	5	1.089	0.030	0.014
Babble and talk funnily	Parents allow out with friends	3	1.381	0.140	0.021
	Parents know where I am afterschool	3	1.512	0.140	0.004
	Parents know where I am afterschool	4	1.482	0.140	0.008
	Parents know where I am afterschool	5	1.446	0.120	0.003
	Times religious service	3	1.334	0.130	0.030
	Times religious service	4	1.468	0.120	0.002
	Importance religion	2	1.348	0.150	0.048
Inferior	Parents allow out with friends	2	1.386	0.150	0.040
	Parents allow out with friends	4	1.502	0.130	0.002
	Coming back at night at set time	4	1.525	0.180	0.020

	Highest paternal education	1	1.064	0.030	0.043
Unable to concentrate	Repeated grade	1	0.866	0.060	0.029
	Maternal employment status	1	0.885	0.040	0.005
Unable to write properly	Parents allow out with friends	4	1.326	0.110	0.015
	Paternal employment status	1	0.896	0.040	0.006
	Hours after school without adult	5	1.358	0.150	0.048
	Hours after school without adult	6	1.329	0.130	0.039
People not interested in me	Parents allow out with friends	4	1.279	0.110	0.028
	Parents know who I go out with	2	1.404	0.150	0.029
	Hours after school without adult	6	1.307	0.130	0.045
	Times go out leisure	3	1.299	0.100	0.015
	Times go out leisure	4	1.432	0.140	0.012
	Importance religion	4	1.326	0.120	0.023
	Parents check homework	4	0.710	0.120	0.006
People won't like me	Race	1	1.232	0.060	0.002
	Importance religion	3	1.521	0.150	0.006
	Importance religion	4	1.534	0.130	0.001
I am vulnerable	Parents allow out with friends	4	1.602	0.150	0.002
	Importance religion	2	1.866	0.200	0.002
	Importance religion	4	1.650	0.170	0.005
I sweat	Repeated grade	1	0.858	0.070	0.038
	Times go out leisure	5	0.679	0.190	0.047

	Importance religion	2	1.595	0.170	0.009
	Importance religion	3	1.507	0.160	0.014
	Importance religion	4	1.488	0.130	0.004
	Parents check homework	2	0.741	0.130	0.022
	Parents check homework	3	0.717	0.120	0.006
	Parents check homework	4	0.610	0.130	0.000
I go red	Parents allow out with friends	4	1.353	0.130	0.023
	Times religious service	3	1.508	0.160	0.011
	Parents check homework	2	0.753	0.130	0.042
	Parents check homework	3	0.691	0.120	0.004
	Parents check homework	4	0.730	0.140	0.034
I am weird	Parents help homework	2	1.354	0.130	0.022
	Parents help homework	4	1.456	0.120	0.003
	Talk about problems with parents	2	0.764	0.100	0.008
	Talk about problems with parents	3	0.683	0.110	0.001
	Highest maternal education	1	1.067	0.020	0.026
	Maternal employment status	1	0.882	0.040	0.011
	Adult confidant	3	1.279	0.110	0.037
People see I am nervous	Parents limiting tv time	2	1.316	0.120	0.031
	Parents allow out with friends	3	1.357	0.150	0.048
	Parents allow out with friends	4	1.388	0.110	0.005
	Coming back at night at set time	2	1.432	0.150	0.017
	Highest paternal education	1	1.056	0.020	0.049

	Evening's fun and recreation	5	1.478	0.190	0.048
	Evening's fun and recreation	6	1.890	0.190	0.001
	Parents check homework	2	0.776	0.110	0.034
	Parents check homework	4	0.744	0.130	0.025
People think I am boring	Parents allow out with friends	4	1.290	0.100	0.015

*Levels are in the order indicated in the questionnaire except for socio-demographic characteristics which were reverse coded

How often parents provided help with homework when needed, how often parents allow going out with friends on school nights, if one would talk problems over with one or both of their parents, parental knowledge of who the student went out with at night (if they did go out at night), parental employment status and hours spent after school without an adult present were significantly associated ($p < 0.05$) with the self-perception variable, ability to enjoy life as much as anyone.

The odds of an increased ability to enjoy life as much as anyone for students whose parents *sometimes* provided help with homework when needed were 1.44 (95% CI, 1.06 to 1.94) times than for those whose parents did not ($p = 0.02$). The odds of an increased ability to enjoy life as much as anyone for students whose parents *often* provided help with homework when needed were 1.48 (95% CI, 1.07 to 2.04) times than for those whose parents never did ($p = 0.02$). The odds of an increased ability to enjoy life as much as anyone for students whose parents *often* allow going out with friends on school nights were 0.73 (95% CI, 0.55 to 0.96) times than for those whose parents never did so ($p = 0.03$). The odds of an increased ability to enjoy life as much as anyone for students who would talk problems over, for at least *some* of their problems, with one or both of their parents were 1.29 (95% CI, 1.02 to 1.61) times than for those who never ($p = 0.03$). The odds of an increased ability to enjoy life as much as anyone for students who would talk problems over, for *most* or all problems, with one or both of their parents were 1.59 (95% CI, 1.21 to 2.06) times than for those who would not ($p = 0.0006$). The odds of an increased ability to enjoy life as much as anyone for students whose parents *always* knew who they went out with at night (if they did go out at night) were 1.54 (95% CI, 1.15 to 2.05) times than for those whose parents never did ($p = 0.003$). The odds of an increased ability to enjoy life as much as anyone for students whose fathers were unemployed were 1.17 (95% CI, 1.05 to 1.28) times

than for those who were self-employed ($p = 0.002$). The odds of an increased ability to enjoy life as much as anyone for students who spent *less than an hour* after school without an adult present were 0.58 (95% CI, 0.39 to 0.85) times than for those who spent no or almost no time alone ($p = 0.005$).

The preference to talk problems over with one or both of their parents and how often one went out for leisure were significantly associated ($p < 0.05$) with feeling of hopelessness about the future. The odds of increased feeling of hopelessness about the future for students who would talk problems over with one or both of their parents for at least *some* of their problems were 1.19 (95% CI, 1 to 1.41) times than for those who would not ($p = 0.049$). The odds of an increased feeling of hopelessness about the future for students who would talk problems over with one or both of their parents for *most or all* problems were 1.29 (95% CI, 1.05 to 1.55) times than for those who would not ($p = 0.01$). The odds of an increased feeling of hopelessness about the future for students who went out for leisure *almost every day* were 0.58 (95% CI, 0.38 to 0.83) times than for those who never went ($p = 0.005$).

How often parents provided help with homework when needed, how often parents allowed going out with friends on school nights, parental knowledge of who one went out with at night (if they did go out at night), maternal employment status and importance attached to religion were significantly associated ($p < 0.05$) with feeling good to be alive. The odds of increased feeling good to be alive for students whose parents *sometimes* provided help with homework when needed were 1.31 (95% CI, 1 to 1.71) times than for those whose parents did not ($p = 0.047$). The odds of an increased feeling good to be alive for students whose parents *often* provided help with homework when needed were 1.49 (95% CI, 1.12 to 1.96) times than for those who received no help ($p = 0.006$). The odds of an increased feeling good to be alive for students whose parents *often* allowed going out with friends on school nights were 1.34 (95% CI, 1.02 to 1.73) times than for those who were never allowed ($p = 0.03$). The odds of an increased feeling good to be alive for students whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 1.41 (95% CI, 1 to 1.99) times than for those whose parents never knew ($p = 0.049$). The odds of an increased feeling good to be alive for students whose mothers were self-employed were 0.89 (95% CI, 0.8 to 0.98) times than for those who indicated their mothers were unemployed ($p = 0.03$). The odds of an increased feeling good to be alive for students who indicated that religion was *pretty important* in their lives were 1.524 (95% CI, 1.08 to 2.12) times than for those who indicated religion was not important in their lives ($p = 0.02$). The odds of an increased feeling good to be alive for students who indicated that religion was *very important* were 1.67 (95% CI, 1.24 to 2.23) times than for those who indicated religion was not important in their lives ($p = 0.0005$).

Preference to talk problems over with one or both parents and parental knowledge of who the student went out with at night (if they did go out at night) were significantly associated ($p < 0.05$) with taking positive attitude towards self. The odds of an increased positive attitude towards self for students who would talk problems over with one or both of their parents for *most or all* problems were 1.24 (95% CI, 1.01 to 1.5) times than for those who would not ($p = 0.032$). The odds of an increased positive attitude towards self for students whose parents *always* knew who they went out with at night (if they did go out at night) were 1.26 (95% CI, 1.04 to 1.53) times than those whose parents never knew ($p = 0.0182$).

How often one went out for leisure and importance attached to religion were significantly associated ($p < 0.05$) with feeling like a person of worth on an equal plane with others. The odds of an increased feeling like a person of worth on an equal plane with others for students who went out for leisure *once or twice a month* were 1.64 (95% CI, 1.24 to 2.16) times than those who never went out ($p = 0.0004$). The odds of an increased feeling like a person of worth on an equal plane with others for students who indicated that religion was *very important* in their lives were 1.47 (95% CI, 1.09 to 1.96) times than those who indicated religion was not important in their lives ($p = 0.0107$).

The preference to talk problems over with one or both of their parents, how frequently one had dinner with one or both parents or guardians during a typical week, and the importance attached to religion were significantly associated ($p < 0.05$) with the feeling there was not much to be proud of. The odds of an increased feeling that there was not much to be proud of for students who would talk problems over with one or both of their parents for *most or all* problems were 1.58 (95% CI, 1.2 to 2.05) times than for those who did not ($p = 0.0007$). The odds of an increased feeling that there was not much to be proud of for students who had dinner for *4-5 days* with one or both parents or guardians during a typical week were 1.62 (95% CI, 1.11 to 2.36) times than for those who reported having dinner together for less than one day per week ($p = 0.01$). The odds of an increased feeling that there was not much to be proud of for students who had dinner for *6-7 days* with one or both parents or guardians during a typical week were 1.76 (95% CI, 1.32 to 2.35) times than for those who reported having dinner together for less than one day per week ($p = 0.0001$). The odds of an increased feeling there was not much to be proud of for students who indicated that religion was *little important* in their lives were 0.67 (95% CI, 0.44 to 0.99) times than for those who indicated that religion was not important ($p = 0.0496$). The odds of increased feeling there was not much to be proud of for students who indicated that religion was *pretty important* in their lives were 0.66 (95% CI, 0.44 to 0.95) times than for those who indicated that religion was not important ($p = 0.03$). The odds of increased feeling

there was not much to be proud of for students who indicated that religion was *very important* in their lives were 0.60 (95% CI, 0.43 to 0.84) times than for those who indicated that religion was not important ($p = 0.0034$).

How often parents allowed going out with friends on school nights, if one would talk problems over with one or both of their parents, parental knowledge of who they went out with at night (if they did go out at night), hours spent after school without an adult present and how often one went out for leisure were significantly associated ($p < 0.05$) with sometimes feeling not good at all. The odds of an increased indication that sometimes one felt not good at all for students whose parents *often* allow them to go out with friends on school nights were 1.32 (95% CI, 1.04 to 1.66) times than for those who were not allowed ($p = 0.02$). The odds of an increased indication that sometimes one felt not good at all for students who would talk problems over with one or both of their parents for *most or all* problems were 1.42 (95% CI, 1.13 to 1.77) times than for those who prefer not to ($p = 0.002$). The odds of an increased indication that sometimes one felt not good at all for students who whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 1.50 (95% CI, 1.06 to 2.1) times than for those whose parents never knew ($p = 0.02$). The odds of an increased indication that sometimes one felt not good at all for students who whose parents knew who they went out with at *night most of the times* (if they did go out at night) were 1.43 (95% CI, 1.02 to 1.99) times than for those whose parents never knew ($p = 0.04$). The odds of an increased indication that sometimes one felt not good at all for students whose parents *always* knew who they went out with at night (if they did go out at night) were 1.32 (95% CI, 1.02 to 1.68) times than for those whose parents never knew ($p = 0.03$). The odds of an increased indication that sometimes one felt not good at all for students who spent *1-2 hours* after school without an adult present were 1.56 (95% CI, 1.1 to 2.2) times than for those who spent none or almost none ($p = 0.01$). The odds of an increased indication that sometimes one felt not good at all for students who spent *more than five hours* after school without an adult present were 1.48 (95% CI, 1.12 to 1.92) times than for those who spent none or almost none ($p = 0.004$). The odds of an increased indication that sometimes one felt not good at all for students who went out for leisure *at least once a week* were 1.42 (95% CI, 1.03 to 1.95) times than for those who never went ($p = 0.03$).

How often parents allow going out with friends on school nights, if one would talk problems over with one or both of their parents, how frequently one had dinner with one or both parents or guardians during a typical week were significantly associated ($p < 0.05$) with the feeling that one cannot do anything right. The odds of an increased feeling that one cannot do anything right for students whose

parents *sometimes* allowed them to go out with friends on school nights were 1.49 (95% CI, 1.1 to 1.99) times than for those whose parents never did ($p = 0.008$). The odds of an increased feeling that one cannot do anything right for students whose parents *often* allowed them to go out with friends on school nights were 1.32 (95% CI, 1.05 to 1.67) times than for those whose parents never did ($p = 0.02$). The odds of an increased feeling that one cannot do anything right for students who would talk *most or all problems* over with one or both of their parents were 1.28 (95% CI, 1.03 to 1.56) times than for those who would never ($p = 0.02$). The odds of an increased feeling that one cannot do anything right for students who had dinner with one or both parents or guardians for *two days* during a typical week were 1.87 (95% CI, 1.23 to 2.8) times than for those who had dinner together for less than one day per week ($p = 0.003$). The odds of an increased feeling that one cannot do anything right for students who had dinner with one or both parents or guardians for *4-5 days* during a typical week were 1.46 (95% CI, 1.02 to 2.09) times than those who had dinner together for less than one day per week ($p = 0.0358$). The odds of increased feeling that one cannot do anything right for students who had dinner for *6-7 days* with one or both parents or guardians during a typical week were 1.65 (95% CI, 1.24 to 2.22) times than for those who had dinner together for less than one day per week ($p = 0.0008$).

The preference to talk problems over with one or both of their parents, how often one dinner with one or both parents or guardians during a typical week, the number of hours spent after school without an adult present, the importance attached to religion and how often parents or guardians checked on whether one did their homework were significantly associated ($p < 0.05$) with feeling that life is not useful. The odds of an increased feeling that life is not useful for students who would talk problems over with one or both of their parents, *at least for some problems*, were 1.28 (95% CI, 1.06 to 1.53) times compared to those who would never ($p = 0.008$). The odds of an increased feeling that life is not useful for students who would talk problems over with one or both of their parents for *most or all problems* were 1.31 (95% CI, 1.07 to 1.6) times than for those who would never ($p = 0.008$). The odds of increased feeling that life is not useful for students who had dinner for *4-5 days* during a typical week with one or both parents or guardians were 1.55 (95% CI, 1.12 to 2.14) times than for those who had dinner together for less than a day per week ($p = 0.008$). The odds of increased feeling that life is not useful for students who had dinner with one or both parents or guardians for *6-7 days* during a typical week were 1.37 (95% CI, 1.05 to 1.8) times than for those who had dinner together for less than a day per week ($p = 0.02$). The odds of an increased feeling that life is not useful for students who on average spent *less than an hour* after school without an adult present were 0.72 (95%

CI, 0.52 to 0.98) times than for those who spent none or almost none ($p = 0.04$). The odds of an increased feeling that life is not useful for students who spent *1-2 hours* after school without an adult present were 0.7 (95% CI, 0.5 to 0.95) times than for those who spent none ($p = 0.02$). The odds of increased feeling that life is not useful for students who on average spent *2-3 hours* after school without an adult present were 0.76 (95% CI, 0.57 to 0.99) times than for those who spent none ($p = 0.04$). The odds of an increased feeling that life is not useful for students who spent *more than five hours* after school without an adult present were 0.77 (95% CI, 0.6 to 0.99) times than those who spent none ($p = 0.04$). The odds of an increased feeling that life is not useful for students who indicated that religion was *pretty important* in their lives were 0.73 (95% CI, 0.55 to 0.94) times than those who indicated that religion was not important in their lives ($p = 0.02$). The odds of an increased feeling that life is not useful for students who indicated that religion was *very important* were 0.73 (95% CI, 0.58 to 0.9) times than for those who indicated it was not important in their lives ($p = 0.005$). The odds of an increased feeling that life is not useful for students whose parents or guardians checked on whether they did their homework, albeit *rarely*, were 1.38 (95% CI, 1.1 to 1.71) times than for those whose parents never checked their homework ($p = 0.004$). The odds of an increased feeling that life is not useful for students whose parents or guardians check on whether they did their homework, albeit *sometimes*, were 1.30 (95% CI, 1.04 to 1.6) times than for those whose parents never checked their homework ($p = 0.02$).

There was a significant association ($p < 0.05$) between feeling lonely a lot of times with how often parents provided help with homework when needed, if one would talk problems over with one or both of their parents, how often one had dinner with one or both parents or guardians during a typical week, hours spent after school without an adult present, and how often one went out for leisure. The odds of increasingly feeling lonely a lot of times for students whose parents provided help with homework when needed, albeit *rarely*, were 1.35 (95% CI, 1.01 to 1.8) times than for those who never received help with homework ($p = 0.04$). The odds of increasingly feeling lonely a lot of times for students whose parents *sometimes* provided help with homework when needed were 1.34 (95% CI, 1.01 to 1.76) times than for those who received no help with homework ($p = 0.04$). The odds of increasingly feeling lonely a lot of times for students who would talk problems over with one or both of their parents, for *at least some* problems, were 1.37 (95% CI, 1.11 to 1.67) times than for those who never did ($p = 0.003$). The odds of increasingly feeling lonely a lot of times for students who would talk problems over with one or both of their parents *for most or all* problems were 1.79 (95% CI, 1.43 to 2.22) times than for those who never did ($p = 0$). The odds of increasingly feeling lonely

a lot of times for students who had dinner with one or both parents or guardians for *3 days* during a typical week were 1.57 (95% CI, 1.01 to 2.42) times than for those who had dinner together for less than one day per week ($p = 0.04$). The odds of increasingly feeling lonely a lot of times for students who had dinner for *4-5 days* with one or both parents or guardians during a typical week were 1.79 (95% CI, 1.24 to 2.6) times than for those who had dinner together for less than one day per week ($p = 0.002$). The odds of increasingly feeling lonely a lot of times for students who had dinner with one or both parents or guardians for *6-7 days* during a typical week were 1.54 (95% CI, 1.13 to 2.12) times than for those who had dinner together in less than one day per week ($p = 0.007$). The odds of increasingly feeling lonely a lot of times for students who on average spent *1-2 hours* after school without an adult present were 1.62 (95% CI, 1.13 to 2.29) times than for those who spent none ($p = 0.007$). The odds of increasingly feeling lonely a lot of times for students who on average spent *more than five hours* without an adult present were 1.64 (95% CI, 1.23 to 2.19) times than for those who spent none ($p = 0.0006$). The odds of increasingly feeling lonely a lot of times for students who went out for leisure *at least once a week* were 1.46 (95% CI, 1.07 to 1.95) times than for those who never went ($p = 0.01$).

There were significant associations ($p < 0.05$) between the presence of someone to turn to for help with how often parents provided help with homework when needed, if one would talk problems over with one or both of their parents, parental knowledge of where one was after school and who they went out with at night (if they did go out at night). The odds of an increased likelihood of having someone to turn to for help for students whose parents *often* provided help with homework when needed were 1.72 (95% CI, 1.22 to 2.4) times than for those whose parents never provided help ($p = 0.002$). The odds of an increased likelihood of having someone to turn to for help for students who would talk problems over with one or both of their parents, for *at least some* problems, were 1.32 (95% CI, 1.04 to 1.67) times than for those who never did ($p = 0.02$). The odds of an increased likelihood of having someone to turn to for help for students who would talk problems over with one or both of their parents, for *most or all* problems, were 2.23 (95% CI, 1.66 to 2.99) times for than those who would never ($p = 0$). The odds of an increased likelihood of having someone to turn to for help for students whose parents *always* knew where they were afterschool were 1.44 (95% CI, 1.01 to 2.02) times than for those whose parents never did ($p = 0.04$). The odds of an increased likelihood of having someone to turn to for help for students who whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 0.66 (95% CI, 0.44 to 0.97) times than for those whose parents never knew ($p = 0.04$).

There were significant associations ($p < 0.05$) between often feeling left out of things with how often parents limited the amount of time spent watching TV, parental knowledge of who they went out with at night (if they did go out at night), racial background, and hours spent after school without an adult present. The odds of an increased feeling that one is often left out of things for students whose parents or guardians limited the amount of time spent watching TV, albeit *rarely*, were 1.34 (95% CI, 1.02 to 1.74) times than for those whose parents never ($p = 0.03$). The odds of an increased feeling that one is often left out of things for students whose parents *rarely* knew who they went out with at night (if they did go out at night) were 1.96 (95% CI, 1.4 to 2.7) times than for those whose parents never knew who the student went out with at night ($p = 0$). The odds of an increased feeling that one is often left out of things for students whose parents *always* knew who they went out with at night (if they did go out at night) were 1.47 (95% CI, 1.15 to 1.88) times than for those whose parents never who the student went out with at night ($p = 0.002$). The odds of an increased feeling that one is often left out of things for students who indicated they were from Asian or Indian background were 1.17 (95% CI, 1.01 to 1.32) times than for those who indicated black or African background ($p = 0.02$). The odds of an increased feeling that one is often left out of things for students who on average spent 2-3 hours after school without an adult present were 1.54 (95% CI, 1.14 to 2.06) times than for those who spent none ($p = 0.004$). The odds of an increased feeling that one is often left out of things for students who on average spent *more than five hours* without an adult present were 1.34 (95% CI, 1.03 to 1.76) times than for those who spent none ($p = 0.03$).

There were significant associations ($p < 0.05$) between the presence of someone to talk to when needed with how often parents limit the amount of time spent watching TV, how often parents allow going out with friends on school nights, if one would talk problems over with one or both of their parents, parental knowledge of where one was after school, parental knowledge of who they went out with at night (if they did go out at night), hours spent after school without an adult present, having at least one other adult that they could talk to about problems other than their parents and having parents or guardians check on whether one did their homework. The odds of an increased possibility of having someone to talk to when needed for students whose parents limit the amount of time spent watching TV, albeit *rarely*, were 0.61 (95% CI, 0.43 to 0.86) times than for those whose parents never did ($p = 0.006$). The odds of an increased possibility of having someone to talk to when needed for students whose parents allowed going out with friends on school nights, albeit *rarely*, were 0.60 (95% CI, 0.39 to 0.91) times than for those whose parents never allowed ($p = 0.02$). The odds of an increased possibility of having someone to talk to when needed for students whose parents *often* allowed going

out with friends on school nights were 0.66 (95% CI, 0.46 to 0.94) times than for those whose parents never allowed ($p = 0.02$). The odds of an increased possibility of having someone to talk to when needed for students who would talk problems over with one or both of their parents, for *at least some* of their problems, were 1.43 (95% CI, 1.1 to 1.86) times than for those who would never ($p = 0.007$). The odds of an increased possibility of having someone to talk to when needed for students who would talk problems over with one or both of their parents *for most or all* problems were 2.1 (95% CI, 1.5 to 2.91) times than for those who would never ($p = 0$). The odds of an increased possibility of having someone to talk to when needed for students whose parents *always* knew where they were after school were 1.54 (95% CI, 1.05 to 2.24) times than for those whose parents never knew ($p = 0.02$). The odds of an increased possibility of having someone to talk to when needed for students whose parents knew *most of the time* who they went out with at night (if they did go out at night) were 0.66 (95% CI, 0.43 to 0.98) times than for those whose parents never knew ($p = 0.04$). The odds of an increased possibility of having someone to talk to when needed for students who on average spent *less than an hour* after school without an adult present were 0.55 (95% CI, 0.33 to 0.9) times than for those who spent none or almost none ($p = 0.02$). The odds of an increased possibility of having someone to talk to when needed for students who on average *spent 1-2 hours* after school without an adult present were 0.42 (95% CI, 0.25 to 0.66) times than for those who spent none or almost none ($p = 0.0002$). The odds of an increased possibility of having someone to talk to when needed for students who on average spent *2-3 hours* after school without an adult present were 0.54 (95% CI, 0.34 to 0.84) times than for those who spent none or almost none ($p = 0.007$). The odds of an increased possibility of having someone to talk to when needed for students who *for most or all* problems had at least one other adult that they could talk to about problems other than one's parents were 1.57 (95% CI, 1.14 to 2.16) times than for those who had none ($p = 0.005$). The odds of an increased possibility of having someone to talk to when needed for students whose parents or guardians checked on whether they did their homework, albeit *rarely*, were 1.61 (95% CI, 1.15 to 2.23) times than for those whose parents never checked ($p = 0.005$).

There were significant associations ($p < 0.05$) between one wishing that they had more good friends with how often parents limited the amount of time spent watching TV and importance attached to religion. The odds of increasingly wishing one had more good friends for students whose parents *sometimes* limit the amount of time spent watching TV were 0.65 (95% CI, 0.5 to 0.83) times than for those whose parents never did ($p = 0.0006$). The odds of increasingly wishing one had more good friends for students whose parents *often* limit the amount of time spent watching TV were 0.7 (95%

CI, 0.54 to 0.89) times than for those whose parents never did ($p = 0.005$). The odds of increasingly wishing one had more good friends for students who indicated that religion was *very important* were 0.692 (95% CI, 0.53 to 0.89) times than for those who indicated that religion was not important ($p = 0.005$).

The importance that a student attached to religion was significantly associated ($p < 0.05$) with having friends one can get together with. The odds of having more friends one can get together with for students who attached importance to religion, albeit a *little*, were 1.55 (95% CI, 1.07 to 2.24) times than for those who attached no importance ($p = 0.02$). The odds of having more friends one can get together with for students who whose indicated that religion was *pretty important* were 1.57 (95% CI, 1.11 to 2.19) times than for those who attached no importance to religion ($p = 0.009$). The odds of having more friends one can get together with for students who indicated that religion was *very important* in their lives were 1.62 (95% CI, 1.21 to 2.15) times than for those who attached no importance ($p = 0.0009$).

There were significant associations ($p < 0.05$) between regularly testing of self by doing risky activities with parental knowledge of who students went out with at night (if they did go out at night), hours spent after school without an adult present, times that one went out with a date and how often one went out for leisure. The odds of more regularly testing of oneself with risky activities for students whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 0.66 (95% CI, 0.47 to 0.93) times than for those whose parents never knew who they went out with at night ($p = 0.017$). The odds of more regularly testing of oneself with risky activities for students who spent *more than five hours* after school without an adult present were 0.73 (95% CI, 0.54 to 0.98) times than for those who spent *no or almost no* time ($p = 0.0394$). The odds of more regularly testing of oneself with risky activities for students who went out on a date *once a month or less* were 0.76 (95% CI, 0.6 to 0.94) times than for those who never went out ($p = 0.0142$). The odds of more regularly testing of oneself with risky activities for students who went out on a date *once a week* were 0.54 (95% CI, 0.36 to 0.79) times than for those who never went out ($p = 0.002$). The odds of more regularly testing of self with risky activities for students who went out on a date *2-3 times* in a week were 0.46 (95% CI, 0.29 to 0.72) times than for those who never went ($p = 0.0006$). The odds of an increased frequency of testing oneself with risky activities for students who went out on a date greater than *three times in a week* were 0.43 (95% CI, 0.29 to 0.6) times than for those who never went out ($p = 0$). The odds of more regularly testing of oneself with risky activities for students who went out for leisure activities *only a few times* were 0.74 (95% CI, 0.57 to 0.94) times than for those who never

went out ($p = 0.015$). The odds of more regularly testing of oneself with risky activities for students who went out for leisure activities *at least once a week* were 0.72 (95% CI, 0.52 to 0.98) times than for those who never went out ($p = 0.0422$). The odds of more regularly testing of oneself with risky activities for students who went out for leisure activities *almost every day* were 0.49 (95% CI, 0.33 to 0.73) times than for those who never went out ($p = 0.0004$).

How frequently parents allowed the student to go out with friends on school nights, if they would talk problems over with one or both of their parents, parental knowledge of who they went out with at night (if they did go out at night) and how often one went out for leisure were significantly associated ($p < 0.05$) with preference to explore strange places. The odds of a higher preference to explore strange places for students whose parents *sometimes* allowed them to go out with friends on school nights were 0.66 (95% CI, 0.48 to 0.89) times than for those who were *never* allowed ($p = 0.007$). The odds of a higher preference to explore strange places for students whose parents *often* allow them to go out with friends on school nights were 0.74 (95% CI, 0.58 to 0.94) times than for those whose parents never allowed ($p = 0.0145$). The odds of a higher preference to explore strange places for students who would talk problems over with one or both of their parents for *most or all* problems were 1.27 (95% CI, 1.02 to 1.56) times than for those who did not ($p = 0.0286$). The odds of a higher preference to explore strange places for students whose parents knew *most of the time* who they went out with at night (if they did go out at night) were 0.68 (95% CI, 0.49 to 0.92) times than for those whose parents never knew ($p = 0.02$). The odds of a higher preference to explore strange places for students who went out for leisure *once or twice a month* were 0.64 (95% CI, 0.5 to 0.8) times than for those who never went ($p = 0.0001$). The odds of a higher preference to explore strange places for students who went out for leisure *at least once a week* were 0.66 (95% CI, 0.48 to 0.88) times than for those who never went ($p = 0.0062$).

How frequently parents allowed going out with friends on school nights, parental knowledge of where one was after school, how often one had dinner with one or both parents or guardians during a typical week and having at least one other adult other than one's parents that they could talk to about problems were significantly associated ($p < 0.05$) with preference for engaging in frightening activities. The odds of an increased preference to engage in frightening activities for students whose parents allowed going out with friends on school nights, albeit *rarely*, were 1.49 (95% CI, 1.06 to 2.09) times than for those whose parents never allowed ($p = 0.02$). The odds of an increased preference to engage in frightening activities for students whose parents *often* allow them to go out with friends on school nights were 1.41 (95% CI, 1.06 to 1.86) times than for those whose parents

never allowed ($p = 0.0179$). The odds of an increased preference to engage in frightening activities for students whose parents knew where they were after school, only *sometimes*, were 1.66 (95% CI, 1.14 to 2.39) times than for those whose parents never knew ($p = 0.007$). The odds of an increased preference to engage doing frightening activities for students who had dinner with one or both parents or guardians for *two days* during a typical week were 1.62 (95% CI, 1.03 to 2.51) times than for those who has dinner together for less than one day per week ($p = 0.03$). The odds of an increased preference to engage in frightening activities for students who had at least one other adult that they could talk to about problems other than one's parents for *at least some* of their problems were 1.29 (95% CI, 1.02 to 1.61) times than for those who did not have ($p = 0.0278$). The odds of an increased preference to engage in frightening activities for students who for most or all their problems had *at least one* other adult that they could talk to about their problems other than one's parents were 1.32 (95% CI, 1.03 to 1.68) times than for those who did not have ($p = 0.02$).

There were significant associations ($p < 0.05$) between preference for exciting new experiences with preference to talk problems over with one or both parents, how often one went out for leisure, importance attached to religion and how often parents or guardians checked whether one did their homework. The odds of an increased preference to engage in exciting new experiences for students who would talk problems over with one or both of their parents for *most or all* problems were 1.5 (95% CI, 1.18 to 1.89) times than for those who would not ($p = 0.0007$). The odds of an increased preference to engage in exciting new experiences for students who went out for leisure only a few times were 0.77 (95% CI, 0.6 to 0.98) times than for those who never went out ($p = 0.04$). The odds of an increased preference to engage in exciting new experiences for students who attached importance to religion, albeit a *little*, were 0.65 (95% CI, 0.46 to 0.9) times than for those who indicated religion was not important in their lives ($p = 0.01$). The odds of an increased preference to engage in exciting new experiences for students who whose indicated that religion was *pretty important* were 0.70 (95% CI, 0.5 to 0.96) times than for those who indicated religion was not important in their lives ($p = 0.0301$). The odds of an increased preference to engage in exciting new experiences for students who indicated that parents or guardians *often* checked on whether they did their homework were 1.32 (95% CI, 1 to 1.72) times than for those who indicated their parents never checked their homework ($p = 0.0473$).

How frequently parents allowed going out with friends on school nights, if one would talk problems over with one or both of their parents, how often one went out for leisure and importance attached to religion were significantly associated ($p < 0.05$) with preference for exciting and unpredictable friends.

The odds of a higher preference for exciting and unpredictable friends for students whose parents allowed going out with friends on school nights, albeit *rarely*, were 0.71 (95% CI, 0.52 to 0.97) times than for those whose parents never allowed ($p = 0.03$). The odds of a higher preference for exciting unpredictable friends for students who would talk problems over with one or both of their parents for *most or all* problems were 1.29 (95% CI, 1.01 to 1.62) times than for those who would not ($p = 0.04$). The odds of a higher preference for exciting unpredictable friends for students who went out for leisure *once or twice a month* were 0.79 (95% CI, 0.62 to 0.99) times than for those who never went out ($p = 0.043$). The odds of higher preference for exciting unpredictable friends for students who went out for leisure *at least once a week* were 0.61 (95% CI, 0.45 to 0.82) times than for those who never went ($p = 0.002$). The odds of a higher preference for exciting unpredictable friends for students who attached importance to religion, albeit a *little*, were 0.64 (95% CI, 0.44 to 0.91) times than for those who did not regard religion as important in their lives ($p = 0.01$). The odds of a higher preference for exciting unpredictable friends for students who indicated that religion was *pretty important* were 0.60 (95% CI, 0.43 to 0.84) times than for those who did not regard religion as important in their lives ($p = 0.003$). The odds of a higher preference for exciting unpredictable friends for students who indicated that religion was *very important* in their lives were 0.60 (95% CI, 0.44 to 0.81) times than for those who did not regard religion as important in their lives ($p = 0.0009$).

There were significant associations ($p < 0.05$) between often feeling bored with preference to talk problems over with one or both of parents, how often one went out for leisure and how often parents or guardians checked if one did their homework. The odds of more frequently feeling bored for students who would talk problems over with one or both of their parents, for *at least some* of their problems, were 1.32 (95% CI, 1.08 to 1.61) times than for those who would not ($p = 0.006$). The odds of more frequently feeling bored for students who indicated they would talk problems over with one or both of their parents for *most or all* problems were 1.30 (95% CI, 1.04 to 1.61) times than for those who would not ($p = 0.02$). The odds of more frequently feeling bored for students who went out for leisure activities *almost every day* were 0.64 (95% CI, 0.39 to 0.96) times than for those who never went ($p = 0.046$). The odds of more frequently feeling bored for students who whose parents or guardians frequently checked if they did their homework, albeit *sometimes*, were 1.48 (95% CI, 1.18 to 1.84) times than for those whose parents never checked ($p = 0.0004$).

How frequently the parents allowed going out with friends on school nights, if one would talk problems over with one or both of their parents and how often parents or guardians checked whether one did their homework were significantly associated ($p < 0.05$) with often having nothing to do. The

odds of increasing likelihood of having nothing to do for students whose parents allowed going out with friends on school nights, albeit *rarely*, were 0.59 (95% CI, 0.44 to 0.77) times than for those who scored lowest level ($p = 0.0002$). The odds of increasing likelihood of having nothing to do for students who would talk problems over with one or both of their parents, for *at least some* of their problems, were 1.32 (95% CI, 1.08 to 1.59) times than for those who never would ($p = 0.005$). The odds of increasing likelihood of having nothing to do for students whose parents or guardians frequently checked if they did their homework, albeit *sometimes*, were 1.29 (95% CI, 1.04 to 1.6) times than for those whose parents never checked ($p = 0.02$).

How frequently a student had dinner with one or both parents or guardians during a typical week, how often they went out for leisure, the importance attached to religion and having at least one other adult other than one's parents that could talk to about their problems were significantly associated ($p < 0.05$) with optimism about life in the next few years. The odds of a higher optimism about life in the next few years for students who had dinner with one or both parents or guardians for *3 days* during a typical week were 2.0 (95% CI, 1.04 to 3.8) times than for those who had dinner together for less than one day per week ($p = 0.0361$). The odds of a higher optimism about life in the next few years for students who went out for leisure only *a few times* were 1.44 (95% CI, 1 to 2.05) times than for those who never went out ($p = 0.047$). The odds of a higher optimism about life in the next few years for students who went out for leisure *once or twice a month* were 1.5 (95% CI, 1.03 to 2.08) times than for those who never went out ($p = 0.03$). The odds of a higher optimism about life in the next few years for students who indicated that religion was *pretty important* were 0.63 (95% CI, 0.4 to 0.97) times than for those who indicated that religion was not important in their lives ($p = 0.04$). The odds of a higher optimism about life in the next few years for students who for *most or all* problems had at least one other adult other than one's parents that they could talk to about their problems were 1.6 (95% CI, 1.07 to 2.25) times than for those who had none ($p = 0.02$).

Influence of parent and peer factors on social cognition

There were significant associations ($p < 0.05$) between being unable to speak when nervous or frightened with preference to talking problems over with one or both parents, parental knowledge of who they went out with at night (if they did go out at night), highest paternal level of education and how often one went out for leisure. The odds of a higher likelihood of being unable to speak when nervous or frightened for students who would talk problems over with one or both of their parents for *most or all* problems were 1.39 (95% CI, 1.14 to 1.68) times than for those who would never ($p = 0.0008$).

The odds of a higher likelihood of being unable to speak when nervous or frightened for students who indicated that their parents *always* knew who they went out with at night (if they did go out at night) were 0.74 (95% CI, 0.6 to 0.9) times than for those whose parents never knew who they went out with at night ($p = 0.003$). The odds of a higher likelihood of being unable to speak when nervous or frightened for students whose fathers highest level of education was graduate or professional school after college were 1.06 (95% CI, 1 to 1.1) times than those whose fathers completed grade school or less ($p = 0.0218$). The odds of a higher likelihood of being unable to speak when nervous or frightened for students who went out for leisure *once or twice* a month were 1.28 (95% CI, 1.04 to 1.56) times than for those who never went out ($p = 0.02$).

How frequently one went out for leisure was significantly associated ($p < 0.05$) with feeling unlikeable when nervous or frightened. The odds of increasingly feeling unlikeable when nervous or frightened for students who went out for leisure activities *at least once a week* were 1.38 (95% CI, 1.06 to 1.76) times than for those who never went ($p = 0.01$).

How frequently one had dinner with one or both parents or guardians during a typical week and the how frequently they attended religious services were significantly associated ($p < 0.05$) with indicating that one would tremble or shake when they got nervous or frightened. The odds of an increased feeling that one would tremble or shake when they got nervous or frightened for students who had dinner with one or both parents or guardians for *one day* during a typical week were 1.75 (95% CI, 1.11 to 2.68) times than for those who had dinner together for less than a day per week ($p = 0.01$). The odds of an increased feeling that one would tremble or shake when they got nervous or frightened for students who had dinner for *4-5 days* with one or both parents or guardians during a typical week were 1.52 (95% CI, 1.12 to 2.05) times than for those had dinner together for less than a day per week ($p = 0.007$). The odds of an increased feeling that one would tremble or shake when they got nervous or frightened for students who attended religious services *once or twice a month* were 1.34 (95% CI, 1.05 to 1.69) times than for those who never attended religious services ($p = 0.02$).

There were significant associations ($p < 0.05$) between one feeling that others would stare at them when they were nervous or frightened with how often parents allowed the student to go out with friends on school nights and if one would talk problems over with one or both of their parents. The odds of an increased feeling that others would stare at them when they were nervous or frightened for students whose parents allowed going out with friends on school nights, albeit *rarely*, were 0.62 (95% CI, 0.43 to 0.86) times than for those whose parents never allowed them ($p = 0.005$). The odds of an

increased feeling that others would stare at them when they were nervous or frightened for students whose parents *often* allowed going out with friends on school nights were 0.58 (95% CI, 0.43 to 0.76) times than for those whose parents never allowed them to go out ($p = 0.0001$). The odds of an increased feeling that others would stare at them when they were nervous or frightened for students who would talk problems over with one or both of their parents for *most or all* problems were 1.33 (95% CI, 1.03 to 1.7) times than for those who would not ($p = 0.03$).

How frequently parents allowed going out with friends on school nights, if one would talk problems over with one or both of their parents, parental knowledge of who they went out with at night (if they did go out at night), the number of hours spent after school without an adult present, how often one went out for leisure and having at least one other adult other than one's parents that they could talk to about their problems were significantly associated ($p < 0.05$) with feeling foolish when one got nervous or frightened. The odds of an increased likelihood of feeling foolish when one got nervous or frightened for students whose parents *sometimes* allowed them to go out with friends on school nights were 1.48 (95% CI, 1.02 to 2.12) times than for those whose parents never allowed them ($p = 0.036$). The odds of an increased likelihood of feeling foolish when one got nervous or frightened for students whose parents *often* allowed them to go out with friends on school nights were 1.61 (95% CI, 1.21 to 2.12) times than for those whose parents never allowed them ($p = 0.0008$). The odds of an increased likelihood of feeling foolish when they got nervous or frightened for students who would talk problems over with one or both of their parents, for *at least some* of their problems, were 0.77 (95% CI, 0.61 to 0.95) times than for those who would not ($p = 0.02$). The odds of an increased likelihood of feeling foolish when one got nervous or frightened for students who whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 1.56 (95% CI, 1.06 to 2.27) times than for those whose parents never knew ($p = 0.02$). The odds of an increased likelihood of feeling foolish when one got nervous or frightened for students who spent *more than five hours* after school without an adult present were 1.39 (95% CI, 1 to 1.92) times than for those who spent no or almost no time after school without an adult present ($p = 0.0434$). The odds of an increased likelihood of feeling foolish when one got nervous or frightened for students who went out for leisure *once or twice a month* were 1.30 (95% CI, 1.02 to 1.66) times than for those who never went out ($p = 0.034$). The odds of an increased likelihood of feeling foolish when they got nervous or frightened for students who *for most or all* problems had at least one other adult other than one's parents that they could talk to about their problems were 1.29 (95% CI, 1 to 1.64) times than for those who had none ($p = 0.046$).

Parental knowledge of who the student went out with at night (if they did go out at night), and the highest paternal level of education were significantly associated ($p < 0.05$) with feeling that one would be paralyzed with fear when they got nervous or frightened. The odds of increased feeling that one would be paralyzed with fear when they got nervous or frightened for students whose parents knew *most of the time* who they went out with at night (if they did go out at night) were 1.59 (95% CI, 1.21 to 2.06) times than for those whose parents never knew ($p = 0.0006$). The odds of increased feeling that one would be paralyzed with fear when they got nervous or frightened for students whose fathers' highest education was graduate or professional school after college were 1.06 (95% CI, 1.01 to 1.11) times than for those who completed grade school or less ($p = 0.01$).

The preference to talk about their problems with one or both of their parents and the importance attached to religion were significantly associated ($p < 0.05$) with dropping or spilling things when one got nervous or frightened. The odds of increased tendency to drop or spill things when one got nervous or frightened for students who would talk problems over with one or both of their parents for *most or all* problems were 1.28 (95% CI, 1.05 to 1.53) times than for those who would not ($p = 0.01$). The odds of increased tendency to drop or spill things when one got nervous or frightened for students who indicated that religion was a *little important* in their lives were 1.46 (95% CI, 1.1 to 1.91) times than for those who indicated that religion was not in their lives ($p = 0.007$). The odds of increased tendency to drop or spill things when one got nervous or frightened for students who indicated that religion was *very important* in their lives were 1.26 (95% CI, 1.01 to 1.56) times than for those who indicated that religion was not in their lives ($p = 0.04$).

Racial background, parental knowledge of where one was after school and importance attached to religion were significantly associated ($p < 0.05$) with one feeling they would get sick when nervous or frightened. The odds of an increased feeling that one would get sick when nervous or frightened for students who indicated that they were Asian or Indian were 1.17 (95% CI, 1.01 to 1.35) times than for those who indicated they were black or African ($p = 0.04$). The odds of an increased feeling that one would get sick when nervous or frightened for students whose parents knew where they were after school, albeit *rarely*, were 0.59 (95% CI, 0.42 to 0.81) times than for those whose parents never knew ($p = 0.002$). The odds of an increased feeling that one would get sick when nervous or frightened for students whose parents only *sometimes* knew where they were after school were 0.73 (95% CI, 0.54 to 0.97) times than for those whose parents never knew ($p = 0.03$). The odds of an increased feeling that one would get sick when nervous or frightened for students whose parents *always* knew where they were after school were 0.73 (95% CI, 0.56 to 0.94) times than for those whose parents

never knew ($p = 0.02$). The odds of an increased feeling that one would get sick when nervous or frightened for students whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 1.43 (95% CI, 1.04 to 1.96) times than for those whose parents never knew ($p = 0.03$). The odds of an increased feeling that one would get sick when nervous or frightened for students whose parents knew *most of the time* who they went out with at night (if they did go out at night) were 1.44 (95% CI, 1.06 to 1.94) times than for those whose parents never knew ($p = 0.02$). The odds of an increased feeling that one would get sick when nervous or frightened for students whose parents *always* knew who they went out with at night (if they did go out at night) were 1.43 (95% CI, 1.13 to 1.79) times than for those whose parents never knew ($p = 0.002$). The odds of an increased feeling that one would get sick when nervous or frightened for students who attached a *little* importance to religion in their lives were 1.45 (95% CI, 1.06 to 1.96) times than for those who attached no importance to religion in their lives ($p = 0.02$). The odds of an increased feeling that one would get sick when nervous or frightened for students who indicated that religion was *very important* in their lives were 1.30 (95% CI, 1 to 1.69) times than for those who attached no importance to religion in their lives ($p = 0.046$).

There were significant associations ($p < 0.05$) between the feeling that one was inadequate when they were nervous or frightened with how often parents provided help with homework when needed, how often parents allowed going out with friends on school nights and parent marital status. The odds of an increased feeling that one was inadequate when they got nervous or frightened for students whose parents *sometimes* provided help with homework when needed were 1.44 (95% CI, 1.12 to 1.84) times than for those whose parents did not provide help with homework ($p = 0.004$). The odds of an increased feeling that one was inadequate when they got nervous or frightened for students whose parents *often* provided help with homework when needed were 1.51 (95% CI, 1.16 to 1.94) times than for those whose parents did not provide help with homework ($p = 0.002$). The odds of an increased feeling that one was inadequate when they got nervous or frightened for students whose parents *sometimes* allowed them to go out with friends on school nights were 1.39 (95% CI, 1.03 to 1.85) times than for those who are never allowed ($p = 0.03$). The odds of an increased feeling that one was inadequate when they got nervous or frightened for students whose parents *often* allowed going out with friends on school nights were 1.5 (95% CI, 1.19 to 1.87) times than for those who are never allowed ($p = 0.0003$). The odds of an increased feeling that one was inadequate when they were nervous or frightened for students whose parental marital status was divorced were 1.09 (95% CI, 1.01 to 1.16) times than for those whose parents were married ($p = 0.02$).

How frequently parents allowed going out with friends on school nights, parental knowledge of where one was after school, how often one attended religious services and the importance attached to religion were significantly associated ($p < 0.05$) with feeling that one would babble or talk in a funny manner when they got nervous or frightened. The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students whose parents *sometimes* allowed them to go out with friends on school nights were 1.38 (95% CI, 1.04 to 1.81) times than for those whose parents never allowed them ($p = 0.02$). The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students whose parents *sometimes* knew where they were after school were 1.51 (95% CI, 1.13 to 2.01) times than for those whose parents never knew where they were after school ($p = 0.004$). The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students whose parents knew *most of the time* where they were after school were 1.48 (95% CI, 1.11 to 1.98) times than for those whose parents never knew where they were after school ($p = 0.008$). The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students whose parents *always* knew where they were after school were 1.45 (95% CI, 1.13 to 1.85) times than those whose parents never knew where they were after school ($p = 0.003$). The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students who attended religious services *once or twice a month* were 1.33 (95% CI, 1.03 to 1.73) times than those who never attended religious services ($p = 0.03$). The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students who attended religious services about *once a week or more* were 1.47 (95% CI, 1.15 to 1.87) times than for those who never attended religious services ($p = 0.002$). The odds of an increased feeling that one would babble or talk in a funny manner when they got nervous or frightened for students who attached a *little* importance to religion were 1.35 (95% CI, 0.99 to 1.8) times than those who did not attach importance to religion ($p = 0.048$).

There were significant associations ($p < 0.05$) between feeling inferior when one was nervous or frightened with how often parents allowed going out with friends on school nights, coming back at a set time whenever one went out during weekend nights and the highest maternal level of education. The odds of increased feeling of inferiority when they got nervous or frightened for students whose parents allowed going out with friends on school nights, albeit *rarely*, were 1.39 (95% CI, 1.01 to 1.89) times than for those whose parents never allowed them ($p = 0.04$). The odds of an increased feeling of inferiority when they got nervous or frightened for students whose parents *often* allowed

them to go out with friends on school nights were 1.50 (95% CI, 1.15 to 1.94) times than for those whose parents never allowed them to go out ($p = 0.002$). The odds of an increased feeling of inferiority when they got nervous or frightened for students who *most of the time* came back at a set time whenever they went out during weekend nights were 1.53 (95% CI, 1.06 to 2.17) times than for those who never did ($p = 0.02$). The odds of an increased feeling of inferiority when they got nervous or frightened for students whose maternal highest level of education was graduate or professional school after college were 1.06 (95% CI, 1 to 1.12) times than for those whose maternal highest level of education was grade school or less ($p = 0.04$).

Having repeated grades at least once and maternal employment status were significantly associated ($p < 0.05$) with inability to concentrate when one was nervous or frightened. The odds of an increased inability to concentrate when one got nervous or frightened for students who had repeated grades in school for *two or more times* were 0.87 (95% CI, 0.76 to 0.98) times than for those who had not repeated any grade in school ($p = 0.03$). The odds of an increased inability to concentrate when one got nervous or frightened for students whose maternal employment status was self-employed were 0.89 (95% CI, 0.81 to 0.96) times than for those whose maternal employment status was unemployed ($p = 0.005$).

How frequently parents allowed going out with friends on school nights, paternal employment status and the number of hours spent after school without an adult present were significantly associated ($p < 0.05$) with inability to write properly when one got nervous or frightened. The odds of an increased inability to write properly when nervous or frightened for students whose parents *often* allowed them to go out with friends on school nights were 1.33 (95% CI, 1.05 to 1.66) times than for those whose parents never allowed them ($p = 0.02$). The odds of an increased inability to write properly when one got nervous or frightened for students who whose paternal employment status was *self-employed* were 0.9 (95% CI, 0.82 to 0.96) times than for those whose paternal employment status was *unemployed* ($p = 0.006$). The odds of an increased inability to write properly when nervous or frightened for students who spent *3-5 hours* after school without an adult present were 1.36 (95% CI, 1 to 1.83) times than for those who spent *none or almost none* ($p = 0.048$). The odds of an increased inability to write properly when nervous or frightened for students who spent *greater than five hours* after school without an adult present were 1.33 (95% CI, 1.01 to 1.74) times than for those spent *none or almost none* ($p = 0.0394$).

There were significant associations ($p < 0.05$) between the feeling that people were not interested in them with how often parents allowed the student to go out with friends on school nights, parental knowledge of who they went out with at night (if they did go out at night), hours spent after school without an adult present, how often one went out for leisure, importance attached to religion and having parents or guardians check on whether one did their homework. The odds of an increased feeling that people were not interested in them for students whose parents *often* allowed them to go out with friends on school nights were 1.28 (95% CI, 1.02 to 1.59) times than for those whose parents never allowed them to go out ($p = 0.03$). The odds of an increased feeling that people were not interested in them for students who whose parents knew, albeit *rarely*, who they went out with at night (if they did go out at night) were 1.40 (95% CI, 1.03 to 1.9) times than for those who never knew ($p = 0.03$). The odds of an increased feeling that people were not interested in them for students who spent *more than five hours* after school without an adult present were 1.31 (95% CI, 1 to 1.69) times than for those who spent *none or almost none* ($p = 0.045$). The odds of an increased feeling that people were not interested in them for students who went out for leisure *once or twice a month* were 1.30 (95% CI, 1.05 to 1.6) times than for those who never went out ($p = 0.0146$). The odds of an increased feeling that people were not interested in them for students who went out for leisure activities *at least once a week* were 1.43 (95% CI, 1.08 to 1.89) times than for those who never went out ($p = 0.01$). The odds of an increased feeling that people were not interested in them for students who indicated that religion was *very important* in their lives were 1.33 (95% CI, 1.03 to 1.69) times than for those who indicated that religion was *not important* in their lives ($p = 0.02$). The odds of an increased feeling that people were not interested in them for students who indicated that their parents or guardians *often* checked on whether they did their homework were 0.71 (95% CI, 0.55 to 0.9) times than those whose parents never checked ($p = 0.006$).

A student's racial background and importance attached to religion were significantly associated ($p < 0.05$) with the feeling that people would not like them when they were nervous or frightened. The odds of increased inability to concentrate when they got nervous or frightened for students who indicated their racial background was Asian or Indian were 1.23 (95% CI, 1.07 to 1.41) times than for those who indicated they were black or African ($p = 0.002$). The odds of an increased inability to concentrate when they got nervous or frightened for students who indicated that religion was *pretty important* in their lives were 1.52 (95% CI, 1.12 to 2.05) times than for those who indicated that religion was not important in their lives ($p = 0.006$). The odds of an increased inability to concentrate when they were nervous or frightened for students who indicated that religion was *very important* in

their lives were 1.53 (95% CI, 1.18 to 1.99) times than for those who indicated that religion was not important in their lives ($p = 0.001$).

How frequently parents allowed going out with friends on school nights and the importance attached to religion were significantly associated ($p < 0.05$) with feeling vulnerable when one was nervous or frightened. The odds of an increased feeling of vulnerability when one was nervous or frightened for students whose parents *often* allowed them to go out with friends on school nights were 1.60 (95% CI, 1.18 to 2.15) times than for those whose parents never allowed them to go out ($p = 0.002$). The odds of an increased feeling of vulnerability when one was nervous or frightened for students who attached importance to religion, albeit a *little*, were 1.87 (95% CI, 1.25 to 2.76) times than for those who did not attach importance to religion in their lives ($p = 0.002$). The odds of an increased feeling of vulnerability when one was nervous or frightened for students who indicated that religion was *very important* in their lives were 1.65 (95% CI, 1.16 to 2.33) times than for those who did not attach importance to religion in their lives ($p = 0.005$).

There were significant associations ($p < 0.05$) between the thought that one would sweat when nervous or frightened with having repeated grades at least once, how often one went out for leisure, importance attached to religion, and having parents or guardians check whether one did their homework. The odds of an increased feeling that one would sweat when they got nervous or frightened for students who had repeated school grades *two or more times* were 0.86 (95% CI, 0.74 to 0.99) times than for those who had *never* repeated school grades ($p = 0.04$). The odds of an increased feeling that one would sweat when they got nervous or frightened for students who went out for leisure activities *almost every day* were 0.68 (95% CI, 0.46 to 0.99) times than for those who never went out ($p = 0.047$). The odds of an increased feeling that one would sweat when they got nervous or frightened for students who indicated that religion was a *little important* in their lives were 1.16 (95% CI, 1.12 to 2.26) times than for those who indicated that religion was not important in their lives ($p = 0.009$). The odds of an increased feeling that one would sweat when they got nervous or frightened for students who indicated that religion was *pretty important* in their lives were 1.51 (95% CI, 1.08 to 2.09) times than for those who indicated that religion was not important in their lives ($p = 0.01$). The odds of an increased feeling that one would sweat when they were nervous or frightened for students who indicated that religion was *very important* in their lives were 1.49 (95% CI, 1.13 to 1.94) times than for those who indicated that religion was not important in their lives ($p = 0.004$). The odds of an increased feeling one would sweat when nervous or frightened for students whose parents or guardians *rarely* checked on whether they did their homework were 0.74 (95% CI, 0.57 to 0.95) times

than for those whose parents or guardians never checked their homework ($p = 0.03$). The odds of an increased feeling that one would sweat when they got nervous or frightened for students whose parents or guardians *sometimes* checked on whether they did their homework were 0.72 (95% CI, 0.56 to 0.91) times than for those whose parents or guardians never checked their homework ($p = 0.006$). The odds of an increased feeling that one would sweat when they were nervous or frightened for students who indicated that parents or guardians *often* checked on whether they did their homework were 0.61 (95% CI, 0.46 to 0.79) times than for those whose parents or guardians never checked their homework ($p = 0.0003$).

How frequently parents allowed going out with friends on school nights, how often one attended religious services and how often parents or guardians checked on whether they did their homework were significantly associated ($p < 0.05$) with one indicating that they would go red when they got nervous or frightened. The odds of an increased likelihood to indicate that one went red when they got nervous or frightened for students whose parents *often* allowed them to go out with friends on school nights were 1.35 (95% CI, 1.04 to 1.75) times than for those whose parents never allowed them to go out ($p = 0.02$). The odds of an increased likelihood to indicate that one went red when they were nervous or frightened for students who attended religious services *once or twice a month* were 1.51 (95% CI, 1.09 to 2.06) times than for those who never attended religious services ($p = 0.01$). The odds of an increased likelihood to indicate that one went red when they got nervous or frightened for students whose parents or guardians checked on whether one did their homework, albeit *rarely*, were 0.75 (95% CI, 0.57 to 0.98) times than for those whose parents or guardians never checked their homework ($p = 0.04$). The odds of an increased likelihood to indicate that one went red when got nervous or frightened for students who whose parents or guardians *sometimes* checked on whether one did their homework were 0.69 (95% CI, 0.53 to 0.88) times than for those whose parents or guardians never checked their homework ($p = 0.004$). The odds of an increased likelihood to indicate that one went red when they got nervous or frightened for students who indicated that their parents or guardians *often* checked on whether they did their homework were 0.73 (95% CI, 0.54 to 0.97) times than those whose parents or guardians never checked ($p = 0.03$).

How frequently the parents provided help with homework when needed, if one would talk problems over with one or both of their parents, the highest maternal level of education, maternal employment status and having at least one other adult other than one's parents that they could talk to about their problems were significantly associated ($p < 0.05$) with one feeling weird when they got nervous or frightened. The odds of increasingly feeling weird when they get nervous or frightened for students

whose parents or guardians *rarely* provided help with homework when needed were 1.35 (95% CI, 1.04 to 1.75) times than for those whose parents or guardians never provided help with homework ($p = 0.02$). The odds of increasingly feeling weird when they got nervous or frightened for students whose parents *often* provided help with homework when needed were 1.46 (95% CI, 1.14 to 1.85) times than for those whose parents or guardians never provided help with homework ($p = 0.002$). The odds of increasingly feeling weird when they got nervous or frightened for students who would talk problems over with one or both of their parents, for *at least some* of their problems, were 0.76 (95% CI, 0.62 to 0.93) times than for those who would not ($p = 0.008$). The odds of increasingly feeling weird when they get nervous or frightened for students who would talk problems over with one or both of their parents, for *most or all* problems, were 0.68 (95% CI, 0.54 to 0.85) times than for those who would not ($p = 0.0006$). The odds of increasingly feeling weird when they got nervous or frightened for students whose highest maternal level of education was *graduate or professional school after college* were 1.07 (95% CI, 1 to 1.12) times than for those whose mothers completed *grade school or less* ($p = 0.03$). The odds of increasingly feeling weird when they got nervous or frightened for students who indicated their maternal employment status was *self-employed* were 0.88 (95% CI, 0.8 to 0.97) times than for those who indicated their maternal employment status was *unemployed* ($p = 0.01$). The odds of increasingly feeling weird when they got nervous or frightened for students who for *most or all problems* had at least one other adult other than one's parents that they could talk to about their problems were 1.28 (95% CI, 1.01 to 1.61) times than those who did not have a person to talk to ($p = 0.04$).

There were significant associations ($p < 0.05$) between the belief that others realized it when one got nervous or frightened with how often parents limited the amount of time spent watching TV, how often parents allowed going out with friends on school nights, coming back at night at a set time, highest maternal education, the number of times during a typical week that one went out for fun and recreation without adult supervision and having parents or guardians check on whether one did their homework. The odds of an increased belief that other people realized it when one got nervous or frightened for students whose parents limited the amount of time spent watching TV, though *rarely*, were 1.32 (95% CI, 1.02 to 1.68) times than for those whose parents never did ($p = 0.03$). The odds of an increased belief that other people realized it when one got nervous or frightened for students whose parents *sometimes* allowed them to go out with friends on school nights were 1.36 (95% CI, 1 to 1.83) times than for those whose parents never allowed them to go out ($p = 0.048$). The odds of an increased belief that other people realized it when one got nervous when they got nervous or

frightened for students whose parents *often* allowed them to go out with friends on school nights were 1.39 (95% CI, 1.1 to 1.74) times than for those whose parents never allowed them to go out ($p = 0.005$). The odds of an increased belief that other people realized it when one got nervous or frightened for students who *rarely* came back at a set time whenever they went out during weekend nights were 1.43 (95% CI, 1.06 to 1.92) times than for those who never did ($p = 0.02$). The odds of an increased belief that other people realized it when one got nervous when they got nervous or frightened for students whose maternal highest level of education was *graduate or professional school after college* were 1.06 (95% CI, 1 to 1.11) times than for those whose maternal highest level of education was *grade school or less* ($p = 0.0489$). The odds of an increased belief that other people realized it when they got nervous or frightened for students who on a typical week went out for fun and recreation without adult supervision for *four or five evenings* were 1.48 (95% CI, 1 to 2.17) times than for those who went out for less than one evening per week ($p = 0.048$). The odds of an increased belief that other people realized it when they got nervous or frightened students who on a typical week went out for fun and recreation without adult supervision for *six or seven evenings* were 1.89 (95% CI, 1.28 to 2.78) times than for those who went out for less than one evening per week ($p = 0.001$). The odds of an increased belief that other people realized it when they got nervous or frightened for students whose parents or guardians *rarely* checked on whether they did their homework were 0.78 (95% CI, 0.61 to 0.98) times than for those whose parents *never* checked their homework ($p = 0.03$). The odds of an increased belief that other people realized it when they got nervous or frightened for students who indicated that their parents or guardians *often* checked on whether they did their homework were 0.74 (95% CI, 0.57 to 0.96) times than for those whose parents *never* checked ($p = 0.03$).

How frequently parents allowed going out with friends on school nights was significantly associated ($p < 0.05$) with the feeling that people thought one was boring when they were nervous or frightened. The odds of an increased feeling that people thought one was boring when they were nervous or frightened for students whose parents *often* allowed them to go out with friends on school nights were 1.29 (95% CI, 1.05 to 1.58) times than for those whose parents never did ($p = 0.02$).

2.2. The influence of the psychosocial factors, social cognition and self-perceptions, on engagement

This section presents results on the influence of psychosocial variables including social cognition (measured as the locus of control) and self-perceptions (measured as self-concept) on engagement variables (Table 18).

There were significant associations ($p < 0.05$) between the engagement variable, average grade attained in the school year, with the social cognition variables, the thought that when they got nervous or frightened one would be: paralyzed with fear, drop or spill things, be unable to write properly, and one gets vulnerable. The odds of attaining a higher average grade in the school year for students who indicated that they would be paralyzed with fear when they got nervous or frightened during *half of the times* were 1.4 (95% CI, 1 to 1.92) times than for those who indicated that this thought *never* occurred ($p = 0.047$). The odds of attaining a higher average grade in the school year for students who indicated that they would *usually* drop or spill things when they got nervous or frightened were 0.7 (95% CI, 0.54 to 0.9) times than for those indicated that this thought never occurred ($p = 0.006$). The odds of attaining a higher average grade in the school year for students who indicated that they would *always* drop or spill things when they got nervous or frightened were 0.7 (95% CI, 0.57 to 0.91) times than for those who indicated this thought never occurred ($p = 0.007$). The odds of attaining a higher average grade in the school year for students who indicated that they would *usually* be unable to write properly when they got nervous or frightened were 0.7 (95% CI, 0.56 to 0.96) times than for those who indicated that this thought never occurred ($p = 0.0258$). The odds of attaining a higher average grade in the school year for students who indicated that they would *always* be unable to write properly when they got nervous or frightened were 0.8 (95% CI, 0.61 to 0.97) times than those who indicated that this thought never occurred ($p = 0.0271$). The odds of attaining a higher average grade in the school year for students who indicated that they would on *rare occasions* be vulnerable when they got nervous or frightened were 1.7 (95% CI, 1.21 to 2.48) times than those who indicated that this thought never occurs ($p = 0.0026$).

Table 18 Summary of multilevel proportional odds logistic regression analysis of psychosocial factors (social cognition and self-perceptions) significantly predicting student engagement

Response	Predictor	Predictor			
		ordinal level*	Estimate	SE	p-value
Average grade	Enjoy life	3	1.513	0.180	0.022
	Paralyzed with fear	3	1.390	0.160	0.047
	Drop or spill things	4	0.705	0.120	0.006
	Drop or spill things	5	0.727	0.110	0.007
	Unable to write properly	4	0.739	0.130	0.026

	Unable to write properly	5	0.776	0.110	0.027
	Get vulnerable	2	1.735	0.180	0.003
Likely to graduate	Satisfied with self	3	1.913	0.180	0.000
	Satisfied with self	4	1.491	0.160	0.013
	Satisfied with self	5	1.426	0.140	0.015
	Hopeless future	4	1.338	0.140	0.045
	Person of worth	3	0.659	0.200	0.039
	Nothing to do often	3	1.395	0.150	0.031
Participating music	Nothing to do often	5	1.541	0.110	0.000
	People not interested in me	3	0.720	0.150	0.037
	People not interested in me	5	0.616	0.150	0.002
	People will not like me	3	1.528	0.150	0.007
	People will not like me	5	1.386	0.150	0.036
Participating athletics	Life not useful	2	1.858	0.170	0.000
	Life not useful	3	1.759	0.190	0.003
	Life not useful	5	1.471	0.120	0.002
	Often bored	4	1.455	0.150	0.014
	Tremble or shake	3	0.646	0.190	0.026
	Paralyzed with fear	5	1.467	0.140	0.007
	Unable to write properly	4	0.734	0.130	0.022
	Get vulnerable	2	0.628	0.180	0.014
Participating other activities	Life meaningless	5	1.247	0.110	0.047
	Get sick	3	0.623	0.150	0.003
	Get sick	4	0.613	0.130	0.000
	Get sick	5	0.700	0.120	0.005
	Feel inferior	4	1.454	0.170	0.029
	Feel inferior	5	1.440	0.140	0.010
Enjoy school	Good to be alive	3	1.557	0.200	0.032

	Able to do things well	3	0.622	0.210	0.026
	Life not useful	2	1.616	0.190	0.012
	Frightening activities	5	1.290	0.100	0.020
	Exciting, unpredictable	5	0.740	0.120	0.014
	friends				
	People will not like me	3	1.379	0.160	0.045
	People will not like me	4	1.642	0.160	0.002
	People will not like me	5	1.479	0.150	0.009
Try best in school	Future hopeless	5	1.253	0.110	0.046
	Good to be alive	2	1.451	0.180	0.042
	Positive attitude	4	1.632	0.170	0.005
	Positive attitude	5	1.358	0.150	0.049
	Have friends	4	1.337	0.140	0.039
	Foolish	5	0.733	0.140	0.036
	Inferior	3	1.595	0.170	0.009
	I am weird	5	1.453	0.120	0.003
School work too hard	Satisfied with self	5	1.359	0.150	0.042
	Good to be alive	2	0.666	0.190	0.039
	Someone to turn to	2	1.843	0.210	0.004
	Have friends	2	1.456	0.150	0.013
	Often bored	5	1.250	0.110	0.050
	People reject me	2	1.396	0.150	0.037
School work interesting	Satisfied with self	3	1.478	0.180	0.039
	Able to do things well	4	1.609	0.160	0.004
	Able to do things well	5	1.658	0.150	0.001
	Often bored	3	0.741	0.130	0.023
Time spent extracurricular activities	Happiness	3	1.270	0.110	0.041
	Life meaningless	2	0.783	0.110	0.031
	New, exciting	3	0.687	0.160	0.020
	experiences				

	New, exciting experiences	4	0.607	0.140	0.001
	New, exciting experiences	5	0.760	0.110	0.014
	Often bored	2	1.404	0.130	0.015
	Unable to speak	2	1.720	0.170	0.001
	Unable to speak	3	1.558	0.170	0.013
	Unable to speak	4	1.586	0.160	0.005
	Unable to speak	5	1.828	0.130	0.000
Grades' competition	Life meaningless	2	1.301	0.110	0.020
	Not good at all	3	1.446	0.160	0.022
How others feel if I cheated	Satisfied with self	3	1.458	0.180	0.042
	Satisfied with self	4	1.560	0.160	0.006
	Satisfied with self	5	1.632	0.150	0.001
	Enjoy life	5	1.342	0.140	0.048
	Able to do things well	3	0.463	0.190	0.000
	Nothing to do often	3	0.736	0.150	0.042
	Nothing to do often	4	0.677	0.130	0.005
	People not interested in me	4	1.470	0.130	0.005
How others feel if I defied	Hopeless future	2	0.658	0.160	0.011
	Good to be alive	5	1.275	0.120	0.044
	Life in next few years	3	2.111	0.300	0.016
Importance good grades	Someone to turn to	2	1.587	0.170	0.010
	Someone to turn to	5	1.550	0.130	0.001
	Paralyzed with fear	4	1.656	0.150	0.001
Class interruption misbehaviour	Life meaningless	5	0.738	0.130	0.021
	Cannot do anything right	5	0.727	0.150	0.035
	Life not useful	3	1.770	0.220	0.013

	Life not useful	4	1.522	0.190	0.028
	Life not useful	5	1.615	0.160	0.003
	New, exciting experiences	3	1.617	0.190	0.014
	New, exciting experiences	4	1.698	0.170	0.002
	New, exciting experiences	5	1.465	0.140	0.007
	Nothing to do often	4	0.665	0.140	0.006
	Life in next few years	4	1.953	0.330	0.044
	Life in next few years	5	1.958	0.320	0.040
	Unable to speak	2	1.780	0.200	0.005
	Unable to speak	3	1.574	0.210	0.035
	Unable to speak	4	1.500	0.200	0.046
	Unable to speak	5	1.795	0.160	0.000
	Unlikeable	5	1.782	0.160	0.000
	Get sick	3	1.694	0.180	0.005
	Get sick	5	1.490	0.150	0.011
Own learning interruption	Happiness	2	1.369	0.120	0.009
misbehaviour	Happiness	3	1.346	0.120	0.018
	Unable to speak	2	1.648	0.180	0.008
	People reject me	3	1.606	0.190	0.013
	People reject me	4	1.532	0.170	0.013
	People reject me	5	1.657	0.160	0.003
	Inferior	2	1.371	0.130	0.017
	People will not like me	4	1.363	0.150	0.047
	Get vulnerable	2	0.550	0.180	0.002
	Get vulnerable	4	0.682	0.170	0.033
Misbehaviour rules fair?	Enjoy life	3	0.665	0.190	0.037
	Wish more good friends	3	0.721	0.150	0.032

Happiness	New, exciting experiences	5	1.394	0.120	0.010	
	People stare at me	3	0.661	0.170	0.019	
	I am inadequate	3	1.387	0.160	0.048	
	Parents limit tv time	3	1.301	0.120	0.043	
	Parents limit tv time	4	1.360	0.130	0.022	
	Parents allow out with friends	2	0.675	0.170	0.026	
	Parents allow out with friends	4	0.681	0.140	0.008	
	Talk about problems with parents	2	1.332	0.100	0.008	
	Talk about problems with parents	3	1.777	0.120	0.000	
	Dinner with parents	6	1.473	0.140	0.009	
	Importance religion	3	0.697	0.170	0.042	
	Parents check homework	2	1.317	0.130	0.048	
	Enjoy life	Parents help homework	3	1.438	0.150	0.020
		Parents help homework	4	1.484	0.160	0.016
Parents allow out with friends		4	0.727	0.140	0.026	
Talk about problems with parents		2	1.288	0.110	0.027	
Talk about problems with parents		3	1.587	0.130	0.001	
Parents know who I go out with		5	1.544	0.140	0.003	
Paternal employment status		1	1.165	0.040	0.002	
Hours after school without adult		2	0.582	0.190	0.005	

Hopelessness about future	Talk about problems with parents	2	1.190	0.080	0.049
	Talk about problems with parents	3	1.285	0.090	0.011
	Times go out leisure	5	0.575	0.190	0.005
Good to be alive	Parents help homework	3	1.312	0.130	0.047
	Parents help homework	4	1.485	0.140	0.006
	Parents allow out with friends	4	1.335	0.130	0.031
	Parents know who I go out with	2	1.414	0.170	0.049
	Maternal employment status	1	0.890	0.050	0.028
	Importance religion	3	1.518	0.170	0.015
Positive attitude	Importance religion	4	1.670	0.140	0.001
	Talk about problems with parents	3	1.238	0.090	0.032
	Parents know who I go out with	5	1.263	0.090	0.018
Person of worth	Times go out leisure	3	1.644	0.140	0.000
	Importance religion	4	1.467	0.150	0.011
Not much to be proud of	Talk about problems with parents	3	1.576	0.130	0.001
	Dinner with parents	5	1.621	0.190	0.012
	Dinner with parents	6	1.763	0.140	0.000
	Importance religion	2	0.670	0.200	0.050
	Importance religion	3	0.656	0.190	0.029
	Importance religion	4	0.604	0.170	0.003
	Not good at all	Parents allow out with friends	4	1.323	0.110
Talk about problems with parents		3	1.416	0.110	0.002

	Parents know who I go out with	2	1.501	0.170	0.019
	Parents know who I go out with	4	1.427	0.170	0.037
	Parents know who I go out with	5	1.315	0.120	0.029
	Hours after school without adult	3	1.559	0.170	0.012
	Hours after school without adult	6	1.475	0.130	0.004
	Times go out leisure	4	1.422	0.160	0.031
Can't do anything right	Parents allow out with friends	3	1.490	0.150	0.008
	Parents allow out with friends	4	1.323	0.110	0.018
	Talk about problems with parents	3	1.276	0.100	0.021
	Dinner with parents	3	1.865	0.200	0.003
	Dinner with parents	5	1.462	0.180	0.036
	Dinner with parents	6	1.648	0.140	0.001
Life not useful	Talk about problems with parents	2	1.280	0.090	0.008
	Talk about problems with parents	3	1.314	0.100	0.008
	Dinner with parents	5	1.548	0.160	0.008
	Dinner with parents	6	1.373	0.130	0.020
	Hours after school without adult	2	0.722	0.150	0.041
	Hours after school without adult	3	0.697	0.150	0.024
	Hours after school without adult	4	0.757	0.130	0.043

	Hours after school without adult	6	0.773	0.120	0.040
	Importance religion	3	0.725	0.130	0.017
	Importance religion	4	0.727	0.110	0.005
	Parents check homework	2	1.378	0.110	0.004
	Parents check homework	3	1.296	0.100	0.017
Feel lonely	Parents help homework	2	1.351	0.140	0.041
	Parents help homework	3	1.336	0.140	0.041
	Talk about problems with parents	2	1.367	0.100	0.003
	Talk about problems with parents	3	1.787	0.110	0.000
	Dinner with parents	4	1.573	0.220	0.040
	Dinner with parents	5	1.787	0.180	0.002
	Dinner with parents	6	1.536	0.150	0.007
	Hours after school without adult	3	1.617	0.170	0.007
	Hours after school without adult	6	1.639	0.140	0.001
	Times go out leisure	4	1.459	0.150	0.013
Someone to turn to	Parents help homework	4	1.715	0.170	0.002
	Talk about problems with parents	2	1.320	0.120	0.022
	Talk about problems with parents	3	2.229	0.140	0.000
	Parents know where I am afterschool	5	1.435	0.170	0.039
	Parents know who I go out with	2	0.663	0.190	0.039
Feel left out	Parents limit tv time	2	1.342	0.130	0.029

	Parents know who I go out with	2	1.962	0.160	0.000
	Parents know who I go out with	5	1.471	0.120	0.002
	Race	1	1.168	0.060	0.024
	Hours after school without adult	4	1.536	0.140	0.004
	Hours after school without adult	6	1.342	0.130	0.031
Someone to talk to	Parents limit tv time	2	0.614	0.170	0.006
	Parents allow out with friends	2	0.603	0.210	0.018
	Parents allow out with friends	4	0.660	0.180	0.023
	Talk about problems with parents	2	1.434	0.130	0.007
	Talk about problems with parents	3	2.095	0.160	0.000
	Parents know where I am afterschool	5	1.540	0.190	0.024
	Parents know who I go out with	4	0.655	0.200	0.044
	Hours after school without adult	2	0.553	0.250	0.019
	Hours after school without adult	3	0.415	0.240	0.000
	Hours after school without adult	4	0.544	0.220	0.007
	Adult confidant	3	1.574	0.160	0.005
	Parents check homework	2	1.607	0.160	0.005
Wish more good friends	Parents limit tv time	3	0.652	0.120	0.001

	Parents limit tv time	4	0.699	0.120	0.005
	Importance religion	4	0.692	0.130	0.005
Have friends	Importance religion	2	1.551	0.180	0.019
	Importance religion	3	1.566	0.170	0.009
	Importance religion	4	1.618	0.140	0.001
Self-test with risky activities	Parents know who I go out with	2	0.661	0.170	0.017
	Hours after school without adult	6	0.732	0.150	0.039
	Times out with date	2	0.759	0.110	0.014
	Times out with date	4	0.537	0.190	0.002
	Times out with date	5	0.463	0.220	0.001
	Times out with date	6	0.427	0.180	0.000
	Times go out leisure	2	0.735	0.120	0.015
	Times go out leisure	4	0.723	0.150	0.042
	Times go out leisure	5	0.493	0.200	0.000
Explore strange places	Parents allow out with friends	3	0.659	0.150	0.007
	Parents allow out with friends	4	0.743	0.120	0.015
	Talk about problems with parents	3	1.268	0.100	0.029
	Parents know who I go out with	4	0.676	0.160	0.016
	Times go out leisure	3	0.637	0.110	0.000
	Times go out leisure	4	0.658	0.150	0.006
Frightening activities	Parents allow out with friends	2	1.494	0.170	0.020
	Parents allow out with friends	4	1.405	0.140	0.018
	Parents know where I am afterschool	3	1.659	0.180	0.007

	Dinner with parents	3	1.616	0.220	0.033
	Adult confidant	2	1.287	0.110	0.028
	Adult confidant	3	1.324	0.120	0.024
New, exciting experiences	Talk about problems with parents	3	1.498	0.120	0.001
	Times go out leisure	2	0.772	0.120	0.036
	Importance religion	2	0.650	0.170	0.012
	Importance religion	3	0.702	0.160	0.030
	Parents check homework	4	1.315	0.130	0.047
Exciting, unpredictable friends	Parents allow out with friends	2	0.712	0.150	0.033
	Talk about problems with parents	3	1.286	0.110	0.036
	Times go out leisure	3	0.789	0.110	0.043
	Times go out leisure	4	0.612	0.150	0.002
	Importance religion	2	0.639	0.180	0.014
	Importance religion	3	0.604	0.170	0.003
	Importance religion	4	0.599	0.150	0.001
Often bored	Talk about problems with parents	2	1.322	0.100	0.006
	Talk about problems with parents	3	1.301	0.100	0.017
	Times go out leisure	5	0.638	0.220	0.047
	Parents check homework	3	1.477	0.110	0.000
Nothing to do often	Parents allow out with friends	2	0.590	0.140	0.000
	Talk about problems with parents	2	1.317	0.090	0.005
	Parents check homework	3	1.294	0.100	0.019

Life in next few years	Dinner with parents	4	1.995	0.320	0.036
	Times go out leisure	2	1.438	0.180	0.047
	Times go out leisure	3	1.470	0.170	0.030
	Importance religion	3	0.631	0.220	0.037
	Adult confidant	3	1.554	0.190	0.021

*Levels are in the order indicated in the questionnaire

The self-perception measures self-satisfaction, feeling of hopelessness about the future, feeling like a person of worth on an equal plane with others and often finding nothing to do were significantly associated ($p < 0.05$) with prospects of graduating from high school. The odds of increased prospects to graduate from high school for students who *neither agreed nor disagreed* that they were self-satisfied were 1.9 (95% CI, 1.33 to 2.73) times compared to those who *disagreed* ($p = 0.0004$). The odds of an increased prospect to graduate from high school for students who *mostly agreed* that they were self-satisfied were 1.5 (95% CI, 1.08 to 2.04) times than for those who *disagreed* ($p = 0.01$). The odds of an increased prospect to graduate from high school for students who fully *agreed* that they were self-satisfied were 1.4 (95% CI, 1.07 to 1.89) times than for those who *disagreed* ($p = 0.02$). The odds of increased prospect to graduate from high school for students who *mostly agreed* of feeling of hopelessness about the future were 1.3 (95% CI, 1 to 1.77) times than for those who *disagreed* ($p = 0.045$). The odds of an increased prospect to graduate from high school for students who *neither agreed nor disagreed* feeling that they were of personal worth on an equal plane with others were 0.66 (95% CI, 0.44 to 0.97) times than those who *disagreed* ($p = 0.04$). The odds of an increased prospect to graduate from high school for students who *neither agreed nor disagreed* about having nothing to do often were 1.4 (95% CI, 1.03 to 1.88) times than for those who *disagreed* ($p = 0.03$).

There was a significant association ($p < 0.05$) between participating in music or other performing arts with having nothing to do often. The odds of an increased participation in music or other performing arts for students who *agreed* they had nothing to do often were 1.54 (95% CI, 1.22 to 1.94) times for than those who *disagreed* ($p = 0.0002$).

The ability to enjoy life as much as anyone else was significantly associated ($p < 0.05$) with the engagement variable, average grade attained in the school year. The odds of attaining a higher average grade in the school year for students who *neither agreed nor disagreed* that they enjoyed life as much as anyone were 1.5 (95% CI, 1.06 to 2.15) times than for those who *disagreed* ($p = 0.02$).

The feeling when one was afraid or nervous that people would not be interested in them and others would not like them were significantly associated ($p < 0.05$) with participating in music or other performing arts. The odds of increased participation in music or other performing arts for students who thought *half of the time* when they were afraid or nervous that people would not be interested in them were 0.72 (95% CI, 0.52 to 0.97) times than for those who disagreed ($p = 0.04$). The odds of increased participation in music or other performing arts for students who *always* felt that people would not be interested in them when they got afraid or nervous were 0.61 (95% CI, 0.45 to 0.83) times than for those who indicated this thought never occurred ($p = 0.002$). The odds of increased participation in music or other performing arts for students who thought *half of the time* when they were afraid or nervous that people would not like them were 1.53 (95% CI, 1.12 to 2.08) times than for those who indicated this thought never occurred ($p = 0.007$). The odds of increased participation in music or other performing arts for students who *always* thought when they were afraid or nervous that people would not like them were 1.39 (95% CI, 1.02 to 1.88) times than for those who indicated this thought *never* occurred ($p = 0.04$).

The feeling that life was not very useful and often feeling bored were significantly associated ($p < 0.05$) with the extent of participation in athletics teams. The odds of increased participation in athletics team for students who *mostly disagreed* feeling that their lives were not very useful were 1.86 (95% CI, 1.31 to 2.61) times than for those who *disagreed* ($p = 0.0004$). The odds of increased participation in athletics team for students who *neither agreed nor disagreed* to the feeling that their lives were not very useful were 1.76 (95% CI, 1.2 to 2.56) times than for those who *disagreed* ($p = 0.003$). The odds of increased participation in athletics team for students who *agreed* feeling that their lives were not very useful were 1.47 (95% CI, 1.14 to 1.88) times than for those who *disagreed* ($p = 0.002$). The odds of increased participation in athletics team for students who *mostly agreed* feeling that their lives were not very useful were 1.46 (95% CI, 1.07 to 1.96) times than for those who *disagreed* ($p = 0.0141$).

The feeling when nervous or frightened that one would begin trembling or shaking, become paralyzed with fear, be unable to write properly, and get vulnerable were significantly associated ($p < 0.05$) with the extent of participation in athletics team. The odds of increased participation in athletics team for students who thought *half of the time* when they were nervous or frightened that they would tremble or shake were 0.65 (95% CI, 0.44 to 0.94) times than for those who indicated that this thought never occurred ($p = 0.03$). The odds increased participation in athletics team for students who thought that they would *always* be paralyzed with fear when they were nervous or frightened were 1.47 (95% CI, 1.11 to 1.93) times than for those who indicated that this thought never occurred ($p = 0.007$). The odds

of increased participation in athletics team for students who thought that they would *usually* be unable to write properly when they got nervous or frightened were 0.73 (95% CI, 0.56 to 0.95) times than for those who indicated that this thought never occurs ($p=0.02$). The odds of increased participation in athletics team for students who indicated that that they would on *rare occasions* be vulnerable when they were nervous or frightened were 0.63 (95% CI, 0.43 to 0.9) times than for those who indicated that this thought never occurs ($p=0.01$).

The feeling that life is often meaningless was significantly associated ($p<0.05$) with participating in other school clubs or activities during the school year. The odds of increased participation in other school clubs or activities during the school for students who *agreed* that life is often meaningless were 1.25 (95% CI, 1 to 1.55) times than for those who disagreed ($p=0.047$).

The thought that one would get sick and feel inferior when nervous or frightened was significantly associated ($p<0.05$) with participating in other school clubs or activities during the school year. The odds of increased participation in other school clubs or activities during the school year for students who thought they would get *sick half of the times* when they were nervous or frightened were 0.62 (95% CI, 0.45 to 0.84) times than for those who indicated that this thought never occurred ($p=0.003$). The odds of increased participation in other school clubs or activities during the school year for students who *usually* thought that they would get sick when they got nervous or frightened were 0.61 (95% CI, 0.46 to 0.8) times than for those who indicated that this thought never occurred ($p=0.0004$). The odds of increased participation in other school clubs or activities during the school for students who *always* thought that they would get sick when they were nervous or frightened were 0.70 (95% CI, 0.54 to 0.89) times than for those who indicated that this thought never occurred ($p=0.005$). The odds of increased participation in other school clubs or activities during the school for students who *usually* felt inferior when they were nervous or frightened were 1.45 (95% CI, 1.04 to 2.03) times than for those who indicated that this thought never occurred ($p=0.03$). The odds of increased participation in other school clubs or activities during the school year for students who *always* thought they would feel inferior when they got nervous or frightened were 1.44 (95% CI, 1.09 to 1.89) times than for those who indicated that this thought never occurred ($p=0.01$).

The self-perception factors: feeling good to be alive, ability to do things as well as others, feeling that life is not useful, preference for engaging in frightening activities, and preference for exciting and unpredictable friends were significantly associated ($p<0.05$) with enjoying being in school. The odds of increasingly enjoying being in school for students who *neither agreed nor disagreed* that they felt

good to be alive were 1.56 (95% CI, 1.03 to 2.33) times than for those who disagreed ($p=0.03$). The odds of increasingly enjoying being in school for students who *neither agreed nor disagreed* that they were able to do things as well as others were 0.62 (95% CI, 0.4 to 0.94) times than for those who disagreed ($p=0.03$). The odds of increasingly enjoying being in school for students who *mostly disagreed* feeling that life is very not useful were 1.62 (95% CI, 1.11 to 2.34) times than for those who completely disagreed ($p=0.02$). The odds of increasingly enjoying being in school for students who *agreed* that they preferred engaging in frightening activities were 1.29 (95% CI, 1.04 to 1.59) times than for those who *disagreed* ($p=0.02$). The odds of increasingly enjoying being in school for students who *agreed* that they preferred being with exciting and unpredictable friends were 0.74 (95% CI, 0.58 to 0.93) times than for those who disagreed ($p = 0.01$).

The social cognitive aspect that other people would not like the student when they got nervous or frightened was significantly associated ($p<0.05$) with enjoying being in school. The odds of increasingly enjoying being in school for students who thought other people would not like them *half of the time* when they got nervous or frightened were 1.38 (95% CI, 1 to 1.88) times than for those who indicated that this thought never occurred ($p = 0.045$). The odds of increasingly enjoying being in school for students who *usually* thought that other people would not like them when they got nervous or frightened were 1.64 (95% CI, 1.19 to 2.25) times than for those who indicated that this thought never occurred ($p = 0.002$). The odds of increasingly enjoying being in school for students who *always* thought other people would not like them when they got nervous or frightened were 1.48 (95% CI, 1.1 to 1.98) times than for those who indicated that this thought never occurred ($p = 0.009$).

The feeling of hopelessness about the future, feeling good to be alive and having a positive attitude towards oneself were significantly associated ($p<0.05$) with trying one's best in school. The odds of increasingly trying their best in school for students who *agreed* that felt hopeless about the future were 1.25 (95% CI, 1 to 1.56) times than for those who disagreed ($p = 0.046$). The odds of increasingly trying their best in school for students who *mostly agreed* that they felt good to be alive were 1.45 (95% CI, 1 to 2.06) times than for those who disagreed ($p = 0.04$). The odds of increasingly trying their best in school for students who *mostly agreed* about having a positive attitude towards self were 1.63 (95% CI, 1.16 to 2.3) times than for those who disagreed ($p = 0.0049$). The odds of increasingly trying their best in school for students who *agreed* that they had a positive attitude towards self were 1.36 (95% CI, 1 to 1.85) times than for those who disagreed ($p = 0.049$). The odds of increasingly trying one's best in school for students who *mostly agreed* that they had friends they could get around with were 1.34 (95% CI, 1.01 to 1.75) times than for those who disagreed.

Feeling foolish, inferior, or weird when one got nervous or frightened were significantly associated ($p < 0.05$) with trying one's best in school. The odds of increasingly trying their best in school for students who indicated they would *always* feel foolish when they were nervous or frightened were 0.73 (95% CI, 0.54 to 0.97) times than for those who indicated that this thought *never* occurred ($p = 0.04$). The odds of increasingly trying their best in school for students who indicated they would feel inferior *half of the time* when they were nervous or frightened were 1.6 (95% CI, 1.11 to 2.24) times than for those who indicated that this thought *never* occurred ($p = 0.009$). The odds of increased trying their best in school for students who indicated that they would *always* feel weird when they got nervous or frightened were 1.45 (95% CI, 1.13 to 1.86) times than for those who indicated that this thought *never* occurred ($p = 0.003$).

There were significant associations ($p < 0.05$) between finding schoolwork too hard to understand with student self-satisfaction, feeling good to be alive, the presence of someone to turn to for help, having friends they could get together with and often feeling bored. The odds of increasingly finding schoolwork too hard to understand for students who fully *agreed* that they were self-satisfied were 1.36 (95% CI, 1.01 to 1.83) times than for those who *disagreed* ($p = 0.04$). The odds of increasingly finding schoolwork too hard to understand for students who *mostly disagreed* that they felt good to be alive were 0.67 (95% CI, 0.44 to 0.97) times than for those who *totally disagreed* that they felt good to be alive ($p = 0.04$). The odds of increasingly finding schoolwork too hard to understand for students who *mostly disagreed* they had someone to turn to if they needed help were 1.84 (95% CI, 1.21 to 2.78) times than for those who *disagreed* ($p = 0.004$). The odds of increasingly finding schoolwork too hard to understand for students who *mostly disagreed* that they had friends they could get together with were 1.46 (95% CI, 1.07 to 1.95) times than for those who *totally disagreed* ($p = 0.01$). The odds of increasingly finding schoolwork too hard to understand for students who *agreed* they were often bored were 1.25 (95% CI, 0.99 to 1.56) times than for those who *disagreed* ($p = 0.049$).

The feeling that people would reject them when they were nervous or frightened was significantly associated ($p < 0.05$) with finding schoolwork too hard to understand. The odds of increasingly finding schoolwork too hard to understand for students who thought on *rare* occasions that people would reject them when they were nervous or frightened were 1.4 (95% CI, 1.02 to 1.91) times than for those who *never* indicated that this thought *never* occurs ($p = 0.04$).

Self-satisfaction, the ability to do things as well as others, finding schoolwork interesting, the ability to do things as well as others and often feeling bored were significantly associated ($p < 0.05$) with finding schoolwork interesting. The odds of increasingly finding schoolwork interesting for students who *neither agreed nor disagreed* that they were self-satisfied were 1.48 (95% CI, 1.01 to 2.14) times than for those who disagreed ($p = 0.04$). The odds of increasingly finding schoolwork interesting for students who *mostly agreed* to being able to do things as well as others were 1.61 (95% CI, 1.16 to 2.21) times than for those who disagreed ($p = 0.004$). The odds of increasingly finding schoolwork interesting for students who *agreed* to being able to do things as well as others were 1.66 (95% CI, 1.22 to 2.24) times than for those who disagreed ($p = 0.001$). The odds of increasingly finding schoolwork interesting for students who *neither agreed nor disagreed* that they were often bored were 0.74 (95% CI, 0.57 to 0.95) times than for those who disagreed ($p = 0.02$).

Feeling happy, feeling that life was meaningless, preference for new, exciting experiences and often feeling bored were significantly associated ($p < 0.05$) with time spent in extra curricula activities. The odds of increased time spent in extra curricula activities for students felt *very happy* were 1.27 (95% CI, 1 to 1.59) times than for those who indicated that they were not too happy ($p = 0.04$). The odds of increased time spent in extra curriculum for students who *mostly disagreed* that life was meaningless were 0.78 (95% CI, 0.62 to 0.97) times than for those who totally disagreed ($p = 0.03$). The odds of increased time spent in extra curriculum for students who *neither agreed nor disagreed* that they preferred new, exciting experiences even if they had to break the rules were 0.69 (95% CI, 0.5 to 0.94) times than for those who disagreed ($p = 0.02$). The odds of increased time spent in extra curriculum for students who *mostly agreed* that they preferred exciting new experiences even if they had to break rules were 0.61 (95% CI, 0.45 to 0.81) times than for those who disagreed ($p = 0.0008$). The odds of increased time spent in extra curriculum for students who fully *agreed* that they preferred exciting new experiences even if they had to break rules were 0.76 (95% CI, 0.61 to 0.94) times than for those disagreed ($p = 0.01$). The odds of increased time spent in extra curriculum for students who *mostly disagreed* about that they felt bored were 1.40 (95% CI, 1.06 to 1.84) times than for those who completely disagreed ($p = 0.02$).

The thought that one would be unable to speak when nervous or frightened was significantly associated ($p < 0.05$) with time spent in extra curriculum activities. The odds of increased time spent in extra curriculum activities for students who thought that they would be unable to speak on *rare* occasions when they were nervous or frightened were 1.72 (95% CI, 1.23 to 2.4) times than for those who indicated that this thought never occurred ($p = 0.001$). The odds of increased time spent in extra

curriculum for students who thought that would be unable to speak *half of the time* when they were nervous or frightened were 1.56 (95% CI, 1.09 to 2.21) times than for those who indicated that this thought never occurred ($p = 0.01$). The odds of increased time spent in extra curriculum for students who thought they would *usually* be unable to speak when they got nervous or frightened were 1.59 (95% CI, 1.14 to 2.19) times than for those who indicated that this thought never occurred ($p = 0.005$). The odds of increased time spent in extra curriculum for students who felt that they would be unable to speak *always* when they got nervous or frightened were 1.83 (95% CI, 1.41 to 2.36) times than for those who indicated that this thought never occurred.

The feeling that life was meaningless and sometimes feeling one was not good at all were significantly associated ($p < 0.05$) with increased competition for grades. The odds of increased engagement in competition for grades with other students in the school for students who *mostly disagreed* that life often seemed meaningless were 1.30 (95% CI, 1.04 to 1.62) times than for those who disagreed ($p = 0.02$). The odds of increased engagement in competition for grades with other students in the school for students who *neither agreed nor disagreed* to the thought of sometimes feeling that they were not good at all were 1.45 (95% CI, 1.05 to 1.98) times than for those who disagreed ($p = 0.02$).

Self-satisfaction, the ability to enjoy life as much as anyone, the ability to do things as well as others and often finding oneself with nothing to do were significantly associated ($p < 0.05$) with how one thought others would feel if he or she cheated on a test. The odds of one thinking that colleagues would express an increased dislike if they cheated on a test for students who *neither agreed nor disagreed* that they were self-satisfied were 1.46 (95% CI, 1.01 to 2.09) times than for those who disagreed ($p = 0.04$). The odds of one thinking that their colleagues would express increased dislike if one cheated on a test for students who *mostly agreed* that they were self-satisfied were 1.56 (95% CI, 1.13 to 2.14) times than for those who disagreed ($p = 0.006$). The odds of one thinking that the colleagues would express increased dislike if one cheated on a test for students who *fully agreed* that they were self-satisfied were 1.63 (95% CI, 1.21 to 2.19) times than for those who disagreed ($p = 0.001$). The odds of one thinking that the colleagues would express increased dislike if one cheated on a test for students who *agreed* that they enjoyed life as much as anyone were 1.34 (95% CI, 1 to 1.79) times than for those who disagreed ($p = 0.048$). The odds of one thinking that their colleagues would express increased dislike if one cheated on a test for students who *neither agreed nor disagreed* of being able to do things as well as others were 0.46 (95% CI, 0.31 to 0.68) times than for those who disagreed ($p = 0$). The odds of one thinking that their colleagues would express increased dislike if one cheated on a test for students who *neither agreed nor disagreed* that they often had nothing to do

were 0.74 (95% CI, 0.54 to 0.98) times than for those who disagreed ($p = 0.0415$). The odds of one thinking that their colleagues would express increased dislike if one cheated on a test for students who *mostly agreed* that they often had nothing to do were 0.68 (95% CI, 0.51 to 0.88) times than for those who disagreed ($p = 0.005$).

The feeling that people would not be interested in the student when they were nervous or frightened was significantly associated ($p < 0.05$) with how one thought others would feel if they cheated on a test. The odds of one thinking that their colleagues would express higher dislike if one cheated on a test for those who *usually* thought that people not interested in them when they were nervous or frightened were 1.475 (95% CI, 1.12 to 1.92) times than for those who indicated that this thought never occurred ($p = 0.005$).

There were significant associations ($p < 0.05$) between an increased dislike by others if one intentionally angered their teacher with the feeling of hopelessness about the future, feeling good to be alive and optimism about life in the next few years. The odds of an increased dislike by others if one intentionally angered their teacher for students who *mostly disagreed* that the future often seemed hopeless were 0.66 (95% CI, 0.47 to 0.9) times than for those who disagreed ($p = 0.01$). The odds of an increased dislike by others if one intentionally angered their teacher for students who *agreed* feeling good to be alive were 1.28 (95% CI, 1 to 1.61) times than for those who disagreed ($p = 0.04$). The odds of an increased dislike by others if one intentionally angered their teacher for students who indicated that life in the next few years would not improve but would *stay about the same* were 2.11 (95% CI, 1.15 to 3.87) times than for those who scored indicated life would get much better ($p = 0.02$).

The presence of someone to always turn to if one needed help was significantly associated ($p < 0.05$) with their attaching importance to getting good grades. The odds of an increased attaching importance to getting good grades for students who *mostly disagreed* there was always someone to turn to if they needed help were 1.59 (95% CI, 1.11 to 2.25) times than for those who completely disagreed ($p = 0.01$). The odds of an increased attaching importance to getting good grades for students who *agreed* that there was always someone to turn to if they needed help were 1.55 (95% CI, 1.2 to 2.01) times than for those who disagreed ($p = 0.0008$).

The feeling that one would be paralyzed with fear when they got nervous or frightened was significantly associated ($p < 0.05$) with attaching importance to getting good grades. The odds of an increased attaching of importance to getting good grades for students who *usually* thought that they

would be paralyzed with fear when they were nervous or frightened were 1.66 (95% CI, 1.22 to 2.25) times than for those who indicated that this thought never came to mind ($p = 0.001$).

The feeling that life was meaningless, the feeling that one cannot do anything right, feeling that life is not useful, preference for new, exciting experiences even if one had to break the rules, often having nothing to do and optimism about life in the next few years were significantly associated ($p < 0.05$) with the number of times the teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week. The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who *agreed* that life often seemed meaningless were 0.74 (95% CI, 0.57 to 0.95) times than for those who disagreed ($p = 0.02$). The odds of a higher number of times that teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who *agreed* to feeling that they cannot do anything right were 0.73 (95% CI, 0.54 to 0.97) times than for those who disagreed ($p = 0.04$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who *neither agreed nor disagreed* feeling that their lives was not useful were 1.77 (95% CI, 1.12 to 2.77) times than for those who disagreed ($p = 0.01$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who *mostly agreed* feeling that their lives were not useful were 1.52 (95% CI, 1.04 to 2.21) times than for those who disagreed ($p = 0.03$). The odds of a higher number of times that teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who completely *agreed* feeling that their lives were not useful were 1.62 (95% CI, 1.17 to 2.21) times than for those who disagreed ($p = 0.003$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who *neither agreed nor disagreed* to preference for new and exciting experiences even if they have to break the rules were 1.62 (95% CI, 1.1 to 2.37) times than for those who disagreed ($p = 0.01$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who *mostly agreed* that they preferred exciting new experiences even if they have to break the rules were 1.7 (95% CI, 1.21 to 2.37) times than for those who disagreed ($p = 0.002$). The odds of a higher number of times that the teachers needed to interrupt class to deal with misbehaviour or "goofing off" during an average school week as indicated by students who

agreed that they preferred exciting new experiences even if they have to break the rules were 1.5 (95% CI, 1.11 to 1.92) times than those who disagreed ($p = 0.0065$). The odds of a higher number of times that the teachers needed to interrupt class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who *mostly agreed* to often finding themselves with nothing to do were 0.67 (95% CI, 0.49 to 0.89) times than for those who disagreed ($p = 0.006$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who indicated that life would *get somewhat worse* in the next few years were 1.95 (95% CI, 1.01 to 3.75) times than for those who indicated that life would get much better ($p = 0.04$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who indicated that life in the next few years would *get much worse* were 1.96 (95% CI, 1.02 to 3.72) times than for those who indicated that life would get much better ($p = 0.04$).

There were significant associations ($p < 0.05$) between the number of times the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week with the feeling that when nervous or frightened, one would be: unable to speak, unlikeable, and sick. The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who thought that they would be unable to speak *half of the times* when they were nervous or frightened were 1.57 (95% CI, 1.03 to 2.39) times than for those indicated that this thought never occurred ($p = 0.04$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who would *usually* be unable to speak when nervous or frightened were 1.50 (95% CI, 1 to 2.23) times than for those who indicated that this thought never occurred ($p = 0.046$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who would *always* be unable to speak when nervous or frightened were 1.8 (95% CI, 1.31 to 2.45) times than for those who indicated that this thought never occurred ($p = 0.0002$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who would *always* be unlikeable when nervous or frightened were 1.78 (95% CI, 1.29 to 2.45) times than for those who indicated that this thought never occurred ($p = 0.0004$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with

misbehaviour or “goofing off” during an average school week as indicated by students who would feel sick *half of the times* when they were nervous or frightened were 1.69 (95% CI, 1.17 to 2.44) times than for those who indicated that this thought never occurred ($p = 0.005$). The odds of a higher number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” during an average school week as indicated by students who would *always* feel sick when nervous or frightened were 1.49 (95% CI, 1.09 to 2.02) times than for those who indicated that this thought never occurred ($p = 0.01$).

There was significant association between feeling happy ($p < 0.05$) and the number of times the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week. The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who indicated they were *pretty happy* were 1.37 (95% CI, 1.08 to 1.73) times than for those who indicated they were not too happy ($p = 0.009$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who indicated they *very happy* were 1.35 (95% CI, 1.05 to 1.71) times than for those who indicated that they were not too happy ($p = 0.02$).

There were significant associations ($p < 0.05$) between the number of times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week with the thoughts when one was nervous or frightened that: one would be unable to speak, people would reject them, they would feel inferior, people would not like them and they would get vulnerable. The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who indicated that they would be unable to speak on *rare* instances when they got nervous or frightened were 1.65 (95% CI, 1.14 to 2.37) times than for those who indicated that this thought never occurred ($p = 0.008$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who thought that people would reject them *half of the times* when they were nervous or frightened were 1.61 (95% CI, 1.1 to 2.33) times than for those who indicated that this thought never occurred ($p = 0.01$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who thought that people would *usually* reject them when they were nervous or frightened were 1.53 (95% CI, 1.09 to 2.14) times than for those who indicated that this thought never occurred ($p = 0.01$). The odds of a

higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who thought that people would *always* reject them when they were nervous or frightened were 1.66 (95% CI, 1.19 to 2.29) times than for those who indicated that this thought never occurred ($p = 0.003$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who indicated they would on *rare* occasions feel inferior when they got nervous or frightened were 1.37 (95% CI, 1.05 to 1.77) times than for those who indicated that this thought never occurred ($p = 0.02$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who thought that people would *usually* not like them when they got nervous or frightened were 1.36 (95% CI, 1 to 1.85) times than for those who indicated that this thought never occurred ($p = 0.047$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who indicated that they would get vulnerable on *rare* occasions when they got nervous or frightened were 0.55 (95% CI, 0.37 to 0.79) times than for those who indicated that this thought never occurred ($p = 0.002$). The odds of a higher number of the times that the teachers needed to interrupt the class to deal with misbehaviour or “goofing off” by self during an average school week for students who indicated that they would *usually* get vulnerable when they got nervous or frightened were 0.6824893 (95% CI, 0.48 to 0.96) times than those who indicated that this thought never occurred ($p = 0.0328$).

There were significant associations ($p < 0.05$) between believing that the rules about student behaviour in their school were generally fair and reasonable with the ability to enjoy life as much as anyone, wishing one had more good friends and the preference for new and exciting experiences. The odds of an increased feeling that the rules about student behaviour in their school were generally fair and reasonable for students who *neither agreed nor disagreed* that they enjoyed life as much as anyone were 0.67 (95% CI, 0.45 to 0.97) times than those who disagreed ($p = 0.04$). The odds of an increased feeling that the rules about student behaviour in their school were generally fair and reasonable for students who *neither agreed nor disagreed* that they wished to have more good friends were 0.72 (95% CI, 0.53 to 0.97) times than for those who disagreed ($p = 0.03$). The odds of an increased feeling that the rules about student behaviour in their school were generally fair and reasonable for students who *agreed* that they preferred new and exciting experiences even if they would have to break the rules were 1.39 (95% CI, 1.08 to 1.79) times than for those who disagreed ($p = 0.0096$).

The feelings that other people would stare at one and that they were inadequate whenever they were nervous or frightened were significantly associated ($p < 0.05$) with feeling that the rules about student behaviour in their school were generally fair and reasonable. The odds of an increased feeling that the rules about student behaviour in their school were generally fair and reasonable for students who thought that one would stare at them *half of the times* when they were nervous or frightened were 0.66 (95% CI, 0.46 to 0.93) times than for those who indicated that this thought never occurred ($p = 0.02$). The odds of an increased feeling that the rules about student behaviour in their school were generally fair and reasonable for students who indicated that they would feel inadequate *half of the times* when they were nervous or frightened were 1.39 (95% CI, 1 to 1.91) times than for those who indicated that this thought never occurred ($p = 0.048$).

Research Question 3: Pathways Through which Personal and Contextual Factors Influence the Impact of Behavioural and Emotional Engagement on the Risk for and Occurrence of Delinquency and Substance Use

Correlations between variables

Correlations are expected and desirable between a set of test questions if they are used to measure similar underlying dimensions. An initial analysis of the correlation matrices from the variables measuring the different dimensions was performed to assess the suitability for factor analysis and structural equation models. An initial assessment of the correlation matrices of variables used to measure the various dimensions was performed. It was assessed if the determinants of the matrices and the eigen values for the variables were positive. Bartlett's test was used to test if the population correlation matrices resembled identity matrices which may happen due to too little correlation between variables in a correlation matrix.

Table 19 shows the correlation matrix of the variables used to measure delinquency. The determinant of the matrix was positive (0.11) as desired. The eigenvalues for the thirteen variables were also positive. Bartlett's test was used to test if the population correlation matrix resembles an identity matrix which happens when variables in the correlation matrix have too little correlation. Bartlett's test was highly significant, $\chi^2_{78} = 1956$, $p < .001$, and therefore factor analysis was appropriate.

Table 19 *Correlation matrix for the variables measuring delinquency amongst students*

Observed variable*	A85	A86	A87	A88	A89	A90	A91	A136	A137	A138	A139	A140	A141
A85	1												
A86	0.20	1.00											
A87	0.00	0.41	1.00										
A88	-0.14	-0.31	-0.28	1.00									
A89	-0.14	-0.13	-0.02	0.22	1.00								
A90	-0.16	-0.32	-0.26	0.35	0.22	1.00							
A91	-0.08	-0.46	-0.45	0.39	0.03	0.47	1.00						
A136	-0.13	-0.06	-0.08	0.09	0.14	0.14	0.05	1.00					
A137	0.00	-0.20	-0.36	0.26	0.03	0.18	0.29	0.11	1.00				
A138	-0.08	-0.11	-0.05	0.12	0.18	0.09	0.04	0.20	0.12	1.00			
A139	-0.08	-0.15	-0.24	0.10	0.11	0.18	0.20	0.14	0.39	0.11	1.00		
A140	-0.12	-0.09	-0.03	0.06	0.19	0.11	0.05	0.20	0.03	0.33	0.19	1.00	
A141	-0.17	-0.22	-0.25	0.11	0.07	0.20	0.32	0.11	0.36	0.08	0.19	0.11	1.00
Eigen values	3.25	1.58	1.23	0.98	0.89	0.84	0.78	0.76	0.70	0.62	0.51	0.46	0.40

*A85 - Intentionally missing school in the past month; A86 - Skipping class one was not supposed to in the past one month; A87 - Class lateness without approved excuse in an average school week; A88 - Involvement in serious fight in the last one year; A89 - Damage to school property in the past year; A90 - Suspended or expelled from school at least once; A91 - Weapon to school in the past one month; A136 - Ran away from home for more than 24 hours in the past year; A137 - Involvement in group fights in the past year; A138 - Hurt someone badly enough in the past year to need bandages or a doctor; A139 - Taken other's belongings in the past year ; A140 - Entry into a building not allowed in the past year; A141 - Sale of an illegal drug in the past one year.

Table 20 (a) and (b) shows the correlation matrix of the variables used to measure engagement. The determinant of the matrix (0.056) was positive as desired. The eigenvalues for the twenty-four variables were also positive. Bartlett's test was highly significant, $\chi^2_{276} = 2567$, $p < .001$ which indicated enough correlation as appropriate for factor analysis.

Table 20 (a) *Correlation matrix for the variables measuring student engagement*

Observed variable*	A62	A67	A68	A69	A71	A72	A73	A74	A77	A78	A79	A83
A62	1.00											
A67	0.06	1.00										
A68	0.00	0.42	1.00									
A69	0.15	0.27	0.08	1.00								
A71	0.11	0.13	0.14	0.13	1.00							
A72	0.12	0.17	0.14	0.17	0.28	1.00						
A73	0.03	0.33	0.36	0.26	0.09	0.06	1.00					
A74	0.16	0.10	0.06	0.14	0.22	0.19	0.09	1.00				
A77	0.06	0.19	0.13	0.15	0.10	0.10	0.18	0.10	1.00			
A78	-0.07	0.22	0.20	0.09	0.09	0.05	0.24	0.10	0.43	1.00		
A79	0.00	0.17	0.15	0.17	0.02	0.10	0.14	0.06	0.15	0.16	1.00	
A83	0.05	0.08	0.10	0.18	0.15	0.14	0.08	0.12	0.16	0.17	0.09	1.00
A81	-0.18	0.08	0.17	-0.02	-0.02	-0.01	0.07	-0.07	0.08	0.19	0.03	0.06
A82	-0.16	0.05	0.13	-0.04	-0.04	-0.01	0.02	0.04	0.02	0.15	0.03	0.02
A64	0.14	0.12	0.05	0.05	0.01	0.00	0.05	0.01	0.04	0.03	0.15	0.03
A65	0.03	0.08	0.04	0.07	-0.02	-0.05	0.12	-0.08	0.03	0.03	0.08	-0.04
A66	0.18	0.14	0.05	0.13	0.08	-0.02	0.14	0.00	0.09	0.03	0.12	0.04
A75	-0.04	0.06	0.07	0.03	0.02	-0.04	0.01	-0.07	-0.03	0.03	0.07	-0.02
A76	0.13	0.09	0.05	0.17	0.13	0.02	0.09	0.09	0.02	0.03	0.17	0.12
A61	-0.18	0.03	0.03	0.00	-0.04	0.00	0.16	-0.15	-0.04	-0.04	0.00	-0.17

A63	-0.19	0.01	0.00	-0.01	0.03	-0.01	0.08	-0.15	0.01	0.04	0.04	-0.05
A70	-0.09	0.01	0.09	-0.12	0.02	0.00	0.08	-0.12	0.02	0.06	-0.06	-0.09
A80	-0.01	0.12	0.06	0.17	0.05	0.04	0.16	0.02	0.18	0.06	0.32	-0.04
A84	-0.04	0.03	0.02	0.06	0.12	0.13	0.00	0.02	0.05	-0.04	-0.01	0.00
Eigen values	2.92	2.07	1.79	1.46	1.24	1.20	1.12	1.03	0.97	0.93	0.89	0.87

Table 20 (b) *Correlation matrix for the variables measuring student engagement*

Observed variable*	A81	A82	A64	A65	A66	A75	A76	A61	A63	A70	A80	A84
A81	1.00											
A82	0.47	1.00										
A64	-0.03	0.01	1.00									
A65	0.10	0.01	0.24	1.00								
A66	-0.08	-0.09	0.34	0.37	1.00							
A75	0.08	0.04	0.07	0.08	0.08	1.00						
A76	-0.08	-0.10	0.12	0.11	0.14	0.17	1.00					
A61	0.06	0.03	-0.01	0.07	-0.02	0.00	-0.04	1.00				
A63	0.07	0.03	-0.04	0.07	-0.04	0.04	0.01	0.21	1.00			
A70	0.09	0.10	-0.01	0.04	-0.04	-0.01	-0.01	0.12	0.13	1.00		
A80	-0.02	-0.05	0.05	0.13	0.03	0.02	0.13	0.09	0.13	0.08	1.00	
A84	0.09	-0.04	0.00	-0.04	-0.03	0.00	0.00	0.00	0.08	0.09	0.06	1.00
Eigen values	0.79	0.77	0.74	0.69	0.68	0.66	0.62	0.57	0.54	0.50	0.47	0.45

*A62 - Likelihood to graduate; A67 - Enjoying being in school; A68 - How frequently one hates being in school in the past year; A69 - Trying one's best in school in the past year ; A71 - Failure to complete or turn in assignments; A72 - Getting sent to the office; A73 - Finding school work interesting; A74 - How often one finds that their friends encourage them to do things which their teachers wouldn't like; A77 - How one thought others would feel if they cheated on a test; A78 - How one thought most students would feel if they intentionally did things to make their teachers angry ; A79 - Importance attached to being a leader in student activities ; A83 - Extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable; A81 - Number of times teachers interrupted class to deal with

misbehaviour or "goofing off" during an average school week ; A82 - Number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week ; A64 - Participating in music or other performing arts ; A65 - Extent of participation in athletics team ; A66 - Participating in other school clubs or activities during the school ; A75 - Length of time spent in extra curricula activities; A76 - Grades competition amongst students; A61 - Average grade in the school year; A63 - Hours spent on homework in an average week in school and out of school; A70 - Finding school work too hard to understand ; A80 - Attaching importance to getting good grades ; A84 - Number of one's friends who dropped out of school

Table 21 shows the correlation matrix of the variables used to measure parental monitoring and involvement. The determinant of the matrix was positive (0.22). The eigenvalues for the nine variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{36} = 1357$, $p < .001$, which indicated enough correlation which is appropriate for factor analysis.

Table 21 *Correlation matrix for the variables measuring parental involvement and monitoring*

Observed variable*	A105	A104	A106	A102	A98	A99	A100	A101	A103
A105	1.00								
A104	0.48	1.00							
A106	0.44	0.33	1.00						
A102	0.31	0.17	0.20	1.00					
A98	0.29	0.20	0.19	0.25	1.00				
A99	0.24	0.19	0.21	0.03	0.19	1.00			
A100	0.23	0.20	0.17	-0.02	0.14	0.53	1.00		
A101	0.05	0.05	0.14	-0.13	0.04	0.30	0.33	1.00	
A103	0.03	0.02	0.00	-0.17	0.18	0.24	0.23	0.20	1.00
Eigen values	2.59	1.68	0.99	0.83	0.75	0.63	0.60	0.47	0.46

*A105 - Parental knowledge of who went out with at night; A104 - Knowledge of where one was after school by parents or guardians ; A106 - Practice of coming back at a set time whenever one went out during weekend nights; A102 - Parents or guardians allowing one to go out with friends on school nights; A98 - Having at least one other adult other than one's parents who one feels able to talk to if they were having problems in life; A99 - Having parents or guardians check on whether one did their homework; A100 - How often parents or guardians provide help with homework when it's needed; A101 - How often parents or guardians limit the amount of time spent watching TV; A103 - Acceptance to talk about one's problems over with one or both of your parents or guardian

Table 22 shows the correlation matrix of the variables used to measure parental substance use. The variable A42 induced a negative determinant and eigenvalues and was removed. The determinant of the resultant matrix was positive (6.57×10^{-7}). The eigenvalues for the twenty-one remaining variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{210} = 12658$, $p < .001$, which indicated enough correlation as appropriate for factor analysis.

Table 22 *Correlation matrix for the variables measuring parental substance use*

Observed variable*	A17	A18	A20	A21	A23	A24	A26	A27	A29	A30	A32	A33	A35	A36	A38	A39	A41	A44	A45	A47	A48	
A17	1.00																					
A18	0.32	1.00																				
A20	0.83	0.34	1.00																			
A21	0.20	0.66	0.22	1.00																		
A23	0.16	0.12	0.12	0.11	1.00																	
A24	0.04	0.19	0.00	0.32	0.37	1.00																
A26	0.08	0.09	0.06	0.10	0.73	0.30	1.00															
A27	0.03	0.17	0.02	0.30	0.31	0.73	0.43	1.00														
A29	0.26	0.15	0.17	0.09	0.09	0.04	0.05	0.00	1.00													
A30	0.09	0.19	0.03	0.21	0.10	0.19	0.10	0.17	0.40	1.00												
A32	0.12	0.05	0.11	0.11	0.10	0.02	0.05	0.00	0.20	0.11	1.00											
A33	0.25	0.20	0.21	0.06	0.12	-0.02	0.06	-0.04	0.52	0.21	0.32	1.00										
A35	0.15	0.07	0.15	0.08	0.08	0.00	0.01	-0.01	0.17	0.08	0.75	0.28	1.00									
A36	0.08	0.05	0.08	0.08	0.08	0.05	0.03	0.04	0.17	0.09	0.26	0.25	0.22	1.00								
A38	0.19	0.08	0.19	0.16	0.12	-0.01	0.05	-0.02	0.38	0.20	0.50	0.46	0.40	0.46	1.00							
A39	0.18	0.10	0.18	0.16	0.14	0.01	0.07	0.00	0.35	0.21	0.53	0.51	0.42	0.46	0.93	1.00						
A41	0.19	0.08	0.18	0.16	0.13	-0.01	0.06	-0.01	0.37	0.21	0.55	0.53	0.44	0.48	0.96	0.96	1.00					
A44	0.23	0.15	0.31	0.02	0.07	-0.04	0.00	0.03	0.16	0.06	0.05	0.27	0.21	0.05	0.08	0.08	0.08	1.00				
A45	0.18	0.18	0.25	0.03	0.08	-0.07	0.01	0.00	0.17	0.03	0.12	0.32	0.25	0.14	0.19	0.21	0.22	0.48	1.00			
A47	0.40	0.19	0.42	0.10	0.09	-0.02	0.05	0.00	0.22	0.12	0.35	0.46	0.32	0.29	0.56	0.60	0.62	0.25	0.21	1.00		
A48	0.10	0.09	0.08	0.17	0.09	0.10	0.04	0.03	0.18	0.12	0.37	0.38	0.30	0.54	0.49	0.58	0.61	0.04	0.15	0.43	1.00	
Eigen values	5.82	2.72	2.13	1.46	1.28	1.21	1.07	0.88	0.74	0.65	0.58	0.49	0.41	0.35	0.33	0.26	0.22	0.17	0.15	0.06	0.02	

*A17 - Maternal smoking frequency; A18 - Paternal smoking frequency; A20 - Maternal smoking intensity; A21 - Paternal smoking intensity; A23 - Maternal frequency of alcohol use; A24 - Paternal frequency of alcohol use; A26 - Maternal alcohol use intensity; A27 - Paternal alcohol use intensity; A29 - Maternal cannabis use frequency; A30 - Paternal cannabis use frequency; A32 - Maternal amphetamine use frequency; A33 - Paternal amphetamine use frequency; A35 - Maternal barbiturates use frequency; A36 - Paternal barbiturates use frequency; A38 - Maternal frequency of cocaine use; A39 - Paternal frequency of cocaine use; A41 - Maternal frequency of heroin use; A44 - Maternal frequency of LSD psychedelics and tranquilizer use; A45 - Paternal frequency of LSD psychedelics and tranquilizer use; A47 - Maternal use of other substances; A48 - Paternal use of other substances.

Table 23 shows the correlation matrix of the variables used to measure the pressure from peers to use substances. The determinant of the resultant matrix was positive (0.067) as desired. The eigenvalues for the eight variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{28} = 2422$, $p < .001$, which indicated enough correlation as appropriate for factor analysis.

Table 23 *Correlation matrix for the variables measuring peer pressure to use substances*

Observed variable*	A53	A54	A55	A56	A57	A58	A59	A60
A53	1.00							
A54	0.52	1.00						
A55	0.47	0.17	1.00					
A56	0.44	0.25	0.43	1.00				
A57	0.19	0.08	0.21	0.22	1.00			
A58	0.19	0.23	0.24	0.23	0.57	1.00		
A59	0.20	0.03	0.43	0.28	0.57	0.47	1.00	
A60	0.19	0.01	0.22	0.38	0.53	0.46	0.61	1.00
Eigen values	3.27	1.57	0.93	0.66	0.50	0.43	0.36	0.27

*A53 - Number of friends who smoke; A54 - Number of friends who use alcohol; A55 - Number of friends who use cannabis; A56 - Number of friends who use other substances; A57 - Pressure from friends to smoke; A58 - Pressure from friends to use alcohol; A59 - Pressure from friends to use cannabis; A60 - Pressure from friends to use other substances

Table 24 (a) and (b) shows the correlation matrix of the variables used to measure self-perception. The determinant of the resultant matrix ($1.81E-19$) was positive as desired. The eigenvalues for the twenty-six variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{351} = 38285$, $p < .001$, and therefore factor analysis was appropriate.

Table 24 (a) *Correlation matrix for the variables measuring self-perception*

Observed variable*	A108	A109	A111	A114	A116	A117	A122	A135	A110	A113	A115	A118	A126
A108	1.00												
A109	0.20	1.00											
A111	0.36	0.30	1.00										
A114	0.16	0.27	0.32	1.00									
A116	0.18	0.18	0.36	0.32	1.00								
A117	0.24	0.21	0.21	0.13	0.09	1.00							
A122	0.28	0.23	0.34	0.25	0.19	0.28	1.00						
A135	0.13	0.16	0.20	0.15	0.12	0.22	0.17	1.00					
A110	0.06	0.08	0.19	0.11	0.17	0.14	0.09	0.13	1.00				
A113	0.01	0.13	0.21	0.22	0.31	-0.12	0.09	0.11	0.34	1.00			
A115	0.03	0.16	0.19	0.28	0.39	-0.18	0.04	0.02	0.28	0.52	1.00		
A118	0.14	0.19	0.14	0.15	0.20	0.18	0.04	0.13	0.35	0.41	0.40	1.00	
A126	-0.09	0.07	0.00	0.08	0.16	-0.21	-0.05	-0.03	0.13	0.39	0.41	0.27	1.00
A130	-0.05	-0.01	-0.06	0.03	0.03	-0.15	-0.10	-0.01	0.18	0.29	0.27	0.28	0.27
A112	0.12	0.21	0.13	0.13	0.12	0.25	0.08	0.12	0.20	0.10	0.05	0.20	0.00
A119	0.14	0.17	0.13	0.11	0.18	0.27	0.03	0.11	0.32	0.30	0.26	0.57	0.13
A120	0.29	0.20	0.30	0.16	0.17	0.48	0.25	0.23	0.19	-0.02	-0.05	0.23	-0.21
A121	0.24	0.15	0.18	0.04	0.17	0.18	0.12	0.15	0.20	0.12	0.09	0.36	-0.01
A123	0.14	0.17	0.18	0.02	0.05	0.17	0.07	0.07	0.18	0.08	0.12	0.32	-0.04
A125	0.04	0.02	-0.05	-0.08	-0.08	0.01	-0.03	-0.01	0.03	-0.09	0.00	0.09	-0.05

A133	0.17	0.11	0.25	0.11	0.07	0.25	0.14	0.15	0.20	0.04	0.02	0.26	-0.05
A134	0.13	0.08	0.17	0.01	0.03	0.29	0.12	0.15	0.13	-0.11	-0.11	0.13	-0.19
A127	0.06	0.02	0.05	-0.04	-0.12	0.22	0.08	0.11	-0.05	-0.23	-0.27	-0.14	-0.30
A128	0.08	0.02	0.03	-0.06	-0.07	0.14	-0.01	0.10	-0.03	-0.16	-0.23	-0.02	-0.17
A129	0.10	0.05	0.05	0.01	-0.04	0.20	0.04	0.07	-0.04	-0.17	-0.22	-0.02	-0.20
A132	0.11	-0.03	0.01	-0.11	-0.15	0.25	0.13	0.07	-0.12	-0.38	-0.38	-0.24	-0.38
Eigen values	4.66	3.68	2.27	1.47	1.20	1.08	1.02	0.88	0.85	0.78	0.76	0.71	0.67

Table 24 (b) Correlation matrix for the variables measuring self-perception

Observed variable*	A130	A112	A119	A120	A121	A123	A125	A133	A134	A127	A128	A129	A132
A130	1.00												
A112	0.02	1.00											
A119	0.19	0.26	1.00										
A120	-0.06	0.27	0.35	1.00									
A121	0.11	0.12	0.36	0.32	1.00								
A123	0.08	0.15	0.30	0.28	0.39	1.00							
A125	-0.02	0.04	0.06	0.04	0.13	0.15	1.00						
A133	0.06	0.16	0.22	0.25	0.39	0.31	0.11	1.00					
A134	-0.04	0.16	0.11	0.28	0.26	0.29	0.06	0.44	1.00				
A127	-0.06	0.06	-0.05	0.21	0.03	0.06	0.04	0.06	0.15	1.00			
A128	0.15	0.12	0.01	0.20	0.08	0.09	0.03	0.04	0.14	0.37	1.00		
A129	0.16	0.06	0.07	0.20	0.10	0.05	-0.03	0.08	0.19	0.34	0.44	1.00	

A132	-0.14	0.00	-0.14	0.22	0.05	0.05	0.03	0.07	0.23	0.33	0.31	0.34	1.00
Eigen values	0.65	0.61	0.57	0.57	0.53	0.52	0.50	0.48	0.44	0.41	0.39	0.36	0.00

*A108 - Feeling of happiness; A109 - Satisfied with self; A111 - Enjoy life like others; A114 - Positive attitude towards self; A116 - Able to do things as well as most other people; A117 - Feel one does not have much to be proud of; A122 - Always having someone to turn to if one needed help; A135 - Outlook about life in the next years (worse for higher scores); A110 - Life often seeming meaningless; A113 - Feeling good to be alive; A115 - Feeling as a person of worth, on an equal plane with others; A118 - Sometimes thinking that one is not good at all; A126 - Usually having a few friends around that one can get together with; A130 - Preference to engage in frightening things; A112 - The future often seeming hopeless; A119 - Feeling that one cannot do anything right; A120 - Feeling that one's life is not very useful; A121 - Feeling lonely a lot of times ; A123 - Often feeling left out of things; A125 - Often wishing one had more good friends; A133 - Often feeling bored; A134 - Often finding oneself having nothing to do; A127 - Gets a real kick out of doing things that are a little dangerous; A128 - Often testing oneself every by risky activities; A129 - Preference to explore strange places; A132 - Preference for exciting and unpredictable friends

Table 25 shows the correlation matrix of the variables used to measure self-substance use. The determinant of the resultant matrix was positive (0.0011) as desired. The eigenvalues for the fifteen variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{105} = 6036.696$, $p < .001$, and therefore factor analysis was deemed appropriate.

Table 25 *Correlation matrix for the variables measuring self-use of substances*

Observed variable*	A16	A19	A22	A25	A49	A50	A28	A31	A34	A37	A40	A43	A46	A51	A52
A16	1.00														
A19	0.85	1.00													
A22	0.37	0.42	1.00												
A25	0.35	0.36	0.73	1.00											
A49	0.51	0.51	0.21	0.21	1.00										
A50	0.22	0.22	0.26	0.26	0.33	1.00									
A28	0.52	0.47	0.28	0.36	0.27	0.19	1.00								
A31	0.10	0.08	0.02	0.02	0.01	0.04	0.25	1.00							
A34	0.20	0.25	0.13	0.11	0.07	0.06	0.17	0.38	1.00						
A37	0.16	0.25	0.21	0.14	0.14	0.05	0.21	0.26	0.09	1.00					
A40	0.14	0.24	0.21	0.20	0.09	0.07	0.18	0.15	0.28	0.62	1.00				
A43	0.12	0.15	0.11	0.10	0.03	0.12	0.23	0.41	0.28	0.40	0.68	1.00			
A46	0.26	0.30	0.16	0.19	0.27	0.19	0.38	0.28	0.24	0.14	0.12	0.18	1.00		
A51	0.28	0.31	0.21	0.14	0.37	0.18	0.40	0.22	0.03	0.37	0.18	0.32	0.22	1.00	
A52	0.18	0.24	0.24	0.11	0.30	0.24	0.18	0.15	0.03	0.37	0.24	0.23	0.26	0.71	1.00
Eigen values	4.53	2.05	1.46	1.33	1.05	0.90	0.73	0.69	0.57	0.48	0.46	0.25	0.24	0.15	0.13

*A16 - Self smoking frequency; A19 - Self smoking intensity; A22 - Self frequency of alcohol use; A25 - Self alcohol use intensity; A49 - Number of times one tried to stop smoking; A50 - Number of times one tried to stop using alcohol; A28 - Self frequency of cannabis use; A31 - Self frequency of amphetamine use; A34 - Self frequency of barbiturates use; A37 - Self frequency of cocaine use; A40 - Self frequency of heroin use; A43 - Self frequency of LSD, psychedelics and tranquilizer use; A46 - Self other substances use frequency; A51 - Number of times one tried to stop using cannabis; A52 - Number of times one tried to stop using other substances

Table 26 shows the correlation matrix of the variables used to measure social cognition. The determinant of the resultant matrix (0.00036) was positive as desired. The eigenvalues for the twenty variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{190} = 7061$, $p < .001$, and therefore factor analysis was appropriate.

Table 26 *Correlation matrix for the variables measuring social cognition*

Observed variable*	A146	A150	A151	A152	A153	A154	A155	A156	A157	A158	A159	A160	A163	A142	A143	A144	A145	A147	A148	A149
A146	1.00																			
A150	0.53	1.00																		
A151	0.65	0.50	1.00																	
A152	0.27	0.24	0.31	1.00																
A153	0.69	0.48	0.59	0.33	1.00															
A154	0.40	0.31	0.35	0.26	0.46	1.00														
A155	0.44	0.41	0.43	0.18	0.43	0.58	1.00													
A156	0.59	0.40	0.51	0.26	0.53	0.41	0.42	1.00												
A157	0.59	0.35	0.47	0.27	0.52	0.36	0.35	0.69	1.00											
A158	0.67	0.46	0.57	0.29	0.71	0.46	0.46	0.54	0.54	1.00										
A159	0.46	0.39	0.35	0.22	0.43	0.32	0.35	0.31	0.35	0.48	1.00									
A160	0.47	0.32	0.44	0.23	0.43	0.24	0.32	0.25	0.26	0.40	0.48	1.00								
A163	0.47	0.34	0.40	0.17	0.40	0.35	0.33	0.51	0.53	0.42	0.29	0.31	1.00							
A142	-0.02	-0.02	0.09	0.14	0.02	0.11	0.08	0.01	0.05	0.06	0.06	0.12	0.02	1.00						
A143	0.36	0.21	0.31	0.19	0.31	0.25	0.23	0.35	0.37	0.27	0.23	0.22	0.37	0.20	1.00					
A144	0.14	0.18	0.13	0.19	0.13	0.18	0.18	0.19	0.15	0.11	0.13	0.18	0.15	0.34	0.25	1.00				
A145	-0.27	-0.09	-0.17	0.11	-0.18	0.04	-0.05	-0.10	-0.08	-0.21	-0.12	-0.12	-0.03	0.20	0.09	0.26	1.00			
A147	0.40	0.28	0.35	0.20	0.29	0.22	0.17	0.43	0.44	0.26	0.21	0.13	0.33	0.12	0.40	0.24	0.13	1.00		
A148	0.19	0.14	0.16	0.17	0.19	0.25	0.21	0.19	0.17	0.17	0.20	0.18	0.19	0.17	0.21	0.28	0.10	0.29	1.00	
A149	0.26	0.31	0.28	0.28	0.24	0.28	0.29	0.19	0.26	0.24	0.24	0.26	0.26	0.14	0.25	0.23	0.12	0.24	0.33	1.00
Eigen values	6.91	1.99	1.27	1.00	0.91	0.89	0.78	0.75	0.70	0.65	0.60	0.58	0.51	0.50	0.44	0.37	0.34	0.29	0.27	0.25

* List of some thoughts that go through the minds when one is nervous or frightened. A146 - Foolish; A150 - I am going to be sick; A151 - I am inadequate ; A152 - I will babble or talk funnily ; A153 - Inferior; A154 - I will be unable to concentrate ; A155 - I will be unable to write properly; A156 - People are not interested in me; A157 - People will not like me; A158 - I am vulnerable ; A159 - I will sweat/perspire;

A160 - I go red ; A163 - People think I am boring; A142 - I will be unable to speak; A143 - I am unlikeable; A144 - I am going to tremble or shake uncontrollably; A145 - People will stare at me; A147 - People will reject me; A148 - I will be paralysed with fear; A149 - I will drop or spill things

Table 27 shows the correlation matrix of the variables used to measure social-demographic characteristics. The determinant of the resultant matrix was positive (0.023) as desired. The eigenvalues for the eleven variables were also positive. For these data, Bartlett's test was highly significant, $\chi^2_{55} = 3378$, $p < .001$, and therefore factor analysis was appropriate.

Table 27 Correlation matrix for the variables measuring student socio-demographic characteristics

Observed variable*	A1	A2	A3	A4	A6	A7	A8	A10	A12	A13	A14
A1	1.00										
A2	-0.07	1.00									
A3	0.06	0.60	1.00								
A4	-0.03	-0.03	0.00	1.00							
A6	0.02	-0.24	-0.10	-0.01	1.00						
A7	-0.04	0.05	0.05	-0.05	0.09	1.00					
A8	-0.09	-0.15	-0.07	0.03	0.15	0.06	1.00				
A10	-0.04	-0.06	-0.01	0.70	0.04	-0.05	0.05	1.00			
A12	-0.02	0.00	0.03	-0.03	0.10	0.77	0.08	-0.05	1.00		
A13	-0.02	-0.17	-0.07	0.00	0.74	0.21	0.10	0.01	0.22	1.00	
A14	-0.09	-0.15	-0.07	0.04	0.27	0.06	0.70	0.02	0.07	0.23	1.00
Eigen values	2.41	1.87	1.63	1.41	1.25	0.98	0.38	0.32	0.27	0.24	0.23

*A1 - Gender; A2 - Age; A3 - Highest education achieved; A4 - Race; A6 - Maternal highest level of education; A7 - Paternal highest level of education; A8 - Maternal employment status; A10 - Ethnicity; A12 - Paternal highest education (range); A13 - Maternal highest education (range); A14 - Paternal employment status (category)

Exploratory Factor Analysis

For different dimensions of same factor, for instance engagement, where theoretical links were not clearly denoted from the source of the research instrument, exploratory factor analysis was used to examine items that loaded onto the same factor in order to identify common themes. This assisted in identifying common dimensions within which the questions were highly loading in order to identify the constructs.

Delinquency

Table 28 presents rotated (varimax) component loadings for delinquency items. Two factors were distinguished. The questions that loaded highly on the first delinquency factor were carrying weapon to school (highest loading of 0.69), involvement in group fights, suspension or expulsion from school, involvement in serious fights, sale of illegal drugs and taking of other student's belongings (lowest loading of 0.34). Considering the second factor, going into buildings without permission loaded highest with a loading of 0.57 and hurting others and running away from home with the lowest loading of 0.37. These two factors were named as delinquency 1 and delinquency 2 for purposes of further analysis and interpretation.

Table 28 *Rotated component loadings for delinquency items**

Item	Component		Communalities
	1	2	
Weapon to school in the past one month	0.69		0.48
Involvement in group fights in the past year	0.53		0.32
Suspended or expelled from school at least once	0.51		0.27
Involvement in serious fight in the last one year	0.47		0.23
Sale of an illegal drug in the past one year	0.42		0.21
Taken other student's belongings in the past year	0.34		0.18
Entry into a building not allowed in the past year		0.57	0.33
Hurt someone badly enough in the past year to need bandages or a doctor		0.51	0.27
Ran away from home for more than 24 hours in the past year		0.37	0.15

Eigenvalues	1.56	0.88
Percent of total variance	17	10
Number of test measures	6	3

*Factor loadings =>0.30

The measure of fit based upon off diagonal values was 0.94 which is higher than the cut-off of 0.9 (Unwin, 2013) which indicated that two factors were sufficient.

Engagement

Table 29 presents rotated (varimax) component loadings for engagement items. Four factors were distinguishable. The questions that loaded highly on delinquency factor one were enjoying being in school with the highest loading of 0.46, finding school work interesting, how one thought others would feel if they cheated on a test , trying one’s best in school in the past year, how one thought most students would feel if they intentionally did things to make their teachers angry, how frequently one hates being in school in the past year, getting sent to the office, failure to complete or turn in assignments, how often one finds that their friends encourage them to do things which their teachers would not like, extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable and importance attached to being a leader in student activities with the lowest loading of 0.3. Finding schoolwork interesting loaded moderately on the fourth factor. These items fit the description of emotional engagement which focuses on positive emotional temperaments and affective responses concerning educational processes, practices and actors (Hirschfield & Gasper, 2011) and this factor was therefore labelled as emotional engagement.

Considering the second factor participating in other school clubs or activities during the school, loaded highest with a loading of 0.64, extent of participation in athletics team and participating in music or other performing arts with the lowest loading of 0.47. These items correspond to social or behavioural or participatory engagement which can be categorized as one of social, extracurricular, and non-academic school activities involving interactions with peers (Appleton et al., 2008). Hirschfield and Gasper (2011) also defined behavioural engagement as participation in school-connected activities, both academic and extra-curricular. This factor was therefore labelled as social engagement.

The questions that loaded highly on engagement factor two were the number of times teachers interrupted class to deal with misbehaviour or “goofing off” by anyone in the class during an average

school week with a loading of 0.67 and number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week with a loading of 0.59. These corresponded to similar definition as emotional engagement but from a negative perspective and the factor was labelled as negative emotional engagement.

Considering questions that loaded highest on engagement factor four, average grade in the school year loaded highest with a loading of 0.45, attaching importance to getting good grades and hours spent on homework in an average week in school and out of school with the lowest loading of 0.31. Previous studies defined cognitive or intellectual or academic engagement the effort, investment, and strategies that students put on learning (Appleton et al., 2008). Hirschfield and Gasper (2011) also defined cognitive engagement as the mental labour that students either invest or are motivated to invest in academic tasks. This factor was therefore labelled as cognitive engagement.

Table 29 *Rotated component loadings for engagement items**

Item	Component				Communalities
	1	3	2	4	
Enjoying being in school	0.46				0.29
Finding schoolwork interesting	0.43		0.31		0.32
How one thought others would feel if they cheated on a test	0.43				0.20
Trying one's best in school in the past year	0.42				0.22
How one thought most students would feel if they intentionally did things to make their teachers angry	0.42				0.27
How frequently one hates being in school in the past year	0.41				0.25
Getting sent to the office	0.38				0.16
Failure to complete or turn in assignments	0.37				0.15
How often one finds that their friends encourage them to do things which their teachers wouldn't like	0.36				0.20
Extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable?	0.35				0.18

Importance attached to leadership in student activities	0.3				0.15
Participating in other school clubs or activities during the school		0.64			0.43
Extent of participation in athletics team		0.58			0.35
Participating in music or other performing arts		0.47			0.23
Grades competition amongst students					0.13
Length of time spent in extra curricula activities					0.04
Number of times teachers interrupted class to deal with misbehaviour or “goofing off” during an average school week			0.67		0.46
Number of times teachers interrupted class to deal with misbehaviour or “goofing off” by self during an average school week			0.59		0.35
Likelihood to graduate					0.18
Average grade in the school year			0.45		0.21
Attaching importance to getting good grades			0.32		0.18
Hours spent on homework in an average week in school and out of school			0.31		0.10
Eigenvalues	1.88	1.25	1.18	0.84	
Percent of total variance	8	5	5	3	
Number of test measures	11	3	2	4	

*Factor loadings =>0.30

The measure of fit based upon off diagonal values was 0.9 which was exactly equal to the cut-off of 0.9 which indicated that four factors were sufficient.

Parental involvement

Table 29 *Rotated component loadings for engagement items**

Table 30 presents rotated (varimax) component loadings for parental involvement items. Two factors were distinguishable. The questions that loaded highly on factor one were parental knowledge of who went out with at night with the highest loading of 0.8, knowledge of where one was after school by parents or guardians, practice of coming back at a set time whenever one went out during weekend nights, parents or guardians allowing one to go out with friends on school nights and having at least

one other adult other than one's parents who one feels able to talk to if they were having problems in life with the lowest loading of 0.4. These items are related to parental monitoring and this factor was therefore labelled as parental monitoring. Considering the second factor, how often parents or guardians provide help with homework when it's needed loaded highest with a loading of 0.65, having parents or guardians check on whether one did their homework, how often parents or guardians limit the amount of time spent watching tv and acceptance to talk about one's problems over with one or both parents or guardians with the lowest loading of 0.4. These factors correspond to parental involvement and this factor was therefore labelled as parental involvement.

Table 30 *Rotated component loadings for parental involvement items**

Item	Component		Communalities
	1	2	
Parental knowledge of who went out with at night	0.8		0.61
Knowledge of where one was after school by parents or guardians	0.5		0.30
Practice of coming back at a set time whenever one went out during weekend nights	0.5		0.28
Parents or guardians allowing one to go out with friends on school nights	0.5		0.26
Having at least one other adult other than one's parents who one feels able to talk to if they were having problems in life	0.4		0.17
How often parents or guardians provide help with homework when it's needed		0.65	0.48
Having parents or guardians check on whether one did their homework		0.62	0.47
How often parents or guardians limit the amount of time spent watching TV		0.47	0.23
Acceptance to talk about one's problems over with one or both of your parents or guardians		0.4	0.16
Eigenvalues	1.7	1.33	

Percent of total variance	17	13
Number of test measures	5	4

*Factor loadings =>0.30

The measure of fit based upon off diagonal values was 0.96 which is higher than the cut-off of 0.9 (Unwin, 2013) which indicated that two factors were sufficient.

Self-perception

Table 31 presents rotated (varimax) component loadings for the self-perception items. Four factors were distinguished. The questions that loaded highly on the first factor of self-perception were always having someone to turn to if one needed help (highest loading of 0.67), having someone one can talk to if they need to, enjoying life as much as anyone, positive attitude towards self and ability to do things as well as most other people (lowest loading of 0.39). These items fit the description of self-perception which can be defined as how a person views themselves or any of the mental or physical attributes that constitute the self (<https://dictionary.apa.org/self-perception>) and this factor was therefore labelled as self-perception.

Considering the second factor, feeling good to be alive loaded highest (loading of 0.63) followed by feeling as a person of worth on an equal plane with others, preference to engage in frightening things, sometimes thinking that one is not good at all, usually having a few friends around that one can get together with and life often seeming meaningless, with the lowest loading of 0.33. The item, sometimes thinking that one is not good at all loaded equally to this factor and factor four (0.53) but was allocated to this factor based on a higher loading when oblique rotation was used. These items correspond to self-esteem which is a dimension of self-concept involving a person's evaluation of themselves and their competency (Marsh & Craven, 2006) and were therefore labelled as self-esteem.

The questions that loaded highly on the thirds factor of self-perception factor were preference for new and exciting experiences, even if one had to break the rules (highest loading 0.67), often testing oneself every now and then by doing risky activities, preference to explore strange places, getting a real kick out of doing things that are a little dangerous and the preference for exciting and unpredictable friends (the lowest loading of 0.52). This represents a disposition to courage which is a cognitive dimension where one defines risk and evaluates alternative activities before making a choice to proceed with those activities with potential negative consequences in attempts to achieve positive outcomes for self or others while recognizing that this outcome may not be achieved (Rate,

Clarke, Lindsay, & Sternberg, 2007). These items are therefore a cognitive aspect of self-perception and were labelled as self-cognition.

Considering the questions that loaded highest on the fourth factor of self-perception, feeling lonely a lot of times loaded highest with a loading of 0.56 followed by often feeling left out of things, often feeling bored, feeling that one cannot do anything right, often finding oneself having nothing to do and feeling that one's life is not very useful with the lowest loading of 0.44. The item, feeling that one's life is not very useful loaded equally with factor one at a factor loading of 0.44 but was allocated to factor four due to a clear relationship with factor four. The questions that load highly on this factor seem to be related to different aspects of self-efficacy which concerns an individual's belief in their capacity to implement behaviours necessary to produce specific performance attainments (Bandura, 1977b, 1986b, 1997) which reflects assurance in the capability to manage own motivation, behaviour, and social environment. This factor was therefore labelled as self-efficacy.

Table 31 *Rotated component loadings for self-perception items**

Item	Component				Communalities
	1	2	3	4	
Always having someone to turn to if one needed help	0.67				0.46
Someone to talk to	0.62				0.43
Enjoy life like others	0.57				0.36
Positive attitude towards self	0.48				0.29
Able to do things as well as most other people	0.44	0.31			0.31
Feel one does not have much to be proud of	0.42			0.37	0.42
Feeling of happiness	0.41				0.21
Satisfied with self	0.39				0.19
Feeling good to be alive		0.63			0.51
Feeling as a person of worth, on an equal plane with others		0.6	-0.34		0.53
Preference to engage in frightening things		0.57			0.39

Sometimes thinking that one is not good at all	0.53		0.53	0.58
Usually having a few friends around that one can get together with	0.52			0.36
Life often seeming meaningless	0.33		0.3	0.22
New, exciting experiences		0.67		0.48
Often testing oneself every by risky activities		0.67		0.46
Preference to explore strange places		0.61		0.38
Gets a real kick out of doing things that are a little dangerous		0.52		0.33
Preference for exciting and unpredictable friends	-0.4	0.52		0.44
Feeling lonely a lot of times			0.56	0.36
Often feeling left out of things			0.55	0.31
Often feeling bored			0.54	0.33
Feeling that one cannot do anything right	0.41		0.52	0.46
Often finding oneself having nothing to do			0.47	0.31
Feeling that one's life is not very useful	0.44		0.44	0.47
Eigenvalues	2.7	2.44	2.38	2.37
Percent of total variance	10	9	8	8
Number of test measures	9	9	6	8

*Factor loadings =>0.30

The measure of fit based upon off diagonal values was 0.97 which is higher than the cut-off of 0.9 (Unwin, 2013) which indicated that the two factor solution was sufficient.

Social cognition

Table 32 presents rotated (varimax) component loadings for social cognition items. Two factors were distinguished. The questions that loaded highly on the first factor of social cognition factor were the following thoughts that go through people's minds when they are nervous or frightened: feeling foolish (the highest loading of 0.86), feeling vulnerable, feeling inferior, feeling inadequate, people would not be interested in them, feeling weird, people would not like them, they were going to be

sick, they would sweat or perspire, people would think they were boring, they would be unable to write properly, people would see they were nervous, they would be unable to concentrate, they would go red, and they would babble or talk funnily (the lowest loading of 0.33). Considering the second factor, the feeling when one was nervous or frightened that they would tremble or shake uncontrollably loaded the highest (loading of 0.53) followed by people would stare at them, they would be unable to speak, they would be paralyzed with fear, they would drop or spill things, and they would be unlikeable with the lowest loading of 0.4. Skinner et al. (1990) distinguished social cognition into internal and external causes which could be assumed to be inversely related to each other and are therefore regarded to be a single, bipolar dimension. Factors one and two were therefore labelled as external and internal social cognition respectively.

Table 32 *Rotated component loadings for social cognition survey items**

Item	Component		Communalities
	1	2	
Foolish	0.86		0.74
I am vulnerable	0.82		0.67
Inferior	0.79		0.62
I am inadequate	0.72		0.53
People are not interested in me	0.69		0.51
I am weird	0.68		0.48
People will not like me	0.66		0.48
I am going to be sick	0.59		0.37
I will sweat/perspire	0.56		0.33
People think I am boring	0.56		0.37
I will be unable to write properly	0.56		0.35
People will see I am nervous	0.54		0.37
I will be unable to concentrate	0.52		0.34
I go red	0.51		0.27
I will babble or talk funnily	0.33		0.19
I am going to tremble or shake uncontrollably		0.53	0.29
People will stare at me		0.53	0.37

I will be unable to speak	0.42	0.18
I will be paralyzed with fear	0.41	0.21
I will drop or spill things	0.32	0.4
I am unlikeable	0.37	0.4
People will reject me	0.38	0.4
Eigenvalues	6.69	1.82
Percent of total variance	30	8
Number of test measures	15	7

*Factor loadings =>0.30

The measure of fit based upon off diagonal values was 0.98 which is higher than the cut-off of 0.9 (Unwin, 2013) which indicated that the two factors were sufficient.

Confirmatory Factor Analysis

Confirmatory factor analysis was used to test how well the observed variables are related to the underlying latent factors. The latent factors were standardized to enable free estimation of all factor loadings.

Substance use by students

Figure 3 shows the tested model where the circles represent latent variables and rectangles represent the measured variables.

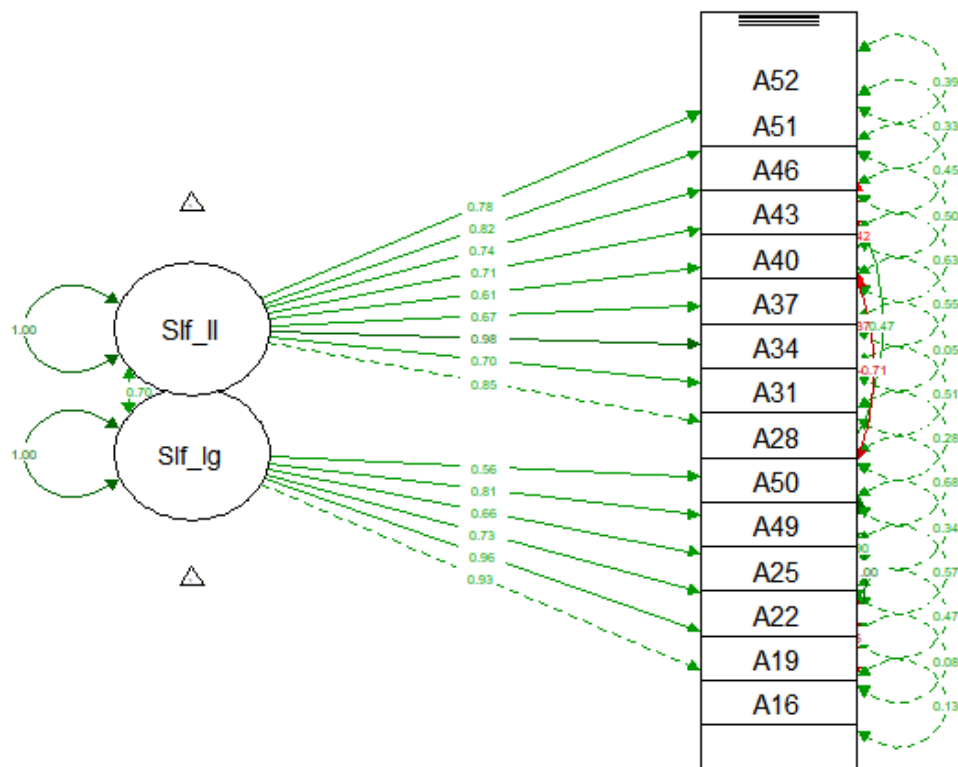


Figure 3 Confirmatory analysis for student substance use.

Bentler-Bonett Normed Fit Index (NFI)= 0.992; Goodness of Fit Index = .996; root mean square error of approximation = .031; $\chi^2_1= 3.40$; $p=0.065$. Slf_II-self use of legal substances; Slf_Ig-self use of illegal substances; A16 -Self smoking frequency; A19 - Self smoking intensity; A22 - Self frequency of alcohol use; A25 - Self alcohol use intensity; A49 - Number of times one tried to stop smoking; A50 - Number of times one tried to stop using alcohol; A28 - Self frequency of cannabis use; A31 - Self frequency of amphetamine use; A34 - Self frequency of barbiturates use; A37 - Self frequency of cocaine use; A40 - Self frequency of heroin use; A43 - Self frequency of LSD, psychedelics and tranquilizer use; A46 - Self other substances use frequency; A51 - Number of times one tried to stop using cannabis; A52 - Number of times one tried to stop using other substances.

The model fit was excellent, with a GFI of 0.996, NFI of 0.992 and RMSEA of 0.052. The model did fit the data significantly ($\chi^2_1=3.4$, $p=0.065$). All indicators showed highly significant factor loadings ($p<0.001$), with absolute factor loadings greater than 0.3 (Table 33).

Substance use variables associated with smoking including frequency (standardized coefficient = 0.934) and intensity (standardized coefficient = 0.959) of smoking showed highest loading on student use of legal substances while the number of times one tried to stop using alcohol least loaded on this variable (0.563).

Student use of barbiturates (standardized coefficient = 0.976) and heroin (standardized coefficient = 0.61) demonstrated highest and least loading respectively on the variable representing use of illegal substance. The standardized coefficients indicated that all items loaded positively and therefore changed in the same direction between the latent and observed variables (Table 33).

Table 33 Standardized and unstandardized coefficients from confirmatory factor analysis of student substance use

Latent						
Factor	Indicator*	B	SE	Z	p-value	Beta
Self-use						
legal	A16	1.000	0.000	NA	NA	0.934
	A19	1.027	0.020	51.440	0.000	0.959
	A22	0.778	0.049	15.850	0.000	0.727
	A25	0.705	0.052	13.519	0.000	0.658
	A49	0.871	0.061	14.290	0.000	0.813
	A50	0.603	0.058	10.394	0.000	0.563
Self-use						
illicit	A28	1.000	0.000	NA	NA	0.849
	A31	0.822	0.058	14.064	0.000	0.698
	A34	1.149	0.099	11.595	0.000	0.976
	A37	0.790	0.054	14.518	0.000	0.671
	A40	0.715	0.067	10.694	0.000	0.607
	A43	0.831	0.065	12.766	0.000	0.706
	A46	0.873	0.059	14.728	0.000	0.742
	A51	0.965	0.076	12.675	0.000	0.819
	A52	0.917	0.079	11.568	0.000	0.779

*A16 - Self smoking frequency; A19 - Self smoking intensity; A22 - Self frequency of alcohol use; A25 - Self alcohol use intensity; A49 - Number of times one tried to stop smoking; A50 - Number of times one tried to stop using alcohol; A28 - Self frequency of cannabis use; A31 - Self frequency of

amphetamine use; A34 - Self frequency of barbiturates use; A37 - Self frequency of cocaine use; A40 - Self frequency of heroin use; A43 - Self frequency of LSD, psychedelics and tranquilizer use; A46 - Self other substances use frequency; A51 - Number of times one tried to stop using cannabis; A52 - Number of times one tried to stop using other substances

Parental substance use

Figure 4 shows the tested model where the circles represent latent variables and rectangles represent measure variables.

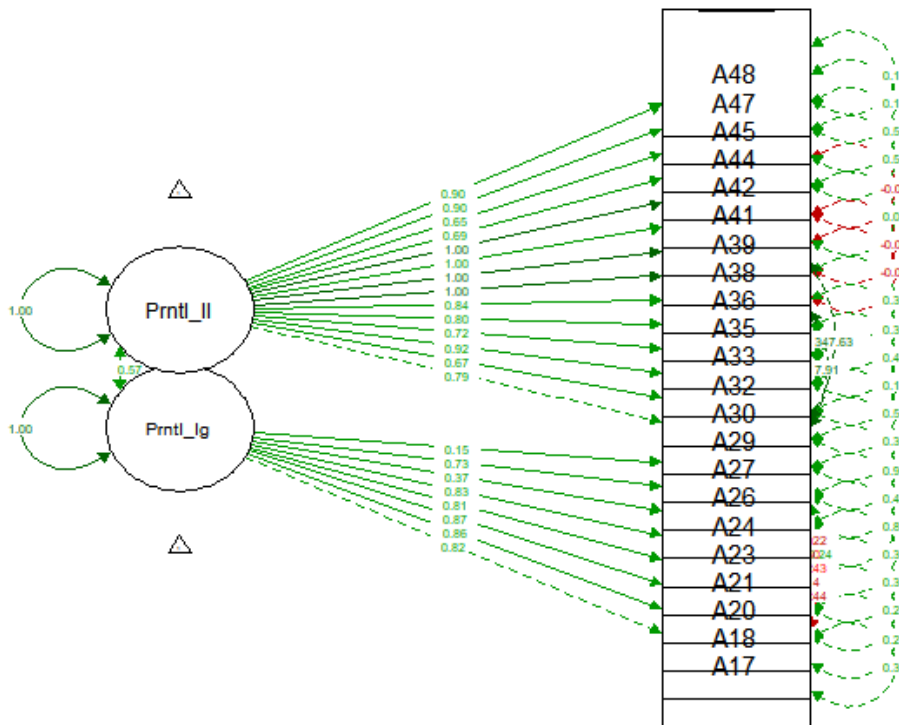


Figure 4 Confirmatory analysis for parental substance use.

Bentler-Bonett Normed Fit Index (NFI)= 1; Goodness of Fit Index = 1; root mean square error of approximation = .12; $\chi^2_1= 14$; p=0.00016. Prntl_lg-parental use of legal substances; Prntl_Il-parental use of illegal substances; A16 -Self smoking frequency; A17 - Maternal smoking frequency; A18 - Paternal smoking frequency; A20 -Maternal smoking intensity; A21 - Paternal smoking intensity; A23 - Maternal frequency of alcohol use; A24 -Paternal frequency of alcohol use; A26 - Maternal alcohol use intensity; A27 - Paternal alcohol use intensity; A29 -

Maternal cannabis use frequency ; A30 - Paternal cannabis use frequency ; A32 - Maternal amphetamine use frequency ; A33 -Paternal amphetamine use frequency ; A35 - Maternal barbiturates use frequency ; A36 - Paternal barbiturates use frequency ; A38 - Maternal frequency of cocaine use ; A39 - Paternal frequency of cocaine use ; A41 - Maternal frequency of heroin use ; A42 – Paternal frequency of heroin use; A44 - Maternal frequency of LSD psychedelics and tranquilizer use ; A45 - Paternal frequency of LSD psychedelics and tranquilizer use ; A47 - Maternal use of other substances ; A48 - Paternal use of other substances .

The model fit was excellent, with a GFI of 1, NFI of 1. However, the model had a RMSEA of 0.122 and did not fit the data significantly ($\chi^2_1= 146.1, p=0.0001$). All indicators showed highly significant factor loadings ($p<0.001$), with absolute factor loadings greater than 0.3 except paternal alcohol use intensity whose factor loading was 0.15 (Table 34).

Paternal smoking frequency (standardized coefficient = 0.862) and maternal smoking intensity (standardized coefficient = 0.869) showed highest loading on parental use of legal substances while paternal frequency of alcohol use loaded least on this variable (standardized coefficient = 0.374) when variables with factor loading of at least 0.3 were considered.

Both paternal and maternal frequency of cocaine and heroin use (standardized coefficient = 1) loaded highest while paternal frequency of LSD psychedelics and tranquilizer use loaded least (standardized coefficient = 0.65) on the variable representing use of illegal substance. The standardized coefficients indicated that all items loaded positively and therefore changed in the same direction between the latent and observed variables (Table 34).

Table 34 *Standardized and unstandardized coefficients from confirmatory factor analysis of parental substance use*

Latent						
Factor	Indicator*	B	SE	Z	p-value	Beta
Parental						
legal	A17	1.000	0.000	NA	NA	0.823
	A18	1.047	0.082	12.754	0.000	0.862
	A20	1.056	0.033	31.541	0.000	0.869
	A21	0.979	0.059	16.509	0.000	0.806
	A23	1.008	0.082	12.354	0.000	0.830

	A24	0.455	0.041	11.166	0.000	0.374
	A26	0.886	0.073	12.090	0.000	0.730
	A27	0.182	0.031	5.904	0.000	0.150
Parental						
illicit	A29	1.000	0.000	NA	NA	0.788
	A30	0.845	0.076	11.067	0.000	0.666
	A32	1.166	0.092	12.697	0.000	0.919
	A33	0.911	0.088	10.329	0.000	0.718
	A35	1.013	0.073	13.865	0.000	0.799
	A36	1.065	0.096	11.085	0.000	0.840
	A38	1.269	0.083	15.257	0.000	1.000
	A39	1.269	0.083	15.255	0.000	1.000
	A41	1.269	0.083	15.257	0.000	1.000
	A42	1.269	0.082	15.449	0.000	1.000
	A44	0.874	0.073	11.893	0.000	0.689
	A45	0.827	0.074	11.159	0.000	0.652
	A47	1.143	0.103	11.145	0.000	0.901
	A48	1.146	0.111	10.331	0.000	0.904

*A17 - Maternal smoking frequency; A18 - Paternal smoking frequency; A20 - Maternal smoking intensity; A21 - Paternal smoking intensity; A23 - Maternal frequency of alcohol use; A24 - Paternal frequency of alcohol use; A26 - Maternal alcohol use intensity; A27 - Paternal alcohol use intensity; A29 - Maternal cannabis use frequency; A30 - Paternal cannabis use frequency ; A32 - Maternal amphetamine use frequency; A33 - Paternal amphetamine use frequency ; A35 - Maternal barbiturates use frequency; A36 - Paternal barbiturates use frequency; A38 - Maternal frequency of cocaine use; A39 - Paternal frequency of cocaine use; A41 - Maternal frequency of heroin use; A44 - Maternal frequency of LSD psychedelics and tranquilizer use; A45 - Paternal frequency of LSD psychedelics and tranquilizer use; A47 - Maternal use of other substances; A48 - Paternal use of other substances

Peer pressure to use substances

Figure 5 shows the tested model where circles represent latent variables and rectangles represent measured variables.

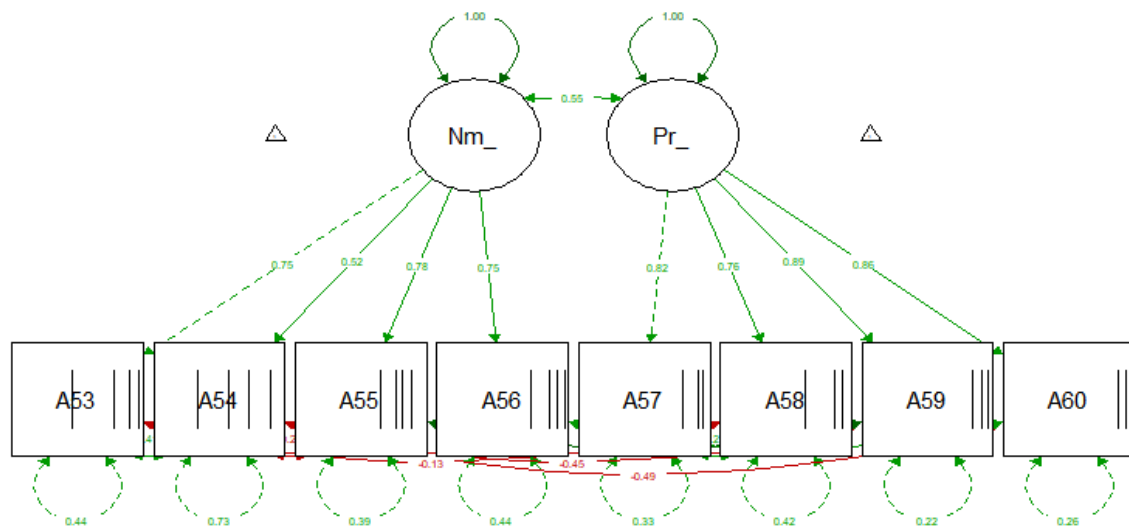


Figure 5 Confirmatory analysis for peer pressure to use substances.

Bentler-Bonett Normed Fit Index (NFI) = 0.997; Goodness of Fit Index = 0.999; root mean square error of approximation = .028; $\chi^2_1 = 1.697$; $p=0.19$. Nm_-number of friends who use substances; Pr_-pressure from friends to use substances; A53 - Number of friends who smoke; A54 - Number of friends who use alcohol; A55 - Number of friends who use cannabis; A56 - Number of friends who use other substances; A57 - Pressure from friends to smoke; A58 - Pressure from friends to use alcohol; A59 - Pressure from friends to use cannabis; A60 - Pressure from friends to use other substances.

The model fit was excellent, with a GFI of 0.999, NFI of 0.997 and RMSEA of 0.122 and fit the data significantly ($\chi^2_1 = 1.697$, $p=0.19$). All indicators showed highly significant factor loadings ($p<0.001$), with absolute factor loadings greater than 0.3 (Table 35).

The number of friends who use cannabis (standardized coefficient = 0.778) and number of friends who use alcohol (standardized coefficient = 0.516) loaded most and least respectively on this factor representing the number of friends using substances. Concerning peer pressure to use substances, pressure from friends to use cannabis (standardized coefficient = 0.885) and pressure from friends to smoke (standardized coefficient = 0.760) showed the highest and lowest loading respectively on this latent variable. The standardized coefficients indicated that all the items loaded positively and therefore changed in the same direction between the latent and observed variables (Table 35).

Table 35 Standardized and unstandardized coefficients from confirmatory factor analysis of peer pressure to use substances

Latent Factor	Indicator	B	SE	Z	p-value	Beta
Number of using friends	A53	1.000	0.000	NA	NA	0.748
	A54	0.689	0.063	10.941	0.000	0.516
	A55	1.040	0.072	14.435	0.000	0.778
	A56	1.001	0.064	15.642	0.000	0.748
Pressure from friends	A57	1.000	0.000	NA	NA	0.818
	A58	0.928	0.040	23.249	0.000	0.760
	A59	1.082	0.052	20.984	0.000	0.885
	A60	1.054	0.044	23.784	0.000	0.862

*A53 - Number of friends who smoke; A54 - Number of friends who use alcohol; A55 - Number of friends who use cannabis; A56 - Number of friends who use other substances; A57 - Pressure from friends to smoke; A58 - Pressure from friends to use alcohol; A59 - Pressure from friends to use cannabis; A60 - Pressure from friends to use other substances

Delinquency

Figure 6 shows the tested model where circles represent latent variables and rectangles represent measure variables.

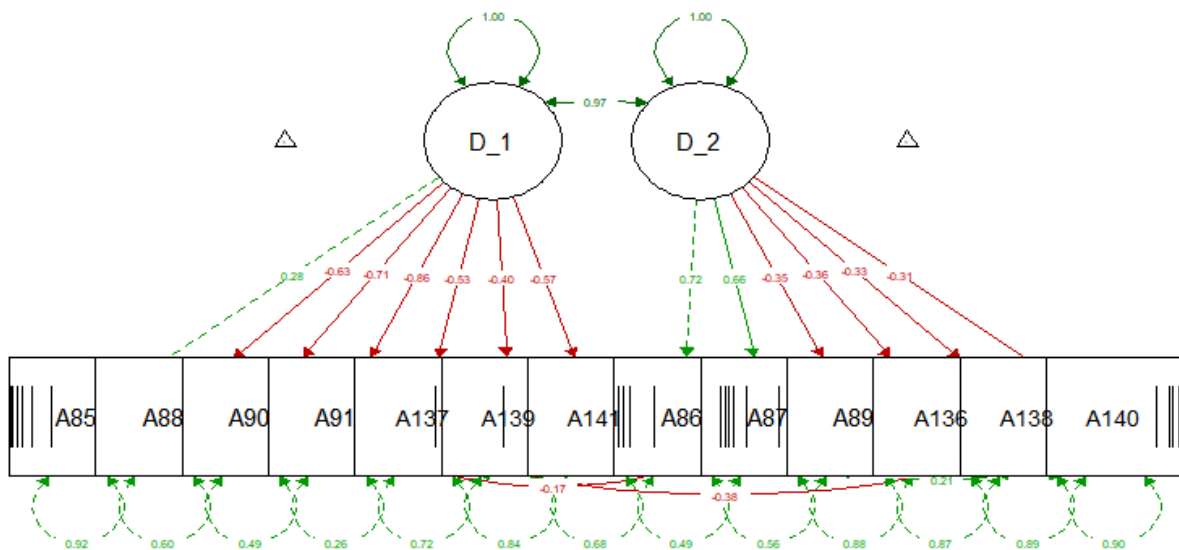


Figure 6 Confirmatory analysis for delinquency.

Bentler-Bonett Normed Fit Index (NFI) = 0.955; Goodness of Fit Index = 0.993; root mean square error of approximation = .049; $\chi^2_1 = 3.13$; $p=0.077$. Nm_-number of friends who use substances; Pr_-pressure from friends to use substances; A53 - Number of friends who smoke; A54 - Number of friends who use alcohol; A55 - Number of friends who use cannabis; A56 - Number of friends who use other substances; A57 - Pressure from friends to smoke; A58 - Pressure from friends to use alcohol; A59 - Pressure from friends to use cannabis; A60 - Pressure from friends to use other substances.

The model fit was excellent, with a GFI of 0.993, NFI of 0.955 and RMSEA of 0.049 and fit the data significantly ($\chi^2_1 = 3.13, p=0.077$). All indicators showed highly significant factor loadings ($p<0.001$), with absolute factor loadings greater than 0.3 except for the indicator, intentionally missing school in the past month, which had a factor loading equal to 0.3 (Table 36).

Having taken weapon to school in the past one month (standardized coefficient = -0.86) and intentionally missing school in the past month (standardized coefficient = 0.29) showed highest and lowest absolute loading respectively on the first factor representing delinquency. Concerning the second dimension of delinquency, skipping class one was not supposed to in the past one month (standardized coefficient = 0.72) showed highest absolute loading while hurting someone badly enough in the past year to need bandages or a doctor and entry into a building without authorisation in the past year showed equally lowest (standardized coefficient = -0.313) absolute loading respectively on this latent variable. The standardized coefficients indicated that all the items except intentionally missing school in the past month, skipping class one was not supposed to in the past one month and class lateness without approved excuse in an average school week loaded negatively and therefore changed inversely between the latent and observed variables (Table 36).

Table 36 *Standardized and unstandardized coefficients from confirmatory factor analysis of delinquency*

Latent Factor	Indicator	B	SE	Z	p-value	Beta
Delinquency 1	A85	1.000	0.000	NA	NA	0.284
	A88	-2.223	0.354	-6.280	0.000	-0.632
	A90	-2.514	0.405	-6.206	0.000	-0.714
	A91	-3.018	0.506	-5.960	0.000	-0.857
	A137	-1.864	0.328	-5.676	0.000	-0.529

	A139	-1.399	0.259	-5.409	0.000	-0.397
	A141	-1.995	0.341	-5.853	0.000	-0.567
Delinquency 2	A86	1.000	0.000	NA	NA	0.716
	A87	0.925	0.064	14.458	0.000	0.662
	A89	-0.492	0.081	-6.086	0.000	-0.352
	A136	-0.504	0.090	-5.616	0.000	-0.361
	A138	-0.462	0.079	-5.830	0.000	-0.331
	A140	-0.437	0.080	-5.445	0.000	-0.313

*A85 - Intentionally missing school in the past month; A86 - Skipping class one was not supposed to in the past one month; A87 - Class lateness without approved excuse in an average school week; A88 - Involvement in serious fight in the last one year; A89 - Damage to school property in the past year; A90 - Suspended or expelled from school at least once; A91 - Weapon to school in the past one month; A136 - Ran away from home for more than 24 hours in the past year; A137 - Involvement in group fights in the past year; A138 - Hurt someone badly enough in the past year to need bandages or a doctor; A139 - Taken other's belongings in the past year; A140 - Entry into a building not allowed in the past year; A141 - Sale of an illegal drug in the past one year.

Engagement

Figure 7 shows the tested model where the circles represent latent variables and the rectangles represent measure variables.

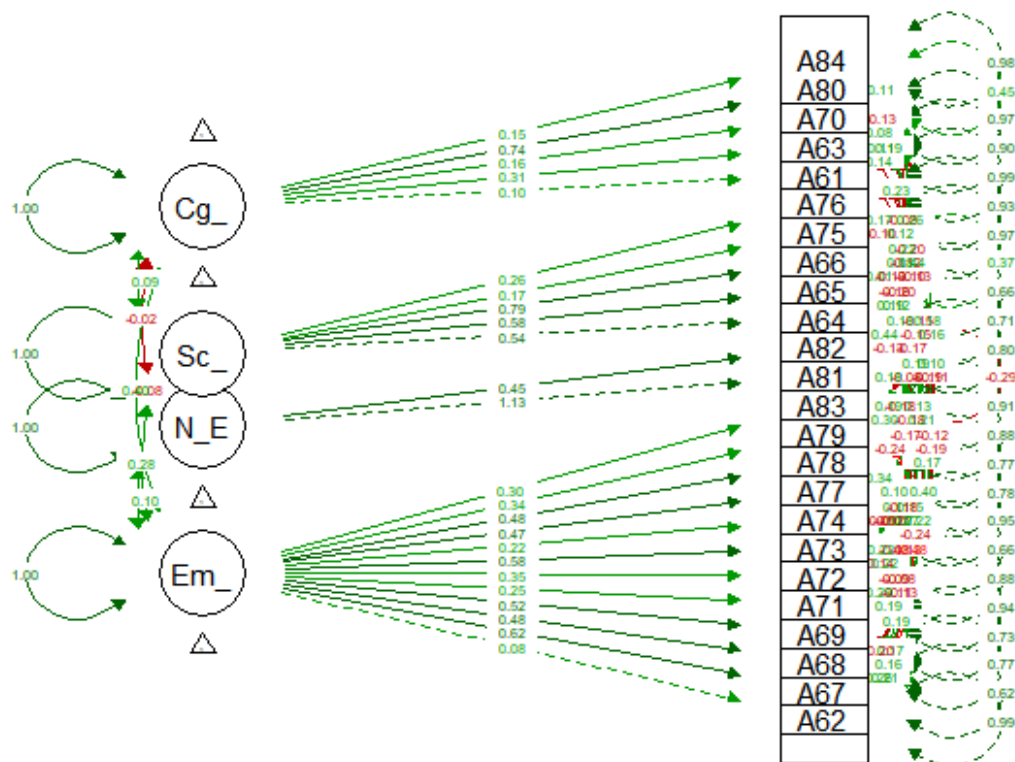


Figure 7 Confirmatory analysis for engagement.

Bentler-Bonett Normed Fit Index (NFI) = 0.961; Goodness of Fit Index = 0.994; root mean square error of approximation = .011; $\chi^2_1 = 1.11$; $p=0.29$. Cg_ - cognitive engagement; Sc_ - social engagement; Sc_ - social engagement; N_E - negative emotional engagement; Em_ - emotional engagement; A62 - Likelihood to graduate; A67 - Enjoying being in school; A68 - How frequently one hates being in school in the past year; A69 - Trying one's best in school in the past year; A71 - Failure to complete or turn in assignments; A72 - Getting sent to the office; A73 - Finding school work interesting; A74 - How often one finds that their friends encourage them to do things which their teachers would not like; A77 - How one thought others would feel if they cheated on a test ; A78 - How one thought most students would feel if they intentionally did things to make their teachers angry; A79 - Importance attached to being a leader in student activities; A83 - Extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable; A81 - Number of times teachers interrupted class to deal with misbehaviour or "goofing off" during an average school week; A82 - Number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average

school week; A64 - Participating in music or other performing arts; A65 - Extent of participation in athletics team; A66 - Participating in other school clubs or activities during the school; A75 - Length of time spent in extra curricula activities; A76 - Grades competition amongst students; A61 - Average grade in the school year; A63 - Hours spent on homework in an average week in school and out of school; A70 - Finding school work too hard to understand; A80 - Attaching importance to getting good grades; A84 - Number of one's friends who dropped out of school.

The model fit was excellent, with a GFI of 0.994, NFI of 0.961 and RMSEA of 0.011. The model fit the data significantly ($\chi^2_1 = 1.11, p=0.29$). All indicators showed insignificant factor loadings ($p>0.05$) except all indicators of the social engagement dimension. However all items except the likelihood of one graduating from high school (emotional engagement), how often one finds that their friends encourage them to do things which their teachers would not like (emotional engagement), length of time spent in extra curricula activities (social engagement), average grade in the school year (social engagement), finding school work too hard to understand (social engagement) and the number of one's friends who dropped out of school (social engagement) showed absolute factor loadings greater than 0.3 (Table 37).

Enjoying being in school (standardized coefficient = 0.618) and the extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable (standardized coefficient = 0.296) showed the highest and lowest loadings respectively on emotional engagement amongst those factors with absolute factor loadings greater than 0.3. Concerning social engagement, participating in other school clubs or activities during the school (standardized coefficient = 0.793) and the length of time spent in extra curricula activities (standardized coefficient = 0.171) showed the highest and lowest loading respectively on this latent variable amongst those that showed absolute factor loadings greater than 0.3. Attaching importance to getting good grades (standardized coefficient = 0.744) and hours spent on homework in an average week in school and out of school (standardized coefficient = 0.312) showed the highest and lowest loadings respectively on cognitive engagement amongst the factors with absolute factor loadings greater than 0.3.

The standardized coefficients indicated that all items loaded positively and therefore changed in the same direction between the latent and observed variables (Table 37).

Table 37 Standardized and unstandardized coefficients from confirmatory factor analysis of engagement

Latent Factor	Indicator	B	SE	Z	p-value	Beta
Emotional engagement	A62	1.000	0.000	NA	NA	0.077
	A67	8.067	5.297	1.523	0.128	0.618
	A68	6.227	4.133	1.507	0.132	0.477
	A69	6.805	4.416	1.541	0.123	0.522
	A71	3.299	2.156	1.530	0.126	0.253
	A72	4.548	2.974	1.529	0.126	0.349
	A73	7.588	4.970	1.527	0.127	0.582
	A74	2.876	1.930	1.490	0.136	0.220
	A77	6.100	4.090	1.491	0.136	0.468
	A78	6.229	4.203	1.482	0.138	0.477
	A79	4.454	2.929	1.521	0.128	0.341
Negative emotional engagement	A83	3.858	2.585	1.493	0.135	0.296
	A81	1.000	0.000	NA	NA	1.135
Social engagement	A82	0.396	0.231	1.714	0.087	0.450
	A64	1.000	0.000	NA	NA	0.541
	A65	1.078	0.252	4.281	0.000	0.583
	A66	1.467	0.328	4.467	0.000	0.793
	A75	0.316	0.087	3.625	0.000	0.171
Cognitive engagement	A76	0.489	0.120	4.084	0.000	0.264
	A61	1.000	0.000	NA	NA	0.104
	A63	2.997	2.029	1.477	0.140	0.312
	A70	1.559	0.907	1.718	0.086	0.162
	A80	7.156	4.752	1.506	0.132	0.744
	A84	1.418	1.028	1.380	0.168	0.148

*A62 - Likelihood to graduate; A67 - Enjoying being in school; A68 - How frequently one hates being in school in the past year; A69 - Trying one's best in school in the past year ; A71 - Failure to complete or turn in assignments; A72 - Getting sent to the office; A73 - Finding school work

interesting; A74 - How often one finds that their friends encourage them to do things which their teachers would not like; A77 - How one thought others would feel if they cheated on a test; A78 - How one thought most students would feel if they intentionally did things to make their teachers angry; A79 - Importance attached to being a leader in student activities; A83 - Extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable; A81 - Number of times teachers interrupted class to deal with misbehaviour or "goofing off" during an average school week; A82 - Number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week; A64 - Participating in music or other performing arts; A65 - Extent of participation in athletics team; A66 - Participating in other school clubs or activities during the school; A75 - Length of time spent in extra curricula activities; A76 - Grades competition amongst students; A61 - Average grade in the school year; A63 - Hours spent on homework in an average week in school and out of school; A70 - Finding school work too hard to understand; A80 - Attaching importance to getting good grades; A84 - Number of one's friends who dropped out of school

Parental involvement

Figure 8 shows the tested model where the circles represent latent variables and the rectangles represent measure variables.

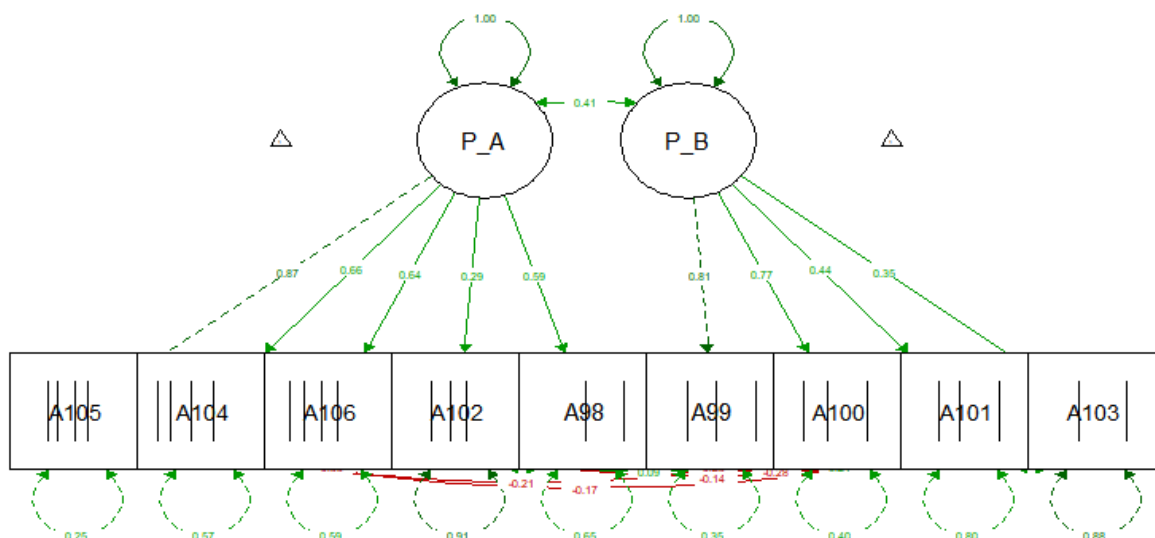


Figure 8 Confirmatory analysis for parental involvement.

Bentler-Bonett Normed Fit Index (NFI) = 0.991; Goodness of Fit Index = 0.996; root mean square error of approximation = .033; chi-square = 1.20; degrees of freedom = 1; p=0.16. P_A-

parental monitoring; P_B - parental involvement; A105 - Parental knowledge of who went out with at night; A104 - Knowledge of where one was after school by parents or guardians; A106 - Practice of coming back at a set time whenever one went out during weekend nights; A102 - Parents or guardians allowing one to go out with friends on school nights; A98 - Having at least one other adult other than one's parents who one feels able to talk to if they were having problems in life; A99 - Having parents or guardians check on whether one did their homework; A100 - How often parents or guardians provide help with homework when it's needed; A101 - How often parents or guardians limit the amount of time spent watching TV; A103 - Acceptance to talk about one's problems over with one or both of your parents or guardians.

The model fit was excellent, with a GFI of 0.996, NFI of 0.991 and RMSEA of 0.033. The model fit the data significantly ($\chi^2_1 = 1.20$, $p=0.16$). All the indicators showed insignificant factor loadings ($p>0.05$) except all indicators of the social engagement dimension. All the items showed absolute factor loadings greater than or equal to 0.3 (Table 38).

Concerning parental monitoring, the items parental knowledge of who one went out with at night (0.866) and parents or guardians allowing one to go out with friends on school nights (0.293) showed highest and lowest loading respectively. How often parents or guardians provide help with homework when it was needed (0.774) and acceptance to talk about one's problems over with one or both parents or guardians (0.374) showed highest and lowest loading on parental involvement respectively.

The standardized coefficients indicated that all the items loaded positively and therefore changed in the same direction between the latent and observed variables (Table 38).

Table 38 Standardized and unstandardized coefficients from confirmatory factor analysis of parental involvement

Latent Factor	Indicator*	B	SE	Z	p-value	Beta
Parental monitoring	A105	1.000	0.000	NA	NA	0.866
	A104	0.757	0.054	14.082	0.000	0.656
	A106	0.740	0.053	13.967	0.000	0.641
	A102	0.338	0.059	5.771	0.000	0.293
	A98	0.680	0.125	5.453	0.000	0.589
Parental involvement	A99	1.000	0.000	NA	NA	0.806
	A100	0.961	0.064	14.998	0.000	0.774
	A101	0.551	0.049	11.321	0.000	0.443
	A103	0.431	0.054	8.036	0.000	0.347

*A105 - Parental knowledge of who went out with at night; A104 - Knowledge of where one was after school by parents or guardians; A106 - Practice of coming back at a set time whenever one went out during weekend nights; A102 - Parents or guardians allowing one to go out with friends on school nights; A98 - Having at least one other adult other than one's parents who one feels able to talk to if they were having problems in life; A99 - Having parents or guardians check on whether one did their homework; A100 - How often parents or guardians provide help with homework when it is needed; A101 - How often parents or guardians limit the amount of time spent watching TV; A103 - Acceptance to talk about one's problems over with one or both parents or guardians

Self-perception

Figure 9 shows the tested model where the circles represent latent variables and the rectangles represent measure variables.

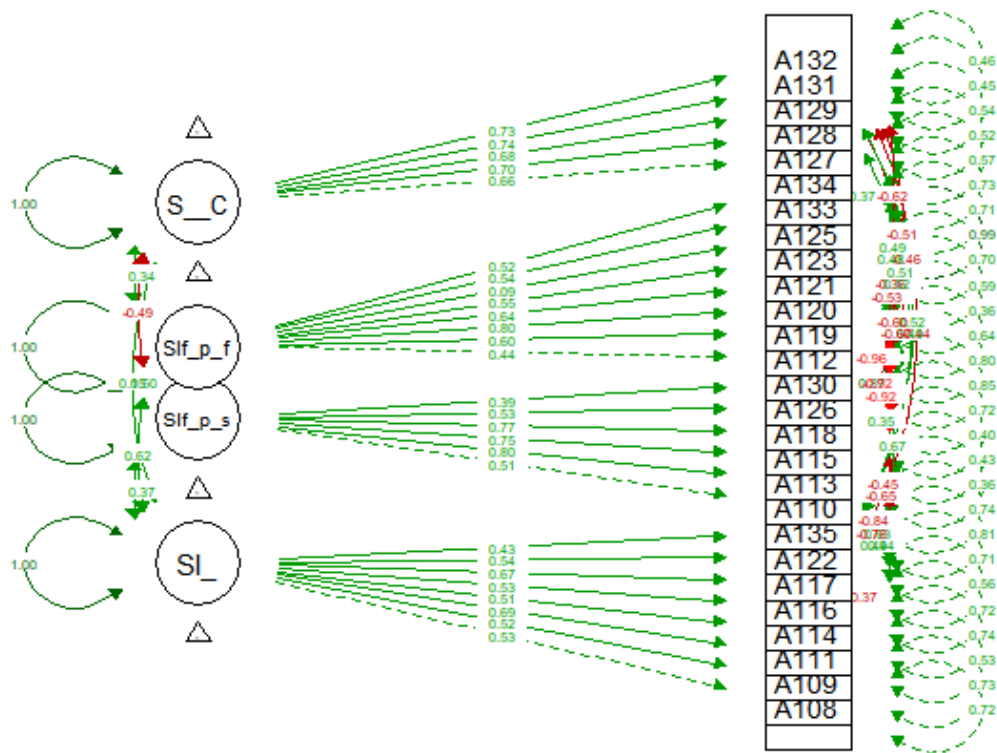


Figure 9 Confirmatory analysis for self-perception.

Bentler-Bonett Normed Fit Index (NFI) = 0.90; Goodness of Fit Index = 0.944; root mean square error of approximation = .077; $\chi^2_1 = 6.28$; $p=0.012$. SL - Self-perception; Sif_p_s - Self-esteem; Sif_p_f - Self efficacy; S_C - Self cognition. A108 - Feeling of happiness; A109 - Satisfied with self; A111 - Enjoy life like others; A114 - Positive attitude towards self; A116 - Able to do things as well as most other people; A117 - Feel one does not have much to be proud of; A122 - Always having someone to turn to if one needed help; A135 - Outlook about life in the next years (worse for higher scores); A110 - Life often seeming meaningless; A113 - Feeling good to be alive; A115 - Feeling as a person of worth, on an equal plane with others; A118 - Sometimes thinking that one is not good at all; A126 - Usually having a few friends around that one can get together with; A130 - Preference to engage in frightening things; A112 - The future often seeming hopeless; A119 - Feeling that one cannot do anything right; A120 - Feeling that one's life is not very useful; A121 - Feeling lonely a lot of times ; A123 - Often feeling left out of things; A125 - Often wishing one had more good friends; A133 - Often feeling bored; A134 - Often finding oneself having nothing to do; A127 - Gets a real kick out of doing things that are a little dangerous; A128 - Often testing oneself every by risky activities; A129 - Preference to explore

strange places; A131 –Preference for new, exciting experiences; A132 - Preference for exciting and unpredictable friends.

The model fit was excellent, with a GFI of 0.944 and, NFI of 0.90. However, the RMSEA was 0.077 and the model did not fit the data significantly ($\chi^2_1 = 6.28$ $p=0.012$). All the indicators showed highly significant factor loadings ($p<0.001$), with absolute factor loadings greater than 0.3 except for the indicator, often wishing one had more good friends (standardized coefficient = 0.092) (Table 39).

Having taken a weapon to school in the past one month (standardized coefficient = -0.86) and intentionally missing school in the past month (standardized coefficient = 0.29) showed highest and lowest absolute loading respectively on the first factor representing delinquency.

Considering the dimension self-perception, enjoying life as well as others (standardized coefficient = 0.688) and the feeling that one does not have much to be proud of (standardized coefficient = 0.667) showed highest loading while outlook about life in the next years (worse for higher scores) (standardized coefficient = 0.434) had the lowest absolute loading on this factor. Feeling good to be alive (standardized coefficient = 0.800) and the preference to engage in frightening things (standardized coefficient = 0.387) showed the highest and lowest loading on self-efficacy respectively. The feeling that one's life is not very useful (standardized coefficient = 0.798) and often finding oneself having nothing to do (standardized coefficient = 0.516) showed the highest and lowest loading on self-esteem for those items with loading greater than 0.3. For self-cognition, the preference for new and exciting experiences even if one must break rules (standardized coefficient = 0.744) had the highest loading while getting motivation out of doing things that are a little dangerous and preference to explore strange places equally loaded lowest to this factor (standardized coefficient = 0.657). The standardized coefficients indicated that all the items loaded positively and therefore changed in the same direction between the latent and observed variables (Table 39).

Table 39 Standardized and unstandardized coefficients from confirmatory factor analysis of self-perception

Latent Factor	Indicator	B	SE	Z	p-value	Beta
Self-perception	A108	1.000	0.000	NA	NA	0.529
	A109	0.975	0.086	11.282	0.000	0.516
	A111	1.300	0.095	13.731	0.000	0.688
	A114	0.969	0.089	10.864	0.000	0.513
	A116	1.000	0.090	11.068	0.000	0.529
	A117	1.260	0.103	12.253	0.000	0.667
	A122	1.022	0.094	10.835	0.000	0.541
	A135	0.821	0.095	8.646	0.000	0.434
Self esteem	A110	1.000	0.000	NA	NA	0.509
	A113	1.571	0.104	15.154	0.000	0.800
	A115	1.476	0.100	14.700	0.000	0.752
	A118	1.516	0.103	14.652	0.000	0.772
	A126	1.042	0.095	10.947	0.000	0.531
	A130	0.759	0.086	8.813	0.000	0.387
Self-efficacy	A112	1.000	0.000	NA	NA	0.443
	A119	1.351	0.116	11.675	0.000	0.599
	A120	1.800	0.153	11.762	0.000	0.798
	A121	1.448	0.129	11.253	0.000	0.642
	A123	1.241	0.114	10.916	0.000	0.550
	A125	0.207	0.094	2.199	0.028	0.092
	A133	1.208	0.118	10.243	0.000	0.536
	A134	1.164	0.118	9.865	0.000	0.516
Self-cognition	A127	1.000	0.000	NA	NA	0.657
	A128	1.059	0.055	19.204	0.000	0.696
	A129	1.027	0.056	18.510	0.000	0.675
	A131	1.132	0.054	21.085	0.000	0.744
	A132	1.115	0.054	20.651	0.000	0.733

*A108 - Feeling of happiness; A109 - Satisfied with self; A111 - Enjoy life like others; A114 - Positive attitude towards self; A116 - Able to do things as well as most other people; A117 - Feel one

does not have much to be proud of; A122 - Always having someone to turn to if one needed help; A135 - Outlook about life in the next years (worse for higher scores); A110 - Life often seeming meaningless; A113 - Feeling good to be alive; A115 - Feeling as a person of worth, on an equal plane with others; A118 - Sometimes thinking that one is not good at all; A126 - Usually having a few friends around that one can get together with; A130 - Preference to engage in frightening things; A112 - The future often seeming hopeless; A119 - Feeling that one cannot do anything right; A120 - Feeling that one's life is not very useful; A121 - Feeling lonely a lot of times; A123 - Often feeling left out of things; A125 - Often wishing one had more good friends; A133 - Often feeling bored; A134 - Often finding oneself having nothing to do; A127 - Gets a real kick out of doing things that are a little dangerous; A128 - Often testing oneself every by risky activities; A129 - Preference to explore strange places; A132 - Preference for exciting and unpredictable friends

Social cognition

Figure 10 shows the tested model where the circles represent latent variables and the rectangles represent measure variables.

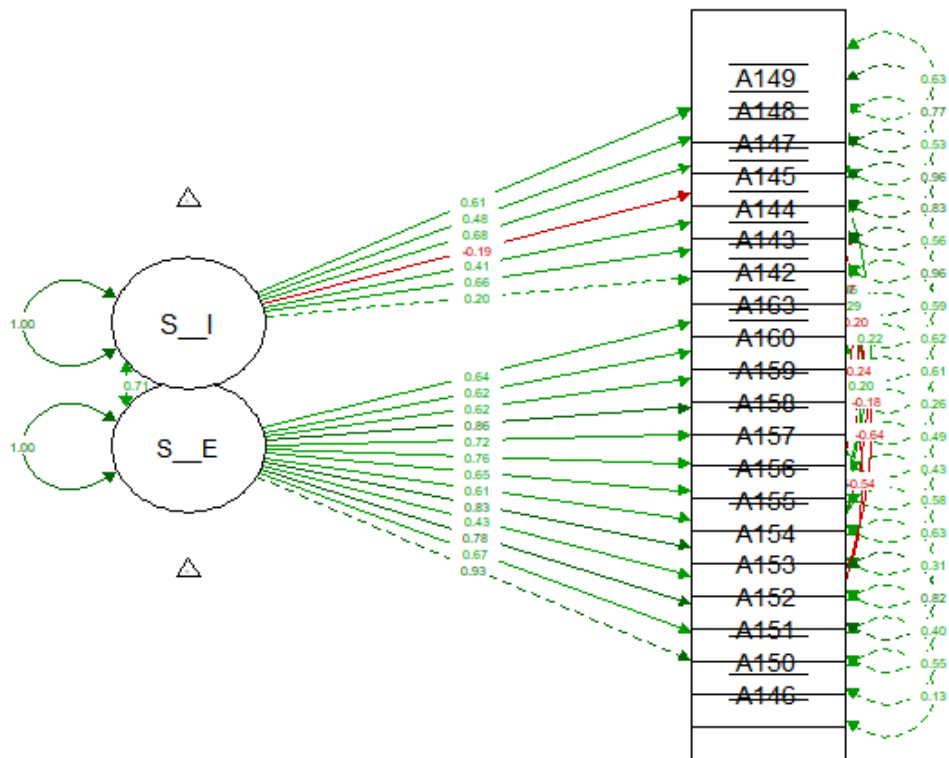


Figure 10 Confirmatory analysis for social cognition.

Bentler-Bonett Normed Fit Index (NFI) = 0.991; Goodness of Fit Index = 0.993; root mean square error of approximation = .040; $\chi^2_1 = 2.43$; $p=0.12$. S_I - internal social cognition; S_E - internal social cognition; A146 – Feel foolish; A150 - I am going to be sick; A151 - I am inadequate; A152 - I will babble or talk funnily; A153 - Inferior; A154 - I will be unable to concentrate; A155 - I will be unable to write properly; A156 - People are not interested in me; A157 - People will not like me; A158 - I am vulnerable; A159 - I will sweat or perspire; A160 - I will go red; A163 - People think I am boring; A142 - I will be unable to speak; A143 - I am unlikeable; A144 - I am going to tremble or shake uncontrollably; A145 - People will stare at me; A147 - People will reject me; A148 - I will be paralysed with fear; A149 - I will drop or spill things.

The model fit was excellent, with a GFI of 0.993, NFI of 0.991 and RMSEA was 0.04. The model fit the data significantly ($\chi^2_1 = 2.43$; $p=0.12$). All the indicators showed highly significant factor loadings ($p<0.001$), with absolute factor loadings greater than 0.3 except for inability to speak (standardized

coefficient = 0.199) and feeling people will stare at them (standardized coefficient = -0.191) when they were nervous or frightened (Table 40).

The feeling when they were nervous or frightened that one was foolish (standardized coefficient = 0.934) and they would babble or talk funnily (standardized coefficient = 0.427) showed highest and lowest absolute loading respectively on the external dimension of social cognition. Concerning the internal dimension of social cognition, the feeling when they were nervous or frightened that people will reject them (standardized coefficient = 0.685) and that they will tremble or shake uncontrollably (standardized coefficient = 0.410) showed highest and lowest absolute loading respectively among the items with loading greater than 0.3.

The standardized coefficients indicated that all the items loaded positively and therefore changed in the same direction between the latent and observed variables except for the feeling that people will stare at the student which showed a weak negative loading (standardized coefficient = -0.191) (Table 40).

Table 40 *Standardized and unstandardized coefficients from confirmatory factor analysis of social cognition*

Latent Factor	Indicator* B	SE	Z	p-value	Beta	
Social cognition:						
external	A146	1.000	0.000	NA	NA	0.934
	A150	0.715	0.026	27.736	0.000	0.668
	A151	0.833	0.021	39.485	0.000	0.778
	A152	0.457	0.033	13.648	0.000	0.427
	A153	0.890	0.020	44.355	0.000	0.832
	A154	0.648	0.029	22.724	0.000	0.605
	A155	0.695	0.026	26.535	0.000	0.649
	A156	0.810	0.021	38.747	0.000	0.757
	A157	0.767	0.023	33.137	0.000	0.716
	A158	0.918	0.020	46.980	0.000	0.857
	A159	0.665	0.027	24.658	0.000	0.621
	A160	0.661	0.028	23.413	0.000	0.617
	A163	0.685	0.027	25.317	0.000	0.640

Social cognition:

internal	A142	1.000	0.000	NA	NA	0.199
	A143	3.325	0.776	4.284	0.000	0.661
	A144	2.060	0.456	4.520	0.000	0.410
	A145	-0.961	0.399	-2.411	0.016	-0.191
	A147	3.446	0.823	4.189	0.000	0.685
	A148	2.421	0.573	4.228	0.000	0.481
	A149	3.060	0.732	4.180	0.000	0.608

* List of some thoughts that go through the minds when one is nervous or frightened. A146 - Foolish; A150 - I am going to be sick; A151 - I am inadequate; A152 - I will babble or talk funnily; A153 - Inferior; A154 - I will be unable to concentrate; A155 - I will be unable to write properly; A156 - People are not interested in me; A157 - People will not like me; A158 - I am vulnerable ; A159 - I will sweat/perspire; A160 - I go red ; A163 - People think I am boring; A142 - I will be unable to speak; A143 - I am unlikeable; A144 - I am going to tremble or shake uncontrollably; A145 - People will stare at me; A147 - People will reject me; A148 - I will be paralysed with fear; A149 - I will drop or spill things

Structural Equation Modelling

Two SEM models were run to test hypothesized models on pathways through which personal and contextual factors influence the impact of different dimensions of engagement on the occurrence of delinquency and substance use. The models were used to test the hypothesis that personal and contextual factors may have a direct impact on occurrence of delinquency and substance use. The models were also used to test partial mediation where the effects of personal and contextual factors are partially mediated by engagement.

Pathways influencing delinquency

Figure 11 graphically illustrates the structural form of the hypothesized model while Table 41 shows the parameter estimates and associated statistics for pathways through which personal and contextual factors influence the impact of different dimensions of engagement on occurrence of delinquency.

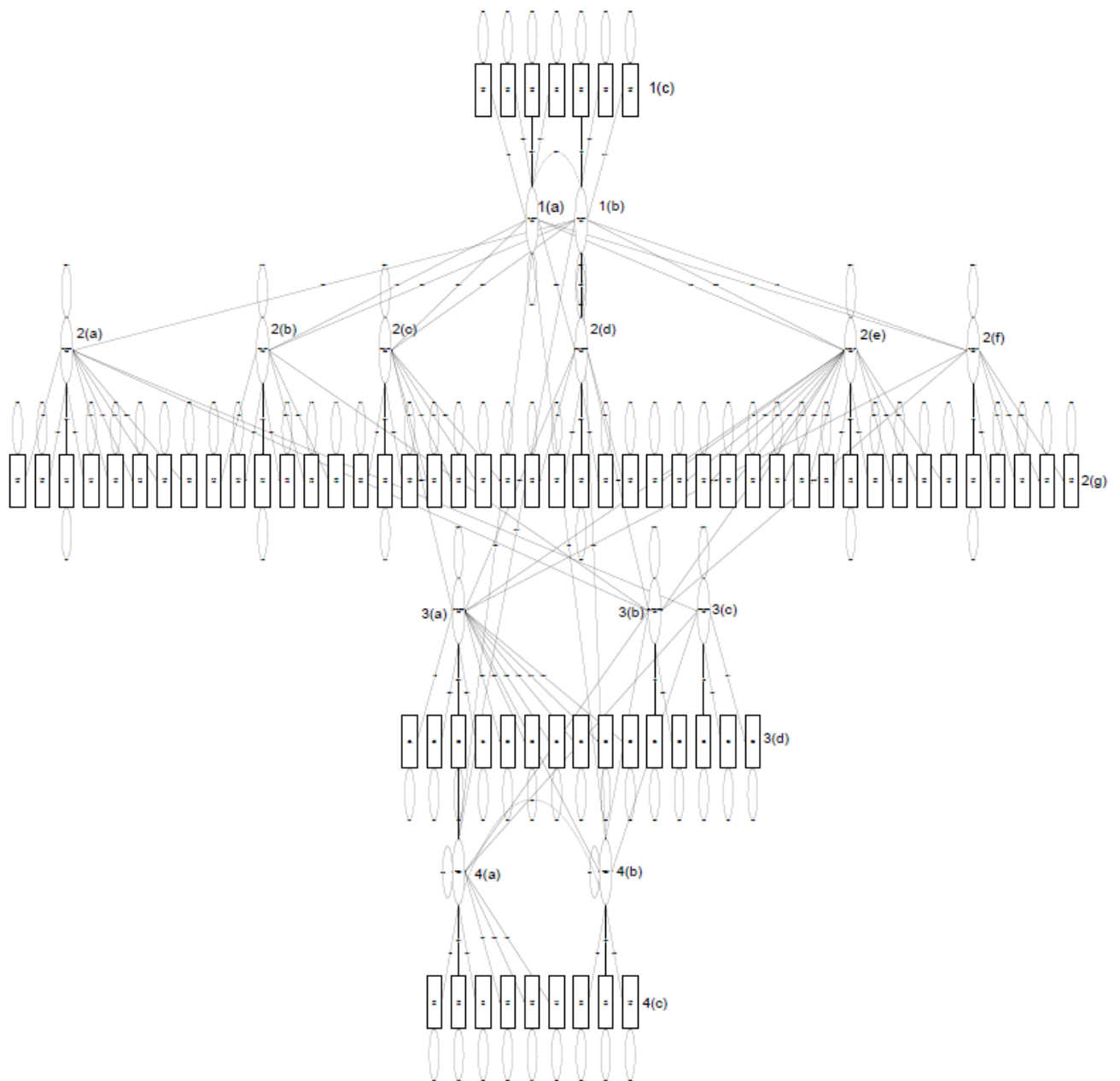


Figure 11 Hypothesized structural equation model assessing pathways through which personal and contextual factors influence the impact of different dimensions of engagement on occurrence of delinquency.

Bentler-Bonett Normed Fit Index = .9; Goodness of Fit Index = .9; root mean square error of approximation = .067; $\chi^2_1 = 5$; $p=0$. 1(a) – parental monitoring; 1(b) – parental involvement; 1(c) – parental involvement observed variables; 2(a) – self-perception; 2(b) – self-esteem; 2(c) – self-efficacy; 2(d) – self-cognition; 2(e) – social cognition: external; 2(f) – social cognition: internal; 2(g) – self-perception observed variables; 3(a) – emotional engagement; 3(b) – negative emotional engagement; 3(c) – social engagement; 3(d) – engagement observed variables; 4(a) – delinquency 1; 4(b) – delinquency 2; 4(c) delinquency observed variables.

The hypothesized model was a good fit to the data with a NFI of 0.9, GFI of .9; and RMSEA of .067. The normed chi-square however showed a p-value of 0.025 ($\chi^2=5$) which was slightly less than 0.05. Modification was therefore made based on both modification indices and theoretical rationale by adding residual correlations between: involvement in a serious fight in the last one year and sale of an illegal drug in the past one year, involvement in a serious fight in the last one year and taking other student's belongings in the past year, sometimes thinking that one is not good at all and feeling that one cannot do anything right, having parents or guardians check on whether one did their homework and how often parents or guardians provide help with homework when needed, parental knowledge of who they went out with at night and knowledge of where one was after school by parents or guardians, class lateness without approved excuse in an average school week and entry into a building without permission in the past year, feeling one does not have much to be proud of and feeling that one's life is not very useful, how one thought others would feel if they cheated on a test and how one thought most students would feel if one intentionally did things to make their teachers angry, inability to concentrate and inability to write properly when one was nervous or frightened, ability to do things as well as most other people and feeling as a person of worth on an equal plane with others, usually having a few friends around that one can get together with and preference for exciting and unpredictable friends, often feeling bored and often finding oneself having nothing to do, and the feeling when they got they are afraid or nervous that people are not interested in them and people will not like them.

Direct Effects

Emotional engagement was negatively associated with delinquency 1 (standardized coefficient = -0.983, $p=0$) and predictive of higher delinquency 2 (standardized coefficient = 1.262, $p=0$). Negative emotional engagement was negatively associated with delinquency 1 (standardized coefficient = -1.441, $p=0.001$) and predictive of higher delinquency 2 (standardized coefficient = 1.733, $p=0.001$) (Table 41).

Parental involvement was positively associated with self-cognition (standardized coefficient = 0.537, $p=0$), self-efficacy (standardized coefficient = 0.792, $p=0$), self-perception (standardized coefficient = 0.667, $p=0$), social cognition: internal (standardized coefficient = 0.514, $p=0$), delinquency 1 (standardized coefficient = 2.186, $p=0$) but predictive of lower delinquency 2 (standardized coefficient = -2.416, $p=0$).

Parental monitoring was negatively associated with delinquency 1 (standardized coefficient = -1.471, $p = 0.001$), self-cognition (standardized coefficient = -0.562, $p = 0$) but predictive of higher delinquency 2 (standardized coefficient = 1.373, $p = 0.009$), self-efficacy (standardized coefficient = 0.121, $p = 0.023$), self-esteem (standardized coefficient = 0.759, $p = 0$), external social cognition (standardized coefficient = 0.895, $p = 0$) and internal social cognition (standardized coefficient = 0.799, $p = 0$).

Self-cognition was positively predictive of emotional engagement (standardized coefficient = 0.169, $p = 0.015$) and negative emotional engagement (standardized coefficient = 0.265, $p = 0.001$). Self-efficacy was negatively associated with emotional engagement (standardized coefficient = -1.426, $p = 0$). Self-esteem was predictive of lower negative emotional engagement (standardized coefficient = -0.721, $p = 0$). Self-perception was predictive of lower emotional engagement (standardized coefficient = -0.266, $p = 0.015$) but higher social engagement (standardized coefficient = 0.189, $p = 0.002$). External social- cognition was predictive of lower emotional engagement (standardized coefficient = -1.436, $p = 0$) and negative emotional engagement (standardized coefficient = -1.224, $p = 0$). However, social cognition: internal was positively associated with both emotional engagement (standardized coefficient = 2.631, $p = 0$) and negative emotional engagement (standardized coefficient = 1.872, $p = 0$).

Indirect Effects

There were significant positive relationships between parental involvement and delinquency 1 which were mediated by: self-perception through negative emotional engagement (standardized indirect coefficient = 0.256, $p = 0.001$); and self-efficacy through emotional engagement (standardized coefficient = 1.111, $p = 0.002$) (Table 41).

Parental involvement was also predictive of lower delinquency 1, an effect which was mediated by: self-cognition through emotional engagement (standardized coefficient = -0.09, $p = 0.031$), self-cognition through negative emotional engagement (standardized coefficient = -0.205, $p = 0.018$), internal social cognition through emotional engagement (standardized coefficient = -1.33, $p = 0.002$), internal social cognition through negative emotional engagement (standardized coefficient = -1.387, $p = 0$), internal social cognition through emotional engagement (standardized coefficient = -1.33, $p = 0.002$), and internal social cognition through negative emotional engagement (standardized coefficient = -1.387, $p = 0$) (Table 41).

There were significant negative relationships between parental involvement and delinquency 2 which were mediated by: self-perception through negative emotional engagement (standardized coefficient = -0.307, $p = 0.001$), and self-efficacy through emotional engagement (standardized coefficient = -1.426, $p = 0.001$). However, parental involvement was predictive of higher delinquency 2 in the presence of mediation by: self-cognition through emotional engagement (standardized coefficient = 0.115, $p = 0.024$), self-cognition through negative emotional engagement (standardized coefficient = 0.246, $p = 0.018$), social cognition: internal through emotional engagement (standardized coefficient = 1.708, $p = 0.002$), internal social cognition through negative emotional engagement (standardized coefficient = 1.668, $p = 0$), internal social cognition through emotional engagement (standardized coefficient = 1.708, $p = 0.002$), and internal social cognition through negative emotional engagement (standardized coefficient = 1.668, $p = 0$) (Table 41).

Parental monitoring was predictive of higher delinquency 1 in the presence of mediation by: negative emotional engagement (standardized coefficient = 0.788, $p = 0$), self-cognition through emotional engagement (standardized coefficient = 0.094, $p = 0.044$), self-cognition through negative emotional engagement (standardized coefficient = 0.214, $p = 0.019$), external social cognition through emotional engagement (standardized coefficient = 1.263, $p = 0.003$), external social cognition through negative emotional engagement (standardized coefficient = 1.579, $p = 0.003$), internal social cognition through emotional engagement (standardized coefficient = -2.065, $p = 0.001$), internal social cognition through emotional engagement (standardized coefficient = -2.065, $p = 0.001$), and internal social cognition through negative emotional engagement (standardized coefficient = -2.155, $p = 0.001$).

Parental monitoring was predictive of lower delinquency 2 when the effect was mediated by: self-esteem through negative emotional engagement (standardized coefficient = -0.947, $p = 0$), self-cognition through emotional engagement (standardized coefficient = -0.12, $p = 0.036$), self-cognition through negative emotional engagement (standardized coefficient = -0.257, $p = 0.018$), social external cognition through emotional engagement (standardized coefficient = -1.622, $p = 0.001$), and social external cognition through negative emotional engagement (standardized coefficient = -1.898, $p = 0.002$). However, parental monitoring was predictive of higher delinquency 2 when the effect was mediated by: internal social cognition through emotional engagement (standardized coefficient = 2.652, $p = 0$), internal social cognition through emotional engagement (standardized coefficient = 2.652, $p = 0$), and internal social cognition through negative emotional engagement (standardized coefficient = 2.59, $p = 0$).

Total Effect

Parental involvement showed a significantly negative total predictive effect on delinquency 2 when considering both the direct predictive effect of parental involvement on delinquency 2 and the mediation role of: self-perception through negative emotional engagement (standardized total coefficient = -2.723, $p = 0$), self-perception through social engagement (standardized total coefficient = -2.402, $p = 0$), self-esteem through negative emotional engagement (standardized total coefficient = -2.38, $p = 0$), self-efficacy through emotional engagement (standardized total coefficient = -3.842, $p = 0$), self-cognition through emotional engagement (standardized total coefficient = -2.301, $p = 0$), self-cognition through negative emotional engagement (standardized total coefficient = -2.169, $p = 0$), external social cognition through emotional engagement (standardized total coefficient = -2.255, $p = 0$), and external social cognition through negative emotional engagement (standardized total coefficient = -2.228, $p = 0$) (Table 41).

There were however significant positive total relationships between parental involvement and delinquency 1 when accounting for both the direct predictive effect of parental involvement on delinquency 1 and the mediation role of: self-perception through negative emotional engagement (standardized total coefficient = 2.441, $p = 0$), self-perception through social engagement (standardized total coefficient = 2.185, $p = 0$), self-esteem through negative emotional engagement (standardized total coefficient = 2.156, $p = 0$), self-efficacy through emotional engagement (standardized total coefficient = 3.296, $p = 0$), self-cognition through emotional engagement (standardized total coefficient = 2.096, $p = 0$), self-cognition through negative emotional engagement (standardized total coefficient = 1.981, $p = 0$), external social cognition through emotional engagement (standardized total coefficient = 2.06, $p = 0$), and external social cognition through negative emotional engagement (standardized total coefficient = 2.029, $p = 0$) (Table 41).

There were significant negative total relationships between parental monitoring and delinquency 1 consisting of both the direct predictive effect of parental monitoring on delinquency 1 and the mediation role of: self-efficacy through emotional engagement (standardized total coefficient = -1.301, $p = 0.006$), self-cognition through emotional engagement (standardized total coefficient = -1.378, $p = 0.003$), self-cognition through negative emotional engagement (standardized total coefficient = -1.257, $p = 0.002$), internal social cognition through emotional engagement (standardized total coefficient = -3.536, $p = 0$), internal social cognition through emotional

engagement (standardized total coefficient = -3.536, $p = 0$), and internal social cognition through negative emotional engagement (standardized total coefficient = -3.626, $p = 0$) (Table 41).

There were significant positive total relationships between parental monitoring and delinquency 2 when accounting for both the direct predictive effect of parental monitoring on delinquency 2 and the mediation role of: self-efficacy through emotional engagement (standardized total coefficient = 1.155, $p = 0.036$), self-cognition through emotional engagement (standardized total coefficient = 1.253, $p = 0.018$), self-cognition through negative emotional engagement (standardized total coefficient = 1.116, $p = 0.015$), internal social cognition through emotional engagement (standardized total coefficient = 4.025, $p = 0$), internal social cognition through emotional engagement (standardized total coefficient = 4.025, $p = 0$), and internal social cognition through negative emotional engagement (standardized total coefficient = 3.963, $p = 0$) (Table 41).

Table 41 Results from structural equation model assessing pathways through which personal and contextual factors influence the impact of different dimensions of engagement on occurrence of delinquency

Effect	Model*	B	SE	Z	p-value	B
Direct Effect	Self-esteem<-Parental monitoring	1.319	0.148	8.925	0.000	0.759
	Self-efficacy<-Parental monitoring	0.174	0.076	2.273	0.023	0.121
	Self-cognition<-Parental monitoring	-1.110	0.139	-7.969	0.000	-0.562
	Self-perception<-Parental involvement	0.999	0.139	7.204	0.000	0.667
	Self-esteem<-Parental involvement	-0.051	0.132	-0.382	0.703	-0.028
	Self-efficacy<-Parental involvement	1.158	0.181	6.411	0.000	0.792
	Self-cognition<-Parental involvement	1.083	0.187	5.796	0.000	0.537
	Social cognition: external<-Parental monitoring	2.453	0.265	9.243	0.000	0.895
	Social cognition: internal<-Parental monitoring	1.289	0.180	7.177	0.000	0.799
	Social cognition: external<-Parental involvement	-0.248	0.260	-0.951	0.341	-0.089
	Social cognition: internal<-Parental involvement	0.846	0.199	4.264	0.000	0.514
	Negative emotional engagement<-Self perception	-0.097	0.040	-2.438	0.015	-0.266
	Social engagement<-Self perception	0.197	0.063	3.151	0.002	0.189
	Negative emotional engagement<-Self esteem	-0.221	0.059	-3.721	0.000	-0.721
	Emotional Engagement<-Self efficacy	-1.552	0.305	-5.084	0.000	-1.426
	Emotional Engagement<-Self cognition	0.134	0.055	2.432	0.015	0.169
	Negative emotional engagement<-Self cognition	0.072	0.022	3.206	0.001	0.265
Emotional Engagement<-Social cognition: external	-0.817	0.153	-5.325	0.000	-1.436	

	Negative emotional engagement←Social cognition: external	-0.238	0.057	-4.209	0.000	-1.224
	Emotional Engagement←Social cognition: internal	2.542	0.396	6.422	0.000	2.631
	Negative emotional engagement←Social cognition: internal	0.619	0.145	4.260	0.000	1.872
	Delinquency 1←Emotional Engagement	-0.912	0.172	-5.309	0.000	-0.983
	Delinquency 1←Negative emotional engagement	-3.906	1.206	-3.240	0.001	-1.441
	Delinquency 1←Social engagement	-0.004	0.050	-0.076	0.939	-0.004
	Delinquency 2←Emotional Engagement	1.578	0.248	6.359	0.000	1.262
	Delinquency 2←Negative emotional engagement	6.328	1.936	3.268	0.001	1.733
	Delinquency 2←Social engagement	0.137	0.075	1.824	0.068	0.108
	Delinquency 1←Parental monitoring	-2.129	0.669	-3.181	0.001	-1.471
	Delinquency 2←Parental monitoring	2.679	1.029	2.604	0.009	1.373
	Delinquency 1←Parental involvement	3.225	0.796	4.054	0.000	2.186
	Delinquency 2←Parental involvement	-4.804	1.205	-3.988	0.000	-2.416
Indirect Effect	Delinquency 1 ←Negative emotional engagement← Parental monitoring	1.141	0.324	3.521	0.000	0.788
	Delinquency 1 ← Emotional Engagement ← Self efficacy ← Parental monitoring	0.246	0.139	1.770	0.077	0.170
	Delinquency 1 ← Emotional Engagement ← Self cognition ← Parental monitoring	0.135	0.067	2.018	0.044	0.094
	Delinquency 1 ← Negative emotional engagement ← Self cognition ← Parental monitoring	0.310	0.132	2.349	0.019	0.214

Delinquency 1 ← Negative emotional engagement ← Self-perception ← Parental involvement	0.377	0.116	3.246	0.001	0.256
Delinquency 1 ← Social engagement ← Self-perception ← Parental involvement	-0.001	0.010	-0.076	0.940	-0.001
Delinquency 1 ← Negative emotional engagement ← Self-esteem ← Parental involvement	-0.044	0.117	-0.373	0.709	-0.030
Delinquency 1 ← Emotional Engagement ← Self efficacy ← Parental involvement	1.639	0.522	3.138	0.002	1.111
Delinquency 1 ← Emotional Engagement ← Self cognition ← Parental involvement	-0.132	0.061	-2.162	0.031	-0.090
Delinquency 1 ← Negative emotional engagement ← Self cognition ← Parental involvement	-0.303	0.128	-2.364	0.018	-0.205
Delinquency 1 ← Emotional Engagement ← Social cognition: external ← Parental monitoring	1.828	0.616	2.970	0.003	1.263
Delinquency 1 ← Negative emotional engagement ← Social cognition: external ← Parental monitoring	2.285	0.769	2.973	0.003	1.579
Delinquency 1 ← Emotional Engagement ← Social cognition: internal ← Parental monitoring	-2.989	0.920	-3.248	0.001	-2.065
Delinquency 1 ← Emotional Engagement ← Social cognition: internal ← Parental involvement	-1.962	0.640	-3.064	0.002	-1.330
Delinquency 1 ← Negative emotional engagement ← Social cognition: internal ← Parental involvement	-2.047	0.550	-3.725	0.000	-1.387

Delinquency 1 <- Emotional Engagement <- Social cognition: internal <- Parental monitoring	-2.989	0.920	-3.248	0.001	-2.065
Delinquency 1 <- Negative emotional engagement <- Social cognition: internal <- Parental monitoring	-3.118	0.904	-3.447	0.001	-2.155
Delinquency 1 <- Emotional Engagement <- Social cognition: external <- Parental involvement	-0.185	0.208	-0.888	0.374	-0.125
Delinquency 1 <- Negative emotional engagement <- Social cognition: external <- Parental involvement	-0.231	0.268	-0.861	0.389	-0.156
Delinquency 1 <- Emotional Engagement <- Social cognition: internal <- Parental involvement	-1.962	0.640	-3.064	0.002	-1.330
Delinquency 1 <- Negative emotional engagement <- Social cognition: internal <- Parental involvement	-2.047	0.550	-3.725	0.000	-1.387
Delinquency 2 <- Negative emotional engagement <-Self- esteem<- Parental monitoring	-1.848	0.517	-3.574	0.000	-0.947
Delinquency 2 <-Emotional Engagement <-Self efficacy <- Parental monitoring	-0.425	0.232	-1.830	0.067	-0.218
Delinquency 2 <- Emotional Engagement <- Self cognition <- Parental monitoring	-0.234	0.112	-2.096	0.036	-0.120
Delinquency 2 <- Negative emotional engagement <- Self cognition <- Parental monitoring	-0.502	0.213	-2.356	0.018	-0.257
Delinquency 2 <-Negative emotional engagement <-Self- perception<- Parental involvement	-0.611	0.185	-3.305	0.001	-0.307

Delinquency 2 <- Social engagement <-Self-perception<- Parental involvement	0.027	0.017	1.564	0.118	0.014
Delinquency 2 <- Negative emotional engagement <-Self- esteem<- Parental involvement	0.071	0.190	0.373	0.709	0.036
Delinquency 2 <- Emotional Engagement <- Self efficacy <- Parental involvement	-2.836	0.859	-3.303	0.001	-1.426
Delinquency 2 <- Emotional Engagement <- Self cognition <- Parental involvement	0.229	0.101	2.258	0.024	0.115
Delinquency 2 <- Negative emotional engagement <- Self cognition <- Parental involvement	0.490	0.207	2.369	0.018	0.246
Delinquency 2 <- Emotional Engagement <-Social cognition: external <- Parental monitoring	-3.164	0.972	-3.255	0.001	-1.622
Delinquency 2 <- Negative emotional engagement <- Social cognition: external <- Parental monitoring	-3.701	1.209	-3.061	0.002	-1.898
Delinquency 2 <- Emotional Engagement <- Social cognition: internal <- Parental monitoring	5.172	1.431	3.614	0.000	2.652
Delinquency 2 <-Emotional Engagement <- Social cognition: internal <- Parental involvement	3.396	1.075	3.159	0.002	1.708
Delinquency 2 <- Negative emotional engagement <- Social cognition: internal <- Parental involvement	3.316	0.904	3.670	0.000	1.668
Delinquency 2 <-Emotional Engagement <- Social cognition: internal <- Parental monitoring	5.172	1.431	3.614	0.000	2.652

	Delinquency 2 <- Negative emotional engagement <- Social cognition: internal <- Parental monitoring	5.051	1.381	3.658	0.000	2.590
	Delinquency 2 <- Emotional Engagement <- Social cognition: external <- Parental involvement	0.319	0.355	0.899	0.368	0.161
	Delinquency 2 <- Negative emotional engagement <- Social cognition: external <- Parental involvement	0.374	0.431	0.868	0.385	0.188
	Delinquency 2 <- Emotional Engagement <- Social cognition: internal <- Parental involvement	3.396	1.075	3.159	0.002	1.708
	Delinquency 2 <- Negative emotional engagement <- Social cognition: internal <- Parental involvement	3.316	0.904	3.670	0.000	1.668
Total Effect	Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Negative emotional engagement <- Self-esteem <- Parental monitoring)	-0.988	0.546	-1.808	0.071	-0.683
	Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Emotional Engagement <- Self efficacy <- Parental monitoring)	-1.883	0.689	-2.734	0.006	-1.301
	Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Emotional Engagement <- Self cognition <- Parental monitoring)	-1.994	0.666	-2.994	0.003	-1.378
	Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Negative emotional engagement <- Self cognition <- Parental monitoring)	-1.819	0.583	-3.119	0.002	-1.257

Delinquency 1 <- Parental involvement + (Delinquency 1 <- Negative emotional engagement <-Self-perception<- Parental involvement)	3.602	0.833	4.326	0.000	2.441
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Social engagement <-Self-perception<- Parental involvement)	3.224	0.795	4.054	0.000	2.185
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Negative emotional engagement <-Self-esteem<- Parental involvement)	3.181	0.747	4.260	0.000	2.156
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Emotional Engagement <- Self efficacy <- Parental involvement)	4.863	1.114	4.366	0.000	3.296
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Emotional Engagement <- Self cognition <- Parental involvement)	3.093	0.776	3.987	0.000	2.096
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Negative emotional engagement <- Self cognition <- Parental involvement)	2.922	0.709	4.120	0.000	1.981
Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Emotional Engagement <- Social cognition: external <- Parental monitoring)	-0.301	0.849	-0.354	0.723	-0.208

Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Negative emotional engagement <- Social cognition: external <- Parental monitoring)	0.156	0.546	0.286	0.775	0.108
Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Emotional Engagement <- Social cognition: internal <- Parental monitoring)	-5.117	1.182	-4.330	0.000	-3.536
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Emotional Engagement <- Social cognition: internal <- Parental involvement)	1.263	0.914	1.381	0.167	0.856
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Negative emotional engagement <- Social cognition: internal <- Parental involvement)	1.178	0.651	1.810	0.070	0.798
Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Emotional Engagement <- Social cognition: internal <- Parental monitoring)	-5.117	1.182	-4.330	0.000	-3.536
Delinquency 1 <- Parental monitoring + (Delinquency 1 <- Negative emotional engagement <- Social cognition: internal <- Parental monitoring)	-5.247	1.357	-3.868	0.000	-3.626
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Emotional Engagement <- Social cognition: external <- Parental involvement)	3.040	0.719	4.228	0.000	2.060

Delinquency 1 <- Parental involvement + (Delinquency 1 <- Negative emotional engagement <- Social cognition: external <- Parental involvement)	2.994	0.680	4.402	0.000	2.029
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Emotional Engagement <- Social cognition: internal <- Parental involvement)	1.263	0.914	1.381	0.167	0.856
Delinquency 1 <- Parental involvement + (Delinquency 1 <- Negative emotional engagement <- Social cognition: internal <- Parental involvement)	1.178	0.651	1.810	0.070	0.798
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Negative emotional engagement <- Self-esteem <- Parental monitoring)	0.831	0.863	0.962	0.336	0.426
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Emotional Engagement <- Self efficacy <- Parental monitoring)	2.253	1.075	2.096	0.036	1.155
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Emotional Engagement <- Self cognition <- Parental monitoring)	2.445	1.030	2.373	0.018	1.253
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Negative emotional engagement <- Self cognition <- Parental monitoring)	2.177	0.893	2.439	0.015	1.116

Delinquency 2 <- Parental involvement + (Delinquency 2 <- Negative emotional engagement <-Self-perception<- Parental involvement)	-5.415	1.259	-4.303	0.000	-2.723
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Social engagement <-Self-perception<- Parental involvement)	-4.777	1.203	-3.971	0.000	-2.402
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Negative emotional engagement <-Self-esteem<- Parental involvement)	-4.733	1.136	-4.167	0.000	-2.380
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Emotional Engagement <- Self efficacy <- Parental involvement)	-7.640	1.716	-4.452	0.000	-3.842
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Emotional Engagement <- Self cognition <- Parental involvement)	-4.576	1.179	-3.880	0.000	-2.301
Delinquency 2 <- Parental involvement + (Delinquency 2 <-Negative emotional engagement <-Self cognition <- Parental involvement)	-4.314	1.065	-4.050	0.000	-2.169
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Emotional Engagement <- Social cognition: external <- Parental monitoring)	-0.485	1.370	-0.354	0.723	-0.249

Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Negative emotional engagement <- Social cognition: external <- Parental monitoring)	-1.022	0.872	-1.173	0.241	-0.524
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Emotional Engagement <- Social cognition: internal <- Parental monitoring)	7.851	1.764	4.451	0.000	4.025
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Emotional Engagement <- Social cognition: internal <- Parental involvement)	-1.409	1.451	-0.970	0.332	-0.708
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Negative emotional engagement <- Social cognition: internal <- Parental involvement)	-1.488	0.966	-1.541	0.123	-0.748
Delinquency 2 <- Parental monitoring + (Delinquency 2 <-Emotional Engagement <- Social cognition: internal <- Parental monitoring)	7.851	1.764	4.451	0.000	4.025
Delinquency 2 <- Parental monitoring + (Delinquency 2 <- Negative emotional engagement <- Social cognition: internal <- Parental monitoring)	7.730	2.046	3.778	0.000	3.963
Delinquency 2 <- Parental involvement + (Delinquency 2 <- Emotional Engagement <- Social cognition: external <- Parental involvement)	-4.485	1.108	-4.047	0.000	-2.255

Delinquency 2 ← Parental involvement + (Delinquency 2 ← Negative emotional engagement ← Social cognition: external ← Parental involvement)	-4.430	1.049	-4.222	0.000	-2.228
Delinquency 2 ← Parental involvement + (Delinquency 2 ← Emotional Engagement ← Social cognition: internal ← Parental involvement)	-1.409	1.451	-0.970	0.332	-0.708
Delinquency 2 ← Parental involvement + (Delinquency 2 ← Negative emotional engagement ← Social cognition: internal ← Parental involvement)	-1.488	0.966	-1.541	0.123	-0.748

*The arrow points to the direction of the effect

Pathways influencing substance use

The exploration of the modification indices and factor loadings of the baseline SEM analysis indicated that self-illicit substance use may consist of more than one factor. An exploratory analysis was conducted on self-illicit substances variables. Parallel analysis suggested three factors and components. Table 42 presents rotated (varimax) component loadings for adolescent illicit substance use items. Three factors were distinguished. The questions that loaded highly on the first factor were self-use frequencies of heroin with the highest loading of 0.85, cocaine and either LSD or psychedelics or tranquilisers with the lowest loading of 0.62. Considering the second factor, the number of times one tried to stop using cannabis loaded highest with a loading of 0.85 followed by the number of times one tried to stop using other substances, and self-use frequency of cannabis with the lowest loading of 0.47. The third factor consisted of self-use frequency of barbiturates with the highest loading of 0.67 followed by amphetamine and other substances with the lowest loading of 0.38. The first factor consisted of commonly used and known illegal substances (Peltzer et al., 2010; Ramlagan et al., 2010b) while the second factor consists of cannabis associated substances. The third factor consists of amphetamine and barbiturates which are both organic compounds that act as central nervous system stimulants. These three factors during the SEM analysis were referred to as hard drugs, cannabis like, and CNS stimulants for the first, second and third factor respectively.

Table 42 *Rotated component loadings for adolescent illicit substance use items*

Item	Component			Communalities
	1	2	3	
Frequency: heroin use	0.85			0.74
Frequency: cocaine use	0.77	0.32		0.7
Frequency: LSD, psychedelics and tranquilizer use	0.62			0.49
Number of times one tried to stop using cannabis		0.87		0.8
Number of times one tried to stop using other substances		0.62		0.48
Frequency: cannabis use		0.47		0.3
Frequency: barbiturates use			0.67	0.45
Frequency: amphetamine use			0.6	0.44
Frequency: other substances use		0.31	0.38	0.24
Eigenvalues	1.89	1.63	1.12	

Percent of total variance	21	18	12
Number of test measures	3	3	3

*Factor loadings >0.30

The measure of fit based upon off diagonal values was 0.94 which is higher than the cut-off of 0.9 (Unwin, 2013) which indicated that three factors were sufficient.

Figure 12 graphically illustrates the structural form of the hypothesized model while Table 43 shows the parameter estimates and the related statistics from the analysis of pathways through which personal and contextual factors influence the impact of the different dimensions of engagement on the occurrence of substance use.

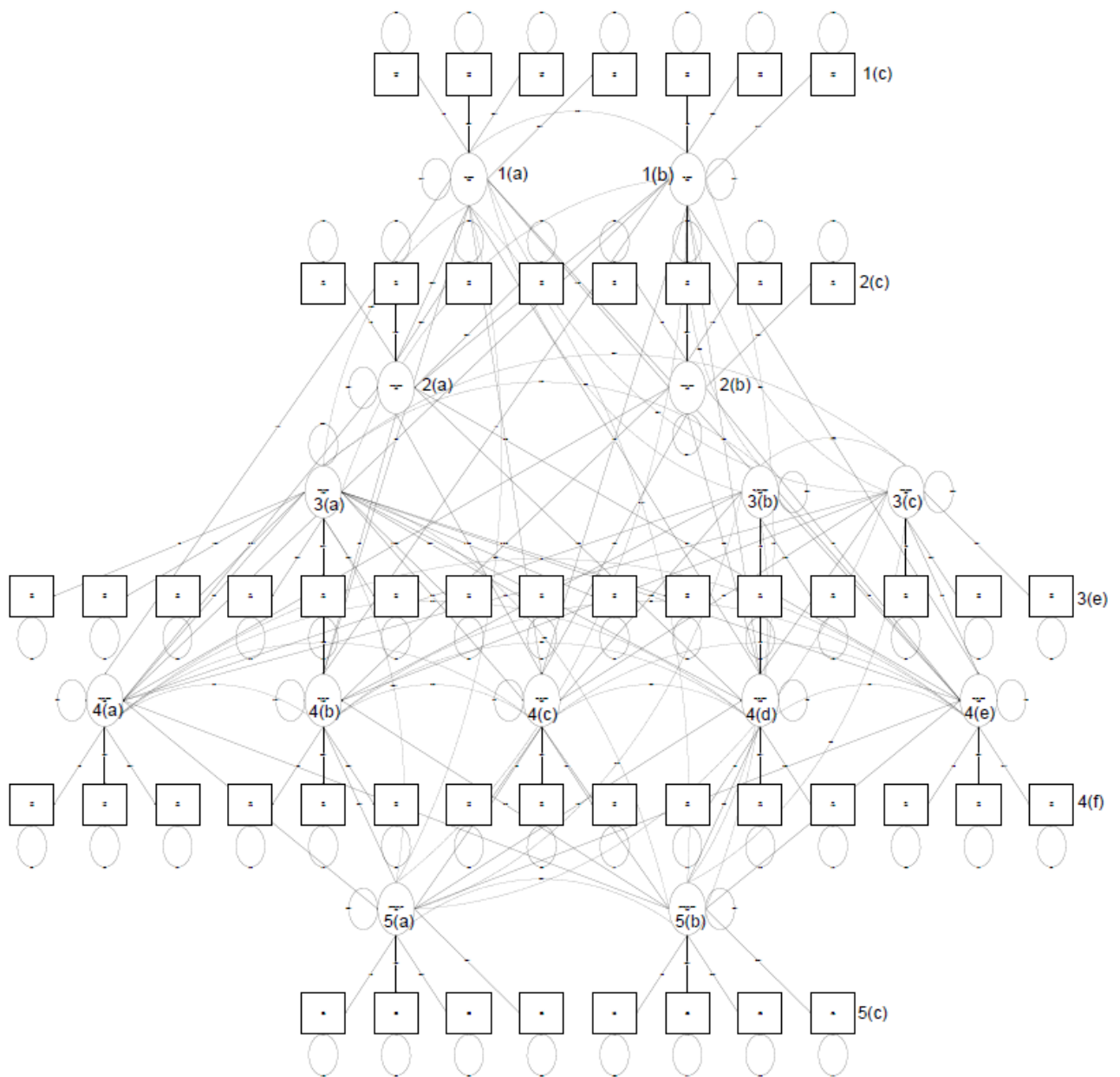


Figure 12 Hypothesized structural equation model assessing pathways through which personal and contextual factors influence the impact of different dimensions of engagement on occurrence of substance use.

Bentler-Bonett Normed Fit Index = .944; Goodness of Fit Index = .97; root mean square error of approximation = .056; $\chi^2_1 = 3.84$; $p = 0.0501$. 1(a) –Parental monitoring; 1(b) - Parental involvement; 1(c) –Parental factors observed variables; 2(a) – Number of substance using friends; 2(b) – Pressure from friends to use substances; 2(c) –Peer factors observed variables; 3(a) – Emotional engagement; 3(b) – Negative emotional engagement; 3(c)- Social engagement; 3(d) –Engagement observed variables; 4(a) – self substance use: smoking; 4(b) - self substance use: alcohol; 4(c)- self substance use: hard drugs; 4(d) - self substance use: cannabis like; 4(e) - self substance use: CNS stimulants; 4(f) –Self substance use observed variables; 5(a) - parental

substance use: alcohol; 5(b) - parental substance use: smoking; 5(c) –Parental substance use observed variables.

The hypothesized model was an excellent fit to the data with NFI of 0.94, GFI of .97; and RMSEA of .056. The model fit the data significantly ($\chi^2_1 = 3.84, p = 0.0501$). No modification was made on the final model.

Direct Effects

Parental involvement was predictive of higher number of friends who used substances (standardized coefficient = 1.363, $p = 0$) and pressure from friends to use substances (standardized coefficient = 1.492, $p = 0$). Parental involvement was also predictive of lower self-use of CNS stimulants (standardized coefficient = -6.275, $p = 0.014$) (Table 43).

Parental monitoring was predictive of a lower number of using friends (standardized coefficient = -1.691, $p = 0$) and pressure from friends to use (standardized coefficient = -1.56, $p = 0$) substances. Parental monitoring was positively associated with self-use of CNS stimulants (standardized coefficient = 7.124, $p = 0.011$) (Table 43).

Parental use of alcohol was predictive of higher self-use of alcohol (standardized coefficient = 0.236, $p = 0$) and self-use of CNS stimulants (standardized coefficient = 0.316, $p = 0$). However, parental use of alcohol was negatively associated with self-use of hard drugs (standardized coefficient = -0.228, $p = 0$). Parental smoking was positively associated with self-use of CNS stimulants (standardized coefficient = 0.621, $p = 0$) (Table 43).

The number of substances using friends was positively associated with self-use of CNS stimulants (standardized coefficient = 2.139, $p = 0.001$). Pressure from friends to use substances was predictive of lower smoking (standardized coefficient = -0.673, $p = 0.025$) but higher use of CNS stimulants (standardized coefficient = 0.963, $p = 0.021$).

Emotional engagement was predictive of lower self-use of CNS stimulants (standardized coefficient = -0.629, $p = 0.004$). Negative emotional engagement was negatively associated with smoking (standardized coefficient = -0.15, $p = 0.051$) (Table 43).

Indirect Effects

Two indirect effects were significantly different but for discussion when comparing with direct and total effects, the effects that were significant at p -value less than 0.10 are also presented here. There were significant negative relationships between parental monitoring and self-use of CNS stimulants

which was mediated by the number of using friends (standardized indirect coefficient = -3.617, $p = 0.021$). Parental monitoring was positively predictive of student smoking in the presence of mediation by pressure from friends to use (standardized indirect coefficient = 1.051, $p = 0.065$) substances. There were negative relationships between parental monitoring and self-use of CNS stimulants when accounting for mediation by pressure from friends to use (standardized indirect coefficient = -1.503, $p = 0.065$) (Table 43) substances.

There were significant positive relationships between parental involvement and self-use of CNS stimulants after mediation by the number of substances using friends (standardized indirect coefficient = 2.915, $p = 0.034$). Parental involvement was predictive of lower smoking by the student after the mediatory effect of pressure from friends to use substances (standardized indirect coefficient = -1.005, $p = 0.072$). There were positive relationships between parental involvement and self-use of CNS stimulants in the presence of mediation effect of pressure from friends to use substances (standardized indirect coefficient = 1.437, $p = 0.076$) (Table 43).

Total Effects

There were significant positive total relationships between parental involvement and smoking by the student when accounting for both the direct predictive effect of parental involvement on student smoking and mediation by the number of friends who used substances (standardized total coefficient = 2.427, $p = 0.026$) (Table 42). Significant positive total relationships between parental involvement and self-use of cannabis like substances were found when considering both the direct predictive effect of parental involvement on self-use of cannabis like substances and mediation by the number of friends who used substances (standardized total coefficient = 2.372, $p = 0.026$). There were significant negative total relationships between parental involvement and self-use of CNS stimulants when accounting for both the direct predictive effect of parental involvement on self-use of CNS stimulants and the mediatory role of: the number of friends who used substances (standardized total coefficient = -3.36, $p = 0.023$), and pressure from friends to use substances (standardized total coefficient = -4.838, $p = 0.017$) (Table 43).

Parental monitoring was significantly predictive of lower student smoking when accounting for both the direct predictive effect of parental monitoring on student smoking and the mediatory role of the number of friends who used substance (standardized total coefficient = -3.032, $p = 0.013$). There were significant negative total relationships between parental monitoring and self-use of cannabis like substances when accounting for both the direct predictive effect of parental monitoring on self-use of

cannabis like substances and mediation by the number of friends who used substances (standardized total coefficient = -2.939, $p = 0.013$) (Table 43).

Parental monitoring was significantly predictive of increased self-use of CNS stimulants when accounting for both the direct predictive effect of parental monitoring on self-use of CNS stimulants and mediation by the number of: substance using friends (standardized total coefficient = 3.507, $p = 0.03$), and pressure from friends to use substances (standardized total coefficient = 5.621, $p = 0.015$).

Table 43 Results from structural equation model assessing pathways through which personal and contextual factors influence the impact of different dimensions of engagement on occurrence of substance use among students

Effect	Model*	B	SE	Z	p-value	Beta
Direct Effect	Self-use: smoke<-Number of using friends	-0.159	0.440	-0.361	0.718	-0.133
	Self-use: alcohol<-Number of using friends	0.309	0.364	0.849	0.396	0.261
	Self-use: hard drugs <-Number of using friends	-0.544	0.442	-1.232	0.218	-0.498
	Self-use: cannabis like <-Number of using friends	-0.033	0.400	-0.083	0.934	-0.029
	Self-use: CNS stimulants <-Number of using friends	2.973	0.931	3.194	0.001	2.139
	Self-use: smoke<-Pressure from friends to use	-0.797	0.355	-2.248	0.025	-0.673
	Self-use: alcohol<-Pressure from friends to use	-0.326	0.287	-1.138	0.255	-0.279
	Self-use: hard drugs<-Pressure from friends to use	-0.457	0.329	-1.388	0.165	-0.421
	Self-use: cannabis like<-Pressure from friends to use	-0.579	0.327	-1.768	0.077	-0.506
	Self-use: CNS stimulants <-Pressure from friends to use	1.328	0.577	2.301	0.021	0.963
	Number of using friends<-Parental monitoring	-2.063	0.340	-6.068	0.000	-1.691
	Number of using friends<-Parental involvement	1.606	0.339	4.731	0.000	1.363
	Pressure from friends to use<-Parental monitoring	-1.918	0.321	-5.973	0.000	-1.560
	Pressure from friends to use<-Parental involvement	1.772	0.332	5.334	0.000	1.492
	Self-use: smoke<-Emotional engagement	0.559	0.331	1.691	0.091	0.320
	Self-use: smoke<-Negative emotional engagement	-0.201	0.103	-1.950	0.051	-0.150
	Self-use: smoke<-Social engagement	0.094	0.111	0.841	0.400	0.056

Self-use: alcohol<-Emotional engagement	0.094	0.268	0.350	0.726	0.054
Self-use: alcohol<-Negative emotional engagement	0.099	0.080	1.235	0.217	0.075
Self-use: alcohol<-Social engagement	0.021	0.084	0.251	0.802	0.013
Self-use: hard drugs<-Emotional engagement	-0.012	0.322	-0.036	0.971	-0.007
Self-use: hard drugs<-Negative emotional engagement	0.168	0.091	1.840	0.066	0.137
Self-use: hard drugs<-Social engagement	0.054	0.111	0.484	0.629	0.035
Self-use: cannabis like<-Emotional engagement	0.561	0.302	1.853	0.064	0.332
Self-use: cannabis like<-Negative emotional engagement	0.064	0.090	0.712	0.476	0.049
Self-use: cannabis like<-Social engagement	-0.068	0.096	-0.714	0.475	-0.042
Self-use: CNS stimulants <-Emotional engagement	-1.282	0.450	-2.850	0.004	-0.629
Self-use: CNS stimulants <-Negative emotional engagement	0.310	0.189	1.637	0.102	0.198
Self-use: CNS stimulants <-Social engagement	0.100	0.159	0.630	0.529	0.051
Self-use: smoke<-Parental monitoring	-4.742	2.571	-1.844	0.065	-3.257
Self-use: alcohol<-Parental monitoring	-1.583	1.991	-0.795	0.427	-1.100
Self-use: hard drugs<-Parental monitoring	-3.978	2.522	-1.578	0.115	-2.985
Self-use: cannabis like<-Parental monitoring	-4.201	2.386	-1.761	0.078	-2.987
Self-use: CNS stimulants <-Parental monitoring	12.078	4.778	2.528	0.011	7.124
Self-use: smoke<-Parental involvement	3.669	2.151	1.706	0.088	2.608
Self-use: alcohol<-Parental involvement	1.106	1.628	0.679	0.497	0.795
Self-use: hard drugs<-Parental involvement	3.184	2.088	1.525	0.127	2.473

	Self-use: cannabis like<-Parental involvement	3.276	2.005	1.634	0.102	2.411
	Self-use: CNS stimulants <-Parental involvement	-10.280	4.167	-2.467	0.014	-6.275
	Self-use: smoke<-Parental use: alcohol	0.005	0.064	0.083	0.934	0.005
	Self-use: smoke<-Parental use: smoke	0.139	0.098	1.415	0.157	0.145
	Self-use: alcohol<-Parental use: alcohol	0.252	0.048	5.222	0.000	0.236
	Self-use: alcohol<-Parental use: smoke	-0.022	0.081	-0.272	0.786	-0.023
	Self-use: hard drugs<-Parental use: alcohol	-0.226	0.063	-3.562	0.000	-0.228
	Self-use: hard drugs<-Parental use: smoke	0.159	0.098	1.631	0.103	0.182
	Self-use: cannabis like<-Parental use: alcohol	0.029	0.054	0.545	0.586	0.028
	Self-use: cannabis like<-Parental use: smoke	-0.056	0.093	-0.607	0.544	-0.061
	Self-use: CNS stimulants <-Parental use: alcohol	0.398	0.102	3.899	0.000	0.316
	Self-use: CNS stimulants <-Parental use: smoke	0.691	0.131	5.267	0.000	0.621
Indirect Effect	Self-use: smoke <- Number of using friends <- Parental monitoring	0.328	0.933	0.351	0.725	0.225
	Self-use: alcohol <- Number of using friends <- Parental monitoring	-0.637	0.740	-0.860	0.390	-0.442
	Self-use: hard drugs <- Number of using friends <- Parental monitoring	1.123	1.016	1.105	0.269	0.842
	Self-use: cannabis like <- Number of using friends <- Parental monitoring	0.068	0.831	0.082	0.935	0.048
	Self-use: CNS stimulants <- Number of using friends <- Parental monitoring	-6.133	2.653	-2.312	0.021	-3.617

Self-use: smoke <- Number of using friends <- Parental involvement	-0.255	0.732	-0.349	0.727	-0.181
Self-use: alcohol <- Number of using friends <- Parental involvement	0.496	0.578	0.858	0.391	0.356
Self-use: hard drugs <- Number of using friends <- Parental involvement	-0.874	0.812	-1.076	0.282	-0.679
Self-use: cannabis like <- Number of using friends <- Parental involvement	-0.053	0.648	-0.082	0.935	-0.039
Self-use: CNS stimulants <- Number of using friends <- Parental involvement	4.775	2.256	2.116	0.034	2.915
Self-use: smoke <- Pressure from friends to use <- Parental monitoring	1.530	0.828	1.846	0.065	1.051
Self-use: alcohol <- Pressure from friends to use <- Parental monitoring	0.626	0.587	1.067	0.286	0.435
Self-use: hard drugs <- Pressure from friends to use <- Parental monitoring	0.876	0.715	1.224	0.221	0.657
Self-use: cannabis like <- Pressure from friends to use <- Parental monitoring	1.110	0.739	1.503	0.133	0.789
Self-use: CNS stimulants <- Pressure from friends to use <- Parental monitoring	-2.549	1.383	-1.843	0.065	-1.503
Self-use: smoke <- Pressure from friends to use <- Parental involvement	-1.413	0.785	-1.801	0.072	-1.005

	Self-use: alcohol <- Pressure from friends to use <- Parental involvement	-0.578	0.549	-1.053	0.292	-0.416
	Self-use: hard drugs <- Pressure from friends to use <- Parental involvement	-0.809	0.670	-1.208	0.227	-0.629
	Self-use: cannabis like <- Pressure from friends to use <- Parental involvement	-1.026	0.699	-1.466	0.143	-0.755
	Self-use: CNS stimulants <- Pressure from friends to use <- Parental involvement	2.355	1.326	1.775	0.076	1.437
Total Effect	Self-use: smoke <- Parental monitoring + (Self-use: smoke <- Number of using friends <- Parental monitoring)	-4.414	1.770	-2.494	0.013	-3.032
	Self-use: alcohol <- Parental monitoring + (Self-use: alcohol <- Number of using friends <- Parental monitoring)	-2.220	1.314	-1.689	0.091	-1.542
	Self-use: hard drugs <- Parental monitoring + (Self-use: hard drugs <- Number of using friends <- Parental monitoring)	-2.856	1.638	-1.743	0.081	-2.143
	Self-use: cannabis like <- Parental monitoring + (Self-use: cannabis like <- Number of using friends <- Parental monitoring)	-4.133	1.660	-2.489	0.013	-2.939

Self-use: CNS stimulants <- Parental monitoring + (Self-use: CNS stimulants <- Number of using friends <- Parental monitoring)	5.946	2.742	2.168	0.030	3.507
Self-use: smoke <- Parental involvement + (Self-use: smoke <- Number of using friends <- Parental involvement)	3.414	1.535	2.224	0.026	2.427
Self-use: alcohol <- Parental involvement + (Self-use: alcohol <- Number of using friends <- Parental involvement)	1.602	1.116	1.435	0.151	1.151
Self-use: hard drugs <- Parental involvement + (Self-use: hard drugs <- Number of using friends <- Parental involvement)	2.310	1.390	1.662	0.096	1.794
Self-use: cannabis like <- Parental involvement + (Self-use: cannabis like <- Number of using friends <- Parental involvement)	3.223	1.452	2.219	0.026	2.372
Self-use: CNS stimulants <- Parental involvement + (Self-use: CNS stimulants <- Number of using friends <- Parental involvement)	-5.505	2.428	-2.267	0.023	-3.360
Self-use: smoke <- Parental monitoring + (Self-use: smoke <- Pressure from friends to use <- Parental monitoring)	-3.212	1.900	-1.691	0.091	-2.206

Self-use: alcohol <- Parental monitoring + (Self-use: alcohol <- Pressure from friends to use <- Parental monitoring)	-0.957	1.461	-0.655	0.512	-0.665
Self-use: hard drugs <- Parental monitoring + (Self-use: hard drugs <- Pressure from friends to use <- Parental monitoring)	-3.102	1.926	-1.610	0.107	-2.328
Self-use: cannabis like <- Parental monitoring + (Self-use: cannabis like <- Pressure from friends to use <- Parental monitoring)	-3.091	1.767	-1.749	0.080	-2.198
Self-use: CNS stimulants <- Parental monitoring + (Self-use: CNS stimulants <- Pressure from friends to use <- Parental monitoring)	9.530	3.923	2.429	0.015	5.621
Self-use: smoke <- Parental involvement + (Self-use: smoke <- Pressure from friends to use <- Parental involvement)	2.256	1.509	1.495	0.135	1.604
Self-use: alcohol <- Parental involvement + (Self-use: alcohol <- Pressure from friends to use <- Parental involvement)	0.527	1.129	0.467	0.640	0.379
Self-use: hard drugs <- Parental involvement + (Self-use: hard drugs <- Pressure from friends to use <- Parental involvement)	2.375	1.529	1.553	0.120	1.844

Self-use: cannabis like ← Parental involvement +	2.250	1.413	1.592	0.111	1.656
(Self-use: cannabis like ← Pressure from friends to use ← Parental involvement)					
Self-use: CNS stimulants ← Parental involvement +	-7.925	3.319	-2.388	0.017	-4.838
(Self-use: CNS stimulants ← Pressure from friends to use ← Parental involvement)					

*The arrow points to the direction of the effect

Chapter Summary

This chapter presents the main findings of the study. An initial presentation of the trends and distribution of the socio-demographic and sample characteristics, substance use, and peer influence is made using an exploratory data analysis. This is followed by a presentation of the results from significant univariate tests of association between socio-demographic variables and substance use, socio-demographic factors and delinquency, engagement and delinquency, engagement in independent activities out of school and delinquency, engagement and substance use, and between parental monitoring and delinquency.

The first research question was aimed at establishing if dependent variables change with grade level and school level factors which were subsequently used as input for multilevel models. The fit indices for the substance use, delinquency, psychosocial variables models which included the essential change in the likelihood ratios and the associated p -values were used in decision making. Various relationships showed a significant p -value which supported the conjecture that it is important to model the variability in intercepts due to grade level and school level factors because this significantly improves the fit of the model while accounting for the hierarchical nature of the data.

The results from the second research question were from multilevel CLMs assessing the influence of parental and peer factor variables on the psychosocial factor measures. The psychosocial factors included social cognition (measured as the locus of control) and self-perceptions (measured as self-concept). This was followed by an analysis of the influence of the psychosocial factors on student engagement. Significantly different associations or predictions are reported in the tables and the changes in odds for the different ordinal levels as compared to the baseline are interpreted in the associated text.

The results from the final research question are presented. This shows pathways through which personal and contextual factors influence the impact of behavioural and emotional engagement on the risk for and occurrence of delinquency and substance use. An initial analysis of the correlation matrices of the variables measuring the different dimensions was performed to assess the suitability for factor analysis and structural equation models. For dimensions of the same factor, for instance engagement, where theoretical links were not clearly denoted from the source of the research instrument, exploratory factor analysis was used to examine items that loaded onto the

same factor to identify common themes. Common dimensions within the questions which were highly loading to the various factors were used to identify the constructs. Confirmatory factor analysis was subsequently used to test how well the observed variables are related to the underlying latent factors. This analysis assisted to specify the nomological network of each of the constructs by distinguishing and defining the internal and external perspectives of the constructs and their dimensions. Two dimensions were distinguished for delinquency, four for engagement, (emotional engagement, social or behavioural or participatory engagement, and cognitive engagement), two for parental involvement (parental monitoring and parental involvement), four for self-concept (self-perception, self-esteem, self-cognition and self-efficacy), two for social cognition (external and internal dimensions) and three for illicit substance. Two SEM models were run to test hypothesized pathways through which personal and contextual factors influence the impact of different dimensions of engagement on the occurrence of delinquency and substance use. These models confirmed the hypothesis that personal and contextual factors may have a direct impact on occurrence of delinquency and substance use. Partial mediation was also revealed where the effects of personal and contextual factors are partially mediated by engagement.

CHAPTER 5 DISCUSSION

Introduction

The adolescence period is characterized by either of two tendencies which involve either enhanced opportunities for positive engagements with the community or susceptibility to self and socially detrimental behaviours (Schwartz et al., 2010). Early adolescence is a life phase defined by numerous biological and social changes as well as enhanced freedom of behaviour and exploration of new challenges and opportunities (Mrug & Windle, 2009).

It is therefore essential to protect against the initiation of problematic behaviours such as substance use and delinquency because initiation at the ages before 15 years have been associated with an enhanced risk for long-term challenges and negative life sequelae (Schwartz et al., 2010). Prevention science in early adulthood is an area of research and practice aimed at eradicating the initiation of and reducing harmful or risky behaviours through the cultivation of positive factors which include engagement with family, school and community (Schwartz et al., 2010).

A problem-focused paradigm has been widely used in theory, research, and practice to reduce detrimental behaviours to health and life trajectories such as the abuse of alcohol, other substances, and delinquency. This paradigm is used as a strategy to support the planning, organization, and implementation of prevention policies, programs, and practices (Leffert et al., 1998a). During this process, it is important to identify developmental assets which are a set of contextual and individual factors that have been shown to increase key developmental outcomes by reducing health detrimental behaviours while also increasing positive outcomes (Leffert et al., 1998a).

Poor school engagement has been associated in numerous studies with higher rates of school failure, withdrawal and problematic behaviour (Al-Alwan, 2014). Student engagement has therefore been an increasingly important area of inquiry for families, students, educators, and researchers (Appleton et al., 2008). Therefore, this study investigated the influence and pathway through which personal and contextual factors impact the association between behavioural and emotional engagement on the risk for and occurrence of delinquency and substance use. Individual and contextual influences were considered as underlying explanatory aspects to the association

between multiple levels of student engagement and problematic behaviour including delinquency and substance use. An understanding of the scantily studied mechanism behind the increasing evidence which points towards school engagement as protective against risky behaviours will enhance the adoption of these findings in research and policy (Li et al., 2011). Prevention scientists have unearthed and tested programs and policies based on risk and protective factors to recommend useful interventions for the prevention of substance abuse, delinquency, and violence amongst adolescents (Hawkins et al., 2007; Kennedy et al., 2020; Stone et al., 2012).

This section discusses the results of this study, relates them to existing studies and reports, and proposes plausible theoretical background to consider when interpreting important trends presented in the results section. Statistically significant factors and processes are presented and discussed.

The results from this study may be interpreted based on the social development model (SDM). SDM is an important theoretical basis of interventions that rely on the interaction of risk and protective factors during the development of both prosocial behaviour and antisocial behaviours (Hawkins et al., 2007). The prosocial aspect of the SDM explains the role of protective factors on the development of prosocial bonds and beliefs or norms that result in positive outcomes. On the other hand, the antisocial aspects of the SDM are concerned with the interaction between risk factors resulting in antisocial behaviour (Hawkins et al., 2007). This hypothesis proposes that a series of developmental stages from childhood to adolescence are cumulatively instrumental to the formation of behavioural traits due to prosocial and antisocial influences. The developmental role of the SDM involves the three types of exogenous factors, namely social structure position (for instance age, race, gender, and socioeconomic status), individual constitutional factors (for instance temperament and intelligence); and external (such as laws, norms, family and classroom) (Hawkins et al., 2007).

Exploratory Data Analysis

Demographic, Socio-Economic and Sample Characteristics

Background variables such as pupil socioeconomic status, previous academic grades and drop-out history of friends may influence the occurrence of outcomes such as delinquency, conduct problems, and school connectedness (Lansford, Dodge, Pettit, & Bates, 2016; Mrug & Windle,

2009).

The initial analysis involved an outline of the distribution of student characteristics and socio-demographic variables including the number of student respondents per school, gender, level of education, if one repeated grade in the past, race, parental marital status, parental level of education and parental occupation.

The mean student age was 16.7 (standard deviation = 2.6) and was relatively symmetrical with a median age of 16 years with a majority (66.5%; n=560) of the students aged between 15 and 18 years. These age groups when compared to childhood have been accompanied by social context changes which introduce the individual to greater freedom and less social control (Stone et al., 2012). The increased freedom and reduced social control may compromise the transition to adult roles and responsibilities which may negatively impact an individual's long-term life trajectories. For instance, the highest instances of use and abuse of substances have been associated with young adults between the age of 18 and 26 (Stone et al., 2012).

The sample was fairly balanced in terms of gender with 57% females and 43% males. However, a majority were from the black ethnic background (93.4%; n=833) which is also a close reflection of the demographic structure of Pretoria whose estimates from the 2011 census consisted of 77.4% of blacks (Census, 2012). The key variables measured in this study are invariant to factors such as the ethnic background. For instance, Ainsworth-Darnell and Downey (1998) reported that school engagement, a key variable in this study, was equivalent between African American students and white students.

Parental factors were also considered. Muchiri and dos Santos (2018) reported that among the risk factors associated with substance use among adolescents were included family backgrounds characterized by divorced parents and either unemployed or fully employed mothers. When this study's sample is viewed with regards to these risk profiles, only a minority of students came from either divorced or widowed backgrounds. However, a majority of the mothers were employed on a full-time basis (63.6%; n=530) while another 0.3% (n=86) were either unemployed or self-employed.

Substance use

The frequency and intensity of tobacco, alcohol, cannabis and use of other drugs were studied. The

substance used by the majority of the students was alcohol (31.3%; n=265) with 6% (n=51) using 5 or 6 (6%; n=51) units in each episode. These results mirrored those from a previous study among high school students where an average of 32% (35.5% of male and 29.7% of female students) used alcohol and similarly comprised of those consuming six or more alcohol units (binge drinking) within 30 days (Chauke, Van der Heever, & Hoque, 2015). Respondents in this study however reported higher parental use (31.6% of mothers and 42.6% of fathers) than the study by Chauke et al. (2015) who reported that 28.9% of the adults at home used alcohol. Their study was however based on a rural high school student population whereas this study is based on an urban and peri-urban population. Heavy drinking among adolescents has been associated with a higher risk of alcohol dependence and persistence as well as other negative outcomes such as negative emotionality and low constraint (Laurin Chassin, Flora, & King, 2004).

There was a higher prevalence in smoking (12.7%) and cannabis use (11.3%) than hard drugs including amphetamine (1.9%), barbiturates (0.3%), cocaine (0.4%), heroin (0.8%) and other substances combined 5.3% (n=43). This mirrors the trend from previous reports where the prevalence of cannabis use by adolescents was 2% to 9% and among adults 2%, cocaine/ crack (0.3%), mandrax/ sedatives (0.3%), club drugs/ amphetamine-type stimulants (0.2%-0.3%), opiates (0.1%) and hallucinogens (0.1%) (Peltzer et al., 2010). Li et al. (2011) reported that the prevalence in the use of cannabis in boys increased with grade from 1.4 % in grade 5 to 14.5 % in grade 11. A similar trend was reported for cigarette use where smoking increased from 4.3 % in boys from grade 5 to 17.4 in boys from grade 11 (Li et al., 2011a). The higher use of alcohol and cigarettes than cannabis are in agreement with previous results which indicated that students associated a reduced risk to the use of cigarettes and alcohol than to the use of cannabis (Henry, Swaim, & Slater, 2005).

The results indicated that 52.5% (n=433), 27.4% (n=219), 70.7% (n=578) and 25.8% (n=202) reported they had at least one friend who used cannabis, smoked, used alcohol and other substances respectively. Previous studies indicated similar use patterns of cigarettes, alcohol, binge drinking, and, cannabis between young adults and their peers (Andrews, Tildesley, Hops, & Li, 2002). Costello, Dierker, Jones and Rose (2008) in their study on trajectories of smoking and their risk factors found that there were higher chances of the youth belonging to the smoking trajectory groups compared to non-smokers if they associated with smoking peers, used alcohol and were involved in other delinquent behaviours. In their study, persistent high smokers had more

likelihood of associating with smoking friends when compared with those who had either stopped or were stable light smokers. It is therefore important to consider the influence of using peers when formulating interventions.

Parental use of substances was also reported by the students with the most prevalent substance being maternal (31.6%; n=266) and paternal (42.6%; n=324) alcohol use. It has been reported that parental alcoholism increases the risk for alcohol and drug use and dependence among the children as a result of increased impulsiveness and lower agreeableness in children from such families (Laurin Chassin et al., 2004). This family history of use, therefore, is associated with a higher likelihood of early-onset and persistent use (Laurin Chassin et al., 2004). For instance, parental alcoholism and smoking whose use were similarly reported amongst parents in this study was previously associated with early-onset and persistent use of these substances including use disorders (Laurie Chassin, Presson, Pitts, & Sherman, 2000; Jackson, Sher, & Schulenberg, 2005; Oliveira et al., 2019). Familial use of substances is an important predictor of adolescent substance use. For instance, Laurin Chassin et al. (2004) reported that children from families that have a history of alcoholism were more likely to grow up in trajectories of heavy alcohol use and disorders. Adolescents who were higher users of alcohol and other substances were linked to families with higher risk of alcohol use. However, even though the adolescents who drank less or experimentally used alcohol and drugs experienced higher dependence risk, the most likely dependence was on alcohol use alone without other substances and a lower risk of comorbid or persistent dependence.

Delinquent Behaviour

Health detrimental behaviours such as substance use go hand in hand with delinquency, both are correlated and therefore interventions formulated to solve one are also applicable to the other (ESPAD, 2015; Hirschi, 1969). The genesis of several types of delinquency has its roots in the adolescent period and has been associated with a lifelong and serious antisocial pathway (Loeber & Le Blanc, 1990).

The results indicated that 16% (n=109) of the students had been involved in a serious fight in school or away in the previous year and 20.6% (n=143) had hurt someone badly enough in the past year to need bandages or a doctor. Li et al. (2011) also reported a prevalence of hitting or beating up others ranging from 5.54 % to 39.4 % depending on grade and gender. The prevalence

estimates of damage to school property in the past year by the students in this study (17.1%; n=115) was also similar to those of Li et al. (2011) which ranged between 6.65% to 35.73% depending on the grade and gender of the student. However, almost half of the students (48.9%; n=327) reported having taken other's belongings in the past year though only 12.1% (n=23) reported having done so five or more times. Li et al. (2011) reported that between 10.08 % and 18.33% had reported having stolen which varied depending on gender and grade. A smaller proportion (8.4%; n=63) reported carrying a weapon such as a gun, knife, or club to school for at least a day in the last month. Li et al. (2011) reported an annual prevalence of students who carried weapons among boys ranging from 12% at age 10 to 23% at age 13.

Univariate tests of association

The associations between the key study variables socio-demographic variables and engagement with substance use were first studied before their inclusion in subsequent multivariate models. The associations between socio-demographic factors, engagement and parental monitoring and involvement with delinquency were also studied.

Association between socio-demographic variables and substance use

There was a significant association ($p < 0.05$) between the current school grade and having repeated grades in the past with smoking, use of alcohol, heroin and other substances. Having repeated grades was additionally associated with increased use of hard drugs including cannabis, amphetamine, barbiturates, cocaine, heroin and LSD, psychedelics, or tranquilisers. Older students have been reported to be less perceptive of the consequences of the use of various substances (Henry et al., 2005). Li et al. (2011) reported a marked increase in the hazard of substance use initiation between grades 10 and 11 compared to between grades 5 to 10.

Gender was significantly associated with the intensity and frequency of smoking and the frequency of cannabis use. Henry et al. (2005) reported that girls tended to associate less risk with smoking than boys. A significant interaction was reported between alcohol, tobacco and cannabis use where the initiation risk in boys was significantly higher than in girls (Schwartz et al., 2010). The protective effect of a Positive Youth Development programme was reported against tobacco, cannabis and hard drug use initiation in girls but only against hard drug use in boys indicating that protective effects against detrimental and risky behaviours may generally be stronger for girls than

for boys (Schwartz et al., 2010). Schwartz et al. (2010) also reported that alcohol use differs from other risk behaviour in that use is revered in many societies, where alcohol is provided in many social events involving the youth including in protective programmes against substance use especially for boys. A distinction by gender could also be made in age-related changes that influence heavy drinking which was suggested to be due to the assumption of adult social roles such as parenthood and spousal roles by females at a younger age than males and the experience of higher incidences of adverse consequences associated with heavy drinking in females than in males during late adolescence and young adulthood, which results in a different alcohol use trajectory (Windle, Mun, & Windle, 2015). When results from South Africa are considered, males were reported to have eight times more chances of substance use initiation than females (van Heerden et al., 2009).

There was a significant association between age and smoking intensity, and the frequency as well as the intensity of the use of alcohol, cannabis, barbiturates and either LSD, psychedelics or tranquilizer. The current grade which is also related to the student's age was significantly associated with the intensity and frequency of smoking and alcohol use and the frequency of heroin and other substance use. Leffert et al. (1998) reported higher use of alcohol and other school problematic behaviours among students between grades 9 and 12 than those from grades 6 to 8.

Several parental background factors were also associated with substance use. Parental marital status was significantly associated with the frequency of alcohol (and intensity), cannabis, and cocaine use. You and Sharkey (2009) reported that students from families without both parents had a lower school engagement than those who lived in families with both biological parents. Paternal and maternal education which are indicators of parental socio-economic status were significantly associated with smoking, alcohol use, and use of other hard drugs. Maternal employment status was also significantly associated with how often one smoked.

Changes in school engagement, substance use and delinquency were linked to maternal education and household income in previous reports (Li & Lerner, 2011). Due to reduced prospects for later life opportunities, adolescents may be more likely to be engaged in high-risk behaviours (Leffert et al., 1998a). Such youth may be less engaged with the school and therefore more prone to problematic behaviours (Mrug & Windle, 2009). Such associations may be influenced by gender.

For instance, when maternal education level was higher, Li et al. (2011) reported a lower hazard of substance use in girls than boys.

Association between socio-demographic factors and delinquency

Several socio-demographic factors were significantly associated with delinquency and problematic behaviour variables. There was a significant association between gender and nine of the variables. Boys were shown to be engaged in more violent behaviours when compared to girls and this was consistent for all grades (Leffert et al., 1998a) and boys were twice as likely to engage in delinquent behaviours than girls (Li et al., 2011a). Emotional engagement and problematic behaviours were associated with the gender of students (Li & Lerner, 2011). Females were found to work harder in schoolwork, paid more attention, came to class prepared more often, and were more cooperative than their male counterparts. However, male students skipped classes less frequently but showed behavioural problems more frequently (Finn & Rock, 1997). Self-reports by males supported by parental reports indicated more problematic behaviours in boys than girls (Mrug & Windle, 2009).

Li et al. (2011) in results similar those of this study reported a significant association between age and six problematic behaviour variables. They found out that with increasing age, students were more likely to engage in delinquent behaviours. This study found a significant association between current grade and six behavioural problems. Such a trend may be also associated with age where lower school engagement and more delinquency occur amongst older youth (Mrug & Windle, 2009). More violent behaviours were reported amongst students from grades 6 to 8 than in 9 to 12 graders (Leffert et al., 1998a).

Ethnic background was significantly associated with six of the problem behaviours including missing school and getting suspended or expelled from school. A correlation was previously reported between ethnicity and dropping out of school (Finn, 1989; Peguero, Merrin, Hong, & Johnson, 2016) while self and teacher-student reports by Finn and Rock (1997) indicated ethnic differences in school attendance where low-SES Hispanic students missed school more frequently, were often late for school, or missed classes more frequently than their African-American classmates.

Parental socio-economic status as measured using parental highest education and employment status were also associated with several delinquency variables. The highest paternal education was significantly associated with five problematic behaviour variables while maternal employment status was associated with four variables. Li et al. (2011) also reported that youth whose parents had completed higher levels of education and had higher economic status were less likely to engage in delinquency when compared to their counterparts whose parents had completed less education and had lower per capita income. Student delinquency was also significantly associated with socioeconomic status in a study by You and Sharkey (2009).

Ethnicity was significantly associated with six of the behavioural problem variables. There were moderate to large effect sizes pertaining to the influence of ethnicity on conduct problems where students from African American backgrounds reported higher delinquency and school engagement than their Caucasian colleagues (Mrug & Windle, 2009). Previous studies have reported a correlation between a student's ethnic background and dropping out of school (Finn, 1989; Peguero et al., 2016).

Having repeated grades at least once stood out as a background factor that was significantly associated with the highest number of problematic behaviour variables having been linked to eleven variables. Finn (1989) found school ability and performance, as a correlate of problematic behaviours such as dropping out of school. From the foregoing, these results and previous studies indicate that stratification for socio-economic, demographic and other background variables are needed in both theoretical and practical studies when considering determinants of delinquency and substance use.

Association of engagement and parental involvement with delinquency and substance use

Univariate associations between the variables measuring the key study factor, engagement, with those variables measuring delinquency and substance use were studied before further investigating their multivariate and structural relationships.

Association between engagement and delinquency

Several emotional engagement variables were significantly associated with the highest number of behavioural problem variables. Significant associations were found between hating being in school (with 4 delinquency variables), trying best in school (5 delinquency variables), failure to turn in or

complete assignments (12 delinquency variables), getting sent to the office (12 delinquency variables), finding school work interesting (6 delinquency variables), how often one finds that their friends encourage them to do things which their teachers would not like, (8 delinquency variables), how one thinks others feel if they cheated on a test (4 delinquency variables), how one thought most colleagues would feel if they intentionally did things to make their teachers angry (3 delinquency variables), the importance attached to leadership activities (3 delinquency variables), extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable (5 delinquency variables) and enjoying being in school (6 delinquency variables). The other engagement dimension that was significantly associated with a high number of behavioural problem variables included cognitive engagement variables such as average grades (6 delinquency variables), hours spent on homework week (7 delinquency variables), grades competition in school (4 delinquency variables), prospects of graduating from high school (10 delinquency variables), finding school work too hard (6 delinquency variables) and association with friends who drop out of school (9 delinquency variables). The two negative emotional engagement variables class interruption due to misbehaviour by others (6 delinquency variables), class interruption due to misbehaviour by self (1 delinquency variable) and the three social engagement variables participating in music (1 delinquency variable), participating athletics (1 delinquency variable), how long extra-curriculum (4 delinquency variables) were also significantly associated with delinquency.

You and Sharkey (2009) in similar findings reported that the effect of previous academic grades was largest on student engagement compared to sixteen other variables and highlighted the significant role of student engagement and association with peers who regarded academic success as important. They found that the association of students with friends who dropped out of school and peer academic value had a significant effect on student engagement (You & Sharkey, 2009a).

Li and Lerner (2011) in their study on the grouping of adolescents based on their school engagement and its impact on delinquency reported that one's engagement trajectory was associated with delinquency. Li et al. (2011) indicated that students could stay away from problematic behaviours if they had increased positive and decreased negative emotions (emotional engagement) concerning school, a relationship that agrees with the social development model. A higher engagement of the youth in extra-curriculum activities has been associated with higher levels of positive youth development trajectories (Li, Bebiroglu, Phelps, Lerner, & Lerner, 2008).

Positive peer influence was the most important protective factor and inversely proportional to socially negative and violent behaviours even when demographic factors were controlled for (Leffert et al., 1998a). Low engagement is also related to decreased rates of high school completion (Mrug & Windle, 2009). However, engagement is modifiable, a significant predictor and a target for the prevention of school dropout and enhancement of educational achievement among all student groups (Appleton et al., 2008). Negative engagement measures including school attendance, dropout, tendency to disrupt classes are also positively correlated with delinquency and co-occur in the same individuals even though these statistical relationships have in some instances been sometimes accredited to other explanatory variables such as socioeconomic status (Finn, 1989). Negative engagement variables such as negative interactions between the teachers and students may also lessen engagement which is also associated with other negative engagement outcomes such as lower grades and poor school adjustment (Li & Lerner, 2011). Strong emotional engagement with school reduces the likelihood of behavioural problems due to an increased sense of belongingness (Finn, 1989). Conversely, weakened emotional engagement may lead to behavioural withdrawal from school which results in lower grades and social engagement which may in turn lead to delinquent behaviour (Finn, 1989). This relationship between engagement and school achievement is not only linear but also quadratic such that higher engagement levels leads to a higher increase in achievement than would lower engagement levels in a relationship that Appleton et al. (2008) described as “rich-get-richer” which holds across all gender, socioeconomic, and ethnicity strata. You and Sharkey (2009) reported the potential benefits of such a relationship between engagement and delinquency where most of the students who had unstable engagement trajectories as they transitioned between the 7th grade to 11th grade also demonstrated heightened likelihood to drop out of school and increased psychosocial challenges when compared with their counterparts with a more stable engagement trajectory.

Association between engagement in independent activities out of school and delinquency

Another measure of engagement focused on engagement in activities out of school. The variables including (in brackets are number of significantly associated delinquency variables) hours spent after school without an adult present (8), number of evenings spent on fun and recreation (13), times one went out with a date (12), number of times one went out for leisure activities (11), number of times one attended religious services (5) and importance attached to religion (9) were

significantly associated with delinquency measures.

Li et al. (2008) reported that student engagement in activities out of school such as time spent together with family, exercising, and civic activities was positively correlated with positive life trajectories amongst the youth. Grolnick, Kurowski and Gurland (1999) indicated that self-regulated learning could be forged and maintained in out-of-school environments such as home and family environments. There is therefore a close link between activities that improve engagement between different contexts such as schools, homes and peer contexts. Positive developments acquired in the home environment are passed on to the school environment and vice versa (Grolnick et al., 1999). Such advantages have been found in positive consequences such as an enhanced motivational role of parental involvement on their children's education (Grolnick et al., 1999). Windle et al. (2015) reported that lower religious commitment was associated with increased odds of problematic behaviours such as being in both the high and very high “high drinking trajectory” groups.

Association between engagement and substance use

Several engagement variables were significantly associated with the use of one or more substances. Engagement variables significantly associated with the use of five or more substances included (number of substances in brackets) prospects of graduating from high school (7 substances), hours spent on homework per week (5 substances), association with friends who have dropped out of school (5 substances), getting sent to the office due to misbehaviour (6 substances), and enjoying being in school (5 substances). Other engagement variables significantly associated with the use of substances included (number of substances in brackets) average grade attained in the school year (2 substances), participating in athletics (1 substance), hating being in school (4 substances), trying one's best in school (4 substances), failure to complete or turn in assignments (3 substances), finding schoolwork interesting (4 substances), how one thought most students would feel if they intentionally did things to make their teachers angry (4 substances), how one thinks others feel if they cheated on a test (1 substance), the importance attached to leadership activities (4 substance), the importance attached to good grades (2 substances), how often teachers interrupted class to deal with misbehaviour or “goofing off” (1 substance), and if one felt rules against misbehaviour were fair (1 substance). Similar findings from a study by Windle et al. (2015) indicated that lower school grades elevated the odds of being in a moderately high drinking trajectory. Such students also

started drinking early and had a lessened orientation to tasks (Windle et al., 2015). They reported that the prospects of completing more education years were associated with reduced odds of being in a high and very “high drinking trajectory” groups. Lower levels of the engagement variable, levels of religious commitment, were linked with lower inhibitory pressure against alcohol and high drinking behaviour which increased the odds of being grouped with high and very high “high drinking trajectory” (Windle et al., 2015). Similarly to this study, others have reported significant associations between engagement and substance use and delinquency. Li et al. (2011) reviewed other studies and highlighted the close link between delinquency and health-compromising behaviours which has led to the suggestion that the two problematic behaviour dimensions may emanate from the same root cause. Similar school engagement-based interventions may therefore be applied to target both delinquency and substance use problems.

Li and Lerner (2011) reported a link between an adolescent’s engagement trajectory and substance use. It should also be noted that the engagement trajectories also varied with ethnicity and socioeconomic status indicators such as household income and maternal education (Li & Lerner, 2011) and these factors may therefore modify the relationship between engagement and substance use.

Association between parental monitoring and delinquency

An important relationship of interest in this study concerns the influence of parental monitoring on delinquency. Univariate associations were therefore studied between variables measuring the two factors.

Parental monitoring variables significantly associated with the highest number of delinquency variables were (number of substances in brackets) having at least one other adult other than one's parents who they could talk to if they were having problems in life (10), parental knowledge of who they went out with at night (if they did go out at night) (10), parents or guardians allowing one to go out with friends on school nights (9) and parental or guardian knowledge of where one was after school (9). Other parental monitoring variables significantly associated with delinquency measures (number of substances in brackets) included having parents or guardians check on whether one did their homework (4), acceptance to talk about one's problems over with one or both parents or guardians (4), coming back at a set time whenever one went out during weekend nights (7), and how often one had dinner with one or both parents or guardians during a typical week (5).

Parental monitoring when accompanied with involvement in literacy activities such as reading has been shown to increase school adjustment and reduce behavioural problems through creating a linkage between the home and school contexts (Grolnick et al., 1999). However, monitoring efforts should also consider that children need autonomy to grow up as unique, active, and volitional beings capable of thinking independently, handling problems and taking up responsibilities (Grolnick et al., 1999; Han, Brussoni, & Mâsse, 2022). The introduction of structure in student activities at home allows the parents to provide unambiguous and coherent instructions, expectations, and rules concerning behaviour (Grolnick et al., 1999). Effective parental monitoring improves engagement in extracurricular activities, such as exercising at home and decreases time spent on activities such as passive media use, leading to increased civic engagement, behavioural and emotional engagement which results in less problematic and risky behaviours as well as higher school grades (Li et al., 2008).

Research Question 1: Variability of The Dependent Variables with Individual-Level and School-Level Factors

The students in this study could be viewed from a hierarchical perspective because they were organized as individuals nested within classes which are in turn nested within schools. Analytical approaches that ignore such hierarchies, though widespread, aggregate individual-level data thus neglect to take into account variation between individuals which cannot be resolved by subsequent disaggregation which in turn does not take into account the clustering (You & Sharkey, 2009a). It was therefore of interest before further modelling to investigate changes with grade level and school-level factors in the dependent variables including substance use, delinquency and the psychosocial variables (social cognitions and self-perceptions).

Substance use

Results about substance use indicated that the frequency of alcohol, heroin and other substances use varied significantly across schools but none of the substance use variables changed significantly across classes.

Several of the delinquency variables varied significantly at either school level or both school and class level. Involvement in a serious fight in the last one year, class lateness without approved excuse in an average school week, involvement in group fights in the past year, intentionally

missing school in the past month, skipping class one was not supposed to in the past one month, the sale of an illegal drug in the past one year, and involvement in a serious fight in the last one year significantly varied at both class and school-level factors. The two delinquency measures, suspension or expulsion from school in the past year and having brought a weapon to school in the past one month varied at the school level only. A previous study of important characteristics influencing dropping out of school demonstrated that the attributes of an institution may influence problematic behaviours such as lower school completion rates (Wehlage & Rutter, 1986).

Engagement

Most of the engagement variables varied significantly at either school, class level or both school and class level. The number of times teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week, finding school work interesting, the number of times teachers interrupted class to deal with misbehaviour or "goofing off" by others during an average school week, enjoying being in school, how frequently one hated being in school in the past year and how a student thought the majority of colleagues would feel if one intentionally did things to make their teachers angry significantly varied with both class and school-level. Engagement variables that varied significantly with school level were the average grade in the school year, the number of one's friends who dropped out of school, competition for grades amongst students, length of time spent in extra-curricular activities, how a student thought others would feel if they cheated in a test, how one perceived their likelihood to graduate from high school, the extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable and participating in other school clubs or activities during the school. Only the two variables, participating in music or other performing arts and the importance attached to being a leader in student activities, varied significantly with class-level factors. Class or school practices have been shown to affect student engagement (Glanville & Wildhagen, 2007). Similar to this study's results that indicated school-level variation, the attributes of an institution has been shown to influence school completion rates in a study on important characteristics influencing dropping out of or staying in school (Wehlage & Rutter, 1986). You and Sharkey (2009) reported inter-student variation in student engagement between individuals attending the same school while school-level variable inputs were found to account for a considerably large quantity of school-level variation in the baseline and subsequent rate of increase in student engagement. Some of the

reasons for such variation may include aspects such as school size which has been shown in many studies to be inversely related to student engagement (see Finn, 1989 for a review) .

Psychosocial factors

Psychosocial factors included social cognitions and self-perceptions.

Self-perceptions

There were two variation patterns in self-perception where three variables significantly differed by both class and school-level factors while the rest by only school-level factors. The three variables that significantly differed by both class and school-level factors included a preference to engage in frightening activities, feeling good to be alive and feeling that life was often meaningless. The feeling that one enjoyed life like others, preference for exciting and unpredictable friends, preference to explore strange places, feeling happy, getting excited from doing dangerous things, perspective concerning life in next few years, preference for new and exciting experiences, sometimes feeling one was not good at all, feeling that there is not much to be proud of, feeling that one is a person of worth on an equal plane with others, regular self-test with risky activities, the presence of someone to talk to when needed and the presence of someone to turn to for help varied significantly with school-level factors. It has previously been reported that the magnitude of the association between self-concept with school performance fluctuates depending on the grade (Dermitzaki & Efklides, 2000). A student may be influenced by the school setting or environment which considerably influences a student's self-concept owing to the school's social climate (Oerter, 1989). Schools described as stressful, competitive or boring have been associated with low student self-confidence (Oerter, 1989). Class size has been cited as an important factor influencing this connection and classes with fewer students enhance interest in school which leads to an improvement in school climate (Oerter, 1989). School size can therefore be used as an explanatory factor of the school level variation in self-concept (Oerter, 1989).

Social Cognition

Social cognitions were measured by how frequently certain thoughts go through the minds of the students when they were nervous or frightened. The feeling that one would get sick, feel foolish, was inadequate, was vulnerable, was inferior, people would not be interested in them, people would see they were nervous, people would think they were boring, and people would not like

them varied with both school and class level factors. The social cognition variables that varied significantly at the school level included the feeling that one was weird, one would go red, one would sweat, one would get paralyzed with fear, people would stare at them and they would be unable to write properly when they are nervous or frightened.

In conclusion concerning the variability of study measures at class and school level, significant variation of intercepts across the different schools and classes was found for different variables. The robust stability of hierarchical systems has been hypothesized since organizational malfunctions do not break down the whole system (Oerter, 1989). For instance, school-based hierarchies may not relate closely to personal hierarchies (Oerter, 1989). The influence of the hierarchies can be viewed with regards to the distinction between systems and environments (Oerter, 1989). While systems adapt to and are tilted towards the environment, systems maintain a difference between them and the environment by preserving boundaries between the two (Oerter, 1989). The student can therefore be viewed as a system contained within other systems such as classes and schools which interact to form an ecology where school characteristics act as ecological properties (Oerter, 1989).

Research Question 2: The Influence of Parent and Peer Factors on Psychosocial Factors and The Influence of The Changes in Psychosocial Factors on Student Engagement

This section discusses significant results from the multilevel cumulative logit models (CLMs) and highlights the protective or promotive direction and magnitude of parental and peer factor measures on the psychosocial factor measures and the influence of the changes in psychosocial factors on student engagement. The psychosocial factors included social cognition (measured as the locus of control) and self-perceptions (measured as self-concept). This was followed by an analysis of the influence of psychosocial factors on student engagement. Only significantly different associations or predictions are discussed. Key ordinal level term distinguishing between lower or higher levels in the scale, where relevant, are italicized in the text, for instance *often*, *sometimes*, *most* of the time.

Influence of parent and peer factors on psychosocial factors

This study used multilevel CLMs to study the impact of parental involvement and monitoring on psychosocial factors including social cognition and self-perceptions. Parental background

characteristics such as employment and occupation were controlled for and only significant associations with social cognition or self-perceptions are discussed here.

Influence of parent and peer factors on self-perception

Self-perception is an important factor influencing school performance, school engagement and positive development. For instance, students who dropped out of school reported lower self-concept scores for between 7 (males) or 8 (females) out of 10 measures of self-concept such as vigour, self-confidence and maturity in personality (Finn, 1989). There was also a relationship between self-concept in school ability with the years of education that a student had accomplished (Finn, 1989).

Several previous studies have reported the potential influence of parental monitoring and peer influence on self-perception and both positive and negative behaviours among students. Li et al. (2008) indicated that, for instance, youth who were part of positive development programs reported an increased tendency to engage in extracurricular activities such as exercising, participating in community activities and they spent less time on media such as TV, video games and surfing online. Adult supervision fosters constructive activities in contrast to the less structured ones thereby protecting against engagement in negative developmental activities which in turn increases emotional engagement with school (Li et al., 2008). How one spends time out of school with peers (such as hanging out with friends) and family (more family activities such as dinner together which increases the amount of time spent together with parents and other adult role models) has an impact on how one also spends their time in school and the emotional engagement with the school which further impacts academic and developmental trajectories (Li et al., 2008). This section highlights the need for structuring the time spent by students away from school because this has an impact on subsequent school activities, performance and positive development. The effect differences between the various measures of self-perception such as the individual "self-pride" and "self-satisfaction" questions which have been previously reported is highlighted (Finn, 1989).

The potential influence of parental involvement and monitoring variables on social cognition and self-perceptions was studied while controlling for parental education and occupation. This

discussion section presents protective and risk factors based on decreased (or increased) likelihood of negative or increased (or decreased) likelihood of positive social cognition and self-perceptions. Parental monitoring and involvement variables that significantly increased the happiness aspect of self-perception included how often parents limit the amount of time spent watching TV (30% and 36% higher likelihood for *often* and *sometimes* respectively compared to *none*), if one would talk problems over with one or both of their parents (33% and 78% higher likelihood for *some* and *most* problems respectively compared to *none*), how often one had dinner with one or both parents or guardians during a typical week (47% higher odds for *6-7 days* per week compared to *none*), and parents or guardians checking on whether the student did their homework (32% higher likelihood for *rarely* compared to *none*). On the other hand, the parental monitoring and involvement variables, how often parents allow going out with friends on school nights (32% less likely for *often* compared to *none*) and importance attached to religion (30% less likely for *very high* compared to *none*) decreased the likelihood of feeling happy. An increase in how often parents limited the amount of time spent watching TV and ability to talk problems over with one or both of their parents therefore increased self-reports of happiness among the students.

There was a higher likelihood of one reporting that they enjoyed life as much as anyone else for students whose parents often provided help with homework when needed (44% and 48% higher odds for *sometimes* and *often* respectively compared to *none*), those who would talk problems over with one or both of their parents (29% and 59% higher likelihood for *some* and *most* respectively compared to *never*), parents knew who one went out with at night (if they did go out at night) (54% higher likelihood for *always* compared to *never*), and paternal employment status (17% higher odds for unemployed compared to the self-employed). However, hours spent after school without an adult present (42% lower odds for *less than an hour* compared to *none*) and how often parents allow going out with friends on school nights (27% lower odds for *often* compared to *none*) were associated with a lower likelihood of enjoying life as much as anyone. Therefore, the students were more likely to enjoy life as much as anyone else as frequency at which the parents provided help with homework and talked problems over with the students increased. Parental motivation and involvement was reported to improve the student's self-esteem by mentoring and fostering higher academic performance in students (Moneva, Roed, Villaro, & Malbas, 2020). This role of parental monitoring and involvement on self-perception is also evident in other measures of self-perception in this discussion.

The preference for talking problems over with one or both of their parents (19% and 29% higher likelihood for *some* and *most or all* problems respectively compared to none) was significantly associated with increased likelihood of feeling of hopelessness about the future. However, how often one went out for leisure was significantly associated with a decreased (42% fewer odds for *almost every day* compared to none) likelihood of feeling hopeless about the future. Koo and Lee (2015) found that children participation in leisure activities after school such as physical activity impacted positively on their self-esteem, self-efficacy and school life.

There were increased odds of feeling good to be alive for students who reported that parents often provided help with homework when needed (31% and 49% increased likelihood for *sometimes* and *often* respectively compared to none), parents knew of who one went out with at night (if they did go out at night) (34% and 41% higher odds for *often* and *rarely* respectively compared to *none*), and attached importance to religion (52% and 67% increased likelihood for *pretty important* and *very important* respectively). However, students who reported that their mothers were self-employed were 11% less likely to indicate that they felt good to be alive than those who indicated their mothers were unemployed.

The positive role of parent-child communication and parental monitoring was highlighted by the finding that preference to talk problems over with one or both parents (24% higher likelihood for *most or all* compared to *none*) and parental knowledge of who the student went out with at night (if they did go out at night) (26% higher odds for *always* compared to *never*) increased the chances of taking a positive attitude towards self.

How often one went out for leisure (64% more likely for *once or twice a month* compared to never) and the importance attached to religion (47% higher likelihood for *very important* compared to not important) increased their self-perception as measured by the student's odds of feeling like a person of worth on an equal plane with others.

Aspects of self-perception that increased the feeling there was not much to be proud of included the preference to talk problems over with one or both of their parents (58% increased likelihood for *most or all* problems compared with none), and frequency of having dinner with one or both parents or guardians during a typical week (62% and 67% increased likelihood for *4-5 days* and *6-7 days* respectively compared to none). However, the importance attached to religion (33%, 34%, 40% decreased odds for *little important*, *pretty important* and *very important* respectively

compared to *none*) led to decreased chances of feeling there was not much to be proud of. This implies that the more one attached importance to religion, the higher the chances of feeling there was much to be proud of in life. An increase in a student's religious beliefs was previously reported to enhance optimism and though social support had a similar effect, the role of religious beliefs showed a higher predictive effect on optimism (Gheinaghi, Sanagoo, & Jouybari, 2018).

How often parents allowed going out with friends on school nights (32% higher odds for *often allowed* compared to *not allowed*), if one would talk problems over with one or both of their parents (42% higher odds for *most or all* compared to *prefer not*), parental knowledge of who they went out with at night (if they did go out at night) (50%, 43% 32% higher likelihood for *rarely*, *most of the times* and *always* respectively compared to *never knew*), hours spent after school without an adult present (56%, and 48% higher odds for *1-2 hours* and *more than five hours* respectively compared to *none or almost none*) and how often one went out for leisure (42% higher likelihood for *at least once a week* compared to *never*) led to increased chances of sometimes feeling not good at all.

Aspects of self-perception associated with increased feeling that one cannot do anything right included how often parents allow going out with friends on school nights (49% and 32% higher chances for *sometimes* and *often* respectively compared to *never*), if one would talk problems over with one or both of their parents (28% higher chances for *most or all problems* compared to *never*), and how often one had dinner with one or both parents or guardians during a typical week (87%, 46 % and 65% higher chances for *two days*, *4-5 days* and *6-7 days* respectively compared to *less than one day per week*).

The preference to talk problems over with one or both parents (28% and 31% increased likelihood for *at least for some* and *most or all* respectively compared to *never*), often one had dinner with one or both parents or guardians during a typical week (55%, 37%, 38% and 30% enhanced likelihood for *4-5 days*, *6-7 days*, *rarely*, and *sometimes* respectively compared to *less than a day per week*), were associated with higher odds of feeling that life is not useful. However, hours spent after school without an adult present (28%, 30%, 24% and 23% decreased likelihood for *less than an hour*, *1-2 hours*, *2-3 hours* and *more than five hours* respectively compared to *none*), and the importance attached to religion (27% decreased likelihood for both *pretty important* and *very important* compared to *not important*) were associated with lower odds of feeling that life is not

useful. This implies that spending more time after school with an adult present (the more time the better) and attaching importance to religion are associated with an increased likelihood to report feeling that life is useful. Previous studies reported that parental presence, interaction and involvement significantly enhanced the self-esteem score of their adolescent off-spring even when socio-economic disadvantages were controlled for (Doi, Isumi, & Fujiwara, 2020).

A couple of factors increased the likelihood of feeling lonely a lot of times including how often parents provided help with homework when needed (35% and 34% higher likelihood for *rarely* and *sometimes* respectively compared to *never*), if one would talk problems over with one or both of their parents (37% and 79% higher odds for *at least some* and *most or all* respectively compare to *never*), frequency of having dinner with one or both parents or guardians during a typical week (57%, 79%, and 54% higher likelihood for *3 days*, *4-5 days*, and *6-7 days* respectively compared to *less than one day per week*), hours spent after school without an adult present (62% and 64% higher chances for *1-2 hours* and *more than five hours* respectively compared to none), and how often one went out for leisure (46% higher chances for *at least once a week* compared to never).

Aspects that increased the likelihood of feeling that there was someone to turn to for help included how often parents provided help with homework when needed (72% increased likelihood for *often* compared to *never*), if one would talk problems over with one or both of their parents (32% and 23% increased likelihood for *at least some* and *most or all* respectively compared to *never*) and parental knowledge of where one was after school (44% higher chances for *always* compared to *never*). However, parental knowledge of who one went out with at night (if they did go out at night) was associated with a reduced likelihood (34% lower likelihood for *rarely* compared with *never*) of feeling that there was someone to turn to for help. Parental monitoring efforts therefore enhance the self-perception of a student but it should be considered that children need autonomy to grow up as unique, active, and volitional beings capable of thinking independently, handling problems and taking up responsibilities (Grolnick et al., 1999; Han et al., 2022).

There were higher chances of often feeling left out of things with increased frequency of parents limiting the amount of time spent watching TV (34% higher likelihood for *rarely* compared to *never*), parental knowledge of who they went out with at night (if they did go out at night) (96% and 47% increased likelihood for *rarely* and *always* respectively compared to *never*), racial background (17% higher odds for *Asian or Indian* compared to *African*), and hours spent after

school without an adult present (54% and 34% higher odds for 2-3 hours and more than five hours compared to none). Even though limiting the amount of time spent watching TV and parental knowledge of who they went out with at night are important parental monitoring activities in the life of a student, consideration should be made when instituting these measures in order to mitigate the student's feeling that they are left out of things.

Aspects associated with increased likelihood of the presence of someone to talk to when needed included if one would talk problems over with one or both of their parents (43% and 110% higher likelihood for at least *some, most or all* compared to *never*), parental knowledge of where one was after school (54% higher odds for always compared to never), having at least one other adult they could talk to about their problems other than their parents (57% higher likelihood for most or all compared to none), and having parents or guardians check on whether one did their homework (61% higher likelihood for *rarely* compared to *never*). However, there were decreased chances of feeling there was someone to talk to when needed with an increase in how often parents limited the amount of time spent watching TV (39% decreased odds for *rarely* compared to *never*), how often parents allowed going out with friends on school nights (40% and 34% decreased likelihood for *rarely, often* respectively compared to never), parental knowledge of who they went out with at night (if they did go out at night) (34% decreased chances for *most of the time* compared to *never*), and hours spent after school without an adult present (45%, 58% and 46% decreased likelihood for *less than an hour, 1-2 hours* and *2-3 hours* respectively compared to *none or almost none*). While parental monitoring efforts are essential for a student's self-perception and esteem, reduced disregard to autonomy may reduce this gain in self-perception and esteem.

How often parents limit the amount of time spent watching TV (35% and 30% decreased odds for *sometimes* and *often* respectively compared to *never*) and the importance attached to religion (31% more likely for *very important* compared to *not important*) were associated with reduced likelihood of wishing one had more good friends. Attaching importance to religion increased the likelihood of having friends one can get together with (55%, 57% and 62% for *little, pretty important* and *very important* respectively compared to *no importance*).

Regular testing of oneself by engaging in risky activities decreased significantly with an increase in parental knowledge of who students went out with at night (if they did go out at night) (34% lower likelihood for *rarely* compared with *never*), hours spent after school without an adult present

(27% lower likelihood for *more than five hours* compared to none or almost none), times one went out with date and how often one went out for leisure (24%, 46%, 54%, 57%, 26%, 28% and 51% less likelihood for *once a month or less, once a week, 2-3 times, three times in a week, only a few times, at least once a week* and *almost every day* respectively compared to *never*).

The likelihood of preferring to exploring strange places was reduced depending on how often parents allowed going out with friends on school nights (34% and 26% reduction in the chances for *sometimes, often* respectively when compared with *never*), parental knowledge of who they went out with at night (if they did go out at night) (32% reduced chances for *most of the time* compared to *never*) and how often one went out for leisure (36% and 34% reduction in likelihood for *twice a month* and *at least once a week* respectively compared to *never*). However, the ability to talk problems over with one or both of their parents for *most or all* problems led to a 27% increase in the likelihood of preferring to exploring strange places. Parental monitoring and involvement in leisure are therefore protective against the preference to exploring strange places.

There was an increased likelihood to prefer doing frightening activities with increased frequency of parents allowing going out with friends on school nights (49% and 41% higher chances for *rarely* and *often* compared to *never*), parental knowledge of where one is after school (66% higher likelihood for *sometimes* compared to *never*), frequency of having dinner with one or both parents or guardians during a typical week (62% higher chances for *two days* compared to *less than one day per week*) and having at least one other adult other than one's parents that they can talk to about problems (29% and 32% higher chances for *at least some* and *at least one* respectively compared to *none*).

The frequency of one going out for leisure (23% reduced odds for *only a few times* compared to *never*) and importance attached to religion (35% and 30% reduced likelihood for *a little* and *pretty important* compared to *not important*) were linked to reduced likelihood of preference for exciting new experiences. However, the preference to talk problems over with one or both parents (50% increased likelihood for *most or all* compared to *none*) and parents or guardians checking whether one did their homework (32% increased likelihood for *often* compared to *never*) were linked to an increased likelihood of preference for exciting new experiences.

How often parents allowed going out with friends on school nights (29% for *rarely* compared to *never*), how often one went out for leisure (21% and 39% reduced likelihood for *once or twice a*

month and *at least once a week* respectively compared to *never*) and importance attached to religion (36%, 40% and 40% reduced likelihood for *a little*, *pretty important* and *very important* respectively compared to *not important*) were significantly associated with decreased preference for exciting unpredictable friends. Autonomy accompanied by parental supervision, leisure and religious beliefs are therefore recommended as protective against the influence of the student by unpredictable peers. However, being able to talk problems over with one or both of their parents for *most or all* problems was associated with a 29% increase in the likelihood of preference for exciting unpredictable friends when compared with those who would not.

There were increased odds of often feeling bored with higher preference to talk problems over with one or both of parents (32% and 30% increased likelihood for *at least some* and *most or all* respectively compared to those who would not) and parents or guardians checking whether one did their homework (48% increased likelihood for *sometimes* compared to *never* checked). However, there was a reduced likelihood by 36% of feeling bored for students who went out for leisure activities *almost every day* than those who *never* went.

The ability and preference to talk problems over with one or both of their parents (32% increased likelihood for *at least some* compared to *never*) and having parents or guardians check whether one did their homework (29% increased likelihood for *sometimes* compared to *never*) were associated with increased likelihood of often having nothing to do. However, how often parents allowed going out with friends on school nights was associated with a 41% reduced likelihood of having nothing to do for students whose parents *rarely* allowed going out with friends on school nights compared to those who would not. Therefore, while parent-child communication and monitoring may be promotive for other dimensions of self-perception, this may be perceived by the student as a hindrance to their autonomy.

There was an increased likelihood of optimism about life in the next few years with an increase in how often one had dinner with one or both parents or guardians during a typical week (100% increased likelihood for *3 days* compared to *less than one day per week*), how often they went out for leisure (44% and 47% increased chance for *a few times* and *once or twice a month* compared to *never*), and having at least one other adult other than one's parents that they could talk to about problems (60% increased likelihood for *most or all* problems compared to *none*). However, those who attached importance to religion as *pretty important* reported a 37% reduced likelihood of

being optimistic about life in the next few years compared to those who indicated that religion was not important in their lives.

The foregoing results are similar to previous studies that indicated that both personal characteristics and interpersonal associations with parents, peers, and teachers were important for effective personal and subsequently school adjustment (Birch & Ladd, 1996). Interactions with peers have been highlighted as a powerful contributor to school engagement, attitudes, and behaviours (You & Sharkey, 2009a). The generalisation, interpretation and application of the findings discussed in this section should however consider that self-perception has been reported to vary with grade. Some studies have reported a decrease in self-esteem as students transitioned to junior high school, others reported constant self-esteem while others reported an increase (Grolnick et al., 1999). Finn (1989) reported growth in self-esteem in all groups of students which was robust against the tendency to drop out from school during three years of a longitudinal study.

Influence of parent and peer factors on social cognition

In contrast to self-perception, cognitive goals are part of a broad set of categories of consequences that should be viewed differently from behaviours (Finn, 1989). Social control may influence self-esteem. For instance, Finn (1989) indicated that youths with low social cognition may resort to problematic behaviours in efforts to boost their self-esteem and favourable school experiences were protective against disruptive and problematic behaviours via increased self-esteem. Social cognition (measured as the locus of control) was assessed by investigating thoughts that go through the students' minds when they are nervous or frightened.

Several parental monitoring and involvement variables increased the likelihood of being unable to speak when nervous or frightened including the preference to talking problems over with one or both of their parents (39% higher odds for *most or all* compared to *never*) (6% for *graduate or professional school after college* compared to *grade school or less*), highest paternal level of education and how often one went out for leisure (28% for *once or twice a month* compared to *never*). However parental knowledge of who one went out with at night (if they did go out at night) was associated with a 26% lower likelihood of being unable to speak when nervous or frightened for students whose parents *always* knew than parents who *never knew* who one went out with at night.

There was a 38% higher likelihood of feeling unlikeable when nervous or frightened for students who went out for leisure activities *at least once a week* compared to those who never went out. How often one had dinner with one or both parents or guardians during a typical week (75% and 52% higher likelihood for *one day* and *4-5 days* respectively compared to *less than a day per week*) and how they attended religious services (34% higher chances for *once or twice a month* compared to those who never attended) increased the chances of indicating that one would tremble or shake when nervous or frightened.

There was a reduction in the likelihood of feeling that others would stare at one when they were nervous or frightened with an increase in the parental monitoring and involvement variable, how often parents allowed the student to go out with friends on school nights (38% and 42% reduced chances for *rarely* and *often* respectively compared to *never*). However, the odds of an increased feeling that others would stare at them when they were nervous or frightened were 33% times higher for students who would talk problems over with one or both of their parents for *most or all* problems than those who *would not*.

Several parental monitoring and involvement variables increased the likelihood of feeling foolish when one got nervous or frightened including how often parents allow going out with friends on school nights (48% and 61% increased likelihood for *sometimes* and *often* respectively compared to *never*), parental knowledge of who they went out with at night (if they did go out at night) (56% increased likelihood for *rarely* compared to *never*), hours spent after school without an adult present (39% increased likelihood for *more than five hours* compared to *none or almost none*), how often one went out for leisure (30% for *once or twice a month* compared with *never*) and having at least one other adult other than one's parents that they could talk to about their problems (29% increased likelihood for *most or all* compared with *none*). However, the chances of reduced feeling that one was foolish when they got nervous or frightened for students who would talk problems over with one or both of their parents, for *at least some* of their problems, were 23% lower than those who would not.

Parental knowledge of who the student went out with at night (if they did go out at night) (59% higher likelihood for *most of the time* compared with *never*), and the highest paternal level of education (6% higher for *graduate or professional school after college* compared with parents who

completed *grade school or less*) increased the likelihood of reporting the feeling that one would be paralyzed with fear when they got nervous or frightened.

There were increased chances of dropping or spilling things when one got nervous or frightened with increased preference to talk problems over with one or both parents (28% higher chances for *most or all*, compared with *not*) and attaching importance to religion (46% and 26% higher likelihood for *little important* and *very important* compared with *not important*)

The ethnic background (17% higher chances for *Asian or Indian* compared to *black or African*), parental knowledge of where one was after school (43%, 44% and 43% increased likelihood for *rarely*, *most of the time* and *always* respectively compared with *never*) and the importance attached to religion (45% and 30 % higher likelihood for *little* and *very important* compared to *no importance*) were associated with increasingly feeling one would be sick when they got nervous or frightened. However, a reduction in the chances of feeling that one would get sick when they got nervous or frightened was reported for students whose parents knew where they were after school (41% and 27% reduction for *rarely* and *always* respectively compared to *never*).

The likelihood of feeling that one was inadequate when they were nervous or frightened increased with the frequency of parents providing help with homework when needed (44% and 39% higher likelihood for *sometimes* and *often* respectively compared with *none*), how often parents allowed going out with friends on school nights (39% and 50% higher chances for *sometimes* and *often* respectively compared with *never*) and parent marital status (9% higher chances for *divorced* compared with *married*).

The feeling that one would babble or talk funnily when they got nervous or frightened increased with how often parents allowed going out with friends on school nights (38% higher likelihood for *sometimes* when compared with *never allowed*), parental knowledge of where one was after school (51%, 48% and 45% higher chances for *sometimes*, *most of the time* and *always* respectively compared with *never*), how often one attended of religious services (33% and 47% higher likelihood for *once or twice a month* and *once a week or more* respectively compared to *never*) and the importance attached to religion (35% higher likelihood for *little* compared with *none*).

Feeling inferior when one was nervous or frightened increased with how often parents allowed going out with friends on school nights (39% and 50% higher likelihood for *rarely* and *often* respectively compared with *never*), coming back at a set time whenever one went out during

weekend nights (53% higher chances for *most of the time* compared to *never*) and the highest maternal level of education (6% higher chances for *graduate or professional school after college* compared to *grade school or less*).

The inability to concentrate when one was nervous or frightened was 13% less for those who had repeated grades *two or more times* than for those who had *not repeated any* grade in school and 11% less for students whose maternal employment status was *self-employed* compared to those who were *unemployed*.

Increased in the frequency at which parents allowed going out with friends on school nights (33% higher likelihood for *often* compared with *never*), and hours spent after school without an adult present (36% and 33% higher chances for *3-5 hours* and *greater than five hours* respectively compared with *none or almost none*) increased the chances of reporting an inability to write properly when one got nervous or frightened. However, students whose paternal employment status was *self-employed* were 10% less likely to report and increased inability to write properly when they were nervous or frightened when compared with those whose paternal employment status was *unemployed*.

The feeling that people were not interested in the students when they were nervous or afraid increased with how often parents allowed going out with friends on school nights (28% higher chances for *often* compared to *never*), parental knowledge of who they went out with at night (if they did go out at night) (40% higher chances for *rarely* compared with *never*), hours spent after school without an adult present (31% higher likelihood for *more than five hours* compared with *none or almost none*), how often one went out for leisure (30% and 43% higher likelihood for *once or twice a month* and *at least once a week* respectively compared with *never*) and the importance attached to religion (33% higher chances for *very important* compared with *not important*). However, having parents or guardians check on whether one did their homework reduced the chances of feeling that people were not interested in them for students who indicated that parents or guardians *often* check on whether they did their homework by 29% compared to those whose parents never checked.

Aspects associated with an increased feeling that people would not like the student when they were nervous or frightened included racial background (23% higher likelihood for Asian or Indian when

compared with black or African) and importance attached to religion (52% and 53% higher likelihood for *pretty important* and *very important* respectively when compared to *not important*).

There was an increased feeling of being vulnerable when nervous or frightened with an increase in the frequency at which the parents allowed one to go out with friends on school nights (60% increased chances for *often* when compared with *never allowed*) and the importance attached to religion (87% and 65% higher chances for a *little* and *very important* respectively when compared to *not important*).

The thought that one would sweat when nervous or frightened reduced for those who had repeated grades at least once (14% lower for *two or more times* compared with *never*), often went out for leisure (32% lower chances for *almost every day* compared with *never*), and whose parents or guardians checked whether they did their homework (26%, 28% and 39% lower chances for *rarely*, *sometimes* and *often* compared with *never*). However, the importance attached to religion increased (60%, 51% and 49% higher likelihood for *little important*, *pretty important* and *very important* respectively when compared with *not important*) the thought that one would sweat when they were nervous or frightened.

The likelihood of the student indicating that they would go red when they were nervous or frightened increased with how often parents allowed going out with friends on school nights (35% higher likelihood for *often* when compared with *never*) and how frequently one attended religious services (51% higher likelihood for *once or twice a month* compared with *never*). However, students whose parents or guardians checked on whether they did their homework experienced a reduced likelihood of such an event by 25%, 31% and 27 % for those children whose parents allowed going out with friends on school nights *rarely*, *sometimes* and *often* respectively compared with those who were *never* allowed.

The likelihood of feeling weird or different when nervous or frightened increased with how often parents provided help with homework when needed (35% and 46% increased likelihood for *rarely* and *often* respectively compared with *never*), the highest maternal level of education (7% higher for *graduate or professional school* when compared with completed *grade school or less*), and having at least one other adult other than one's parents that they could talk to about their problems (28% higher chances for *most or all problems* compared with *none*). However, there were reduced chances of feeling weird or different when nervous or frightened with an increase in the

possibilities of talking problems over with one or both of their parents (24% and 32% reduced chances for *at least some* and *most or all* respectively compared with *none*) and maternal employment status (12% lower likelihood for *self-employed* compared with *unemployed*).

There were increased likelihood of reporting that people realized it when one got nervous or frightened with an increase in how frequently the parents limited the amount of time spent watching TV (32% higher chances for *rarely* compared with *never*), how often parents allowed going out with friends on school nights (36% and 39% higher likelihood respectively for *sometimes* and *often* compared with *never*), coming back at night at a set time whenever they went out during a weekend (43% higher likelihood for *rarely* compared with *never did*), the highest maternal level of education (6% higher for *graduate or professional school after college* compared with *grade school or less*), and the number of times during a typical week that one went out for fun and recreation without adult supervision (48% and 89% higher chances for *four or five evenings* and *six or seven evenings* compared with *less than one evening per week*). However, there were lower odds of believing that people realized it when one got nervous or frightened for students whose parents or guardians checked on whether they did their homework (22% and 26% lower chances for *rarely* and *often* respectively compared to *never*).

The chances of feeling that people thought the student was boring when they were nervous or frightened for students whose parents *often* allowed them to go out with friends on school nights were 29% higher than for those whose parents *never* did.

These results demonstrate that parental monitoring and involvement have a significant influence on the student's social cognition. It was previously suggested that child factors and parental involvement may be important for the development of the child's locus of control and parental and child's locus of control are significantly correlated (Nowicki, Iles-Caven, Gregory, Ellis, & Golding, 2018). Previous studies have reported similar trends for some of the variables discussed in this section. Li et al. (2008) reported reduced behavioural engagement amongst youths who had a habit of going out with friends without laid out plans on how to spend the time and those who regularly used media such as TV, video games and online surfing when compared to their fewer media using colleagues. Higher academic grades and less likelihood to engage in problematic behaviour were reported when the children had dinner more regularly with other family members when compared with those who did not (Li et al., 2008). A similar trend was observed for

emotional engagement where students with higher emotional engagement with school showed improved grades and were less prone to engage in behavioural problems than their less emotionally engaged counterparts (Li et al., 2008). Future application of the research results should therefore focus on operationalising peer influence, parental monitoring and involvement aspects that improve the student's locus of control.

Influence of the psychosocial factors, social cognition and self-perceptions, on engagement

The importance of engagement should be viewed in the context of its precursors such as the fulfilment of essential needs (Appleton et al., 2008). This section discusses the influence of psychosocial variables including social cognition (measured as the locus of control) and self-perceptions (measured as self-concept) on engagement variables.

The odds of an increased average grade attained in the school year, an engagement variable, increased with the social cognition variables that one would be paralyzed with fear (40% higher likelihood for *half of the times* compared with thought *never* occurs), and one gets vulnerable when they were nervous or frightened (70% higher chances for *rare occasions* compared with *never*). However, there were higher chances of a decrease in average grade attained in the school year with an increase in the social cognition feeling that one would drop or spill things (30% lower odds for each of the responses *usually* and *always* compared to *never*) and one would be unable to write properly when they got nervous or afraid (30% and 20% lower odds for *usually* and *always* respectively compared with thought *never* occurs).

The self-perception measures self-satisfaction (90%, 50% and 40% higher likelihood for *neither agreed nor disagreed*, *mostly agreed* and *fully agreed* respectively compared with self-satisfied), feeling of hopelessness about the future (30% for increased likelihood for *mostly* compared with *disagreed*) and often finding nothing to do (40% higher likelihood for *neither agreed nor disagreed* compared with *disagreed*) were associated with increased prospects of graduating from high school. However, students who *neither agreed nor disagreed* feeling like a person of worth on an equal plane with others reported 34% lower prospects of graduating from high school compared with those who disagreed with this thought. Self-esteem was previously reported to significantly predict the likelihood of graduation from high school (Klepfer, 2015).

There was a 54% more likelihood of increased participation in music or other performing arts for students who *agreed* they often had nothing to do than those who disagreed to this thought. There were 50% higher chances of attaining higher average grades in the school year for students *who neither agreed nor disagreed* that they were able to enjoy life as much as anyone compared to those who disagreed about having this thought.

There was a reduced feeling that people would not be interested in them when they were afraid or nervous (28% and 39% lower chances for *half of the time* and *always* respectively compared with those who *disagreed* with this thought) with increased participation in music or other performing arts. Involvement in music was previously shown to enhance self-confidence in adolescents (Shayan, AhmadiGatab, Jeloudar, & Ahangar, 2011). However, there was an increased indication that others would not like them when one was afraid or nervous (53% and 39% higher likelihood for *half of the time* and *always* respectively compared with thought *never occurs*) with increased participation in music or other performing arts.

There was a lower likelihood of participation in athletics teams for those who reported an increased feeling that they would tremble or shake (35% reduced likelihood for *half of the time* compared with thought *never occurs*), be unable to write properly (28% reduced likelihood for *usually* compared with thought *never occurs*) and be vulnerable (37% lower chances for *rare occasions* compared with *never*) when they were nervous or frightened. This could be explained by the observation in a previous study that a student-athlete's social identity positively influences their psychosocial adjustment, academic control and reduced negative emotions which resulted from reduced perception of stress (Parker et al., 2021). However, the odds of increased participation in athletics team for students who thought that they would *always* be paralyzed with fear when nervous or frightened were 47% higher than those who indicated that this thought never occurs.

There was a 25% higher likelihood of increased participation in other school clubs or activities during the school for students who *agreed* that life is often meaningless than for those who disagreed with the thought.

The likelihood to indicate that one would get sick and feel inferior when nervous or frightened was lower (38%, 39% and 30% reduced likelihood for *sick half of the times*, *usually* and *always* respectively when compared to thought *never occurred*) with increased participation in other school clubs or activities during the school year. However, there was an increased likelihood of

increased participation in other school clubs or activities during the school for students who felt inferior when they got nervous or frightened (45% and 44% increased likelihood for *usually* and *always* compared with those for who this *never* occurred). This indicates a bidirectional positive impact of participation in school clubs or activities during the school year on social cognition. A previous study reported that time spent on curricular and extracurricular activities enhanced a student's cognitive ability (Pan, Zhou, & Shek, 2022). However, not all activities are beneficial and it was reported that attending out of school tutoring, watching TV, surfing on the internet and playing games reduced a students' cognitive ability (Pan et al., 2022).

There was a higher likelihood of enjoying being in school with an increase in the self-perception factors feeling good to be alive (56% higher likelihood for those who *neither agreed nor disagreed* compared with those who *disagreed*), feeling that life was not useful (62% higher likelihood for those who *mostly disagreed* compared with those who *completely disagreed*) and preference for engaging in frightening activities (29% increased likelihood for those who *agreed* compared with those who *disagreed*). However, the ability to do things as well as others (38% lower likelihood for *neither agreed nor disagreed* compared with *disagreed*) and preference for exciting and unpredictable friends (26% reduced likelihood for *agreed* compared with *disagreed*) lowered the likelihood to report that the student enjoyed being in school.

The social cognitive item that other people would not like the student when they got nervous or frightened (38%, 64% and 48% for *half of the time*, *usually* and *always* respectively compared to *never*) was linked to an increased likelihood of enjoying being in school.

The likelihood of increasingly trying one's best in school was enhanced by feelings of hopelessness about the future (25% higher likelihood for those who *agreed* compared with those who *disagreed*), feeling good to be alive (45% higher likelihood for those who *mostly agreed* compared to those who *disagreed*) and having a positive attitude towards oneself (63%, 95% and 34% higher likelihood for *mostly agreed*, *agreed*, *mostly agreed* respectively compared with those who *disagreed*).

Feeling inferior (60% higher likelihood for *half of the time* compared with thought *never* occurred), or weird (45% higher likelihood for *always* compared with thought *never* occurred) when they got nervous or frightened were associated with an increased likelihood of trying one's best in school. However, there were 27% lower chances of trying one's best in school for students who indicated

they would *always* feel foolish when they were nervous or frightened compared to those who indicated that this thought never occurred. This is agreement with a previous study which found out that increased social cognition leads to increased educational motivation and cognitive ability which enhances student satisfaction and academic performance (Aghaziarati, Brojerdi, Bedayat, & Asgari, 2020).

There was a higher likelihood of finding schoolwork too hard to understand with increased student self-satisfaction (36% higher likelihood for those who *agreed* compared to those who *disagreed* to this thought), presence of someone to turn to for help (84% higher likelihood for those who *mostly disagreed* compared to those who *completely disagreed* to this thought), having friends one can get together with (46% higher likelihood for those who *mostly disagreed* compared to those who *completely disagreed* to this thought) and often feeling bored (25% higher likelihood for those who *agreed* compared to those who *disagreed* to this thought). However, there was a 33% lower likelihood of finding schoolwork too hard to understand for students who *mostly disagreed* that they felt good to be alive than those who fully *disagreed*.

There was a 40% higher likelihood of finding schoolwork too hard to understand for students who thought on *rare* occasions that people would reject them when they were nervous or frightened when compared to those who indicated that this thought never occurs.

Self-satisfaction (48% higher likelihood for those who *neither agreed nor disagreed* compared with those who *disagreed*), the ability to do things as well as others (61% higher likelihood for those who *mostly agreed* compared with those who *disagreed*), finding schoolwork interesting (61% higher likelihood for those who *mostly agreed* compared with those who *disagreed*) and the ability to do things as well as others (66% higher likelihood for those who *agreed* compared with those who *disagreed*) were linked with higher odds of finding schoolwork interesting. Self-esteem has similarly been found to be related to academic achievement in a reciprocal manner where increase in one leads to an increase in the other (Joshi & Srivastava, 2009). However, the likelihood of finding schoolwork interesting for students who *neither agreed nor disagreed* that they were often bored was 26% lower than those who *disagreed*. Appleton et al. (2008) also reported that high-ability students who had reduced certainty concerning their competency or perceived that they were externally controlled, indicated higher apprehension and resentment toward school

while their counterparts who were more autonomous and surer of their ability felt more inquisitive and persist in school tasks.

There was a decreased likelihood of spending time in extra-curricular activities with an increased feeling that life was meaningless (22% lower likelihood for *mostly disagreed* compared with *totally disagreed*) and preference for new and exciting experiences (31%, 39% and 24% for *neither agreed nor disagreed*, *mostly agreed* and *agreed* respectively compared with those who *disagreed*). However, the odds of spending time in extra-curricular activities increased with the feeling of happiness (27% higher likelihood for *very happy* compared with *not too happy*) and how often one felt bored (40% higher likelihood for *mostly disagreed* compared with *totally disagreed*). This indicates that while the student may engage in extra-curricular activities in efforts to prevent boredom, this leads to a significant enhancement in happiness, a self-esteem variable.

The social cognition variables including the thought that one would be unable to speak (72%, 56%, 59% and 83% higher likelihood for *rare*, *half of the time*, *usually* and *always* respectively compared to thought *never* occurred) when they got nervous or frightened increased the likelihood of spending more time in extra curriculum activities.

There were increased chances of engaging in competition for grades with an increased feeling that life was meaningless (30% higher chances for *mostly disagreed* compared with those who *disagreed*) and sometimes one was not good at all (45% higher chances for *neither agreed nor disagreed* compared with those who *disagreed*).

There were increased odds of one thinking that colleagues would express an increased dislike if they cheated on a test for students who were more self-satisfied (46%, 56% and 63% higher likelihood for *neither agreed nor disagreed*, *mostly agreed* and *agreed* respectively compared with *disagreed*) and who enjoyed life as much as anyone (34% higher likelihood for *agreed* compared with *disagreed*). However, the ability to do things as well as others (54% lower likelihood for *neither agreed nor disagreed* compared with *disagreed*) and often finding oneself with nothing to do (26% and 32% lower likelihood for *neither agreed nor disagreed* and *mostly agreed* respectively compared with *disagreed*) reduced the odds of one thinking that their colleagues would express an increased dislike if they cheated on a test.

The social-cognitive feeling that people would not be interested in the student when they were nervous or frightened was linked to a higher likelihood of reporting (48% higher likelihood for

usually compared with though *never* occurred) that their colleagues would dislike it if one cheated on a test.

There were higher odds of indicating that others disliked one if they intentionally angered their teacher with an increased feeling good to be alive (28% higher likelihood for *agreed* compared with *disagreed*) and optimism about life in the next few years (11% higher likelihood for *stay about the same* compared with *life would get much better*). However, the odds of an increased dislike by others if one intentionally angered their teacher were 34% lower for students who *mostly disagreed* that the future often seemed hopeless compared with those who *disagreed*.

The students were more likely to attach importance to getting good grades with an increased availability of someone to always turn to if one needed help (59% and 55% higher likelihood for *mostly disagreed* and *agreed* respectively compared with *disagreed*). The positive effect of the presence of someone to turn to for support is evident from reports that the engagement of parents in the education of their children is facilitative of a student's enhanced social and academic performance through modulation of the child's behaviour (Epstein, 2018; Hill & Craft, 2003; McWayne et al., 2004). Finn, 1989 reported an increased correlation between performance in school and self-esteem for students who showed higher levels of school engagement than their counterparts.

There were 66% higher chances of attaching importance to getting good grades for students when they *usually* thought that they would be paralyzed with fear when they were nervous or frightened than those who indicated that this thought never came to mind.

There were higher chances of an increase in the number of times teachers interrupted class to deal with misbehaviour or "goofing off" during an average school week with the increased feeling that life was not useful (77%, 52% and 62% higher likelihood for *neither agreed nor disagreed*, *mostly agreed* and *agreed* respectively compared with *disagreed*), preference for new, exciting experiences even if one had to break the rules (62%, 72% and 50% higher likelihood for *neither agreed nor disagreed*, *mostly agreed* and *agreed* respectively compared with *disagreed*), and optimism about life in the next few years (95% and 96% higher likelihood for getting *somewhat worse* and *get much worse* compared with *life would get much better*). However, there were reduced chances of an increase in how often teachers interrupted class to deal with misbehaviour or "goofing off" during an average school week with the increased feeling that life was

meaningless (26% lower likelihood for *agreed* compared with *disagreed*), feeling that one cannot do anything right (27% lower likelihood for *agreed* compared with *disagreed*), and often having nothing to do (33% lower likelihood for *mostly agreed* compared with *disagreed*).

There were increased chances of the teachers more often interrupting classes to deal with misbehaviour or "goofing off" during an average school week with the increased feeling that when nervous or frightened, one would be unable to speak (57%, 50% and 80% higher likelihood for *half of the times*, *usually* and *always* respectively compared with thought *never occurred*), would be unlikeable (78% higher likelihood for *always* compared with), and would get sick (69% and 49% higher likelihood for *half of the times* and *always* respectively compared with *never occurred*). Lower social cognition therefore leads to reduced school engagement which is associated with an increase in behavioural problems such as class interruption due to student behaviours.

The odds of a higher number of the times that teachers interrupted the class to deal with misbehaviour or "goofing off" by self during an average school week for students who indicated they were *pretty happy* and *very happy* were 37% and 35% higher respectively than those who indicated they were not too happy.

The chances of teachers more often interrupting classes to deal with misbehaviour or "goofing off" by self during an average school week were higher with the increased feeling when one was nervous or frightened that they would be unable to speak (65% higher likelihood for *rare* compared with), people would reject them (61% and 53% and 66% higher likelihood for *half of the times*, *usually* and *always* respectively compared with), they would feel inferior (37% higher likelihood for *rare* compared with thought *never occurred*) and people would not like them (36% higher likelihood for *usually* compared with thought *never occurred*). However, the odds of a higher number of the times that teachers interrupted class to deal with misbehaviour or "goofing off" by self during an average school week for students who indicated that they would *rarely* and *usually* get vulnerable when they were nervous or frightened were 45% and 32% lower respectively than those who indicated that this thought *never occurred*. This agrees with the previous observation that lower social cognition is associated with reduced school engagement and increase in behavioural problems such as class interruption due to student behaviours.

The students were less likely to believe that the rules about student behaviour in their school were generally fair and reasonable as they experienced an increased ability to enjoy life as much as anyone (33% lower likelihood for *neither agreed nor disagreed* compared with *disagreed*) and wished they had more good friends (28% lower likelihood for *neither agreed nor disagreed* compared with *disagreed*). However, there was a 39% higher likelihood of increasingly feeling that the rules about student behaviour in their school were generally fair and reasonable for students who *agreed* that they preferred new and exciting experiences even if they would have to break the rules than those who *disagreed* to this thought.

The chances of feeling that the rules about student behaviour in their school were generally fair and reasonable for students who thought that one would stare at them *half of the times* when they were nervous or frightened were 34% lower than for those who indicated that this thought never occurred. However, the odds of feeling that the rules about student behaviour in their school were generally fair and reasonable for students who indicated that they would feel inadequate *half of the times* when they were nervous or frightened were 39% higher than in those who indicated that this thought never occurred.

The aspects reported in this section that increase school engagement are potentially important in practice to alleviate problematic behaviours and increase desirable assets such as school completion which has a desirable impact on lifelong trajectories. Dropping out of school has fundamental implications on a student's economic and social life trajectory that impact both the individual and society (Wehlage & Rutter, 1986). School performance aspects such as previous grades and importance attached to good grades are also important intervention points to improve school engagement which has a desirable impact on school completion rate and other desirable outcomes (You & Sharkey 2009).

Research Question 3: Pathways Through Which Personal and Contextual Factors Influence the Impact of Behavioural and Emotional Engagement on The Risk for and Occurrence of Delinquency and Substance Use

Factor Analysis

Exploratory factor analysis was used to examine items that loaded onto the same factor to identify common dimensions within which the questions highly loaded in order to identify the common

constructs. This assists in specifying the nomological network of each of the constructs by distinguishing and defining the internal and external perspectives of the constructs and their dimensions (Byrne, 1984; Clark & Watson, 2019). An examination of how strongly each of the items of the scale loads into each of the factors validates the facets of the construct (Byrne, 1984; Clark & Watson, 2019). To test for the internal consistency and validity for the constructs, the extent to which the dimensions fit the data were further tested using confirmatory factor analysis.

Delinquency

A two factors solution was sufficient for delinquency. The first one involved the variables: carrying a weapon to school, involvement in group fights, suspension or expulsion from school, involvement in serious fights, sale of illegal drugs and taking of other student's belonging. Having taken a weapon to school in the past one month loaded highest to this factor. The second factor included the variables such as going into buildings without permission, hurting others and running away from home. This factor was best represented by skipping class one was not supposed to in the past one month which loaded highest to it. Similar variables in previous studies highly loaded to delinquency including skipping class and class lateness (Glanville & Wildhagen, 2007). Problematic behaviours which are part of externalizing behaviours can be divided into conduct problems and delinquency (Mrug & Windle, 2009). Conduct problems, include commonly apparent behaviours such as antagonism, and aggression to others while delinquency encompasses both apparent and non-apparent antisocial behaviours which are legally punishable e.g. stealing, destroying property and physically attacking others (Mrug & Windle, 2009).

Engagement

Previous studies have also used items similar to this study to measure engagement. Finn and Rock (1997) measured student engagement as “work hard” which defined efforts to get good grades, “absent-tardy” which defined the frequency of absence from or late arrival to school, “engage” which represented how much homework the student completes and how much they avoid being disruptive, “attend” which reflected missing, lateness and cutting classes, “sports” which captured how many athletic games they participated, and “extracurricular” which was concerned with how many academic-focused extracurricular hobbies they were active in such as band and clubs. Jimerson, Campos and Greif (2014) in a review of 45 studies proposed five frameworks of school

engagement including performance in academics, behaviour in the classroom, engagement in extracurricular activities, interpersonal relationships, and the school community.

A growing body of research has recognized that engagement measures should not be combined into general indices and all dimensions should be considered while taking into account the possible key differences in precursors of engagement in order to unravel the distinct role of each type of engagement on important outcomes (Li & Lerner, 2011). This has the potential to deepen the characterization of the students and how they associate with the school context which is an important prerequisite to the understanding of this construct and betterment of student academic, social and emotional outcomes (Appleton et al., 2008). Despite the multidimensional nature of engagement, there are a lot of variations in the number and categories of the dimensions of engagement which vary between two and four outcomes (Appleton et al., 2008). However, Glanville and Wildhagen (2007) reported that engagement in most reports encompassed labels including “participation,” “identification,” “attachment,” “motivation,” and “membership” which should be considered together in research.

Four factors were distinguishable from the engagement items in this study. Both EFA and CFA indicated that enjoying being in school showed the highest loading on emotional engagement. The items loading highly on this factor fit the description of emotional engagement which focuses on positive emotional temperaments and affective responses concerning educational processes, practices and actors (Hirschfield & Gasper, 2011). The items that best described emotional engagement included enjoying being in school which loaded most to this factor followed by finding school work interesting, how one thought others would feel if they cheated on a test, trying one’s best in school in the past year, how one thought most students would feel if they intentionally did things to make their teachers angry, how frequently one hated being in school in the past year, getting sent to the office due to misbehaviour, failure to complete or turn in assignments, how often one finds that their friends encourage them to do things which their teachers would not like, the extent to which one felt that the rules about student behaviour in their school were generally fair and reasonable and the importance attached to being a leader.

Most of these aspects including absenteeism, truancy, lateness and failure to attend classes without an approved reason, and being disruptive are also associated with a high risk of withdrawal from

school and are in a lot of cases demonstrated concurrently in the same person (Appleton et al., 2008; Birch & Ladd, 1996; Finn, 1989).

The second factor which was labelled as social engagement was best characterized by the item participating in other school clubs or activities during the school which loaded highest to this factor judging from both EFA and CFA. Social or behavioural or participatory engagement can be categorized as one of the social, extracurricular, and non-academic school activities involving interactions with peers (Appleton et al., 2008). Behavioural engagement can be regarded as participation in school-connected activities, both academic and extra-curricular (Appleton et al., 2008; Hirschfield & Gasper, 2011). Such extracurricular activities may increase the extent to which a student identifies with school, encourage a feeling of belongingness as more time is spent in school and are a source of feeling attached to the school for students who are weak academically (Finn, 1989).

School engagement has been defined as the degree to which students are involved in both academic and non-academic activities, bond with the school and regard the aims of education as important (Li & Lerner, 2011). The behavioural part of school engagement encompasses the pursuit of academic tasks, school-based social events, positive behaviour, and desisting from engaging in activities which are disruptive to education (Li & Lerner, 2011).

Emotional engagement comprises the emotional response of a student to the school, teachers and colleagues' education (Li & Lerner, 2011). This has also been referred to as the engagement of the heart (Appleton et al., 2008). This should be distinguished from cognitive engagement also referred to as intellectual or academic engagement which encompasses the engagement of the mind (Appleton et al., 2008).

Initial proposals have included two dimensions of engagement namely behavioural and emotional or affective dimensions (Appleton et al., 2008). A third concept was added which included a cognitive dimension that involved self-regulation, setting of scholarly goals, aspirations and efforts spent towards learning (Appleton et al., 2008). Others have proposed a four-component concept where engagement can be categorized as academic, behavioural, cognitive, and psychological (Appleton et al., 2008).

Another factor considered in this study was emotional engagement but from a disengaged perspective and was therefore labelled as negative emotional engagement. Various researchers in

the field of engagement also incorporate negative behavioural aspects including delinquency, truancy, or misbehaviour as part of measures of engagement (Jimerson et al., 2014). The two items defining this factor most as shown by the high loading included the number of times teachers interrupted class to deal with misbehaviour or “goofing off” by *others* and *self* in the class during an average school week which are indicators of misbehaviour or truancy. Several items have been proposed to measure the “lack of disengagement” which measures disengaged or disruptive behaviour such as difficulty remaining attentive, low attitude towards school topics and absenteeism (Jimerson et al., 2014). Such aggressive and disruptive tendencies when demonstrated in elementary school have been linked to problems adjusting to high school such as low grades and dropping out of school (Birch & Ladd, 1996). A taxonomy by Finn (1989) defined the first level of engagement as the dimension where a student adheres to school and class rules such as timely arrival while the negation of these involves behavioural problems such as disruptive behaviours and lack of attention (Finn & Rock, 1997). There has been an increase in the preferential focus by engagement researchers to negative engagement areas that are not academically focused which includes behaviours such as being disruptive to classes and skipping school (Li & Lerner, 2011).

The last engagement dimension considered in this study was cognitive engagement whose highest loading question based on both EFA and CFA was the average grade in the school year. Previous studies defined cognitive or intellectual or academic engagement as the effort, investment, and strategies that students put on learning (Appleton et al., 2008). Hirschfield and Gasper (2011) also defined cognitive engagement as the mental labour that students either invest in or are motivated to invest in academic tasks. This factor was therefore labelled as cognitive engagement.

Parental involvement

Two parental involvement factors were distinguishable including parental monitoring and involvement. Both EFA and CFA indicated that the item parental knowledge of who one went out with at night loaded highest to parental monitoring while how often parents or guardians provide help with homework when it’s needed loaded highest on parental involvement. Other highly loading parental involvement items included parental or guardian knowledge of where one was after school, the practice of coming back at a set time whenever one went out during weekend nights, parents or guardians allowing one to go out with friends on school nights and having at

least one other adult other than one's parents who one could talk to if they were having problems in life. Highly loading parental monitoring items included having parents or guardians check on whether one did their homework, how often parents or guardians limited the amount of time spent watching television and acceptance to talk about one's problems over with one or both parents or guardians. Similar to these important parental factors in this work, Leffert et al. (2010) outlined parental factors which they regarded as assets including support (provision of love and support and communication where the youth and parents communicate positively in an environment encouraging them to pursue parental advice and counselling) as well as boundaries and expectations (laying down of distinct rules, consequences and monitoring). Parental involvement is a key factor that affects academic achievement especially when it involves communication about school activities (Hong & Ho, 2005). Past studies have similarly proposed the consideration of parental involvement as a multidimensional construct where a substantial number of measures are involved (Hong & Ho, 2005).

Self-concept

An application of canonical analysis indicated that the different aspects of self-concept (SC) are related in a bipolar fashion which compensates in such a way that a weak functioning in one aspect is compensated by a strong functioning in another (Byrne, 1984). Frustration or humiliation diminishes self-view which may lead to problematic behaviours in students (Finn, 1989). SC describes experiences, especially those involving social relations, as a sequence of action and reaction (Epstein, 2011). The SC is the theory that one constructs about themselves and whose postulates are hierarchically arranged starting from the more general concepts to the more specific. For instance, Epstein (1973) suggested SC could begin with self-esteem, then moving to second-order aspects pertaining to competence, moral self-approval, power and self-appraisal on how worthy of love one is. Lowest order concepts include the evaluation of specific competencies (Epstein, 1973).

In general terms, SC refers to our perception of ourselves; in specific terms, it is our attitudes, feelings and knowledge about our abilities, skills, appearance, and social acceptability (Byrne, 1984). Byrne (1984) indicated that SC is the nucleus of one's personality. An extensive review by Epstein (1973) indicated that the perceptions that we hold about ourselves are derived from our

social environment and are believed to provide the culminating force in directing our behaviour; this behaviour, in turn, influences the way we perceive ourselves.

Four self-concept factors were distinguished in this study including self-perception, self-esteem, self-cognition and self-efficacy. Self-perception was best measured by the constant presence of someone to turn to if one needed help and other variables such as having someone they could talk to if they need, enjoying life as much as anyone, positive attitude towards self and ability to do things as well as most other people. Self-perception encompasses how a person views themselves or any of the mental or physical attributes that constitute the self (<https://dictionary.apa.org/self-perception>). Self-perception of one's abilities defines the cognitive perspective of self-concept that involves their viewpoint and belief concerning their abilities. Self-perception can therefore be viewed as a self-portrayal about own strengths and weaknesses with regards to proficiency in a certain field (Dermitzaki & Efklides, 2000).

Self-esteem was best measured by the item feeling good to be alive. Other variables loading highly on self-esteem included feeling like a person of worth on an equal plane with others, preference to engage in frightening things, sometimes thinking that one was not good at all, usually having a few friends around that one could get together with and life often seeming meaningless. Self-concept involves a person's evaluation of themselves and their competency (Marsh & Craven, 2006). Self-esteem, which is in contrast to self-description, involves a person evaluating themselves and their worthiness and is related to self-worth (Dermitzaki & Efklides, 2000; Finn, 1989). However, a positive SC should not be deemed to be related to high self-esteem though considerable associations have been shown between academic or ability SC, self-esteem and perceived effort (Oerter, 1989).

The questions that loaded most highly on the third dimension of SC were preference for new and exciting experiences even if they must break the rules, followed by often testing oneself by engaging in risky activities, preference to explore strange places, getting a real kick out of doing things that are a little dangerous and preference for exciting and unpredictable friends. This dimension refers to the disposition to courage which is a cognitive dimension where one defines the risk and evaluates alternative activities before choosing to proceed with those activities with potentially negative consequences in attempts to achieve positive outcomes for self or others while recognizing that this outcome may not be achieved (Rate et al., 2007).

Self-efficacy was best measured by feeling lonely a lot of times followed by often feeling left out of things, often feeling bored, feeling that one cannot do anything right, often finding oneself having nothing to do and feeling that one's life is not very useful. These are different aspects of self-efficacy which can be described as an individual's belief in their capacity to implement behaviours necessary to produce specific performance attainments (Bandura, 1977b, 1986b, 1997). This reflects the assurance in one's capability to manage their own motivation, behaviour, and social environment.

From the foregoing, it is apparent that self-concept is a multidimensional construct that has many facets. Many studies have treated SC as a single dimension and interchangeably with self-concept aspects such as self-concept, self-perception, self-esteem, and self-efficacy (for a review, see Dermitzaki & Efklides, 2000). Dermitzaki and Efklides (2000) in their examination of self-concept aspects distinguished between cognitive aspects such as self-perception and the more evaluative counterparts such as self-esteem. Oerter (1989) suggested a division of self-concept into the affective dimension referred to as self-esteem and the cognitive dimension regarded as self-concept. Dermitzaki and Efklides (2000) used confirmatory factor analysis to distinguish self-concept aspects such as self-perception, self-esteem, self-efficacy. They proposed that an individual's capabilities based on the perception of others could be regarded as first order while self-concept is second order.

Social cognition

External and internal dimensions of social cognition measured as the locus of control were distinguished. The questions that most highly described external dimension was feeling foolish when one was nervous or frightened. This was followed by the items: feeling vulnerable, feeling inferior, feeling inadequate, people would not be interested in them, feeling weird, people would not like them, they were going to be sick, they would sweat or perspire, people would think they were boring, they would be unable to write properly, people would see they were nervous, they would be unable to concentrate, they would go red, and they would babble or talk funnily when one was nervous or frightened. When the internal dimension was considered, the feeling that they would tremble or shake uncontrollably when one was nervous or frightened best described this factor followed by: people would stare at them, they would be unable to speak, they would be paralyzed with fear, they would drop or spill things, and they would be unlikeable. Internal and

external aspects of locus of control have been previously reported. Skinner et al. (1990) distinguished social cognition into internal and external causes which could be assumed to be inversely related to each other and are therefore regarded to be a single, bipolar dimension. Such perceptions of control in students may either enhance or diminish school engagement and the consequent cognitive performance or grades and other performance. Behaviours emanating from the self have an internal locus of causality and are experienced by one's choice. On the other hand, those behaviours emanating from an external locus either originate from out of the self, are forced to the self, or are encouraged from outside the self. Self-determination theory, therefore, posits two external loci of causality-oriented motivations, i.e., external and introjected and another two which are external in their causality, i.e. identified and integrated (Grolnick et al., 1999). The different ordinal levels of measures rating the feelings when the students got nervous or frightened indicated that there were considerable variations in the sense of control. Such perceptions of variations in powerlessness or sense of control are described as a belief that the results of circumstances that one gets into are controlled by forces. Such forces are outside the self and include powerful individuals, luck, fate, or chance that lead to the situation where one has insufficient control over important outcomes and situations in their life (Hong & Ho, 2005). Various authors express the locus of control using diverse terminologies and those related to this study include internal locus of control, mastery, perceived helplessness, and perceived powerlessness (Hong & Ho, 2005).

Substance use

The items measuring the frequency and intensity of smoking showed the highest loading on student use of legal substances while the number of times one tried to stop using alcohol least loaded on this factor. Henry et al. (2005) also reported that smoking showed the highest within individual effect and was also uniquely indicative of other behavioural problems and substance use such as alcohol and illegal drugs. A similar trend was shown by parental use where paternal smoking frequency and maternal smoking intensity depicted the highest loading on parental use of legal substances while the paternal frequency of alcohol also loaded considerably on this factor. In similar results, Jessor, Costa, Krueger and Turbin (2006) reported the consistency between substance use factors and the relationship between cigarette smoking and cannabis use with heavy episodic drinking. This indicated that the use of these substances might reflect a wider substance use pattern encompassing the co-occurrence of these risky behaviours (Jessor et al., 2006). Exploration enabled the recognition of three dimensions of illicit substance use which were named

as hard drugs, cannabis like, and CNS stimulants for the first, second and third factor respectively. The first factor consists of commonly used and known illegal substances (Peltzer et al., 2010; Ramlagan et al., 2010b) while the second factor consists of cannabis-associated substances. The third factor consists of amphetamine and barbiturates which are both organic compounds that act as central nervous system stimulants.

Structural Equation Modelling

Two SEM models were used to test the hypothesized models about pathways through which personal and contextual factors influence the impact of different dimensions of engagement on the occurrence of delinquency and substance use. The models were used to test the hypothesis that personal and contextual factors may have a direct impact on the occurrence of delinquency and substance use as well as partial mediation where the effects of personal and contextual factors are partially mediated by engagement. The relatively large sample size comprising of 898 students who were interviewed enabled the testing of this hypothesis. Various protective and risk factors that had both statistical significance and potential application in research and practice are highlighted in this discussion section.

Pathways influencing delinquency

The SEM model specified in the methods was tested and further modified by the addition of residual correlations between the various theoretically correlated measures.

Direct Effects

The two delinquency factors differed in the direction of their association with the independent variables. Higher emotional engagement led to lower levels of the first delinquency factor. Considering negative emotional engagement, higher levels led to lower levels of the first delinquency factor but of higher levels of the second delinquency factor.

Higher levels of parental involvement were associated with higher levels of self-cognition, self-efficacy, self-perception, social cognition (internal), higher levels of the first delinquency factor, but predictive of lower levels of the second delinquency factor. Higher parental monitoring was associated with lower levels of the first delinquency factor and self-cognition but increased levels

of the second delinquency factor, self-efficacy, self-esteem, social cognition (external and internal locus).

These effects of parental involvement are in agreement with previous studies that reported an influence of parental support on personal control and self-esteem (Ross & Broh, 2000). Li et al. (2008) demonstrated that parental involvement activities such as regularly eating dinner in the family were associated with the reduced likelihood of problematic behaviours and lower chances of reporting low self-esteem. They indicated that such involvement increases the prospects of parents modelling, coaching and monitoring the students (Li et al., 2008). They emphasized an instrumental role on positive development of families, schools and neighbourhoods where the youth participate in various unstructured activities. Parental involvement where parents placed expectations on the children and were more communicative were reported to significantly affect delinquency (You & Sharkey, 2009a).

An increase in self-cognition led to an increased emotional engagement and negative emotional engagement. However, an increased self-efficacy was associated with reduced emotional engagement. Higher levels of self-esteem were associated with less negative emotional engagement. You and Sharkey (2009) reported that self-esteem significantly influenced substance use and delinquency in students owing to the enhanced resilience among students reporting higher self-esteem. Self-esteem also affects the sense of belonging in school which in turn influences problematic behaviours such as delinquency, frequency of absenteeism and dropping out of school (Finn, 1989). Variations in behavioural and emotional engagement were associated with changes in school performance, depression, delinquency and substance use (Li & Lerner, 2011).

Internal locus of control enables one to associate their actions with outcomes and this increases resilience which has been shown to influence student achievement (You & Sharkey, 2009a). An increased external locus of social cognition was predictive of lower emotional engagement and negative emotional engagement. However, higher levels of internal locus of social cognition were associated with higher levels of emotional engagement and negative emotional engagement (You & Sharkey, 2009a). Both student locus of control and self-concept were reported to be positively associated with student engagement (Birch & Ladd, 1996; You & Sharkey, 2009a). Perceived control by the student has been reported to influence engagement in school activities which impacted on the cognitive/ school performance (Skinner et al., 1990). Higher levels of control were

previously reported to be associated with reduced delinquency, substance use and the increase in desirable outcomes such as academic achievement where the internal locus of control appeared to enhance resilience in risky situations (You & Sharkey, 2009a). The effect of locus of control may be through the influence of locus of control on engagement. Skinner et al. (1990) indicated that students who attributed the outcome of their efforts to nonaction causes such as ability, powerful others and luck reported lower engagement. However the students who reported increased self-efficacy, own competence, attribution of outcomes to capacity and strategy beliefs, and external locus of control experienced enhanced engagement (Skinner et al., 1990). However, it should be noted that this relationship between control and engagement does not hold in all situations and low engagement is possible especially if one experiences reduced autonomy due to either being pressurized to higher academic achievement or reduced relatedness to teachers (Skinner et al., 1990).

As self-perception increased, there was reduced emotional engagement but increased social engagement. Reduced self-esteem, self-concept and/or external locus of control have been linked to poor academic performance and engagement (Finn, 1989; Finn & Rock, 1997). Self-esteem also influences substance use and delinquency (You and Sharkey, 2009). Kaplan and Kaplan (1980) reported a higher likelihood to engage in 26 out of 28 problematic behaviours in students exhibiting lower self-esteem ranging from minor activities such as engaging in protests to more major ones such as exam cheating, fighting and stealing. It should however be noted that aspects of SC may influence each other. For instance, Dermitzaki and Efklides (2000) reported that self-esteem affected self-perception but the converse relationship was not true. However, self-esteem was affected by how others perceived one's abilities (Dermitzaki & Efklides, 2000). A reciprocal relationship between problematic behaviours and self-esteem has been previously reported (Appleton et al., 2008; Finn, 1989). In a frustration-self-esteem model, the less successful student in attempts to enhance own esteem may engage in alternate activities that are less socially acceptable and which may seem to enhance bonds with similar-minded peers (Finn, 1989).

Indirect Effects

There was an increased parental involvement with an increase in the levels of the first dimension of delinquency. This increase was mediated by higher levels of self-perception through negative emotional engagement and self-efficacy through emotional engagement.

An increase in parental involvement was associated with lower levels of the first dimension of delinquency after mediation by self-cognition through emotional engagement, self-cognition through negative emotional engagement, internal locus of social cognition through emotional engagement, internal locus of social cognition through negative emotional engagement, internal locus of social cognition through emotional engagement, and internal locus of social cognition through negative emotional engagement.

As parental involvement increased, the levels of the second dimension of delinquency decreased after mediation by self-perception through negative emotional engagement and self-efficacy through emotional engagement. However, increased parental involvement was associated with higher levels of the second dimension of delinquency when accounting for mediation by self-cognition through emotional engagement, self-cognition through negative emotional engagement, internal social cognition through emotional engagement, internal social cognition through negative emotional engagement, internal social cognition through emotional engagement and internal social cognition through negative emotional engagement.

As parental monitoring increased, there were higher levels of the first dimension of delinquency when mediation was considered by negative emotional engagement, self-cognition through emotional engagement, self-cognition through negative emotional engagement, external locus of social cognition through emotional engagement, external social cognition through negative emotional engagement, internal social cognition through emotional engagement, internal social cognition through emotional engagement and internal social cognition through negative emotional engagement.

An increase in parental monitoring was associated with reduced levels of the second aspect of delinquency in the presence of mediation by self-esteem through negative emotional engagement, self-cognition through emotional, self-cognition through negative emotional engagement, external social cognition through emotional engagement and external social cognition through negative emotional engagement. Less parental monitoring and involvement which is characterized by more involvement in unstructured activities out of school and spending time with friends without prior objectives and increased media time have been reported to reduce behavioural engagement in school, reduced academic performance and increased incidence of high-risk behaviours (Li et al., 2008). On the other hand, higher levels of both behavioural and emotional engagement were

linked to improved academic performance and lower incidence of behavioural problems (Li et al., 2008).

However, higher parental monitoring was associated with increased levels of the second dimension of delinquency when there was mediation by internal social cognition through emotional engagement, internal social cognition through emotional engagement and internal social cognition through negative emotional engagement. The role of self-perception on positive engagement on outcomes such as academic achievement has been previously reported (Byrne, 1984). Reduced self-esteem enhances vulnerability to involvement in problematic behaviours (Jessor et al., 2006). Parental involvement including the setting of expectations and communication with children has been shown to affect problematic behaviours including substance use and delinquency (You & Sharkey, 2009a). Such involvement includes the contribution by parents to school activities, prospects about their children's education, communication and supervision (You & Sharkey, 2009a). The mediative role of engagement is characterised by reduced delinquency attributable to an increase in engagement, a relationship which remains stable even when other variables were adjusted for (Li et al., 2011a).

Regarding the locus of control, an enhanced parental involvement was associated with a higher perception of control in the student and higher academic performance (Hong & Ho, 2005). In agreement with this study, Hong and Ho (2005) found a significant mediatory or indirect role of locus of control on parental involvement factors including communication and parental educational goals for their children. Delinquency and substance use among students was also reported to be significantly associated with locus of control (You & Sharkey, 2009a).

Total Effect

An increased parental involvement was associated with reduced total association with the second dimension of delinquency when considering the direct effect of parental involvement on the second dimension of delinquency as well as and the mediation role of self-perception through negative emotional engagement, self-perception through social engagement, self-esteem through negative emotional engagement, self-efficacy through emotional engagement, self-cognition through emotional engagement, self-cognition through negative emotional engagement, external social cognition through emotional engagement and external social cognition through negative emotional engagement.

However there were total relationships between an increased in parental involvement with higher levels of the first dimension of delinquency when considering both the direct predictive effect of parental involvement on the first dimension of delinquency and the mediation role of self-perception through negative emotional engagement, self-perception through social engagement, self-esteem through negative emotional engagement, self-efficacy through emotional engagement, self-cognition through emotional engagement, self-cognition through negative emotional, external social cognition through emotional engagement, and external social cognition through negative emotional engagement. Similar indirect effects of parental involvement on engagement have been previously reported. You and Sharkey (2009) indicated that parental involvement and support could have an indirect effect on school engagement in children by altering their dispositions socially, emotionally, cognitively and in their attitude. Ross and Broh (2000) also reported that support by parents enables perceived control and self-esteem in adolescents which increases over time.

There were reduced levels of the total relationships between parental monitoring with increased levels of the first dimension of delinquency when taking into account the direct predictive effect of parental monitoring on the first dimension of delinquency and the mediative role of self-efficacy through emotional engagement, self-cognition through emotional engagement, self-cognition through negative emotional engagement, internal social cognition through emotional engagement, internal social cognition through emotional engagement, and internal social cognition through negative emotional engagement.

There was an increase in total relationships between parental monitoring with higher levels of the second dimension of delinquency when considering both the direct predictive effect of parental monitoring on the second dimension of delinquency and the mediative role of self-efficacy through emotional engagement, self-cognition through emotional engagement, self-cognition through negative emotional engagement, internal social cognition through emotional engagement, internal social cognition through emotional engagement, and internal social cognition through negative emotional engagement.

The mediative role of locus of control and engagement was previously reported though on the positive trait, academic performance (Skinner et al., 1990). Shochet, Dadds, Ham and Montague (2006) also indicated that parental attachment may influence problematic behaviours in a pathway

that goes through school engagement. Feedback loops have also been demonstrated whereby an attachment to parents influenced delinquency which in turn affected engagement which in turn affected parental attachment in feedback fashion (Finn, 1989).

Grolnick et al. (1999) also reported a pathway between parental involvement which involved an influence of parental involvement on cognitive involvement which then influences self-worth which eventually had an impact on reduced delinquency or learning problems. The impact of parental involvement on desirable outcomes via the mediating variables self-concept and locus of control were also reported by (Hong & Ho, 2005) though they studied the impact on student achievement. This thesis importantly indicates that this advantage from mediatory effects can also be applied for the prevention of delinquency.

Previous findings have also demonstrated the indirect effect of external aspects such as parental expectation, communication between the child and parent and the priority given to academics by peers on engagement through the locus of control and self-concept (You & Sharkey, 2009a). The higher the parental and peer support the higher the locus of control and self-esteem which in turn occasions a larger increase in engagement even after controlling for a myriad of contextual factors (You & Sharkey, 2009). Another aspect involves the less engaged students associating with the more delinquent peers which enhances the likelihood of them also engaging in delinquency and substance use (Li et al., 2011a). Aspects of parental involvement that would be important intervention points from this and previous studies include effective family communication, clear expectations concerning school-related prospects, fostering an environment that encourages children to confide in parents and support for children in academic endeavour (Finn, 1989).

The demonstrated impact of engagement on delinquency in this study can be explained using social control theory which posits that links, attachments and bonds to established institutions act as deterrence to deviant behaviours due to a student's striving to meet the institutions' expectations and norms (Finn, 1989; Li et al., 2011a). Delinquency results in the loosening of inhibitions against such behaviours as a result of a weakening of these bonds (Finn, 1989). Engagement may also play a key role in an adolescent's positive development through supporting strong bonds and credible relationships with positively social adults and peers, enable the acquisition of skills and proficiencies that support adjustment, and informally controlling problematic behaviours (Mrug & Windle, 2009).

A feedback loop through the pathways studied here may also occur as previously reported where a reduction in engagement is also associated with lower self-esteem, self-perception, self-efficacy, family problems, and peer relationship problems. Students with lower levels of school connectedness also recorded significantly lower scores in five of six self-perception scales (Shochet et al., 2006).

Pathways influencing substance use

There has been a close link between delinquency or other health detrimental behaviours and substance use so that the two are often correlated and co-occur (Li et al., 2011a). For, instance the tendency to exhibit reduced behavioural control exposes one to the propensity for alcohol and other substance use disorders (Chassin et al., 2004). It has therefore been suggested that the two negative behaviours may have similar root causes and effective interventions against one may equally apply to the other. This section continues the discussion on pathways influencing problematic behaviours by discussing results from the SEM model which was fit to study the hypothesized structural pathways through which personal and contextual factors influence the impact of different dimensions of engagement on the occurrence of substance use.

Direct Effects

A higher parental involvement was associated with a higher number of substances using friends and pressure from friends to use substances. However, despite this observation, increased parental involvement was linked to a reduced use of CNS stimulants among the students. An increase in parental monitoring was associated with a lower number of using friends and pressure from friends to use substances. However, higher parental monitoring was positively associated with self-use of CNS stimulants. Parental involvement where parents placed expectations on the children and were more communicative were reported to significantly affect substance use (You & Sharkey, 2009a).

An increase in parental use of alcohol was associated with a higher self-use of alcohol and self-use of CNS stimulants. However, increased parental use of alcohol was predictive of lower self-use of hard drugs. Parental smoking was also positively associated with the self-use of CNS stimulants. As the number of substances using friends increased, self-use of CNS stimulants increased. An increased pressure from friends to use substances was associated with reduced smoking but higher self-use of CNS stimulants.

Similar mediatory effects of peer substance use were reported by Henry et al. (2005) as seen in the present study who reported an inverse relationship between bonding to school and peer pressure on cigarette, alcohol and cannabis use.

An increase in emotional engagement was associated with reduced self-use of CNS stimulants. Previous studies similarly found that an increased emotional engagement was associated with a decrease in the likelihood of adolescents engaging in the use of alcohol, cannabis, cigarettes, and violence (Li & Lerner, 2011). However, higher negative emotional engagement was associated with reduced smoking.

These effects reaffirm the proposed theoretical basis of this research. Henry et al. (2005) suggested that this influence of school engagement on substance use may be explained through the social development model. Positive bonds to school may reduce the likelihood of engagement in substance use and other behavioural problems. However, this relationship may be weakened through any of three factors including denial of the student from participating in prosocial activities, perception by a positively engaged student that the benefits of use outweigh consequences and bonding to significant others such as family and peers who use substances even in situations where the student is strongly engaged in the school (Henry et al., 2005). On the other hand, the choice of peers may in turn be related to family and school challenges the student is facing. For this concept, the primary socialization theory posits that both the school and the family influence the choice of peers which will eventually influence substance use in a mediatory fashion. Costello et al. (2008) in their study on trajectories of smoking and their risk factors found that there were higher chances of the youth belonging to the smoking trajectory groups compared to non-smokers if they associated with smoking peers, used alcohol and were involved in other delinquent behaviours (Costello et al., 2008).

Indirect Effects

An increase in parental monitoring led to a decrease in self-use of CNS stimulants when mediation by the number of using friends was considered. However, increased parental monitoring was associated with higher levels of student smoking when the mediation by pressure from friends to use was considered. Lower levels of parental monitoring were predictive of increased self-use of CNS stimulants after considering the mediation by pressure from friends to use.

An increase in parental involvement was associated with increased self-use of CNS stimulants in the presence of mediation by the number of friends who used substances. Higher levels of parental involvement were linked to lower levels of smoking by the student considering the mediation effect of pressure from friends to use substances. However, increased parental involvement was associated with higher self-use of CNS stimulants in the presence of mediation effect of pressure from friends to use substances. Similar mediatory effects of peer substance use were reported by Henry et al. (2005) as seen in the present study. Their results indicated that poor academic performance led to reduced school engagement which in turn increases chances of association with substance-using peers and eventually substance use. Lack of the protective effects of parental control enhanced exposure to use substances through peer pressure, lack of behavioural protection (such as religious service attendance) and the use of use of other substances which enhanced the risk of heavy episodic drinking among young students (Jessor et al., 2006).

Total Effects

There was a higher total predictive effect of parental involvement on increased smoking by the student when accounting for both the direct predictive effect of parental involvement on student smoking and the mediation role of the number of substances using friends. A higher total relationship between parental involvement was found with higher self-use of the cannabis associated group when considering both the direct predictive effect of parental involvement on self-use of the cannabis associated group and the mediation role of the number of friends using substances. There were higher total relationships between parental involvement and increased self-use of CNS stimulants when accounting for both the direct predictive effect of parental involvement on self-use of CNS stimulants and the mediation role of the number of substance using friends and pressure from friends to use substances.

Higher parental monitoring was significantly associated with a reduction in the number of students who smoked when accounting for both the direct predictive effect of parental monitoring on student smoking and the mediation role of the number of substances using friends. A total relationship was detected where higher parental monitoring was linked to reduced self-use of the cannabis associated group when accounting for both the direct predictive effect of parental monitoring on self-use of the cannabis associated group and the mediation role of the number of substance-using friends.

Another pathway of total relationships featured an increase in parental monitoring which was associated with increased self-use of CNS stimulants when accounting for both the direct predictive effect of parental monitoring on self-use of CNS stimulants and the mediation role of the number of substance-using friends and pressure from friends to use substances.

Schwartz et al. (2010) reported a similar pathway involving the influential role of self-esteem, parental and peer factors on substance use. The primary socialization theory (Oetting, Deffenbacher, & Donnermeyer, 1998) provides a basis to understanding some of the pathways to substance use reported in this study. In this, theory, peers play a central role in the determination of adolescent substance use. There is a close connection between disengagement and delinquency where substance-using adolescents foster indifference or anti-social traits such as being rebellious, less engagement to academic endeavours, and discourteous attitude to colleagues and teachers among other problematic behaviours. This change in school bonding influences the perceived risk of substance use which in turn influences substance use and eventually substance use in a feedback loop influences school bonding (Henry et al., 2005).

Other studies have reported that whenever students have a strong bond to significant others such as family and peers who allow or support substance use, this may lead to students using substances even when they are strongly engaged in school (Henry et al., 2005). A family environment that fosters a balance between autonomy and control provides a structure that enables children to create a link between actions and their consequences while providing desirable involvement (Grolnick et al., 1999; Han, Brussoni, & Mâsse, 2022).

CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

The results from this study confirm the hypothesis that personal and contextual factors at individual and school levels may either mediate or moderate the effect of different dimensions of school engagement on delinquency and substance use. The results demonstrated a protective role of positive family, school, and peer experiences against the development of conduct problems, school misbehaviour, truancy, and substance use which were in alignment with the control theory and social learning theories that constitute the social development model. Risk factors for delinquency and substance use were identified which can be categorized in the context of the social-ecological development model, social learning theory, social bond-social control theory, and social disorganization theory. A combination of cumulative link mixed models, cumulative link models and SEM approaches helped to identify important individual and contextual factors on youth functioning and feedback loops between individuals and their contexts were postulated based on the developmental-ecological model.

Delinquency

From the foregoing, practical points to alleviate delinquent behaviours can be derived. It should be noted that engagement may be related to problematic behaviours where problematic behaviours such as regularly being absent from school without proper reason, disruptive behaviours and other delinquent behaviours can be viewed as a process of disengagement (Finn, 1989). This disengagement should be understood as a process that is gradual with time and interventions should therefore target improving and keeping student engagement at high levels (Finn, 1989). Engagement also impacts the educational trajectory in a cyclic nature (both higher engagement and lower engagement lead to different outcomes) and is part of an important pathway through which other constructs such as self-concept, parental involvement and monitoring and locus of control influence important life trajectories. Hawkins et al. (2007) reported significantly increased engagement, better grades, less misbehaviour, reduced disciplinary cases, involvement in a range of crimes, and sale of drugs amongst elementary grade students who were involved in a Social Development Project based on the social development model compared to the control group.

Both in-school and out-of-school engagement should be considered. Previous research illustrates the mediatory role of engagement that creates a link between contextual influences that act as

facilitators and positive school outcomes such as performance (Appleton et al., 2008). However, this study indicated that this relationship is also beneficial in protecting against negative outcomes such as delinquency and substance use. For instance, the results indicated that a student's engagement in extracurricular activities such as social, extracurricular, and athletics may lead to positive outcomes such as enhanced self-esteem, locus of control, educational goals and lower frequency of delinquency. Finn (1989) also reported similar findings and noted that delinquency and withdrawal from school are similar reactions to feeling disengaged from school because engagement is necessary for learning (Finn, 1989).

This study relied only on student reported levels of engagement but did not collect data from teachers. It is advantageous to know that although in this study the student reported levels of engagement were used, previous studies indicated that behavioural and emotional engagement reported by both students and teachers had a similar impact on desirable outcomes (Appleton et al., 2008). Hong and Ho (2005) also reported that the perception of engagement by the student may be just as important or even more important than the actual engagement levels.

Intervention efforts targeting the engagement variables reported here should also distinguish between indicators and facilitators of engagement when choosing malleable predictors of engagement that are more capable of alteration through interventions involving the school, family and peer contexts. Aspects such as race/ethnicity, home language, family income are less tractable to educator and family-based change efforts. Indicators of engagement are the variables that express the extent to which the student connects with the school and learning which includes variables such as grades, frequency of missing school and problematic behaviours (Appleton et al., 2008). On the other hand, facilitators of engagement are background variables that affect the extent of connection such as disciplinary measures in school, parental monitoring of progress in activities and the mindset of peers towards academic achievement (Appleton et al., 2008). Identification of facilitators of engagement can form an important basis for deriving interventions whereas indicators can direct the choice of procedures for timely identification of problematic behaviour initiation and for monitoring of the outcomes in both individual students and programs. Specific facilitators and indicators have been discussed extensively in the discussion section outlining the influence of the psychosocial factors, social cognition and self-perceptions, on engagement. For instance, self-satisfaction and the feeling that one had the ability to do things as

well as others, were linked with higher likelihood of reporting the engagement indicator finding schoolwork interesting.

An alteration in parenting styles could form an effective intervention to behavioural problems through its impact on student engagement both directly and indirectly by changing the child's social, emotional, and cognitive competence. An active communication between the parent and the student concerning school-related activities, programs and studies enhances the student's locus of control which translates to their improved sense of control of their future life's trajectory. Hong and Ho (2005) found that this communication dimension of parental involvement had a stronger effect than how important the student sensed the parents' regard for educational achievements. In emphasizing the importance of parental involvement to an improved sense of control, the pathway of self-concept which in turn it influences both self-control and self-esteem should be considered. Self-esteem is influenced by contexts such as interpersonal support by friends, family or other close adults such as teachers that impact positively on the person (Ross & Broh, 2000).

The aspects to consider regarding the influence of parent and peer factors on self-perception and social cognition can be selected from the discussion section on the impact of individual variables constituting these factors. For instance, as the parents provided help with homework at increased frequency and talked problems over with the students more often, the students were more likely to report being able to enjoy life as much as anyone else. The findings also indicated that the more one attached importance to religion, the higher the chances of feeling that there was much to be proud of in life. Spending more time after school with an adult present (the more time the better) and attaching importance to religion were associated with an increased likelihood to report feeling that life is useful. Students were more likely to feel that there was someone to turn to for help if parents provided help with homework when needed, if they could talk problems over with one or both of their parents and if parents knew more often where they were after school. However, the results indicated that measures appearing positive also could have fewer desirable outcomes. For instance, increased parental monitoring as measured by knowledge of who the student went out with at night (if they did go out at night) led to a reduced feeling that there was someone to turn to for help. Parental monitoring efforts should therefore consider that children need autonomy to grow up as unique, active, and volitional beings capable of independent thinking, handling problems and taking up responsibilities (Grolnick et al., 1999; Han et al., 2022). It was also observed that parents who allowed only a limited time spent watching TV and attaching

importance to religion improved the prospects of a better social experience as measured by having friends one can get together with and wishing one had better friendship experience. Students also were more likely to be optimistic about life in the next few years when they took dinner more frequently with one or both parents or guardians, went out for leisure more regularly and had at least one other adult other than one's parents that they would feel able to talk to about problems. They also had an increased perception that others were interested in them if parents or guardians checked on whether they did their homework.

Despite the application of valid and significantly fitting SEM models in this study, the results were not from an experimental design and the relationship between parental factors and delinquency should not be regarded as causal. Such a design would involve time precedence between cause and effect. However, the study of direct, indirect and total effects provides important inputs for parents and educators to evaluate aspects of students that can be modified to derive recommendations to schools and parents concerning specific variables that can be targeted to protect or decrease the risk of delinquency.

Reinforcement between the protective variables and between these variables and outcomes may serve to further increase the impact of interventional measures against problematic behaviours. For instance, Ross and Broh (2000) found out that positive outcomes and perceptions of control may be mutually reinforcing despite exposure to negative contextual factors such as socioeconomic disadvantages. The reciprocal direction of effect between engagement and problematic behaviours has also been reported (Birch & Ladd, 1996; Li & Lerner, 2011) and should also be considered when interpreting the results. Birch and Ladd (1996) reported that classroom disruption which is negative to both peers and teacher may lead to further enhanced problem behaviour and eventual school withdrawal.

Substance use

Factors outlined here may serve as either assets or liabilities which may be important predictors of the odds of the substance for individual students and the points to guide intervention against substance use initiation and development.

From the protective role of engagement against delinquency which is closely correlated and co-occurring with substance use, it is foreseen that interventions that improve engagement also lead

to reduced substance use among the adolescents. Li et al. (2011) reported that an increase in both behavioural and emotional school engagement were important predictors of a reduced likelihood of substance use initiation even when sociodemographic variables were controlled for. Chassin et al. (2004) reported an association between comorbid conditions associated with an elevated risk of being dependent on alcohol and drugs with increased engagement. Familial alcoholism elevated the risk for both alcohol and drug dependence in part because of heightened chances of being impulsive, neurotic and less agreeable which was also partly due to behavioural issues (Chassin et al., 2004).

Parental and peer influence may have an impact on substance use through influencing the general/academic self-concept. It should be noted that although the results portray the impact of peers on substance use and delinquency from a negative perspective, studies suggest that peers could highly influence positive traits such as the adjustment to school, attitude and behaviours (You & Sharkey, 2009a). Schwartz et al. (2010) reported the positive role of social, behavioural and relational factors such as self-esteem, sensible judgment and bonds where the family and peers acted as protective factors against substance use and risky behaviours.

A limitation is that this study was conducted at a single time point which did not allow to study the trajectories in the predictors and the outcomes including substance use and engagement over time. However, Hong and Ho (2005) in a longitudinal study found that parental involvement when mediation through other variables was considered consistently influenced student achievement in a lasting impact. It is recommended instead of cross-sectional study to conduct a longitudinal study whose design aims to decipher the development and causal ordering in the factors studied here over the adolescence period and how this impacts the individual problematic behaviour and substance use.

Another possible limitation may be the reliance on self-reports during the interviews about substance use. However, the validity of such self-use reports on substance use and delinquency has been previously demonstrated (Elliott, Huizinga, & Menard, 1989; Wills & Cleary, 1997).

A consideration that should be made when interpreting the results of this study is that it examined students in a school setting and may not represent the general adolescent situation because it excluded those who do not attend schools. Despite these possible limitations, the study demonstrated strong evidence of parental, peer and psycho-social factors against substance use

which was both statistically consistent and in line with previous theoretical and empirical evidence. The results, therefore, provide a theoretical and pragmatic basis for prevention science which incorporates the evidence into policy and practices aimed at reducing substance use and behavioural issues amongst adolescents.

The strong relationships and the three subgroups of substances revealed during the exploratory and confirmatory factor analysis and confirmed using SEM indicated that substance use is a problem which is multidimensional in construct and is composed of closely related groups of substances. Interventions should therefore view the problem of substance use as a wider substance use behaviour, rather than independently targeting each of the substance use behaviours. The close link, correlation and co-occurrence between delinquency or other health detrimental behaviours and substance use also indicate that interventions targeting once may also be important for the other.

The results from the Cumulative link mixed models indicate that besides peer and parental factors, other factors such as behavioural protection that was associated with enhanced engagement and psychosocial factors could be protective against substance use. Behavioural protection variables such as how often one attends religious services have been reported to offer redirection and social networks that protect against behaviours that contravene prosocial norms (Jessor et al., 2006). For instance, Jessor et al. (2006) reported a marked church attendance reduction in students who participated in an increasing heavy episodic drinking than in those groups where this risky behaviour either remained constant or declined. The variables indicated in the cumulative link mixed models that improve engagement including participation in extracurricular activities may also significantly contribute to preventive efforts against substance use and delinquency. Such activities, though out of school, have been reported to improve school engagement with a positive impact on academic performance and positive development (Li et al., 2008).

Protective and Promotive Factors as Developmental assets and liabilities

Despite the extensive list of variables and pathways studied in this research, the protective factors from this study can be referred to as developmental assets (Leffert et al., 1998a) that enhance positive adolescent development. This wide repertoire of variables can be categorized into learning-based (such as hours of homework completed) positive values (such as restraint against

substance use), social competence (such as resistance against negative peer pressure), and positive identity (including high self-esteem, self-concept/ sense of purpose and positive view of their future). It has been shown that youths who grow in contexts that increase such assets show a consistent and significant reduction in risky behaviours (Leffert et al., 1998a). The pathways revealed in this study involving direct, indirect effects and total effects of these assets indicate that they do not offer benefits singularly but factors such as psychosocial variables including self-concept and locus of control may act as precursors of other assets such as engagement whereas parental factors may mediate to influence peer factors. These factors can also be used in computing risk behaviour indices which are predictors of risk for early intervention. This study included an extensive repertoire of developmental assets and liabilities including psychosocial variables such as engagement, self-concept, peer, parental factors and locus of control together with outcomes of delinquency and substance use which can be incorporated in such efforts.

Implication for Policy and Programmes

Several school-based policy and programs have been proposed for the prevention of substance abuse in South African schools. The little known and implemented National Policy of Drug Abuse Management in Schools was published in the year 2002 to guide and build the capacity of schools in managing substance abuse (Mokwena et al., 2020). However, it relies upon prohibition, restorative justice, creation of policies and capacity of teachers to access professional development opportunities when dealing with substance use (Mokwena et al., 2020). An important pillar of this policy document is that it encourages schools to develop clear policies and implement interventions (Mokwena et al., 2020). Results of this thesis and other studies can serve as a source of evidence for the formulation of programmes, policies and interventions against substance use and problematic behaviours in South African schools. In 2001 around the same time that the national policy was introduced, the South African Department of Education also launched the mandatory Life Orientation learning area targeting students between Grade 1 and Grade 12 (Protogerou, Flisher, & Morojele, 2012). This program which has also been unsystematically implemented is aimed at fostering healthy lifestyles by encouraging general health and wellbeing while also addressing drug use, sexuality, and the growth in socio-emotive skills (Protogerou et al., 2012). However, few schools prioritise Life Orientation, and teachers tend to implement its components in a subjective and unsystematic fashion (Protogerou et al., 2012). In order to mitigate

this lack of operational programmes, research efforts have been made towards developing and implementing substance use prevention programmes (Protogerou et al., 2012).

Concerning behavioural issues, Gagnon et al. (2021) studied the alignment of South African Department of Education's Alternatives to Corporal Punishment programmes to the positive behavioural interventions and supports (PBIS) which is a framework aimed at improving and integrating every part of the data, systems, and practices that affect daily student outcomes (Gagnon et al., 2021). The study indicated that there were no multi-tiered behavioural support systems in schools and student behavioural interventions were reactive and punitive in nature (Gagnon et al., 2021). The protective factors and pathways recommended from this thesis are proposed as proactive, multi-tiered and systems based behavioural interventions in and out of school.

CONCLUSIONS

This study reports the influence and pathway through which personal and contextual factors impact the association between behavioural and emotional engagement on the risk for and occurrence of delinquency and substance use. Individual and contextual influences were considered as underlying explanatory aspects to the association between multiple levels of student engagement and problematic behaviour including delinquency and substance use.

The most problematic substances used included alcohol followed by smoking and cannabis which were more prevalently used than hard drugs including amphetamine, barbiturates, cocaine, heroin and other substances. The students reported having friends who used cannabis, smoked, used alcohol and other substances which indicates a considerable association with substance using peers. Various problematic behaviours occur among the students, most prevalently including involvement in serious fights and hurting others to a level where they needed bandages or a doctor.

This study demonstrates the mediatory role of engagement as a link between contextual influences that act as facilitators and outcomes that are beneficial in protecting against negative outcomes such as delinquency and substance use. Practical points to alleviate delinquent behaviours and substance use involving both in-school and out-of-school engagement should be considered.

This study identified indicators and facilitators of engagement. These facilitators of engagement form an important basis for deriving interventions whereas the indicators can direct the choice of

procedures for timely identification of problematic behaviour initiation and monitoring of both individual students and programs. Specific facilitators and indicators have been discussed extensively in the discussion section outlining the influence of the psychosocial factors, social cognition and self-perceptions, on engagement. For instance, reporting self-satisfaction and the feeling that one had the ability to do things as well as others were linked to a higher likelihood of finding schoolwork interesting, an engagement indicator. A student's self-worth significantly enhanced their prospects of graduating from high school. Improving social cognition among students may be used to enhance their school engagement by reducing the frequency of class interruption due to student misbehaviours. Higher social cognition leads to increased educational motivation and cognitive ability which may be associated with enhanced student satisfaction and academic performance. Enhanced self-concept was related to finding schoolwork interesting and an enhanced belief by the student that they can perform as well as the others.

The study found that engagement may on the other hand influence psychosocial factors, social cognition and self-perceptions which implied a bidirectional effect. For instance, engagement in extracurricular activities such as music, performing arts and athletics was shown to enhance self-concept and locus of control among the students. Increased locus of control was associated with an increased engagement in school clubs or activities while an increased likelihood of participation in school clubs or activities was in turn associated with an increased locus of control. This indicates a bidirectional protective role of participation in school clubs or activities during the school year on social cognition. Reduced engagement in extra-curricular activities led to more efforts to prevent boredom (a self-esteem variable) by engaging in more extra-curricular activities which resulted in a significant enhancement in happiness (a self-esteem variable).

This study proposes an alteration in parenting styles to formulate an effective intervention to behavioural problems through its impact on student engagement both directly and indirectly by changing the child's social, emotional, and cognitive competence. An active communication between the parent and the student concerning school-related activities, programs and studies enhances the student's locus of control which translates to an improved sense of control of their future life's trajectory.

Parent and peer factors also influence self-perception and social cognition. Parental factors which were associated with enhanced self-perception and social cognition included monitoring,

interaction and involvement. For instance, an increased provision of help with homework by parents and nurturing an environment that improves discussion of issues facing the student more often improved the likelihood of students reporting that they enjoyed life as much as anyone else. More adult presence and higher regard for religion were associated with an increased likelihood to report feeling that life is useful. More regular limiting the time spent watching TV, parent-child communication, parental monitoring of peer associates, opportunities to take part in leisure activities increased self-perception and social cognition among the students, parental or peer presence and care during times of need enhanced the likelihood of the students attaching importance to getting good grades. Parental monitoring efforts should however go hand in hand with allowing autonomy for the students to grow up as unique, active, and volitional beings capable of thinking independently, handling problems and taking up responsibilities.

Other factors besides peer and parental factors, such as those that offer behavioural protection were also associated with enhanced engagement. Such behavioural protection variables included aspects such as regularly attending religious services. Psychosocial factors could also be protective against substance use.

The direct, indirect and total effects on delinquency and substance use provide important inputs for parents and educators to evaluate aspects of students that can be modified to derive recommendations to schools and parents concerning specific variables that can be targeted to protect or decrease the risk of delinquency.

It is advantageous that owing to the correlation and co-occurrence between delinquency and substance use, interventions that are facilitators of engagement may be protective against each of the negative behaviours. Parental and peer influence may have an impact on substance use through influencing the general/academic self-concept.

This study indicates that substances used among the students can be categorized into three subgroups and substance use should therefore be viewed as a multidimensional construct composed of substance use problems related to closely related groups of substances. This implies that interventions targeting one substance may also be to a certain extent be effective for the other.

The extensive list of factors studied in this research form a repertoire of developmental assets that enhance positive adolescent development and be categorized into learning-based, social competence, and positive identity. The direct, indirect effects and total effects on delinquency and

substance use of these assets indicate that they do not offer benefits singularly but factors such as psychosocial variables including self-concept and locus of control may act as precursors of other assets such as engagement whereas parental factors may mediate to influence peer factors. It is proposed that these factors are applied in computing risk behaviour indices which can be applied as predictors of risk for early intervention. The extensive repertoire of developmental assets and liabilities outlined in this study including psychosocial variables such as engagement, self-concept, peer, parental factors and locus of control together with outcomes of delinquency and substance can be used as input for such risk behaviour indices. The pathways through which engagement serves as protective against substance use and delinquency as revealed in this study can be viewed from a general systems theory perspective which posits that behavioural changes in one part of a system impacts behaviour in other parts of the system (Shantone & Nunan, 2018). The protective variables revealed in this study align to most of the nine recommendations made for an effective preventive programme across four behavioural domains (Protogerou et al., 2012). These include comprehensiveness, variation in teaching approaches, appropriate intervention duration, basis on empirically tested theory, fostering of health relationships with peers and adults, appropriate timing and socio-culturally adequate (Protogerou et al., 2012). However, the recommendations need to be further tested as interventions in appropriately designed studies and the programme should be implemented considering issues such as sufficiency of intervention duration, staff and parental training and monitoring and evaluation.

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Annex 1.1: Consent form

Pathways of school engagement in preventing adolescent delinquency and substance use: a survival analysis

I am Beatrice Muchiri, a Doctor of Philosophy in Psychology student at the University of South Africa. I am studying factors and mechanisms that influence student engagement and how these in turn affect substance use and delinquency. The information you provide will be useful in providing practical resources for policy makers in education, educators, parents and others working to promote student engagement-based solutions and therefore development of more evidence-based solutions to behaviour problems. Results will therefore be important towards enhancing positive youth development through factors that counteract problematic behaviour.

All information you give is confidential. The information will aid in the preparation of a dissertation, but no names or identifying particulars will be included. Your answers will not be shared with anyone. Only the investigator will have access to the questionnaire once it has been completed.

You are free to refuse to be interviewed, to withdraw from the interview at any time, or to refuse to fill in a particular question or set of questions.

If there are any specific concerns, you may contact my study supervisor Professor Monika dos Santos through phone number 012 4298577 or email address dsantmml@unisa.ac.za.

I accept to take part in the study: Yes..... No.....

Name of the participant.....

Signature of participant

Date

Witnessed by interviewer (Beatrice Muchiri).....

Signature

Date

Annex 1.2: Parental consent form

Pathways of school engagement in preventing adolescent delinquency and substance use: a survival analysis

I am Beatrice Muchiri, Doctor of Philosophy in Psychology student at the University of South Africa. I am studying factors and mechanisms that influence student engagement and how these in turn affect substance use and delinquency. The information you provide will be useful in providing practical resources for policy makers in education, educators, parents and others working to promote student engagement-based solutions and therefore development of more evidence-based solutions to behaviour problems. Results will therefore be important towards enhancing positive youth development through factors that counteract problematic behaviour.

All information he/ she will give is confidential. The information will aid in the preparation of a dissertation, but no names will be included. The answers will not be shared with anyone. Only the investigator will have access to the questionnaire once it has been completed.

Your son/ daughter will be notified that he/ she is free to refuse to be interviewed, to withdraw from the interview at any time, or to refuse to fill in a particular question or set of questions.

If there are any specific concerns, you may contact my study supervisor Professor Monika dos Santos through phone number 012 4298577 or email address dsantmml@unisa.ac.za.

I consent that my son/daughter may take part in the study Yes..... No.....

Name of the parent/guardian.....

Signature of parent/guardian

Date

Witnessed by interviewer (Beatrice Muchiri).....

Signature

Date

Annex 2: Questionnaires

TIME NOW: _____

DATE: _____

LOCATION CODE: _____

GENERAL INSTRUCTIONS

We will work through the questionnaire as follows: All your answers will be marked in my copy of the questionnaire. I will ask the questions and give you the answer choices. You will have a copy of the questionnaire so that you can follow along.

Pick the answer that is the closest to how you feel. Usually, I will want you to tell me the number that goes with the answer you pick. The interview will take between thirty and forty five minutes to complete.

Please note that there are no right or wrong answers to the questions asked. If there are questions you really do not want to answer, you may skip them.

PLEASE REMEMBER THAT YOUR NAME WILL NOT BE PUT ON THIS QUESTIONNAIRE. Your answers will not be shared with anyone. Only the research staff will have access to the questionnaire once it has been completed.

Thank you for helping us in this study.

Case ID..... Form ID.....School.....

Section 1: Demographic and Socio-Economic Characteristics

First, we would like to ask you a few questions about yourself.

1.1. Gender: Male [] Female []

1.1 How old are you? _____ years

1.2 What is the highest level of education you have attained? _____

1.3 Which race group do you consider yourself to belong to?

Black/African	1
Coloured	2
White	3
Asian/Indian	4
Other (Please Specify)	5

1.4 What is the current marital status of your parents?

Married	1
Single	2
Separated	3
Widowed	4
Divorced	5

1.4 What is the highest level of education you parents have attained?

Mother _____ Father _____

1.5 Which of the following describes the current employment status of your parents?

	Mother	Father
Unemployed	1	1
Employed part-time	2	2
Employed full-time	3	3
Self employed	4	4

1.6 If employed, what kind of work do your parents do?

Mother _____ Father _____

Ethnicity: "How do you describe yourself? (Select one or more responses.)	A. Black Coloured	B. White	C. D. Other
Grade: Have you ever had to repeat a grade in school?	1="No" 2="Yes, one time" 3="Yes, two or more times"		
Parents			
The next four questions ask about your parents. If you were raised mostly by foster parents, stepparents, or others, answer for them. For example, if you have both a stepfather and a natural father, answer for the one that was the most important in raising you.			
What is the highest level of schooling your father completed?	1="Completed grade school or less" 2="Some high school" 3="Completed high school" 4="Some college" 5="Completed college" 6="Graduate or professional school after college"		

	7="Don't know, or does not apply"
What is the highest level of schooling your mother completed?	1="Completed grade school or less" 2="Some high school" 3="Completed high school" 4="Some college" 5="Completed college" 6="Graduate or professional school after college" 7="Don't know, or does not apply"
Does your mother have a full-time job?	1="No" 2="Yes, part-time job" 3="Yes, full-time job"
Does your father have a full-time job?	1="No" 2="Yes, part-time job" 3="Yes, full-time job"

Adolescent and parental substance use

The questions in this section are about substance use by you or your parent/s. Response to parent use is when you are aware of their use.

Tobacco

How often do you or your parent smoke?

	Self	Parent	
		Mother	Father
Never	1	1	1
1 or 2 days in the past 12 months	2	2	2
Once a month or less	3	3	3
2 or 3 days a month	4	4	4
1 or 2 days a week	5	5	5
3 to 5 days a week	6	6	6
Every day or almost every day	7	7	7

How many cigarettes do you or parent smoke on a typical day when you or parent smoke?

	Self	Parent	
		Mother	Father
None	1	1	1
1 or 2	2	2	2
3 or 4	3	3	3
5 or 6	4	4	4
7 or 8	5	5	5
9 or 10	6	6	6
10 or more	7	7	7

Please indicate when you started smoking. Year _____ Month _____ Date (if recalled) _____

Alcohol

How often do you or your parent consume alcohol containing beverage?

	Self	Parent	
		Mother	Father
Never	1	1	1
1 or 2 days in the past 12 months	2	2	2
Once a month or less	3	3	3
2 or 3 days a month	4	4	4
1 or 2 days a week	5	5	5

3 to 5 days a week	6	6	6
Every day or almost every day	7	7	7

How many alcoholic drinks do you or parent take on a typical day when you or parent drink?

	Self	Parent	
		Mother	Father
None	1	1	1
1 or 2	2	2	2
3 or 4	3	3	3
5 or 6	4	4	4
7 or 8	5	5	5
9 or 10	6	6	6
10 or more	7	7	7

Please indicate when you started taking alcohol. Year _____ Month _____ Date (if recalled) _____

Other substances

		Never	1 or 2 days in the past 12 months	Once a month or less	2 or 3 days a month	1 or 2 days a week	3 to 5 days a week	Every day or almost every day
Cannabis	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7
Amphetamines	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7
Barbiturates	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7
Cocaine	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7
Heroin	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7
LSD or other psychedelics and tranquilisers	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7
Other substances (please specify)	Self	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
	Father	1	2	3	4	5	6	7

Please indicate when you started taking this substance:

(i) Name _____ Year _____ Month _____ Date (if recalled) _____

(ii) Name _____ Year _____ Month _____ Date (if recalled) _____

(iii) Name _____ Year _____ Month _____ Date (if recalled) _____

Attempts to stop			
For each of the following drugs, was there ever a time in your life when you tried to quit or reduce your use and had difficulty doing so?			
How many times, if any, have you tried to stop A: smoking ?	1="None" 4="3 to 5 times"	2="Once" 5="6 to 9 times"	3="Twice" 6="10 or more times"
How many times, if any, have you tried to stop B: taking alcohol ?	1="None" 4="3 to 5 times"	2="Once" 5="6 to 9 times"	3="Twice" 6="10 or more times"
How many times, if any, have you tried to stop C: taking cannabis ?	1="None" 4="3 to 5 times"	2="Once" 5="6 to 9 times"	3="Twice" 6="10 or more times"
How many times, if any, have you tried to stop D: using other substances (Please Specify) ?	1="None" 4="3 to 5 times"	2="Once" 5="6 to 9 times"	3="Twice" 6="10 or more times"

Peer Use and Influence	
Peer Use	
How many of your friends would you estimate . . . A: Smoke cigarettes ?	1="None" 2="A Few" 3="Some" 4="Most" 5="All"
How many of your friends would you estimate . . . B: take alcohol ?	1="None" 2="A Few" 3="Some" 4="Most" 5="All"
How many of your friends would you estimate . . . C: smoke cannabis ?	1="None" 2="A Few" 3="Some" 4="Most" 5="All"
How many of your friends would you estimate . . . D: use other substances (Please Specify) ?	1="None" 2="A Few" 3="Some" 4="Most" 5="All"
Peer Influence	
How much pressure do you feel from your friends and schoolmates to . . . A: Smoke cigarettes ?	1="None" 2="A little" 3="Some" 4="A lot"
How much pressure do you feel from your friends and schoolmates to . . . B: Take alcohol ?	1="None" 2="A little" 3="Some" 4="A lot"
How much pressure do you feel from your friends and schoolmates to . . . C: Take cannabis ?	1="None" 2="A little" 3="Some" 4="A lot"
How much pressure do you feel from your friends and schoolmates to . . . D: use other substances (Please Specify) ?	1="None" 2="A little" 3="Some" 4="A lot"

School Engagement and Delinquency

The next questions are about your experiences in school. Which one of the following best describes your average grade in this school year?

9="A (93-100)" (73-76)"	8="A- (90-92)" 2="C- (70-72)"	7="B+ (87-89)" 1="D (69 or below)"	6="B (83-86)"	5="B- (80-82)"	4="C+ (77-79)"	3="C"
How likely is it that you will graduate from high school?						
1="Definitely Won't"		2="Probably Won't"		3="Probably Will"		4="Definitely Will"
About how many hours do you spend in an average week on all of your homework including both in school and out of school?						
1="0 hours"		2="1-4 hours"		3="5-9 hours"		4="10-14 hours" 5="15-19 hours" 6="20-24 hours" 7="25 or more hours"
To what extent have you participated in the following school activities during this school year?						
Music or other performing arts	1="Not At All" 4="Considerable"		2="Slight" 5="Great"		3="Moderate"	
Athletic teams	1="Not At All" 4="Considerable"		2="Slight" 5="Great"		3="Moderate"	
Other school clubs or activities	1="Not At All" 4="Considerable"		2="Slight" 5="Great"		3="Moderate"	
Now thinking back over the past year in school, how often did you . . .						
. . . enjoy being in school?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
. . . hate being in school?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
. . . try to do your best work in school?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
. . . find the schoolwork too hard to understand?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
. . . fail to complete or turn in your assignments?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
. . . get sent to the office, or have to stay after school, because you misbehaved?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
. . . find your schoolwork interesting?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
How often do you find that your friends encourage you to do things which your teachers wouldn't like?		1="Never" 4="Often"		2="Seldom" 5="Almost always"		3="Sometimes"
In which competitive sports (if any) did you participate during the LAST 12 MONTHS? Include school, community, and other organized sports.						
On how many days per week (if any) have you had a physical education (P.E.) or gym class this semester? (Don't count a general health class.)						
0="0 days"		1="1 day"		2="2 days"		3="3 days" 4="4 days" 5="5 days"
How much competition for grades is there among students at your school?						
1="None"		2="A little"		3="Some"		4="Quite a bit" 5="A great deal"
How do you think most of the students in your classes would feel if you cheated on a test?						
1="They would like it very much" dislike it"		2="They would like it"		3="They would not care"		4="They would 5="They would dislike it very much"
How do you think most of the students in your classes would feel if you intentionally did things to make your teachers angry?						
1="They would like it very much" dislike it"		2="They would like it"		3="They would not care"		4="They would 5="They would dislike it very much"
How important is each of the following for being looked up to or having high status in your school? Being a leader in student activities						
1="No Importance"		2="Little Importance"		3="Moderate Importance"		4="Great Importance" 5="Very Great Importance"
How important is each of the following for being looked up to or having high status in your school? Getting good						

grades 1="No Importance" 2="Little Importance" 3="Moderate Importance" 4="Great Importance" 5="Very Great Importance"
During an average school week, about how many times . . . do your teachers interrupt the class to deal with student misbehaviour or goofing off? 1="Never" 2="Less than once a week" 3="1-2 times a week" 4="3-5 times a week" 5="6-9 times a week" 6="10-19 times a week" 7="20 or more"
During an average school week, about how many times . . . does misbehaviour or goofing off by other students in your class interfere with your own learning? 1="Never" 2="Less than once a week" 3="1-2 times a week" 4="3-5 times a week" 5="6-9 times a week" 6="10-19 times a week" 7="20 or more"
Do you feel that the rules about student behaviour in your school are generally fair and reasonable? 1="No" 5="Yes" 4="Yes, mostly" 3="Don't know, can't say" 2="No, mostly"
Have any of your friends dropped out of school? 1="None" 2="A few" 3="Some" 4="Most or all"
During the LAST FOUR WEEKS, how many whole days of school have you missed . . . because you skipped or "cut"? 1="None" 2="1 Day" 3="2 Days" 4="3 Days" 5="4-5 Days" 6="6-10 Days" 7="11 or More"
During the LAST FOUR WEEKS, how often have you gone to school, but skipped a class when you weren't supposed to? 1="Not at all" 2="1 or 2 times" 3="3-5 times" 4="6-10 times" 5="11-20 times" 6="More than 20 times"
During an average school week, about how many times . . . do you come to class late (after class has begun) without an approved excuse? 1="Never" 2="Less than once a week" 3="1-2 times a week" 4="3-5 times a week" 5="6-9 times a week" 6="10-19 times a week" 7="20 or more"
During the LAST 12 MONTHS, how often have you . . . gotten into a serious fight in school or at work? Times" 1="Not At All" 2="Once" 3="Twice" 4="3 or 4 Times" 5="5 or More"
During the LAST 12 MONTHS, how often have you . . . damaged school property on purpose? Times" 1="Not At All" 2="Once" 3="Twice" 4="3 or 4 Times" 5="5 or More"
Have you ever been suspended or expelled from school? 1="No" 2="Yes, one time" 3="Yes, two or more times"
During the LAST FOUR WEEKS, on how many days (if any) were you . . . carrying a weapon such as a gun, knife, or club to school? 1="None" 2="One day" 3="Two days" 4="3-5 days" 5="6-9 days" 6="10 or more days"
On average, how much time do you spend after school each day at home with no adult present? (Count the hours between the end of school and when you go to bed.) 1="None or almost none" 2="Less than an hour" 3="1-2 hours" 4="2-3 hours" 5="3-5 hours" 6="More than 5 hours"
During a typical week, on how many evenings do you go out for fun and recreation? (Don't count things you do with your parents or other adult relatives.) 1="Less than one evening per week" 2="One evening" 3="Two evenings" 4="Three evenings" 5="Four or five evenings" 6="Six or seven evenings per week"
On the average, how often (if ever) do you go out with a date? 1="Never" 2="Once a month or less" 3="2 or 3 times a month" 4="Once a week" 5="2 or 3 times a week" 6="Over 3 times a week"
Go out for a leisure activity e.g. movies, music concert (Specify) 5="Almost every day" 4="At least once a week" 3="Once or twice a month" 2="A few times a year" 1="Never"
How often do you attend religious services?

1="Never"	2="Rarely"	3="Once or twice a month"	4="About once a week or more"
How important is religion in your life?			
1="Not important"	2="A little important"	3="Pretty important"	4="Very important"

Parental Monitoring	
Other than your parents, is there at least one other adult you would feel able to talk to if you were having problems in your life? 3="Yes, for most or all problems" 2="Yes, for at least some of my problems" 1="No"	
How often do your parents (or stepparents or guardians) do the following?	
Check on whether you have done your homework	1="Never" 2="Rarely" 3="Sometimes" 4="Often"
Provide help with your homework when it's needed	1="Never" 2="Rarely" 3="Sometimes" 4="Often"
Limit the amount of time you can spend watching TV	1="Never" 2="Rarely" 3="Sometimes" 4="Often"
Allow you to go out with friends on school nights	1="Never" 2="Rarely" 3="Sometimes" 4="Often"
	1="Never" 2="Rarely" 3="Sometimes" 4="Often"
If you were having problems in your life, do you think you would talk them over with one or both of your parents? 3="Yes, for most or all problems" 2="Yes, for at least some of my problems" 1="No"	
The following questions are about your parents (or stepparents or guardians):	
My parents know where I am after school.	1="Never" 2="Rarely" 3="Sometimes" 4="Most of the time" 5="Always"
When I go out at night, my parents know whom I am with.	1="Never" 2="Rarely" 3="Sometimes" 4="Most of the time" 5="Always"
When I go out on weekend nights I have to be home by a set time.	1="Never" 2="Rarely" 3="Sometimes" 4="Most of the time" 5="Always"
During a typical week, how often do you have dinner with one or both of your parents? 1="<1 day/week" 2="1 day/week" 3="2 days/week" 4="3 days/week" 5="4-5 days/week" 6="6-7 days/week"	
Taking all things together, how would you say things are these days -- would you say you're very happy, pretty happy, or not too happy these days? 3="Very happy" 2="Pretty happy" 1="Not too happy"	

Self-Perception	
How much do you agree or disagree with each of the following statements?	
On the whole, I'm satisfied with myself	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Life often seems meaningless	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I enjoy life as much as anyone	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
The future often seems hopeless	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
It feels good to be alive	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I take a positive attitude toward myself	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I feel I am a person of worth, on an equal plane with others	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I am able to do things as well as most other people	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I feel I do not have much to be proud of	1="Disagree" 2="Mostly Disagree"

	3="Neither" 4="Mostly Agree" 5="Agree"
Sometimes I think that I am no good at all	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I feel that I can't do anything right	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I feel that my life is not very useful	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
A lot of times I feel lonely	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
There is always someone I can turn to if I need help	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I often feel left out of things	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
There is usually someone I can talk to if I need to	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I often wish I had more good friends	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I usually have a few friends around that I can get together with	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I get a real kick out of doing things that are a little dangerous	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I like to test myself every now and then by doing something a little risky.	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I would like to explore strange places.	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I like to do frightening things.	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I like new and exciting experiences, even if I have to break the rules.	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I prefer friends who are exciting and unpredictable.	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I am often bored	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
I often find myself with nothing to do	1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
How do you think your own life will go in the next few years -- do you think it will get better or worse?	
1="Get much better" 2="Get somewhat better" 3="Stay about the same" 4="Get somewhat worse" 5="Get much worse"	

Problematic Behaviour

The next questions deal with activities which may be against the rules or against the law. We hope you will answer all of these questions. However, if you find a question which you cannot answer honestly, we would prefer that you leave it blank. Remember, your answers will never be connected with your name.

During the LAST 12 MONTHS, how often have you			
... run away from home (for more than 24 hours)?	1="Not At All" 4="3 or 4 Times"	2="Once" 5="5 or More Times"	3="Twice"
... taken part in a fight where a group of your friends were against another group?	1="Not At All" 4="3 or 4 Times"	2="Once" 5="5 or More Times"	3="Twice"
... hurt someone badly enough to need bandages or a doctor?	1="Not At All" 4="3 or 4 Times"	2="Once" 5="5 or More Times"	3="Twice"
... taken something not belonging to you?	1="Not At All" 4="3 or 4 Times"	2="Once" 5="5 or More Times"	3="Twice"
... gone into some house or building when you weren't supposed to be there?	1="Not At All" 4="3 or 4 Times"	2="Once" 5="5 or More Times"	3="Twice"
... sold an illegal drug?	1="Not At All" 4="3 or 4 Times"	2="Once" 5="5 or More Times"	3="Twice"
	1="Not At All"	2="Once"	3="Twice"

	4="3 or 4 Times"	5="5 or More Times"
	1="Not At All"	2="Once" 3="Twice"
	4="3 or 4 Times"	5="5 or More Times"

Social Cognitions	
Listed below are some thoughts that go through people's minds when they are nervous or frightened. Indicate, on the left-hand side of the form, how often in the last week each thought has occurred; rate each thought from 1-5 using the following scale:	
1. Thought never occurs	
2. Thought rarely occurs	
3. Thought occurs during half of the times when I am nervous	
4. Thoughts usually occurs	
5. Thought always occurs when I am nervous	
_____	I will be unable to speak
_____	I am unlikeable
_____	I am going to tremble or shake uncontrollably
_____	People will stare at me
_____	I am foolish
_____	People will reject me
_____	I will be paralysed with fear
_____	I will drop or spill things
_____	I am going to be sick
_____	I am inadequate
_____	I will babble or talk funny
_____	I am inferior
_____	I will be unable to concentrate
_____	I will be unable to write properly
_____	People are not interested in me
_____	People won't like me
_____	I am vulnerable
_____	I will sweat/perspire
_____	I am going red
_____	I am weird/different
_____	People will see I am nervous
_____	People think I am boring
Other thoughts not listed (please specify)	
_____
_____
When you <u>feel anxious</u> , how much do you believe each thought to be true. Please rate each thought by choosing a number from the scale below, and put the number which applies on the dotted line on the RIGHT hand side of the form	
	0 10 20 30 40 50 60 70 80 90 100
I do not believe this thought	I am complete convinced this thought is true

THANK YOU VERY MUCH