Mental Health Problems and Academic Failure: A Worry for Adolescents

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Abstract

Academic success during adolescence is important to achieve short and long term educational and career goals. Mental health problems have the potential to disrupt normal classroom functioning and adversely affect academic outcomes. This thesis examines the strength of the relationship between externalising problems (hyperactivity and conduct problems), internalising problems (emotional problems and peer problems), and academic functioning. The thesis used de-identified data from 13-15 year olds who participated in the 2nd Australian Child and Adolescent Survey of Mental Health and Wellbeing (n=2967) undertaken in 2013-15. Level of mental health problems were assessed using parent and youth reports from the Strengths and Difficulties Questionnaire. Academic functioning was assessed using linked Year 9 Naplan academic ratings. It was hypothesised that adolescents aged 13-15 year old with high levels of either externalising or internalising problems would have lower levels of academic performance than other students. Bivariate and multivariate logistic regression was used to assess the strength of the relationship between mental health problems and Naplan ratings, and whether school connectedness and demographic variables modified the relationship between mental health problems and Naplan ratings. These findings will identify the extent to which externalising and internalising problems experienced by 13-15 year olds in Year 9 are associated with poor academic functioning.

Declaration

This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

29th September 2020

Contribution Statement

In writing this thesis, my supervisor, Dr Alyssa Sawyer and co-supervisor, E.Prof Michael Sawyer and I collaborated to generate research questions of interest that could be investigated using pre-collected data from the 2nd Australian Child and Adolescent Survey of Mental Health and Wellbeing (Young Minds Matter report), collected in 2013 to 2014 (Lawrence et al., 2017). This provided participant recruitment, the sample and methodology of testing. My supervisor and co-supervisor and I also collaborated to design appropriate analyses of the data set. I conducted the literature search, completed the ethics application, and was responsible for data analysis and thesis write-up.

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I would like to warmly acknowledge my supervisor, Dr Alyssa Sawyer and co-supervisor, E.Prof Michael Sawyer for their significant contribution to my learning and development in the production of this thesis. I am very thankful for their committed support and generous insight which sparked my enthusiasm in this topic further and has provided me with invaluable understandings of the world of psychology for the future.

I would also like to acknowledge my family and friends for their overwhelming encouragement and understanding during this time. It has eased the thesis process greatly and is hugely appreciated.

Chapter 1: Introduction

The extent to which students achieve short and long-term educational goals in school is of great public importance (Leahy & Selwyn, 2019). Academic performance indicates a level of ability that has impacts beyond adolescent years. This study aims to examine the strength of the association between academic performance and levels of mental health for 13-15 year olds in Year 9. Abnormal levels of mental health can disrupt normal classroom functioning and limit high academic performance (Department of Health, 2015). This study considers the relationship between academic performance to abnormal levels of externalising problems (hyperactivity and conduct problems) and abnormal levels of internalising problems (emotional problems and peer problems). Differences between these mental health problems, in relation to academic outcomes, have not been examined using a representative national sample. Investigating the extent of the relationship between levels of externalising or internalising problems and academic performance could contribute to better understandings of the ways in which these problems interact with school outcomes.

As a minor additional consideration, school connectedness has been considered as a potential confounding factor to this relationship. It is predicted that high levels of school connectedness may act as a protective factor which reduces the strength of the association between academic performance and mental health problems for both types of mental health problems. If this is so it provides information that school connectedness may be worthy of further investigation as a potential target for schools to help reduce the impact of mental health problems on students' academic achievement.

1.1 Role of Academic Success During Adolescence

Academic performance is a key indicator of the extent to which students are meeting short and long-term educational goals. Understanding performance at the adolescent level is

important because this period often acts as the foundation for future academic outcomes (Geiser et al., 2007). Adolescence is a heightened period of personal and social development for people aged 12-18 (Department of Health, 2015). This stage is typically marked by the transition into high school and an increase in school pressures and requirements (Gustafsson et al., 2010). Maintaining academic achievement during this time is important to student wellbeing because it can build positive self-belief that promotes future goal attainment. Achievement also protects against classroom disruption and later problem behaviour (Zhang et al., 2019).

Academic achievement supports adolescent wellbeing because it can foster self-belief. During adolescence, individuals typically develop a greater sense of intrinsic awareness and individual identity (Kapoor & Tomar, 2016). Someone's emerging self-construct can be determined by factors relating to social belonging, personality traits and skills. Academic performance is another issue that directs self-image, and which inevitably drives behaviour. Bandura's social-cognitive theory explains that a positive self-image promotes students' long-term achievements because self-belief mediates problem solving abilities (Salanova et al., 2012). It is therefore important for adolescents to achieve academically as this may lay the foundations of positive self-beliefs which will inevitably support productive behaviour in the future (Kapoor & Tomar, 2016; Muijs, 1997). Academic achievement plays a role in the development of self-concept during adolescence which can have positive and negative consequences on later performance.

High levels of academic performance validate and encourage students' skills enabling for further development and a positive learning experience, while failure to achieve restricts progression. Schooling environments are for the most part, intended to promote thinking skills relating to future work (Seligman et al., 2009). Students who manage to engage with learning requirements benefit their own skill development, intrapersonal understandings, and

social competencies (Qualter et al., 2012; Seligman et al., 2009). Students that fail to achieve disrupt the fundamental nature of the classroom, restrict learning progress, and cannot foster the same sense of belief in future academic goals as highly competent students (Arnold et al., 1999).

Academic performance during early adolescence has consequences on future academic achievement and life satisfaction. High school achievements have been shown to consistently predict success in higher education (Spengler et al., 2015; Kemple, 2013; Geiser & Santelices, 2007). Academic success beyond high school affects economic prospects, social opportunity, health habits and ratings of happiness and life satisfaction (Nikolaev, 2018; Kristoffersen, 2018; Clark & Royer, 2018; Powdthavee et al., 2015). Importantly, academic achievements also protect against the development of problem behaviours like drinking and drug use which have consequences for future achievement and wellbeing (Hawkins, 1997; Zhang et al., 2019). Academic assistance to those students with low performance is important to prevent such negative trajectories as academic achievement is a key social determinant of health (Low et al., 2005). In summary, academic success has been shown to support future individual wellbeing, and as such limiting low academic performance during adolescence is one way to prevent poor social and health outcomes in adulthood.

1.2 Mental Health Problems and Academic Performance

Adolescents with lower levels of mental health have reduced learning outcomes and school engagement (Goodsell et al., 2017). In the Australian National Young Minds Matter Report (YMM) (2015) 1 in 7 students, aged 4 to 17, had a mental disorder (Department of Health, 2015). This accounts for 13.9% of the population (Department of Health, 2015). Adolescents are most at risk of mental disorder development and half of all mental health

disorders experienced by adults have onset by 14 years (Kessler et al., 2005). Mental health problems have significant consequences on school performance including the disruption of cognitive processing, behavioural regulation, and social functioning (Goodsell et al., 2017; Porche et al., 2016). It has been reasoned that those students unable to self-regulate effectively or maintain positive affect, have restricted capabilities to meet the norms and expectations of the school environment (Weber et al., 2016). This was demonstrated in a report from the Department of Health (2015), which reported that students with mental health disorders had lower scores in all subjects compared to other students. Additionally, students with mental health problems are more likely to disengage with school content and have greater rates of absenteeism (Lawrence et al., 2019). There are significant risk factors for poorer academic outcomes associated with lower levels of mental health and as such it is critical that students with lower levels of mental health are supported academically.

Additionally, adolescent mental health is valuable to broader wellbeing outcomes. Multiple reports have suggested that academic performance should not be considered the only goal for learning outcomes in education (Hoagwood & Erwin, 1997; Leahy & Selwyn, 2019; Reupert, 2019). Rather, mental stability is itself, an important indicator of student development and a predictor of positive future trajectories (Reupert, 2019). Considering that not all academic tests accurately predict future readiness, there is an argument that schools should place greater emphasis on supporting other skills like interpersonal skills and emotional adaptability (Reupert, 2019). A national Australian survey from 2019 of 2,052 adults, investigated public opinions of school education and found that, other than basic literacy and numeracy skills, 54.6% of adults rated highly the importance of developmental factors relating to student wellbeing (Leahy & Selwyn, 2019). In this way, levels of mental health are a critical issue for adolescence not just because of the association to academic outcomes but also because mental health is itself, considered essential for the future.

Therefore, recognising and treating mental health problems is needed as early as adolescence to foster adaptive coping behaviours (Skinner & Saxton 2019; Department of Health 2015). Porche (et al., 2016) argues that the increase in maladaptive coping, typical of adolescence, will continue to intensify if behaviours which are avoidant or rejecting of education are not managed.

1.2.1 Externalising and Internalising Mental Health Problems

At a broad level, mental health problems can be divided into externalising and internalising problems. Externalising problems are typically related to disruptive behaviours which are aggressive, impulsive, or erratic (Department of Health, 2015). Hyperactivity-inattention disorder (ADHD) and conduct disorder are key externalising disorders. The YMM report found that 7.4% of the sample population had ADHD, and 2.1% had conduct disorder (Lawrence et al., 2015). Internalising mental health problems include negative and worried thinking styles and withdrawn behaviours (Department of Health, 2015). Anxiety and depressive disorders are key internalising disorders and are experienced by 6.9% and 2.8% of adolescents respectively (Department of Health, 2015). Longitudinal studies have shown that both externalising and internalising mental health problems results in negative academic performance (Porche et al., 2016; Gustafsson et al., 2010). However, classroom difficulties differ depending on which group students most fit into.

Students with higher levels of externalising problems typically fail to engage appropriately in classroom settings while students with higher levels of internalising problems withdraw from participation (Suldo et al., 2014). A study by McLeod and Fettes (2007) suggested that students with externalising problems had lower academic performance than other students due to difficulty completing tasks and listening to instruction. These students are also restricted by reported higher levels of anti-social behaviour and aggressive

behaviour in the classroom compared to students without externalising problems (Gustafsson et al., 2010). Similarly, students with externalising problems have lower rates of engagement, attendance and higher rates of grade repeating or school dropouts (Lawrence et al., 2019). These factors are strongly associated with poorer academic outcomes (Zendarski et al., 2019). Additionally, the problem with underachieving is that students with high symptoms of externalising problems are likely to respond to failure by further avoiding tasks and disengaging (Scholtens et al., 2013; Zhang et al., 2019). Disengaging further limits academic progress and may intuitively lead to increased aggressive or dysfunctional behaviour (Gustafsson et al., 2010).

Students with internalising problems are less likely to disrupt classroom function than students with externalising problems but commonly avoid classroom participation (Porche et al., 2016). Students who are symptomatically sad or worried, have lower motivation to attempt school requirements and anticipate personal failure or peer rejections (Porche et al., 2016). In a study of 97 Californian students in Years 6 to 8, Roeser (et al., 1998) examined the association between negative emotions, measured by the Children's Depression Inventory short-form, and maladaptive classroom behaviours, measured by a self-report of withdrawal. They report a strong association between levels of anxiety and withdrawal from class participation (Roeser et al., 1998). Experiences of withdrawal has consequences for adolescent wellbeing because it obstructs adolescents' cognitive function and weakens the ability to self-regulate feelings and behaviours normally (Gustafsson et al., 2010; Mega et al., 2014).

Although there is a large body of research examining the difficulties of students with externalising or internalising problems, only few studies have considered how both of these mental health problems relate to academic performance. Examining both groups is important to understanding the extent of the association between mental health problems and academic

outcomes. In a US study of 65,680 child and adolescents aged 6-17, Porche (et al., 2016) investigated the association between mental health problems (externalising and internalising) and levels of school engagement and grade retention outcomes. This study reported that participants were less likely to be engaged in school and more likely to repeat grades if they were reported to have a clinically diagnosed mental health problem, as reported on a parent self-report (Porche et al., 2016). This study demonstrated that a number of key mental health problems were associated to some school outcomes, however the current study uses a more robust assessment of academic performance, which allows for a more informative report of the association to mental health for an Australian sample. Additionally, a report by Goodsell (et al., 2017) assessed students' academic performance and mental health problems using data from the National Young Minds Matter report. This study investigated externalising and internalising problems but did not consider both parent and youth reports in analysis of mental health problems. This limits the potential to understand the nuances of mental health problems in relation to adolescent outcomes. The present study addresses this limitation. Goodell's (et al., 2018) investigation also neglected to measure levels of school connectedness in relation to academic performance, which is an additional feature of this study, because levels of school connectedness are a likely confounding variable to the association between academic performance and mental health.

1.3 School Connectedness

School connectedness refers to a student's relations to their school environment and has the potential to be a significant mediating factor to the relationship between academic performance and mental health problems (Department of Health, 2015). This construct captures feelings of belonging, acceptance, support, and safety (Shochet et al., 2006). School connectedness has been widely researched since 1993 and is also understood in terms of school engagement and emotional health (Shochet et al., 2006; Kidjer et al., 2012; Wang &

Eccles, 2012). There is evidence to suggest that typically, higher levels of school connectedness are associated with lower levels of mental health problems, however no research to date has examined whether social connectedness reduces the strength of the association between externalising and internalising mental health problems and academic achievement in the early high school years.

School connectedness is considered particularly relevant to adolescence as external social groups beyond the family become increasingly important to adolescents' developing sense of self and independence during this time (Shochet et al., 2006). The quality of teacher and peer relationships play an important role in wellbeing and attitudes to learning (Bond et al., 2007; Lee, 2014; Shochet et al., 2006). A survey of 8000 students in the UK aged 14 to 16, indicated the high regard for supportive, kind, and interesting teachers in relation to minimising feelings of stress and supporting positive development (McLaughlin & Clarke, 2010). Similarly, in a study of child adjustment into kindergarten, like a transition into high school, high levels of connectedness predicted peer acceptance and the number of mutual friends in the classroom (Gustafsson et al., 2010). Relationship quality is considered important to mental health because it decreases the likelihood of engaging in anti-social behaviours and serves as a barrier to social withdrawal (Carroll et al., 2020; Shochet et al., 2006). School connectedness is shown to play a role in the social experiences of students at school and it is therefore likely that this effects students' level of mental health and academic performance.

Moreover, high levels of connectedness have the potential to effectively maintain positive self-concepts and the motivation to succeed which is associated with academic achievement (McNeely et al., 2004). Students particularly with externalising problems, are more likely to receive negative feedback and harsher discipline in schools (Gustafsson et al., 2010). This perpetuates experiences of disconnection and often creates negative self-beliefs

in relation to academic achievement (Shochet et al., 2006). Having higher levels of school connectedness may reduce the negative expectations which students, teachers and parents have for students with mental health problems. It also limits the perceived dysfunction which maintains negative associations between the school environment and the student (Gustafsson et al., 2010). Therefore, school connectedness has the potential to influence academic performance, although no study has yet adjusted for this confounding factor at a national level.

There is also reasonable evidence to show that school connectedness creates a sense of emotional support for students who require positive affect and stability (Weber et al., 2016). In a study of 12,000 adolescents in Years 7 to 12, Resnick and colleagues examined the association between emotional distress, measured by a 17-item self-report on symptoms of moodiness and depression, and perceived school connectedness (Shochet et al., 2006). They report that 13% to 18% of the variation in emotional distress scores was accounted for by school connectedness scores suggesting that school connectedness is associated with levels of mental health (Shochet et al., 2006). Another report, by Loukas (et al., 2016) shows that levels of school connectedness depend on whether the mental health problem is an externalising or internalising problem. The study of 296 students in Year 6 examined the association between externalising and internalising problems, measured by the SDQ and Children's depression inventory, and school connectedness measured by the 5-item School Connectedness scale (Loukas et al., 2016). This study found that levels of connectedness declined more severely for students with externalising problems than internalising problems by the middle school years. This suggests that levels of school connectedness may be associated with mental health problems differently depending on problem type (Loukas et al., 2016). As such there is evidence to suggest that school connectedness plays a role in adolescents' level of mental health problems, but there is little known about how this effects

academic achievement. It is possible that for students with high levels of mental health problems that good school connectedness may reduce the effect of mental health on academic achievement. The present study considers this possibility.

1.4 The Present Study

The aim of the present study is to examine the association between levels of externalising and internalising mental health problems and levels of academic achievement in adolescents aged 13 to 15. Previous research has indicated that adolescents with lower levels of mental health have worse academic outcomes than students with higher levels of mental health but is limited by the extent to which both externalising and internalising mental health problems have been assessed. The present study will investigate this using a large representative sample of adolescents in Australia who completed a routine objective assessment of academic achievement in Year 9, and parent-and youth-reports of mental health problems using a widely used measure of mental health problems (Strengths and Difficulties Questionnaire). The present study will also consider levels of school connectedness, as a likely confounding variable to the strength of this relationship.

1.4.1 Aims and Hypotheses

This study will investigate the association between level of mental health problems and level of academic performance for 13 to 15-year-olds. Separate analyses will be undertaken to identify the strength of this relationship for externalising and internalising problems. Both parent and adolescent reports will be used in the study.

Hypotheses:

1. Adolescents with abnormal levels of externalising problems have lower levels of academic performance than students with normal levels of externalising problems.

     2. Adolescents with abnormal levels of internalising problems have lower levels of academic performance than students with normal levels of internalising problems.

Chapter 2: Method

2.1 Study Sample

The sample for the current study has been drawn from the Young Minds Matter National Mental Health Survey (YMM) (Lawrence et al., 2015). The survey was conducted in 2013-14 and is the second national survey of child and adolescent mental health in Australia. The survey was commissioned by the Government Department for Health in partnership with the University of Western Australia, the Telethon Kids Institute and Roy Morgan Research. Its aims were to outline the prevalence and impact of child and adolescent mental disorders within Australia and the use of mental health services and their relative efficacy (Lawrence et al., 2015).

The YMM study used an area-based sampling method which selected homes within chosen regions and where there were one or more children living within the household. Eligibility criteria excluded very remote regions and Indigenous Australian populations as these groups were not considered accurately represented within the sample (Lawrence et al., 2015). A total of 6310 eligible families completed the survey which is a response rate of 55% (Lawrence et al., 2015). These respondents were parents and caregivers of children aged 4-17. A total of 5,051 of these participants also gave consent to disclose Naplan results. A final sample of 2967 youth aged 11-17 also completed the survey (Lawrence et al., 2015).

Participants for the present study have been drawn from this large, randomly selected, national community sample. Participants were included in the present study if they were aged 13-15 years old as this age is representative of the target Year 9 population in all states within Australia (ACARA, 2016). Inclusion criteria also only considered students that had completed their YMM survey and Naplan assessment within a 2-year timeframe, as reports on the YMM have limited predictive validity beyond this period (Stone et al., 2010). The

average time between completing the Naplan and SDQ report was 5.4 months for the

complete case. There were 715 in the present study who had complete data available for all

variables required for analysis. A flowchart of how the participants came to be included in the

present study is presented in Figure 1.

Figure 1

Flowchart Showing how Participants Were Included in the Complete Case

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                    ┌─────────────────────────────────────┐
                    │  Total Sample aged 13-15 (n=962)     │
                    └─────────────────────────────────────┘
                                    │
                                    ▼
        ┌───────────────────────────────────────────────────────┐
        │  Sample with YMM assessment and NAPLAN report completed│
        │             within 2-year timeframe (n=809)           │
        └───────────────────────────────────────────────────────┘
                                    │
                                    ▼
          ┌─────────────────────────────────────────────────┐
          │  Sample with fully completed SDQ Questionnaires  │
          │                    (n=809)                       │
          └─────────────────────────────────────────────────┘
                                    │
                                    ▼
          ┌─────────────────────────────────────────────────┐
          │  Sample with fully completed Naplan Assessment   │
          │                    (n=719)                       │
          └─────────────────────────────────────────────────┘
                                    │
                                    ▼
        ┌───────────────────────────────────────────────────────┐
        │  Sample with fully completed School Connectedness Scale│
        │                      (n=715)                          │
        └───────────────────────────────────────────────────────┘
                                    │
                                    ▼
                    ┌─────────────────────────────────────┐
                    │     Final complete case (n=715)      │
                    └─────────────────────────────────────┘
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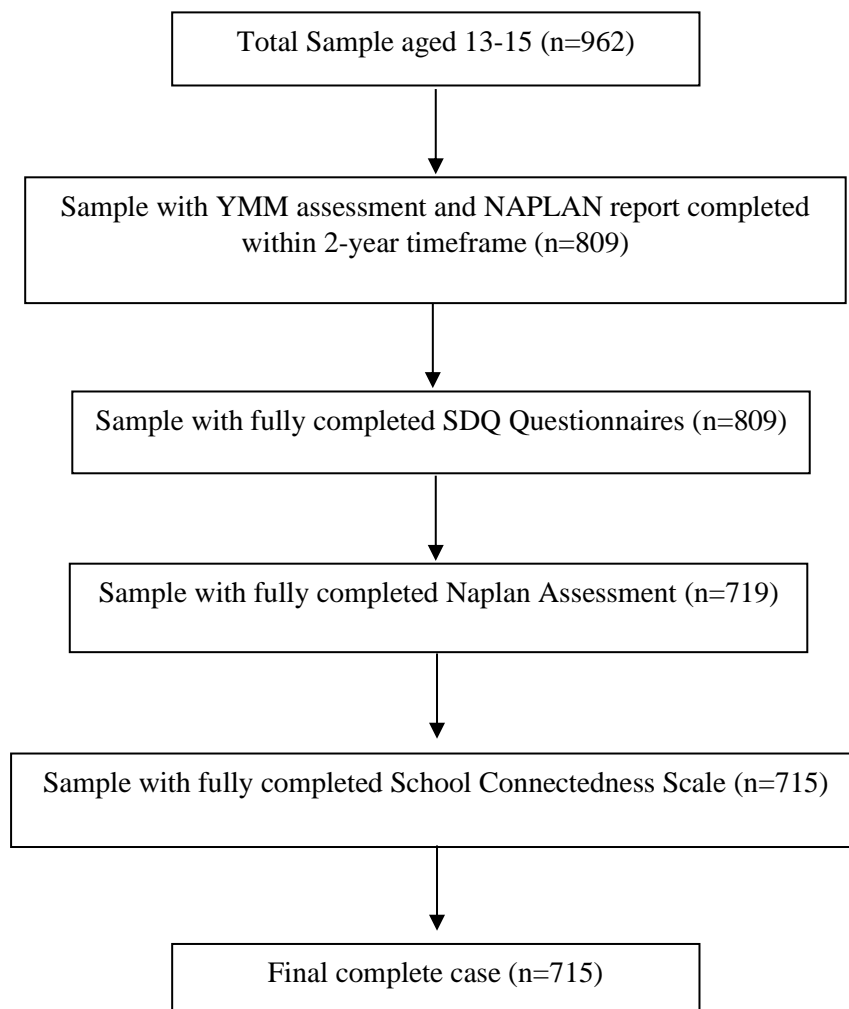
2.2 Measures

2.2.1 Demographic Characteristics

Demographic characteristics assessed for the current study include sex, age, number of parents living within a household and family composition. Sex was categorised into male and female. Age was assessed as years (i.e., 13, 14, 15). Household demographics were measured by the number of parents of the study child living in the household; two, one or zero. Note that zero was a rare response with only 0.8% of the complete case sample in the present study selecting this response. Similarly, family composition was categorised by intact, lone parent, blended, step and other family. 'Blended family' refers to families with two or more children where at least one is natural or adopted and one is a stepchild. 'Other family' refers to families where the child is not the natural, adopted, foster or stepchild and the carers are relatives. For family composition 'intact family' was the reference category.

2.2.2 Academic Performance

Academic performance was measured using de-identified data from the National Assessment Program Literacy and Numeracy (Naplan). The Naplan test is a nationally recognised, standardised assessment of student academic performance in Years 3, 5, 7 and 9 (ACARA, 2016). This program measures student performance across five learning domains that are reflective of the Australian curriculum (ACARA, 2016). These are writing, reading, grammar and punctuation, spelling and numeracy. Each test is assessed separately and designed to isolate skill performance however, test criteria does overlap across some areas of the tests in knowledge base or style of application.

The writing domain assesses student's ability to write a persuasive piece or narrative (ACARA, 2016). This task measures higher order thinking as it requires evaluation, creativity, and an application of literary knowledge (Wyatt-Smith & Jackson, 2016). Students

were scored on a set of scales ranging from 0-3 to 0-6 for 10 set criteria. The grammar domain is divided into two parts (grammar and punctuation) and requires students to identify correct punctuation and grammar use. Similarly, the spelling domain assesses word knowledge in two complimentary parts. Firstly, to identify spelling errors and secondly to correctly identify errors and to correct them. The reading domain tests student's ability to understand a body of text and to analyse it by responding to multiple choice questions. The numeracy domain assesses four key areas with equal numbers of questions allocated to each topic. These topics are 'number,' 'algebra,' 'measurement, chance and data' and 'space.' This test is split into two parts; one without a calculator and one with a calculator allowed. Most of the numeracy test is multiple choice (78%), and students are permitted 40 minutes for each section (ACARA, 2016).

Naplan scores were assessed using scaled scores and categorised into 'below national minimum standard,' 'at national minimum standard' and 'above national minimum standard' for each domain (ACARA, 2016). Test scores are reflective of the total score and not student's ability to answer the most challenging item. The scoring bands are ranked so that the majority of students meet the 'above' standard (approximately 60%) (ACARA, 2016). Scores which are 'at the national standard' indicate that students satisfy the learning expectations of Year 9. Scores which are 'below the national standard' capture students that fail to correctly answer the test questions and require significant learning assistance. These students are categorised as failing to meet the expected learning requirements of Year 9 (ACARA, 2016).

2.2.3 Mental Health Problems

Mental health problems were measured using the youth-reported and parent-reported Strengths and Difficulties Questionnaires (SDQ). Questionnaires for youth and parents are

very similar with only minor grammatical changes to make them appropriate for each respondent (see Appendix 1).

The SDQ is a short screening assessment of mental health for 4-17 year olds that is used broadly in clinical and community settings (Goodman & Scott, 1999). It is a 25-item, multiple choice response questionnaire with 5 questions for each of the 5 subscales. These are, hyperactivity, conduct disorder, emotional problems, peer problems and prosocial behaviour (Goodman & Scott, 1999). Participants mark their responses as 'not true' being 0, 'somewhat true' being 1 or 'certainly true' being 2. The SDQ uses scale cut-off scores to classify participants into normal (80% of scores), borderline (80-90 percentile) and abnormal (>90th percentile) ranges for each subscale (De Vries et al., 2018). Students with abnormal ratings on the SDQ scale scores (not including the prosocial subscale) are classified as highly likely to be experiencing a mental health disorder (Goodman et al., 2000).

The SDQ has been extensively validated and was developed on the models of childhood psychopathology outlined in the Diagnostic Statistic Manual (DSMI-IV) and International Classification of Diseases (ICD-10) (Goodman & Scott, 1999). It is similar to the 118-item Child Behavioural Checklist (CBCL), which is considered the "gold standard" for in-depth child assessments, however the SDQ retains its classification accuracy while using a smaller item pool (Stone et al., 2010). The SDQ scale items have demonstrated acceptable construct, discriminant, and convergent validity (Kersten et al., 2016; Lundh et al., 2008; Muris et al., 2003; Seward et al., 2018). A systematic review of the items also showed appropriate internal reliability (Hawes and Dadd, 2004). Cronbach's alpha generated a strong overall coefficient of 0.73, while the lowest coefficient of 0.41 was reported for the peer problems scale, which is sufficient (Hawes and Dadd, 2004). Additionally, previous studies have reported moderate to high classification accuracy using the SDQ with sensitivity ranging from 82% in clinical samples (with a higher number of cases) to 62% in community

samples (Kersten et al., 2016; Stone et al., 2010). This level of sensitivity in community samples is sound and is estimated to identify two-thirds of mental health disorders accurately (Goodman et al., 2000).

2.2.4 School Connectedness

School connectedness was measured within the YMM youth questionnaire using Resnick's 6-item School Connectedness Scale (Telethon Kids Institute, 2015). This self-report is designed to capture adolescents' feelings about the school environment including whether the adolescents felt close to people at school, safe, involved, happy to be there and treated fairly. This measure is particularly useful for understanding connectedness to the school community (Lawrence et al., 2015). Students were asked to rank how much they agreed or disagreed with the statements on a likert scale of 1-strongly agree, 2- agree, 3-neither agree nor disagree, 4-disagree, 5-strongly disagree. The full list of the scale items for the School Connectedness Scale can be found in Appendix 2.

Evaluation of the scale items is limited but does support the validity of this measure. A goodness of fit-test measuring each of the 6 items estimated 90% of the variance in school connectedness (Lawrence et al., 2015). Additionally, the distribution of school connectedness scores in a sample of 2,737 participants was mostly bimodal which indicates that this assessment is sensitive to higher and lower responses of school connectedness (Lawrence et al., 2015).

For ease of interpretation, adolescents' continuous scores on the School Connectedness Scale were spilt by the median response to create a binary variable. The median response on the School Connectedness Scale was 1.9 out of 5 for the complete case. The two categories created were higher connectedness scores and lower connectedness

scores. Scores closer to 1 indicated higher levels of connectedness while scores closer to 5 indicated lower levels of connectedness.

2.3 Procedure

The YMM survey was developed alongside 20 experts in child and adolescent mental health and data was collected by trained interviewers (Lawrence et al., 2015). All survey respondents (n=2967) completed a questionnaire on a computer tablet. Parents and carers were also interviewed face-to-face. Parent assessments reported demographics characteristics and SDQ reports with adolescents as the subject. The student questionnaire involved the SDQ self-report and the School connectedness scale. A detailed list of the procedures and surveys used in the original study have been made public and can be found online on the Young Minds Matter website (see Lawrence et al., 2015). Year 9 Naplan reports were collected before and after the survey data collection and linked to the final data set.

2.4 Ethical Considerations

The original YMM report received ethics approval from the Department of Health Departmental Ethics Committee (DOH HERC) (Project 17/2012) in accordance with the National Health and Medical Research Council (NHMRC) (Lawrence et al., 2015). Participation in the study was voluntary and participants provided written consent. Access to the Confidentialised Unit Record File (CURF) for this study was approved by the University of Adelaide Human Research Ethics Committee (HREC) (Number 20/25).

2.5 Statistical Analyses

The data set was analysed using the Statistical Package for the Social Sciences (SPSS, Version 26). Hypothesis 1 and 2 were investigated by examining the percentage of Naplan scores below the national minimum standard (NMS) for adolescents with SDQ subscale scores in the abnormal and normal range. All Naplan domain scores were measured (writing,

grammar, spelling, reading and numeracy) and all SDQ mental health subscales scores (hyperactivity, conduct problems, peer problems and emotional problems). Parent reported SDQ subscale scores and youth reported SDQ subscale scores were analysed separately. Confidence intervals provided information about the precision of these estimates and the extent to which the difference between proportions were statistically significant.

Bivariate and multivariate logistic regression was used to adjust for likely confounders of the relationship. Variables included in the multivariate logistic regression include age, gender, number of parents, family composition. Levels of school connectedness (higher connectedness and lower connectedness) were also included in the multivariate analysis to examine whether this variable reduced the strength of the association between adolescents' scores on the SDQ in the abnormal and normal range and the likelihood of scoring below NMS on each Naplan domain.

SDQ subscale scores in the borderline range were not included in analyses because the aim of this study was to investigate abnormal and normal levels of mental health. Borderline reports can be found in Appendix 3. Students that scored 'at' NMS and 'above' NMS on the Naplan assessment can also be found in Appendix 3. These scores were not included because the aim of this study was to consider lower levels of academic performance.

Chapter 3: Results

3.1 Descriptive Statistics

3.1.1 Demographic Characteristics

Frequencies and percentages for the demographic characteristics of the response sample and complete case are presented in Table 1. There are minor differences between the characteristics of participants across the two samples. For example, in the complete case sample just over half of the adolescents are male (53%), majority are living in a household with two parents (79.2%) and most have an intact family (67%). The response sample showed a similar pattern of results but with a lower percentage of adolescents in these groups. Age distributions in both samples are evenly spread between 13, 14 and 15 year olds. Differently, the response sample has a greater percentage of adolescents with higher connectedness (52.2%), whereas there is a slightly higher percentage of adolescents with lower connectedness in the complete case sample (53.1%).

Across both the response and complete case samples, parents reported a higher percentage of SDQ scores in the abnormal range for internalising problems compared to the externalising problems scales. In contrast, youth reported a higher percentage of scores in the abnormal range for externalising problems compared to internalising problems scales.

Table 1

Demographic Characteristics and SDQ Mental Health Problem Scores for the Response (n=2967)
and Complete Case Samples (n=715)

Characteristics		Response Sample		Complete Case	
		n	*%*	*n*	*%*
Child Demographics					
Child Sex					
	Male	1530	51.6	382	53.4
	Female	1437	48.4	333	46.6
Age					
	13	310	10.4	235	32.9
	14	343	11.6	262	36.6
	15	309	10.4	218	30.5
Household Demographics					
Number of parents living in household					
	Two parents	2246	75.5	566	79.2
	One parent	670	22.6	143	20.0
Family Composition					
	Intact family	1896	63.9	479	67.0
	Lone parent family	676	22.8	143	20.0
	Blended family	190	6.4	50	7.0
	Step family	171	5.8	37	5.2
	Other family [a]	34	1.1	6	0.8
School Connectedness [b]					
	Higher Connectedness	1550	52.2	335	46.9
	Lower Connectedness	1417	47.3	380	53.1
SDQ Mental Health Problems					
Parent Rating					
	Hyperactivity Score				
	Abnormal	294	9.9	59	8.3
	Normal	2488	83.9	617	86.3
	Conduct Problems Score				
	Abnormal	262	8.8	46	6.4
	Normal	2521	85.0	624	87.3
	Peer Problems Score				
	Abnormal	424	14.3	86	12.0
	Normal	2233	75.3	555	77.6
	Emotional Problems Score				
	Abnormal	482	16.2	88	12.3
	Normal	2240	75.5	565	79.0
Youth Rating					
	Hyperactivity Score				
	Abnormal	432	14.6	112	15.7
	Normal	2212	74.6	517	72.3
	Conduct Problems Score				
	Abnormal	248	8.4	48	6.7
	Normal	2498	84.2	615	86.0

Peer Problems Score				
Abnormal	151	5.1	31	4.3
Normal	2339	78.8	569	79.6
Emotional Problems Score				
Abnormal	360	12.1	67	9.4
Normal	2387	80.5	602	84.2

Note. A small number of reports did not answer 'how many parents were in the household', $n = 6$ for complete case vs $n=51$ for response sample.

[a] 'Other family' refers to children being raised by their grandparents or other relatives.

[b] Adolescents with ratings of higher connectedness scored above the median score on the School Connectedness scale and adolescents with lower connectedness scored below the median score.

3.1.2 Parent and Youth Demographic Characteristics

Table 2 presents the demographic characteristics of adolescents rated by their parents as scoring in the abnormal and normal ranges on the SDQ problem scales. There are some noticeable differences between groups. Males make up the majority of the sample with abnormal ratings of hyperactivity (78.0%), conduct problems (63.0%) and peer problems (61.6%), while there are more females (55.7%) than males with abnormal emotional problem scores. More adolescents are aged 14 in the abnormal group than 13 or 15, while age remains evenly distributed in the group with scores in the 'normal' range. Similarly to the characteristics shown in Table 1, in Table 2 it can be seen that the majority of the sample had two parent, intact families, and this did not differ by problem type or across the 'abnormal' and 'normal' category groups. However, there was some evidence that the 'normal' group had a slightly higher percentage of intact families.

For adolescents scoring in the normal category on the SDQ scale scores approximately half of parents reported higher ratings of connectedness, while the other half reported lower ratings of connectedness. In contrast for adolescents scoring in the abnormal

category on the SDQ scale scores the majority report lower school connectedness ratings (see Table 2).

Table 3 presents the demographic characteristics of youth who rated themselves as scoring in the abnormal and normal ranges on the SDQ problem scales. Results show that the youth report is mostly consistent with the parent report. Although, a smaller percentage of males (63%) make up the male hyperactivity group and an even greater female population is represented for emotional problems (71.6%).

Table 2

Demographic Characteristics for Adolescents Scoring in the Abnormal and Normal Range for Parent Reported SDQ Externalising and Internalising Problems (n=715)

		Externalising Problems								Internalising Problems							
		Hyperactivity				Conduct Problems				Peer Problems				Emotional Problems			
		Abnormal		Normal		Abnormal		Normal		Abnormal		Normal		Abnormal		Normal	
Characteristics		*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Child Demographics																	
Child Sex																	
	Male	46	78.0	306	49.6	29	63.0	328	52.6	53	61.6	286	51.5	39	44.3	311	55.0
	Female	13	22.0	311	50.4	17	37.0	296	47.4	33	38.4	269	48.5	49	55.7	254	45.0
Age																	
	13	23	39.0	199	32.3	12	26.1	202	32.4	21	24.4	183	33.0	25	28.4	186	32.9
	14	22	37.3	224	36.3	21	45.7	224	35.9	35	40.7	202	36.4	38	43.2	206	36.5
	15	14	23.7	194	31.4	13	28.3	198	31.7	30	34.9	170	30.6	25	28.4	173	30.6
Household Demographics																	
Number of parents living in household																	
	Two parents	45	76.3	490	79.4	36	78.3	495	79.3	62	72.1	440	79.3	60	68.2	457	80.9
	One parent	13	22.0	122	19.8	9	19.6	124	19.9	22	25.6	112	20.2	27	30.7	104	18.4

Family Composition																	
	Intact family	32	54.2	425	68.9	25	54.3	429	68.8	49	57.0	378	68.1	46	52.3	394	69.7
	Lone parent family	13	22.0	122	19.8	9	19.6	124	19.9	22	25.6	111	20.0	27	30.7	103	18.2
	Blended family	8	13.6	38	6.2	7	15.2	38	6.1	6	7.0	37	6.7	4	4.5	39	6.9
	Step family	5	8.5	27	4.4	4	8.7	28	4.5	7	8.1	25	4.5	10	11.4	24	4.2
	Other family [a]	1	1.7	5	0.8	1	2.2	5	0.8	2	2.3	4	0.7	1	1.1	5	0.9
School Connectedness [b]																	
	Higher Connectedness	22	37.3	296	48.0	13	28.3	304	48.7	19	22.1	286	51.5	24	27.3	290	51.3
	Lower Connectedness	37	62.7	321	52.0	33	71.7	320	51.3	67	77.9	269	48.5	64	72.7	275	48.7

Note. A small number of reports did not answer 'number of parents living in household' (*n*=6).

[a] 'Other family' refers to children being raised by their grandparents or other relatives.

[b] Adolescents with ratings of higher connectedness scored above the median score on the School Connectedness scale and adolescents with lower connectedness scored below the median score.

Table 3

Demographic Characteristics for Adolescents Scoring in the Abnormal and Normal Range for Youth Reported SDQ Externalising and Internalising Problems (n=715)

		Externalising Problems								Internalising Problems							
		Hyperactivity				Conduct Problems				Peer Problems				Emotional Problems			
		Abnormal		Normal		Abnormal		Normal		Abnormal		Normal		Abnormal		Normal	
Characteristics		*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Child Demographics																	
Child Sex																	
	Male	63	56.3	266	52.5	29	60.4	318	51.7	16	51.6	311	54.7	19	28.4	349	58.0
	Female	49	43.8	251	48.5	19	39.6	297	48.3	15	48.4	258	45.3	48	71.6	253	42.0
Age																	
	13	22	19.6	185	35.8	11	22.9	206	33.5	12	38.7	190	33.4	19	28.4	206	34.2
	14	47	42.0	184	35.6	22	45.8	224	36.4	8	25.8	206	36.2	24	35.8	220	36.5
	15	43	38.4	148	28.6	15	31.3	185	30.1	11	35.5	173	30.4	24	35.8	176	29.2
Household Demographics																	
Number of parents living in household																	
	Two parents	84	75.0	420	81.2	32	66.7	499	81.1	27	87.1	448	78.7	52	77.6	477	79.2
	One parent	26	23.2	94	18.2	15	31.3	113	18.4	4	12.9	117	20.6	14	20.9	121	20.1

Family Composition																
Intact family	69	61.6	354	68.5	23	47.9	429	69.8	20	64.5	387	68.0	37	55.2	410	68.1
Lone parent family	26	23.2	94	18.2	16	33.3	113	18.4	4	12.9	117	20.6	14	20.9	121	20.1
Blended family	8	7.1	40	7.7	8	16.7	37	6.0	7	22.6	33	5.8	7	10.4	41	6.8
Step family	7	6.3	26	5.0	1	2.1	33	5.4	0	0.0	28	4.9	8	11.9	26	4.3
Other family [a]	2	1.8	3	0.6	0	0.0	3	0.5	0	0.0	4	0.7	1	1.5	4	0.7
School Connectedness [b]																
Higher Connectedness	36	32.1	271	52.4	11	22.9	304	49.4	3	9.7	304	53.4	9	13.4	313	52.0
Lower Connectedness	76	67.9	246	47.6	37	77.1	311	50.6	28	90.3	265	46.6	58	86.6	289	48.0

Note. A small number of reports did not answer 'number of parents living in household' (*n=6*).

[a] 'Other family' refers to children being raised by their grandparents or other relatives.

[b] Adolescents with ratings of higher connectedness scored above the median score on the School Connectedness scale and adolescents with lower connectedness scored below the median score.

3.2 Parent Reports

3.2.1 Academic Performance and Externalising and Internalising Problems

Table 4 presents the percentage of adolescents scoring below NMS who have parent rated SDQ scores in the abnormal and normal range. There is a higher percentage of scores below NMS for adolescents with scores in the abnormal range for hyperactivity and conduct problems than for peer problems and emotional problems, on all NAPLAN domains. Scores on the writing and grammar domain show the largest pattern of effect between scores below NMS and the abnormal category. For example, 39.0% (95% CI:26.5-52.6) of adolescents with ratings of hyperactivity in the abnormal range scored below NMS on the writing domain and 19.6% (95% CI:9.4-33.9) of adolescents with ratings of conduct disorder in the abnormal range scored below NMS on the grammar domain. This pattern was less evident for the numeracy domain across each of the SDQ problem types, however the small sample size of this group (*n*=14) limits the precision of this estimate. It is likely, that this pattern of scores would have remained consistent with the other domains if the sample size had been larger.

There is some evidence to suggest that the strength of the association between scores on the SDQ scales and scores below NMS is weak due to the wide and overlapping 95% confidence intervals (CIs). The CIs are widest for externalising problems scores which gives some indication that the precision of the estimate is low, while the overlapping CIs suggest that the findings are due to chance. However, the nature of the CIs are likely to be a reflection of the smaller sample size, which otherwise would have supported the strong pattern of scores. The pattern of scores is consistent with hypothesis 1 and 2 which shows evidence of a strong association between scores below NMS and SDQ scores in the abnormal range compared to the normal range.

Table 4

Percentage of Adolescents Scoring Below the National Minimum Standard on all Naplan Domains by Parent SDQ Problem Scores (Externalising and Internalising) (n=715)

Parent- rated SDQ Scales	Naplan Domains									
	Writing		Grammar		Spelling		Reading		Numeracy	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Externalising Problems										
Hyperactivity Score										
Abnormal Range	39.0	26.5-52.6	16.9	8.4-29.0	16.9	8.4-29.0	10.2	3.8-20.8	6.8	1.9-16.5
Normal Range	14.4	11.7-17.4	4.9	3.3-6.9	4.4	2.9-6.3	2.3	1.2-3.8	1.5	0.7-2.8
Conduct Problems Score										
Abnormal Range	34.8	21.4-50.2	19.6	9.4-33.9	10.9	3.6-23.6	13.0	4.9-26.3	8.7	2.4-20.8
Normal Range	14.7	12.1-17.8	5.6	3.9-7.7	5.0	3.4-7.0	2.7	1.6-4.3	1.3	0.6-2.5
Internalising Problems										
Peer Problems Score										
Abnormal Range	26.7	17.8-34.4	16.3	9.2-25.8	7.0	2.6-14.6	7.0	2.6-14.6	5.8	1.9-13.0
Normal Range	14.6	11.8-17.8	4.7	3.1-6.8	5.0	3.4-7.2	2.5	1.4-4.2	0.9	0.3-2.1
Emotional Problems Score										
Abnormal Range	21.6	13.5-31.6	10.2	4.8-18.5	5.7	1.9-12.8	5.7	1.9-12.8	4.5	1.3-11.2
Normal Range	15.4	12.5-18.6	5.5	3.8-7.7	5.5	3.8-7.7	2.3	1.2-3.9	0.9	0.3-2.1

Note. For results for adolescents rated by parents as scoring in the 'Borderline' range on the SDQ scales see Appendix 3.

3.2.2 Adjusting for School Connectedness and Demographic Characteristics

Bivariate and multivariate logistic regression was utilised to assess the extent to which levels of school connectedness influence the strength of the relationship between scores on each Naplan domain and parent rated SDQ scores in the abnormal and normal range (Table 5). The multivariate logistic regression also adjusted for demographic characteristics including, age, sex, number of parents within a household and family composition. Complimentary to the earlier findings, the bivariate reports show that adolescents with abnormal levels of SDQ problems had a higher percentage of scores below NMS compared to adolescents with normal SDQ scores (Goodsell et al., 2017). However, there is minimal difference between the bivariate and multivariate reports.

Overall, scores on the numeracy domain show the largest odds ratios and spelling scores show the smallest. For example, adolescents with conduct problems in the abnormal range and scoring on the numeracy domain, show a bivariate odds ratio of 7.3 (95%CI:2.1-25.3) which reduced to 5.7 (95%CI:1.5-21.1) when adjusting for covariates. This suggests that adolescents with abnormal conduct problems are less likely to perform below NMS when adjusting for levels of school connectedness and demographic characteristics. However, scores on the numeracy domain did have large CIs and a relatively small sample size which limits the precision of this estimate. Scores on the other Naplan domains do not show the same wide CI as scores on the numeracy domain and these domains also have larger sample size. It is therefore likely that the difference in the size of the CI between the numeracy domain and the other domains is a reflection of the small sample size and not a reflection of a change in the strength of the association. The similarity between the bivariate odds ratio and multivariate odds ratio across most domains shows evidence for the strong association between lower levels of mental health problems and academic performance below NMS, as adjusting for covariates does not influence the association.

Table 5

Bivariate and Multivariate Logistic Regression (95% CI) Comparing Adolescents With Parent Rated Abnormal vs Normal SDQ Problem Scores (Externalising and Internalising) and Naplan Scores for Each Domain (n=715)

Naplan Domain	Externalising Problems				Internalising Problems			
	Hyperactivity		Conduct Problems		Peer Problems		Emotional Problems	
	Bivariate	Multivariate	Bivariate	Multivariate	Bivariate	Multivariate	Bivariate	Multivariate
Numeracy								
Below NMS [a]	4.9	5.4	7.3	5.7	6.8	5.0	5.3	4.0
	(1.5-16.5)	(1.5-19.8)	(2.1-25.3)	(1.5-21.1)	(1.9-24.0)	(1.4-18.1)	(1.4-20.3)	(1.0-16.1)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Reading								
Below NMS	4.9	3.9	5.4	4.1	2.9	2.8	2.6	2.1
	(1.8-13.2)	(1.3-11.5)	(2.0-14.3)	(1.5-11.6)	(1.1-7.8)	(1.0-7.9)	(0.9-7.4)	(0.7-6.3)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Grammar								
Below NMS	4.0	3.3	4.1	3.9	4.0	4.4	2.0	2.0
	(1.8-8.6)	(1.5-7.3)	(1.8-9.2)	(1.7-8.9)	(2.0-7.9)	(2.1-9.2)	(0.9-4.3)	(0.9-4.6)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Writing								
Below NMS	3.8	2.5	3.1	2.4	2.1	1.6	1.5	1.5
	(2.1-6.7)	(1.4-4.6)	(1.6-5.9)	(1.2-4.9)	(1.3-3.6)	(0.9-2.8)	(0.9-2.6)	(0.8-2.7)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Spelling								
Below NMS	4.5	2.9	2.3	1.7	1.4	1.0	1.0	0.9
	(2.0-9.7)	(1.3-6.5)	(0.9-6.3)	(0.6-4.7)	(0.6-3.5)	(0.4-2.6)	(0.4-2.7)	(0.3-2.4)
At/ Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Note. Variables included in the multivariate logistic regression include age, gender, number of parents, family composition and school connectedness. 1.0 is

the reference category. Numeracy: Below *n*=14; At/Above *n*=701, Reading: Below *n*=26; At/Above *n*=689, Grammar: Below *n*=49; At/Above *n*=666,

Writing: Below *n*=121; At/Above *n*=594, Spelling: Below *n*=40; At/Above *n*=675.

[a] NMS= National Minimum Standard

3.3 Youth Reports

3.3.1 Academic Performance and Externalising and Internalising Problems

The youth report reflects a similar pattern of effect between scores below NMS and the percentage of adolescents with SDQ scores in the abnormal range to the parent report. However, there were fewer scores below NMS and the pattern of effect is less consistent than the results for the parent reported SDQ. Consistent with the parent report, adolescents with externalising problems in the abnormal range had a higher percentage of scores below NMS compared to adolescents with internalising problems in the abnormal range (Table 8). The writing domain had the highest percentage of adolescents with abnormal SDQ scale scores performing below NMS compared to normal SDQ scales scores. The highest percentage in the below NMS range was for the adolescents with conduct problems (27.1%, 95% CI: 15.3-41.8) and hyperactivity in the abnormal range (20.8%, 95% CI: 10.5-35.0). The CIs were mostly large and overlapping which gives some indication that the results may be a chance finding, however the consistent pattern shows good evidence in support of the hypotheses.

Differently to the association shown in the parent report, adolescents with internalising scores in the normal range showed a higher percentage of scores below NMS compared to adolescents with scores in the abnormal range. For the writing domain, 17.8% (95% CI:14.8-21.1) of adolescents with emotional problems in the normal range performed below NMS and only a percentage of 11.9% (95% CI: 5.3-22.2) of adolescents with emotional problems in the abnormal range performed below NMS. This shows that adolescents in the internalising groups did not have a higher percentage of scores below NMS if they scored in the SDQ abnormal range. The adolescents with higher scores in the abnormal range for externalising problems, however, had a higher percentage of scores below NMS compared to adolescents with scores in the normal SDQ range.

Table 6

Percentage of Adolescents Scoring Below the National Minimum Standard on all Naplan Domains by Youth SDQ Problem Scores (Externalising and Internalising) (n=715)

Youth rated SDQ Scales	Naplan Domains									
	Writing		Grammar		Spelling		Reading		Numeracy	
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	%	95%CI
Externalising Problems										
Hyperactivity Score										
Abnormal Range	20.5	13.5-29.2	7.1	3.1-16.6	7.1	3.1-13.6	4.5	1.5-10.1	2.7	0.6-7.6
Normal Range	16.4	13.3-19.9	7.0	4.9-9.5	5.8	3.9-8.2	3.5	2.1-5.4	1.9	0.9-3.5
Conduct Problems Score										
Abnormal Range	27.1	15.3-41.8	20.8	10.5-35.0	8.3	2.3-20.0	10.4	3.5-22.7	8.3	2.3-20.0
Normal Range	15.4	12.7-18.5	5.2	3.6-7.3	4.6	3.0-6.5	2.9	1.7-4.6	1.6	0.8-3.0
Internalising Problems										
Peer Problems Score										
Abnormal Range	12.9	3.6-29.8	3.2	0.1-16.7	0.0	0.0-11.2	3.2	0.1-16.7	3.2	0.1-16.7
Normal Range	16.6	13.6-19.8	5.6	3.9-7.8	5.8	4.0-8.0	3.0	1.7-4.7	1.2	0.5-2.5
Emotional Problems Score										
Abnormal Range	11.9	5.3-22.2	7.5	2.5-16.6	3.0	0.4-10.4	4.5	0.9-12.5	3.0	0.4-10.4
Normal Range	17.8	14.8-21.1	6.8	4.9-9.1	6.3	4.5-8.6	3.2	1.9-4.9	1.7	0.8-3.0

Note. For results for adolescents who rated themselves as scoring in the 'Borderline' range on the SDQ scales see Appendix 3.

3.3.2 Adjusting for School Connectedness and Demographic Characteristics

Table 6 reports the bivariate and multivariate logistic regression results for the youth reported SDQ scores. Adjusting for levels of school connectedness and demographic characteristics mostly reduced the bivariate odd ratios but the difference is minimal, and the CIs are overlapping across groups. Adolescents with conduct problems in the abnormal range had the greatest odds ratios in both the bivariate and multivariate analyses and across all Naplan domains. Conduct problems scores on the numeracy domain showed a multivariate odds ratio of 4.1 (95% CI: 1.2-14.3) compared to only 1.1 (95% CI: 0.3-4.2) for adolescents with hyperactivity scores in the abnormal range. This indicated that adolescents with conduct problems in the abnormal range were significantly more likely to score below NMS than adolescents with SDQ scores in the normal range. This supports the previous findings in Table 5. However, the difference between the bivariate and multivariate regression shows there is little confounding of the association between SDQ scores and Naplan performance.

Additionally, in support of Table 6, the bivariate reports were smaller for the internalising group compared to the externalising group. This shows that scoring in the abnormal range on the internalising subscales did not increase the likelihood of scoring below NMS, in comparison to scoring in the normal ranges on the SDQ internalising subscales.

Table 7

Bivariate and Multivariate Logistic Regression (95% CI) Comparing Adolescents With Youth Rated Abnormal vs Normal SDQ Problem Scores (Externalising and Internalising) and Naplan Scores for Each Domain (n=715)

Naplan Domain	Externalising Problems				Internalising Problems			
	Hyperactivity		Conduct Problems		Peer Problems		Emotional Problems	
	Bivariate	Multivariate	Bivariate	Multivariate	Bivariate	Multivariate	Bivariate	Multivariate
Numeracy								
Below NMS [a]	1.4	1.1	5.5	4.1	2.7	1.8	1.8	1.1
	(0.4-5.2)	(0.3-4.2)	(1.7-18.2)	(1.2-14.3)	(0.3-22.5)	(0.2-16.4)	(0.4-8.5)	(0.2-5.3)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Reading								
Below NMS	1.3	1.3	3.9	3.5	1.1	0.9	1.4	1.5
	(0.5-3.6)	(0.5-3.6)	(1.4-10.9)	(1.2-10.5)	(0.1-8.4)	(0.1-7.8)	(0.4-5.0)	(0.4-5.7)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Grammar								
Below NMS	1.0	1.1	4.8	4.7	0.6	0.6	1.1	1.4
	(0.5-2.3)	(0.5-2.5)	(2.2-10.5)	(2.1-10.9)	(0.1-4.2)	(0.1-4.9)	(0.4-2.9)	(0.5-3.8)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Writing								
Below NMS	1.3	1.1	2.0	1.4	0.7	0.5	0.6	0.7
	(0.8-2.2)	(0.6-2.0)	(1.0-4.0)	(0.7-3.0)	(0.3-2.2)	(0.2-1.6)	(0.3-1.4)	(0.3-1.7)
At/Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Spelling								
Below NMS	1.2	1.1	1.9	1.3	0.0	0.0	0.5	0.4
	(0.6-2.8)	(0.5-2.5)	(0.6-5.7)	(0.4-3.9)	(0.0-0.0)	(0.0-0.0)	(0.1-1.9)	(0.1-2.0)
At/ Above NMS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Note. Variables included in the multivariate logistic regression analyses include age, gender, number of parents, family composition and school connectedness. 1.0 is the reference category. Numeracy: Below *n*=14; At/Above *n*=701, Reading: Below *n*=26; At/Above *n*=689, Grammar: Below *n*=49; At/Above *n*=666, Writing: Below *n*=121; At/Above *n*=594, Spelling: Below *n*=40; At/Above *n*=675.
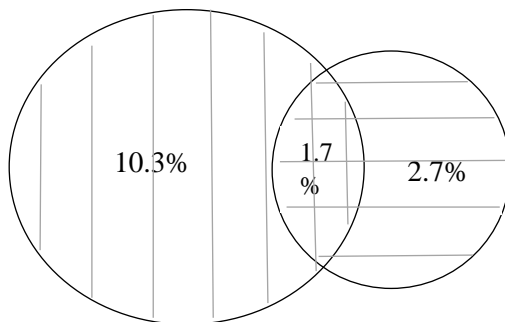
[a] NMS= National Minimum Standard

3.4 Parent and Youth SDQ Reports

The results reported show differences in the pattern of effect of SDQ scores on Naplan domains depending on whether the respondent for the SDQ is the parent or adolescent. It is possible that these different patterns of effect are a result of the different respondents identifying different groups of adolescents as scoring in the abnormal and normal ranges on the SDQ. In order to investigate this a summary of the similarities between parent and youth abnormal reports are presented in Figures 2-5. All figures demonstrate that the parent- and youth-reports are identifying different groups of adolescents as scoring in the abnormal range. There is a very small percentage of adolescents that were reported as having abnormal SDQ problems by both parents and youth. For example, Figure 1 shows that for the parent reported hyperactivity, 12.9% of all participating adolescents scored in the abnormal range. On the youth report for hyperactivity, 5.5% of adolescents were identified as scoring in the abnormal range. However, only 2.8% of adolescents were identified as scoring in the abnormal range for hyperactivity on both the parent-reported and youth-reported questionnaires.

Figure 2-5

Percentage of Adolescents With Abnormal SDQ Mental Health Problems According to Parent and Youth Reports (n=715)

| Parent Rated | Youth Rated | Parent and Youth Rated |

Figure 2 Hyperactivity

5.5%   2.8%   12.9%
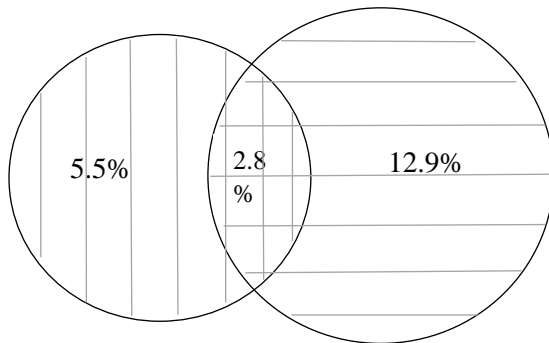
Figure 3. Conduct Problems

4.3%   2.1%   4.6%
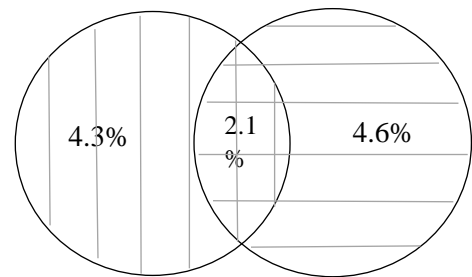
Figure 4. Peer Problems

10.3%   1.7%   2.7%

Figure 5. Emotional Problems

9.1%   3.2%   6.2%
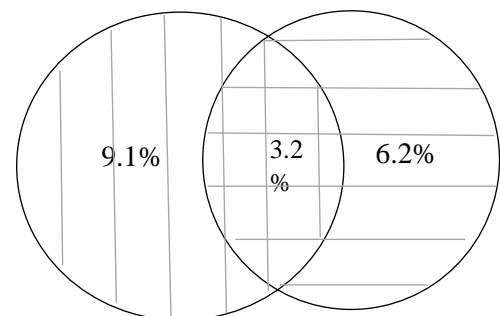
Note. Overlapping percentages reflect the total prevalence of the mental health problem as reported by both parent and youth combined.

Chapter 4: Discussion

4.1 Overview

The present study aimed to examine the association between levels of mental health problems and levels of academic performance for 13 to 15 year olds. Previous research has identified a significant difference between academic outcomes for students with abnormal levels of mental health compared to students with normal levels of mental health (Goodsell et al., 2017). This study aimed to build on understandings of this association by investigating the strength of the relationship for adolescents with levels of externalising problems (hyperactivity and conduct disorder) and levels of internalising problems (peer problems and emotional problems). The association was also critically informed by parent and youth reports of mental health. The results from this study showed sound support for the hypotheses and contribute to understandings of Australian adolescent mental health and educational outcomes at a national scale. There are two key findings from the present study.

4.2 Summary of Findings

4.2.1 Mental Health Problems and Poorer Academic Outcomes

Firstly, adolescents with abnormal levels of mental health have lower levels of academic performance than adolescents with normal levels of mental health. The results showed a consistent pattern between scores below NMS and adolescents with abnormal and normal SDQ ratings. This finding shows support for hypothesis 1 and 2 which predicted that there would be an association between lower levels of academic performance and abnormal levels of mental health (externalising problems and internalising problems). This pattern is also consistent with previous research and reinforces the evidence that adolescents with lower levels of mental health are at a greater risk of failing to meet school expectations than students with higher levels of mental health (Goodsell et al., 2017).

Additionally, although the difference between externalising and internalising outcomes was not a core aim of this study, the results showed a stronger pattern of association between students with high levels of externalising problems with poor academic outcomes compared to adolescents with high levels of internalising problems. Adolescents with hyperactivity and conduct problems more frequently scored below NMS on all Naplan domains compared to adolescents with peer problems and emotional problems. This was consistent across the parent and youth reports. Previous research has shown that adolescents with externalising problems have significant learning difficulties, and as such, it is not unexpected that academic outcomes showed a strong association to poor academic performance (Goodsell et al., 2017). Students with internalising problems did not show the same level of academic failure in this study, however these adolescents still had worse outcomes than students with high levels of mental health. The difference between the number of males in the externalising group and the number of females in the internalising group, reported in this study, are typical of these mental health problems and does not necessarily explain the differences in academic performance (Goodsell et al., 2017; Lawerence et al., 2015). This finding does indicate that the association between mental health and academic performance is stronger for students with externalising problems compared to internalising problems.

Although the results show a strong pattern of association between abnormal levels of mental health problems (externalising and internalising) with lower levels of academic performance, there is some evidence to suggest that the precision of the estimates are low. The results showed mostly wide CIs which is an indication that the percentage of scores may not be capturing the true estimate of adolescent performance. Similarly, the results showed overlapping CIs, particularly for the parent reported SDQ subscale scores, which implied that the findings may be due to chance. It is likely however, that a significant association would

have been found if the sample sizes were larger. Previous studies using larger samples sizes have found a significant association between mental health and academic performance, which given the strong pattern of results, may be a likely explanation for the significance reported in this study (Goodsell et al., 2017; Porche et al., 2016). Although the results show weak statistical significance, the strong and consistent pattern shows sound support for the hypotheses, which meaningfully contributes to understandings of the association.

Furthermore, bivariate and multivariate logistic regression showed that the strength of the association between lower levels of mental health and poor academic performance did not significantly change when adjusting for school connectedness and demographic variables. This result is somewhat surprising given previous research has indicated some association between school connectedness and mental health and academic performance (Bond et al., 2007; Loukas et al., 2016; Weber et al., 2016). Adolescents in this study with abnormal ratings of mental health also reported lower levels of school connectedness than adolescents with normal ratings of mental health, and it would therefore seem likely that levels of connectedness would influence academic outcomes. However, this finding highlights the pervasiveness of the association between lower levels of mental health and poor academic outcomes.

4.2.2 Parent and Youth Reports

Secondly, the strength of the association between levels of mental health and poor academic performance varied depending on parent or youth self-reported SDQ reports. The overall pattern for both parent and youth reports showed that adolescents with mental health problems in the abnormal range had poorer academic outcomes than adolescents with mental health in the normal range. However, there was little agreeance between parent and youth reports of mental health and as such, those adolescents with abnormal mental health as

reported by parents were not the same adolescents with abnormal mental health self-reported by youth. Interestingly, the adolescents with abnormal mental health as reported by parents, had poorer academic outcomes than the adolescents with abnormal mental health as self-reported by youth. This finding shows that parents are identifying a group of adolescents with worse academic performance than the youth.

Previous studies have demonstrated that conflicting parent and youth reports are a common feature of mental health assessments but it is unclear why parents would identify a group of adolescents that have a stronger association with poorer academic outcomes than the youth. Low to moderate parent and youth agreeance is common to SDQ mental health assessments in both community and clinical samples and has also been demonstrated in assessment of the Child Behaviour Checklist and Youth Self Report (Salbach-Andrae et al., 2009; Van der Meer et al., 2008; Van Roy et al., 2010). Commonly, parents overestimate the severity of the mental health problem and youths under-report problems (Salbach-Andrae et al., 2009). It has been argued that differences between parent and youth reports does not discredit the accuracy of either perspective because it shows that experiences of mental health have multiple viewpoints (Van Roy et al., 2010). This is accurate to some extent, however in this case, youth self-reports failed to self-identify mental health problems which were associated with poorer academic outcomes and this has implications for adolescent wellbeing.

If adolescents are unable to recognise mental health problems that others like parents can, this interferes with opportunities for prevention and intervention (Lam, 2014). It is possible that the weaker association between levels of mental health and poorer academic performance reported by youth, reflects adolescents' limited ability to self-regulate and assess their own mental health fairly. As adolescence is a developmental period that features increasing bodily changes and social stressors, it may be that adolescents fail to recognise their own mental state as objectively as parents are able to (Zwaanswijk et al., 2003). It is

necessary that adolescents recognise mental health problems in themselves to allow for timely increased support and ultimately improved academic outcomes (Lam, 2014). The results from this study imply that adolescents would benefit from greater self-awareness of mental health problems.

4.3 Implications

This study highlights the negative impact of the association between lower levels of mental health and poor academic performance on adolescent school outcomes. The primary expectation of school education is that students develop skills and knowledge relating to key areas of the school curriculum (Atweh et al., 2011). The percentage of students with low mental health attaining scores below NMS on the Naplan test, indicate that educators are not equipping these students with the skills needed to meet the expected criteria or facilitating support in areas that require extra assistance. This is a worry for schools and for adolescents. Gaps in academic ability, as evidenced in this study, disrupt classroom functioning and can obscure teacher-student learning expectations (Brophy & McCaslin, 1992). Students in Year 9 with a mental health disorder are performing to the equivalent of 1.5-2.8 years behind students with no mental health disorder and it is unlikely that these students will attain the level of performance that is expected of them in higher grades (Goodsell et al., 2017). The burden of poor academic performance on schools' capacity to meet educational goals and the limits on student outcomes, stresses the importance of continuing and engaged support for students with mental health problems.

Currently, most students with mental health problems have access to some level of support. The YMM report found that 57.2% of adolescents with a mental disorder (aged 12-17) had accessed a health service a year prior to participating in the youth survey (2013-2014), and 57.5% had used a school service (Lawrence et al., 2015). However, the apparent

distinction between academic performance for adolescents with and without mental disorders indicates that current support methods are not resolving the severity and complexity of this issue. It has been suggested that teachers could play a more significant role in the prevention and intervention of adolescent mental health if they were more aware of how to manage mental health problems in the classroom (Mazzer & Rickwood, 2015). This strategy would be in the interest of educational policies considering the strong association between underachievement and adolescents with mental health problems. At a policy level, this would also require a clarification of the expectations of teachers in their roles as educators and supporters of adolescent wellbeing (Suldo et al., 2014). Understanding the extent of the association between mental health problems and academic performance, suggests that the most effective interventions for adolescent outcomes are likely to be those that collaborate with educational polices and mental health policies.

Moreover, the lack of similarity between parent reported and youth reported SDQ scores in this study, suggests that adolescents require a communicative approach that engages consistently across school life and home life. Shared understandings between adolescents, parents, and teachers of the severity of the mental health problems may be the first step to ensuring appropriate services are utilised when necessary and in providing consistent student support. Future interventions should consider the difference between parent and youth understandings of mental health problems to accommodate adolescent support most accurately and effectively.

4.4 Strengths and Limitations

4.4.1 Representative National Sample

The primary strength of this study was the use of the randomly selected, national community sample. The Australian Child and Adolescent Survey of Mental Health and

Wellbeing was the second national report of its kind after the first national report on

adolescent mental health in 1998 (Lawrence et al., 2015). Samples of this magnitude are

unique and effectively capture a range of demographic variances within the Australian

population. These included socio-economic status, family types, household income, levels of

education, parent or carer labour force status and areas of residence. The rigour of the sample

ensures that the adolescents aged 13 to 15 in this study were representative of the majority of

other 13 to 15-year-old adolescents found within the true Australian population. This level of

generalisability was not shown in previous studies. Drawing from a representative national

sample broadens the application of the findings to mental health policies and educational

policies at a national level.

4.4.2 Measure of Mental Health Problems

Additionally, the quality of the mental health measure (SDQ) was a significant

strength of this study. The SDQ effectively captured real world assessments of mental health

that were not dependent on clinical diagnosis. Community assessments of mental health

problems are valuable because they provide unique insight into the rate of mental health

problems as considered by the general population (Goodman et al., 2000). This study also

included parent and youth ratings of mental health problems which is a perspective lacking in

existing research and helps build a more comprehensive understanding of the levels of mental

health found within the adolescent population. Additionally, the average time between SDQ

assessment and collection of data was 5.4 months. Ideally, assessments on the SDQ are

considered within a timeframe of 6 months after completion, which means that the reports

considered in this study were highly likely to accurately reflect levels of adolescent mental

health.

4.4.3 Small Sample Size

A significant limitation to this study was the small sample size. The original YMM report had a response rate of 55% which is slightly more than half of all eligible households within Australia (Lawrence et al., 2015). However, of the participants enrolled in the original study (n=2967), only a proportion of 33% of these adolescents were aged 13 to 15 which limited the size of the participant pool (n=962). Additionally, the sample size was reduced further by excluding adolescents from the complete case if they had missing data. Excluding adolescents with missing data allowed for statistical clarity but the smaller sample size increased the variability between scores which was reflected in the weak level of statistical significance. A larger sample size would likely have shown stronger support for the association between mental health levels and academic outcomes, although there is a strong pattern of effect.

Furthermore, it is worth noting that the adolescents that were excluded from analysis due to gaps in their Naplan reports (n=230 out of n=732), are presumed to be performing at a level below NMS, according to the Naplan guidelines (ACARA, 2016). It is therefore important to recognise that the proportion of students with lower levels of academic performance examined in this study, may be a slight underestimation of the total number of students with academic difficulty reflected in the broader population.

4.4.4 Lack of Teacher Informant

Another weakness of this study was the lack of teacher informants. Teacher reports on the SDQ provide a perspective on the strengths and difficulties of adolescents that the parent and youth reports cannot provide. Teachers' unique insight into adolescent behaviour and mood while in the school context would contribute to a more comprehensive understanding of adolescent mental health problems (Salbach-Andrae et al., 2009). The investigation into

the association between levels of mental health and levels of academic performance would be more representative if additional teacher reports were available in this study.

4.4.5 Naplan Assessment

Finally, although the Naplan assessment was a nationally standardised measure of academic performance, making it practical for this study, there are some criticisms of the test. Firstly, there is evidence to suggest that the assessment domains are not equally difficult. For example, the writing domain requires students to apply literary techniques through evaluation and creation of text, which requires a greater cognitive load and indicates a higher level of comprehension competency than identifying and recalling text, which is what is expected in the other literacy domains (Wyatt-Smith & Jackson, 2016; Willett & Gardiner, 2009). Also, a review of the numeracy domain has determined that the multiple-choice format, which is unique to this domain, may account for 20% of correct answers through guessing alone (Norton, 2009). The potential discrepancy in test difficulty may obscure the understanding of adolescent's degree of academic success or failure across domains.

Additionally, the Naplan test only measures areas of literacy and numeracy and does not assess total school performance (Pendergast & Swain, 2013). This reduces the extent to which academic performance on the Naplan test can predict later academic outcomes considering, other factors, can contribute to future performance (Pendergast & Swain, 2013). Similarly, the short spanning assessment period has been thought to create stressful testing conditions that effect student results, and which, therefore may be unlike the adolescents' true academic capability (Thompson, 2013). Nevertheless, the Naplan assessment is the only nationally standardised measure of academic performance for Australian schools and it allowed for a comprehensive assessment of Year 9 performance on key areas of the curriculum.

4.5 Conclusion

This study showed that academic outcomes in Australian adolescents aged 13 to 15 are strongly influenced by levels of mental health. Adolescents with lower levels of mental health (externalising and internalising) more frequently failed to achieve the standard academic outcomes expected of Year 9, compared to adolescents without mental health problems. This indicates that adolescents with mental health problems, particularly externalising problems, require ongoing and focused support in order for schools to meet their educational goals and to improve the wellbeing and future trajectory of adolescents with mental health problems. This study also showed a distinction between parent and adolescent conceptions of mental health problems which signals the necessity for interventions and prevention strategies to ensure they are communicative and engaging of the broader networks that influence experiences of mental health. Understanding at a national level, the way in which four key mental health problems interact with school outcomes, can inform educational policies and mental health initiatives. The current educational outcomes for adolescents with lower levels of mental health are indeed a worry.

References

ACARA. Australian Curriculum, Assessment and Reporting Authority (2016). NAPLAN. Retrieved from https://www.acara.edu.au/assessment/naplan

Arnold, D. H., Ortiz, C., Curry, J. C., Stowe, R. M., Goldstein, N. E., Fisher, P. H., ... & Yershova, K. (1999). Promoting academic success and preventing disruptive behavior disorders through community partnership. *Journal of Community Psychology*, *27*(5), 589-598.

Atweh, B., & Singh, P. (2011). The Australian curriculum: Continuing the national conversation. *Australian Journal of Education*, *55*(3), 189-196.

Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G., & Patton, G. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *Journal of Adolescent Health*, *40*(4), 357-e9.

Brophy, J., & McCaslin, M. (1992). Teachers' reports of how they perceive and cope with problem students. *The Elementary School Journal*, *93*(1), 3-68.

Carroll, A., Houghton, S., Forrest, K., McCarthy, M., & Sanders-O'Connor, E. (2020). Who benefits most? Predicting the effectiveness of a social and emotional learning intervention according to children's emotional and behavioural difficulties. *School Psychology International*, *41*(3), 197-217.

De Vries, P. J., Davids, E. L., Mathews, C., & Aarø, L. E. (2018). Measuring adolescent mental health around the globe: psychometric properties of the self-report Strengths and Difficulties Questionnaire in South Africa, and comparison with UK, Australian and Chinese data. *Epidemiology and psychiatric sciences*, *27*(4), 369-380.

Department of Health. (2015). The Mental Health of Children and Adolescents. Report on the second Australian Child and Adolescent Survey of Mental Health and Well-being. Retrieved from https://www.health.gov.au/internet/main/publishing.nsf/Content/9DA8CA21306FE6EDCA257E2700016945/%24File/child2.pdf

Geiser, S, & Maria Veronica Santelices. (2007). Validity Of High-School Grades In Predicting Student Success Beyond The Freshman Year: High-School Record vs. Standardized Tests as Indicators of Four-Year College Outcomes. *UC Berkeley: Center for Studies in Higher Education*.

Goodman, R., & Scott, S. (1999). Comparing the Strengths and Difficulties Questionnaire and the Child Behavior Checklist: is small beautiful?. *Journal of abnormal child psychology*, *27*(1), 17-24.

Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2000). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *The British journal of psychiatry*, *177*(6), 534-539.

Goodsell, B. T., Lawrence, D. M., Ainley, J., Sawyer, M., Zubrick, S. R., & Maratos, J. (2017). Child and Adolescent Mental Health and Educational Outcomes: An analysis of educational outcomes from Young Minds Matter: the second Australian Child and Adolescent Survey of Mental Health and Wellbeing.

Gustafsson, J. E., Allodi Westling, M., Alin Åkerman, B., Eriksson, C., Eriksson, L., Fischbein, S., ... & Persson, R. S. (2010). *School, learning and mental health: A systematic review*. Kungl. Vetenskapsakademien.

Hawes, D. J., & Dadds, M. R. (2004). Australian data and psychometric properties of the Strengths and Difficulties Questionnaire. *Australian and New Zealand Journal of Psychiatry*, *38*(8), 644-651.

Hawkins, J. D. (1997). Academic performance and school success: Sources and consequences. In R. P. Weissberg, T. P. Gullotta, R. L. Hampton, B. A. Ryan, & G. R. Adams (Eds.), *Issues in children's and families' lives, Vol. 8. Healthy children 2010: Enhancing children's wellness* (p. 278–305). Sage Publications, Inc.

Hoagwood, K., & Erwin, H. D. (1997). Effectiveness of school-based mental health services for children: A 10-year research review. *Journal of Child and Family Studies*, *6*(4), 435-451.

Kapoor, B., & Tomar, A. (2016). Exploring connections between students' psychological sense of school membership and their resilience, self-efficacy, and leadership skills. *Indian Journal of Positive Psychology*, *7*(1), 55.

Kemple, J. J., Segeritz, M. D., & Stephenson, N. (2013). Building on-track indicators for high school graduation and college readiness: Evidence from New York City. *Journal of Education for Students Placed at Risk (JESPAR)*, *18*(1), 7-28.

Kersten, P., Czuba, K., McPherson, K., Dudley, M., Elder, H., Tauroa, R., & Vandal, A. (2016). A systematic review of evidence for the psychometric properties of the Strengths and Difficulties Questionnaire. *International Journal of Behavioral Development*, *40*(1), 64-75.

Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR & Walters EE (2005). Lifetime prevalence and age of onset distributions of DSM-IV Disorders in the National Comorbidity Survey replication. Archives of General Psychiatry, 62, p 593.

Klinck, M., Vannucci, A., & Ohannessian, C. M. (2019). Bidirectional Relationships Between School Connectedness and Internalizing Symptoms During Early Adolescence. *The Journal of Early Adolescence*, 0272431619858401.

Kristoffersen, I. (2018). Great expectations: Education and subjective wellbeing. *Journal of Economic Psychology*, *66*, 64-78.

Lam, L. T. (2014). Mental health literacy and mental health status in adolescents: a population-based survey. *Child and Adolescent Psychiatry and Mental Health*, *8*(1), 26.

Lawrence, D, Johnson S., Hafekost J, Boterhoven De Haan K, Sawyer M, Ainley J, Zubrick SR (2015). The Mental Health of Children and Adolescents. Report on the second Australian Child and Adolescent Survey of Mental Health and Wellbeing. Department of Health, Canberra.

Lawrence, D., Dawson, V., Houghton, S., Goodsell, B., & Sawyer, M. G. (2019). Impact of mental disorders on attendance at school. *Australian Journal of Education*, *63*(1), 5-21.

Leahy, D., & Selwyn, N. (2019). Public Opinions on Australian Schools & Schooling. *Education Futures, Monash University. Retrieved February*, *25*, 2019.

Lee, J. S. (2014). The relationship between student engagement and academic performance: Is it a myth or reality?. *The Journal of Educational Research*, *107*(3), 177-185.

Loukas, A., Cance, J. D., & Batanova, M. (2016). Trajectories of school connectedness across the middle school years: Examining the roles of adolescents' internalizing and externalizing problems. *Youth & Society*, *48*(4), 557-576.

Low, M. D., Low, B. J., Baumler, E. R., & Huynh, P. T. (2005). Can education policy be health policy? Implications of research on the social determinants of health. *Journal of Health Politics, Policy and Law*, *30*(6), 1131-1162.

Lundh, L. G., Wangby-Lundh, M. A. R. G. I. T., & Bjärehed, J. (2008). Self-reported emotional and behavioral problems in swedish 14 to 15-year-old adolescents: A study

with the self-report version of the strengths and difficulties questionnaire. *Scandinavian journal of psychology*, *49*(6), 523-532.

Mazzer, K. R., & Rickwood, D. J. (2015). Teachers' role breadth and perceived efficacy in supporting student mental health. *Advances in School Mental Health Promotion*, *8*(1), 29-41.

McLaughlin, C., & Clarke, B. (2010). Relational matters: A review of the impact of school experience on mental health in early adolescence. *Educational and Child Psychology*, *27*(1), 91.

McLeod, J. D., & Fettes, D. L. (2007). Trajectories of failure: The educational careers of children with mental health problems. *American journal of sociology*, *113*(3), 653-701.

McNeely, C., & Falci, C. (2004). School connectedness and the transition into and out of health-risk behavior among adolescents: A comparison of social belonging and teacher support. *Journal of school health*, *74*(7), 284-293.

Mega, C., Ronconi, L., & De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *Journal of educational psychology*, *106*(1), 121.

Muijs, R. D. (1997). Predictors of academic achievement and academic self-concept: A longitudinal perspective. *British Journal of Educational Psychology*, *67*(3), 263-277.

Muris, P., Meesters, C., & van den Berg, F. (2003). The strengths and difficulties questionnaire (SDQ). *European child & adolescent psychiatry*, *12*(1), 1-8.

Nikolaev, B. (2018). Does higher education increase hedonic and eudaimonic happiness?. *Journal of happiness Studies*, *19*(2), 483-504.

Norton, S. (2009). The Responses of One School to the 2008 Year 9 NAPLAN Numeracy Test. *Australian Mathematics Teacher*, *65*(4), 26-37.

Pendergast, D., & Swain, K. (2013). Competing interests? NAPLAN and middle schooling assessment practices. *Australian Journal of Middle Schooling*, *13*(1).

Porche, M. V., Costello, D. M., & Rosen-Reynoso, M. (2016). Adverse family experiences, child mental health, and educational outcomes for a national sample of students. *School Mental Health*, *8*(1), 44-60.

Powdthavee, N., Lekfuangfu, W. N., & Wooden, M. (2015). What's the good of education on our overall quality of life? A simultaneous equation model of education and life satisfaction for Australia. *Journal of behavioral and experimental economics*, *54*, 10-21.

Qualter, P., Gardner, K. J., Pope, D. J., Hutchinson, J. M., & Whiteley, H. E. (2012). Ability emotional intelligence, trait emotional intelligence, and academic success in British secondary schools: A 5 year longitudinal study. *Learning and Individual Differences*, *22*(1), 83-91.

Reupert, A. (2019). *Mental Health and Academic Learning in Schools: Approaches for Facilitating the Wellbeing of Children and Young People*. Routledge.

Roeser, R. W., Eccles, J. S., & Strobel, K. R. (1998). Linking the study of schooling and mental health: Selected issues and empirical illustrations at.. *Educational Psychologist*, *33*(4), 153-176.

Rowe, F., & Stewart, D. (2009). Promoting connectedness through whole-school approaches: a qualitative study. *Health Education*.

Salanova, M., Martínez, I., & Llorens, S. (2012). Success breeds success, especially when self-efficacy is related with an internal attribution of causality. *Estudios de Psicología*, *33*(2), 151-165.

Salbach-Andrae, H., Klinkowski, N., Lenz, K., & Lehmkuhl, U. (2009). Agreement between youth-reported and parent-reported psychopathology in a referred sample. *European child & adolescent psychiatry*, *18*(3), 136-143.

Scholtens, S., Rydell, A. M., & Yang-Wallentin, F. (2013). ADHD symptoms, academic achievement, self-perception of academic competence and future orientation: A longitudinal study. *Scandinavian journal of psychology*, *54*(3), 205-212.

Seligman, M. E., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: Positive psychology and classroom interventions. *Oxford review of education*, *35*(3), 293-311.

Seward, R. J., Bayliss, D. M., Stallman, H. M., & Ohan, J. L. (2018). Psychometric properties and norms for the strengths and difficulties questionnaire administered online in an Australian sample. *Australian Psychologist*, *53*(2), 116-124.

Shochet, I. M., Dadds, M. R., Ham, D., & Montague, R. (2006). School connectedness is an underemphasized parameter in adolescent mental health: Results of a community prediction study. *Journal of Clinical Child & Adolescent Psychology*, *35*(2), 170-179.

Skinner, E. A., & Saxton, E. A. (2019). The development of academic coping in children and youth: A comprehensive review and critique. *Developmental Review*, *53*, 100870.

Spengler, M., Brunner, M., Damian, R. I., Lüdtke, O., Martin, R., & Roberts, B. W. (2015). Student characteristics and behaviors at age 12 predict occupational success 40 years

later over and above childhood IQ and parental socioeconomic status. *Developmental psychology*, *51*(9), 1329.

Stone, L. L., Otten, R., Engels, R. C., Vermulst, A. A., & Janssens, J. M. (2010). Psychometric properties of the parent and teacher versions of the strengths and difficulties questionnaire for 4-to 12-year-olds: a review. *Clinical child and family psychology review*, *13*(3), 254-274.

Suldo, S. M., Gormley, M. J., DuPaul, G. J., & Anderson-Butcher, D. (2014). The impact of school mental health on student and school-level academic outcomes: Current status of the research and future directions. *School Mental Health*, *6*(2), 84-98.

Telethon Kids Institute. (2015). *Young Minds Matter: the second Australian Child and Adolescent Survey of Mental Health and Wellbeing, Survey User's Guide.* Centre for Child Health Research, University of Western Australia: Perth, Australia, ISBN 978-1-74052-336-3

Thompson, G. (2013). NAPLAN, My School and Accountability: Teacher perceptions of the effects of testing. *International education journal: comparative perspectives*, *12*(2), 62-84.

Van der Meer, M., Dixon, A., & Rose, D. (2008). Parent and child agreement on reports of problem behaviour obtained from a screening questionnaire, the SDQ. *European child & adolescent psychiatry*, *17*(8), 491-497.

Van Roy, B., Groholt, B., Heyerdahl, S., & Clench-Aas, J. (2010). Understanding discrepancies in parent-child reporting of emotional and behavioural problems: Effects of relational and socio-demographic factors. *BMC psychiatry*, *10*(1), 1-12.

Wang, M. T., & Eccles, J. S. (2012). Adolescent behavioral, emotional, and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of Research on Adolescence*, *22*(1), 31-39.

Weber, M., Wagner, L., & Ruch, W. (2016). Positive feelings at school: On the relationships between students' character strengths, school-related affect, and school functioning. *Journal of Happiness Studies*, *17*(1), 341-355.

Willett, L., & Gardiner, A. (2009, September). A critical analysis of the NAPLAN spelling test. In *International Association for Educational Assessment, 35th Annual Conference*.

Willner, C. J., Gatzke-Kopp, L. M., & Bray, B. C. (2016). The dynamics of internalizing and externalizing comorbidity across the early school years. *Development and psychopathology*, *28*(4pt1), 1033-1052.

Wyatt-Smith, C., & Jackson, C. (2016). NAPLAN data on writing: A picture of accelerating negative change. *Australian Journal of Language and Literacy, The*, *39*(3), 233.

Zendarski, N., Sciberras, E., Mensah, F., & Hiscock, H. (2017). Early high school engagement in students with attention/deficit hyperactivity disorder. *British journal of educational psychology*, *87*(2), 127-145.

Zhang, W., Zhang, L., Chen, L., Ji, L., & Deater-Deckard, K. (2019). Developmental changes in longitudinal associations between academic achievement and psychopathological symptoms from late childhood to middle adolescence. *Journal of Child Psychology and Psychiatry*, *60*(2), 178-188.

Zwaanswijk, M., Van Der Ende, J. A. N., Verhaak, P. F., Bensing, J. M., & Verhulst, F. C. (2003). Factors associated with adolescent mental health service need and

utilization. *Journal of the American Academy of Child & Adolescent Psychiatry*, *42*(6), 692-700.

Appendices

Appendix 1: Parent and Youth SDQ Questionnaires

MENTAL HEALTH

Area Logo
PY1a
Parent Report Measures for
Children and Adolescents
SDQ(P)11-17

Facility Name: _____
Code: |__|__|__|__|__|

Please used gummed label if available

Patient or Client Identifier:
|__|__|__|__|__|__|__|__|

Surname:

Other names:

Date of Birth:
___ ___ / ___ ___ / ___ ___ ___ ___

Sex:
Male ☐₁   Female ☐₂

Address:

Instructions: For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your child's behaviour **over the last six months.**

Binding margin – do not write

	Strengths and Difficulties Questionnaire	Not True	Somewhat True	Certainly True
1.	Considerate of other people's feelings	O	O	O
2.	Restless, overactive, cannot stay still for long	O	O	O
3.	Often complains of headaches, stomach-aches, or sickness	O	O	O
4.	Shares readily with other young people, for example CDs, games, food	O	O	O
5.	Often loses temper	O	O	O
6.	Would rather be alone than with other young people	O	O	O
7.	Generally well behaved, usually does what adults request	O	O	O
8.	Many worries or often seems worried	O	O	O
9.	Helpful if someone is hurt, upset or feeling ill	O	O	O
10.	Constantly fidgeting or squirming	O	O	O
11.	Has at least one good friend	O	O	O
12.	Often fights with other young people or bullies them	O	O	O
13.	Often unhappy, depressed or tearful	O	O	O
14.	Generally liked by other young people	O	O	O
15.	Easily distracted, concentration wanders	O	O	O
16.	Nervous in new situations, easily loses confidence	O	O	O
17.	Kind to younger children	O	O	O
18.	Often lies or cheats	O	O	O
19.	Picked on or bullied by other young people	O	O	O
20.	Often volunteers to help others (parents, teachers, children)	O	O	O
21.	Thinks things out before acting	O	O	O
22.	Steals from home, school or elsewhere	O	O	O
23.	Gets along better with adults than with other young people	O	O	O
24.	Many fears, easily scared	O	O	O
25.	Good attention span, sees chores or homework through to the end	O	O	O

SDQ (P) 11-17 SELF–REPORT MEASURE (1 of 2)

Please turn over – there are a few more questions on the other side

MENTAL HEALTH

Do you have any other comments or concerns?

	Over the last six months, have your child's teachers complained of:	No	A Little	A Lot
36.	Fidgetiness, restlessness or overactivity	o	o	o
37.	Poor concentration or being easily distracted	o	o	o
38.	Acting without thinking, frequently butting in, or not waiting for his or her turn	o	o	o

		No	Yes – minor difficulties	Yes – definite difficulties	Yes – severe difficulties
26.	Overall, do you think that your child has difficulties in any of the following areas: emotions, concentration, behaviour or being able to get along with other people?	o	o	o	o

If you have answered "Yes", please answer the following questions about these difficulties:

		Less than a month	1-5 months	6-12 months	Over a year
27.	How long have these difficulties been present?	o	o	o	o

		Not at all	A little	A medium amount	A great deal
28.	Do the difficulties upset or distress your child?	o	o	o	o
	Do the difficulties interfere with your child's everyday life in the following areas?				
	29. HOME LIFE	o	o	o	o
	30. FRIENDSHIPS	o	o	o	o
	31. CLASSROOM LEARNING	o	o	o	o
	32. LEISURE ACTIVITIES	o	o	o	o
33.	Do the difficulties put a burden on you or the family as a whole?	o	o	o	o

Signature_____   Date_____

Mother/Father/Other (please specify):_____

Thank you very much for your help.   © Robert Goodman 2002

SDQ (P) 11-17 SELF-REPORT MEASURE (2 of 2)

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Module PY1a v1

Area Logo YR1a Youth Report Measures for Children and Adolescents SDQ(S)11-17
Facility Name: _____
Code: | | | | | |

Please used gummed label if available	Patient or Client Identifier: | | | | | | | | |
Surname:	
Other names:	
Date of Birth: __ __ / __ __ / __ __ __ __	Sex: Male ☐₁ Female ☐₂
Address:	

Instructions: For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of how things have been for you **over the last six months.**

	Strengths and Difficulties Questionnaire	Not True	Somewhat True	Certainly True
1.	I try to be nice to other people. I care about their feelings	O	O	O
2.	I am restless, I cannot stay still for long	O	O	O
3.	I get a lot of headaches, stomach-aches, or sickness	O	O	O
4.	I usually share with others, for example CDs, games, food	O	O	O
5.	I get very angry and often lose my temper	O	O	O
6.	I would rather be alone than with people of my age	O	O	O
7.	I usually do as I am told	O	O	O
8.	I worry a lot	O	O	O
9.	I am helpful if someone is hurt, upset or feeling ill	O	O	O
10.	I am constantly fidgeting or squirming	O	O	O
11.	I have one good friend or more	O	O	O
12.	I fight a lot. I can make other people do what I want	O	O	O
13.	I am often unhappy, depressed or tearful	O	O	O
14.	Other people my age generally like me	O	O	O
15.	I am easily distracted, I find it difficult to concentrate	O	O	O
16.	I am nervous in new situations. I easily lose confidence	O	O	O
17.	I am kind to younger children	O	O	O
18.	I am often accused of lying or cheating	O	O	O
19.	Other children or young people pick on me or bully me	O	O	O
20.	I often volunteer to help others (parents, teachers, children)	O	O	O
21.	I think before I do things	O	O	O
22.	I take things that are not mine from home, school or elsewhere	O	O	O
23.	I get along better with adults than with people my own age	O	O	O
24.	I have many fears, I am easily scared	O	O	O
25.	I finish the work I'm doing. My attention is good	O	O	O

Please turn over – there are a few more questions on the other side

MENTAL HEALTH

Do you have any other comments or concerns?

		No	A Little	A Lot
39.	Does your family complain about you having problems with overactivity or poor concentration?	○	○	○
40.	Do your teachers complain about you having problems with overactivity or poor concentration?	○	○	○
41.	Does your family complain about you being awkward or troublesome?	○	○	○
42.	Do your teachers complain about you being awkward or troublesome?	○	○	○

		No	Yes – minor difficulties	Yes – definite difficulties	Yes – severe difficulties
26.	Overall, do you think that you have difficulties in any of the following areas: emotions, concentration, behaviour or being able to get along with other people?	○	○	○	○

If you have answered "Yes", please answer the following questions about these difficulties:

		Less than a month	1-5 months	6-12 months	Over a year
27.	How long have these difficulties been present?	○	○	○	○

		Not at all	A little	A medium amount	A great deal
28.	Do the difficulties upset or distress you?	○	○	○	○
	Do the difficulties interfere with your everyday life in the following areas?				
	29. HOME LIFE	○	○	○	○
	30. FRIENDSHIPS	○	○	○	○
	31. CLASSROOM LEARNING	○	○	○	○
	32. LEISURE ACTIVITIES	○	○	○	○
33.	Do the difficulties make it harder for those around you (family, friends, teachers, etc.)?	○	○	○	○

Your Signature_____   Today's Date_____

Thank you very much for your help.

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Module YR1a v1

Appendix 2: School Connectedness Scale

YED6. How much do you agree or disagree with the following statements?

YED6A I feel close to people at my school

YED6B I feel like I am a part of my school

YED6C I am happy to be at my school

YED6D The teachers at my school treat students fairly

YED6E I feel safe at my school

YED6F I get involved and participate in classes at school

1 - Strongly agree

2 - Agree

3 - Neither agree nor disagree

4 - Disagree

5 - Strongly Disagree

Appendix 3: Percentage of Naplan scores 'Below,' 'At,' and 'Above' National Minimum Standard for Adolescents with Abnormal, Borderline and Normal SDQ Scores (Parent and Youth Reports) (*n=715*)

Hyperactivity (Parent Reported)

Parent-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n=59*)	39.0	26.5-52.6	22.0	12.3-34.7	39.0	26.5-52.6
Borderline (*n=39*)	23.1	11.1-39.3	23.1	11.1-39.3	53.8	37.2-69.9
Normal (*n=617*)	14.4	11.7-17.4	15.7	12.9-18.8	69.9	66.1-73.5
Grammar						
Abnormal (*n=59*)	16.9	8.4-29.0	25.4	15.0-38.4	57.6	44.1-70.4
Borderline (*n=39*)	23.1	11.1-39.3	28.2	15.0-44.9	48.7	32.4-65.2
Normal (*n=617*)	4.9	3.3-6.9	17.7	14.7-20.9	77.5	74.0-80.7
Spelling						
Abnormal (*n=59*)	16.9	8.4-29.0	16.9	8.4-29.0	66.1	52.6-77.9
Borderline (*n=39*)	7.7	1.6-20.9	28.2	15.0-44.9	64.1	47.2-78.8
Normal (*n=617*)	4.4	2.9-6.3	9.7	7.5-12.3	85.9	82.9-88.5
Reading						
Abnormal (*n=59*)	10.2	3.8-20.8	16.9	8.4-29.0	72.9	59.7-83.6
Borderline (*n=39*)	15.4	5.9-30.5	28.2	15.0-44.9	56.4	39.6-72.2
Normal (*n=617*)	2.3	1.2-3.8	14.3	11.6-17.3	83.5	80.3-86.3
Numeracy						
Abnormal (*n=59*)	6.8	1.9-16.5	37.3	25.0-50.9	55.9	42.4-68.8
Borderline (*n=39*)	2.6	0.1-13.6	23.1	11.1-39.3	74.4	57.9-87.0
Normal (*n=617*)	1.5	0.7-2.8	13.0	10.4-15.9	85.6	82.6-88.3

Conduct Problems (Parent Reported)

Parent-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n=46*)	34.8	21.4-50.2	15.2	6.3-28.9	50.0	34.9-65.1
Borderline (*n=45*)	28.9	16.4-44.3	24.4	12.9-39.5	46.7	31.7-62.1
Normal (*n=624*)	14.7	12.1-17.8	16.2	13.4-19.3	69.1	65.3-72.7

	%	95%CI	%	95%CI	%	95%CI
Grammar						
Abnormal (*n=46*)	19.6	9.4-33.9	26.1	14.3-41.1	54.3	39.0-69.1
Borderline (*n=45*)	11.1	3.7-24.1	28.9	16.4-44.3	60.0	44.3-74.3
Normal (*n=624*)	5.6	3.9-7.7	17.6	14.7-20.8	76.8	73.2-80.0
Spelling						
Abnormal (*n=46*)	10.9	3.6-23.6	15.2	6.3-28.9	73.9	58.9-85.7
Borderline (*n=45*)	8.9	2.5-21.2	20.0	9.6-34.6	71.1	55.7-83.6
Normal (*n=624*)	5.0	3.4-7.0	10.4	8.1-13.1	84.6	81.5-87.4
Reading						
Abnormal (*n=46*)	13.0	4.9-26.3	13.0	4.9-26.3	73.9	58.9-85.7
Borderline (*n=45*)	6.7	1.4-18.3	31.1	18.2-46.6	62.2	46.5-76.2
Normal (*n=624*)	2.7	1.6-4.3	14.3	11.6-17.3	83.0	79.8-85.9
Numeracy						
Abnormal (*n=46*)	8.7	2.4-20.8	23.9	12.6-38.8	67.4	52.0-80.5
Borderline (*n=45*)	4.4	5.0-15.1	26.7	14.6-41.9	68.9	53.4-81.8
Normal (*n=624*)	1.3	0.6-2.5	14.1	11.5-17.1	84.6	81.5-87.4

Peer Problems (Parent Reported)

Parent-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n=86*)	26.7	17.8-34.4	24.4	15.8-34.9	48.4	37.9-59.9
Borderline (*n=74*)	23.0	14.0-34.2	14.9	7.7-25.0	62.2	50.1-73.2
Normal (*n=555*)	14.6	11.8-17.8	15.7	12.8-19.0	69.7	65.7-73.5
Grammar						
Abnormal (*n=86*)	16.3	9.2-25.8	22.1	13.9-32.3	61.6	50.5-71.9
Borderline (*n=74*)	12.2	5.7-21.8	23.0	14.0-34.2	64.9	52.9-75.6
Normal (*n=555*)	4.7	3.1-6.8	17.8	14.7-21.3	77.5	73.8-80.9
Spelling						
Abnormal (*n=86*)	7.0	2.6-14.6	19.8	12.0-29.8	73.3	62.6-82.2
Borderline (*n=74*)	8.1	3.0-16.8	12.2	5.7-21.8	79.2	68.8-88.2
Normal (*n=555*)	5.0	3.4-7.2	9.9	7.6-12.7	85.0	81.8-87.9
Reading						
Abnormal (*n=86*)	7.0	2.6-14.6	19.8	12.0-29.8	73.3	62.6-82.2
Borderline (*n=74*)	8.1	3.0-16.8	17.6	9.7-28.2	74.3	62.8-83.8
Normal (*n=555*)	2.5	1.4-4.2	14.2	11.4-17.4	83.2	79.9-86.3
Numeracy						
Abnormal (*n=86*)	5.8	1.9-13.0	25.6	16.8-36.1	68.6	57.7-78.2
Borderline (*n=74*)	5.4	1.5-13.3	16.2	8.7-26.6	78.4	67.3-87.1
Normal (*n=555*)	0.9	0.3-2.1	13.9	11.1-17.0	85.2	82.0-88.1

Emotional Problems (Parent Reported)

Parent-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n*=88)	21.6	13.5-31.6	18.2	10.8-27.8	60.2	49.2-70.5
Borderline (*n*=62)	24.2	14.2-36.7	19.4	10.4-31.4	56.5	43.3-69.0
Normal (*n*=565)	15.4	12.5-18.6	16.0	13.2-19.4	68.5	64.5-72.3
Grammar						
Abnormal (*n*=88)	10.2	4.8-18.5	21.6	13.5-31.6	68.2	57.4-77.7
Borderline (*n*=62)	14.5	6.9-25.8	22.6	12.9-35.0	62.9	49.7-74.8
Normal (*n*=565)	5.5	3.8-7.7	18.1	15.0-21.5	76.5	72.7-79.9
Spelling						
Abnormal (*n*=88)	5.7	1.9-12.8	20.5	12.6-30.4	73.9	63.4-82.7
Borderline (*n*=62)	6.5	1.8-15.7	17.7	9.2-29.5	75.8	63.3-85.8
Normal (*n*=565)	5.5	3.8-7.7	9.2	7.0-11.9	85.3	82.1-88.1
Reading						
Abnormal (*n*=88)	5.7	1.9-12.8	11.4	5.6-19.9	83.0	73.4-90.1
Borderline (*n*=62)	12.9	5.7-23.9	14.5	6.9-25.8	72.6	59.8-83.1
Normal (*n*=565)	2.3	1.2-3.9	15.9	13.0-19.2	81.8	78.3-84.9
Numeracy						
Abnormal (*n*=88)	4.5	1.3-11.2	23.9	15.4-34.1	71.6	61.0-80.7
Borderline (*n*=62)	8.1	2.7-17.8	21.0	11.7-33.2	71.0	58.1-81.8
Normal (*n*=566)	0.9	0.3-2.1	13.6	10.9-16.7	85.5	82.3-88.3

Hyperactivity (Youth Reported)

Youth-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n*=112)	20.5	13.5-29.2	21.4	14.2-30.2	58.0	48.3-67.3
Borderline (*n*=86)	15.1	8.3-24.5	18.6	11.0-28.4	66.3	55.3-76.1
Normal (*n*=517)	16.4	13.3-19.9	15.3	12.3-18.7	68.3	64.1-72.3
Grammar						
Abnormal (*n*=112)	7.1	3.1-16.6	21.4	14.2-30.2	71.4	62.1-79.6
Borderline (*n*=86)	5.8	1.9-13.0	22.1	13.9-32.3	72.1	61.4-81.2
Normal (*n*=517)	7.0	4.9-9.5	17.8	14.6-21.4	75.2	71.3-78.9
Spelling						
Abnormal (*n*=112)	7.1	3.1-13.6	15.2	9.1-23.2	77.7	68.8-85.0
Borderline (*n*=86)	2.3	0.3-8.1	9.3	4.1-17.5	88.4	79.7-94.3

	%	95%CI	%	95%CI	%	95%CI
Normal (*n*=517)	5.8	3.9-8.2	10.8	8.3-13.8	83.4	79.9-86.5
Reading						
Abnormal (*n*=112)	4.5	1.5-10.1	13.4	7.7-21.1	82.1	73.8-88.7
Borderline (*n*=86)	3.5	0.7-9.9	17.4	10.1-27.1	79.1	69.0-87.1
Normal (*n*=517)	3.5	2.1-5.4	15.3	12.3-18.7	81.2	77.6-84.5
Numeracy						
Abnormal (*n*=112)	2.7	0.6-7.6	16.1	9.8-24.2	81.3	72.8-88.0
Borderline (*n*=86)	1.2	0.0-6.3	14.0	7.4-23.1	84.9	75.5-91.7
Normal (*n*=517)	1.9	0.9-3.5	15.7	12.6-19.1	82.4	78.8-85.6

Conduct Problems (Youth Reported)

Youth-reported SDQ Rating	**Naplan Rating**					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n*=48)	27.1	15.3-41.8	22.9	12.0-37.3	50.0	35.2-64.8
Borderline (*n*=52)	25.0	14.0-38.9	25.0	14.0-38.9	50.0	35.8-64.2
Normal (*n*=615)	15.4	12.7-18.5	15.4	12.7-18.5	69.1	65.3-72.7
Grammar						
Abnormal (*n*=48)	20.8	10.5-35.0	25.0	13.6-39.6	54.4	39.2-68.6
Borderline (*n*=52)	13.5	5.6-25.8	21.2	11.1-34.7	65.4	50.9-78.0
Normal (*n*=615)	5.2	3.6-7.3	18.2	15.2-21.5	76.6	73.0-79.9
Spelling						
Abnormal (*n*=48)	8.3	2.3-20.0	12.5	4.7-25.2	79.2	65.0-89.5
Borderline (*n*=52)	15.4	6.9-28.1	11.5	4.4-23.4	73.1	59.0-84.4
Normal (*n*=615)	4.6	3.0-6.5	11.2	8.8-14.0	84.2	81.1-87.0
Reading						
Abnormal (*n*=48)	10.4	3.5-22.7	16.7	7.5-30.2	72.9	58.2-84.7
Borderline (*n*=52)	5.8	1.2-15.9	30.8	18.7-45.1	63.5	49.0-76.4
Normal (*n*=615)	2.9	1.7-4.6	13.8	11.2-16.8	83.3	80.1-86.1
Numeracy						
Abnormal (*n*=48)	8.3	2.3-20.0	12.5	4.7-25.2	79.2	65.0-89.5
Borderline (*n*=52)	0.0	0.0-6.8	26.5	15.6-41.0	73.1	59.0-84.4
Normal (*n*=615)	1.6	0.8-3.0	14.8	12.1-17.9	83.6	80.4-86.4

Peer Problems (Youth Reported)

Youth-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n*=31)	12.9	3.6-29.8	32.3	16.7-51.4	54.8	36.0-72.7
Borderline (*n*=115)	20.0	13.1-28.5	18.3	11.7-26.5	61.7	52.2-70.6
Normal (*n*=569)	16.6	13.6-19.8	15.5	12.6-18.7	68.0	64.0-71.8
Grammar						
Abnormal (*n*=31)	3.2	0.1-16.7	12.9	3.6-29.8	83.9	66.3-94.5
Borderline (*n*=115)	13.9	8.2-21.6	22.6	15.3-31.3	63.5	54.0-72.3
Normal (*n*=569)	5.6	3.9-7.8	18.5	15.3-21.9	75.9	72.2-79.4
Spelling						
Abnormal (*n*=31)	0.0	0.0-11.2	12.9	3.6-29.8	87.1	70.2-96.4
Borderline (*n*=115)	6.1	2.5-12.1	18.3	11.7-26.5	75.7	66.8-83.2
Normal (*n*=569)	5.8	4.0-8.0	9.8	7.5-12.6	84.4	81.1-87.2
Reading						
Abnormal (*n*=31)	3.2	0.1-16.7	19.4	7.5-37.5	77.4	58.9-90.4
Borderline (*n*=115)	7.0	3.1-13.2	19.1	12.4-27.5	73.9	64.9-81.7
Normal (*n*=569)	3.0	1.7-4.7	14.2	11.5-17.4	82.8	79.4-85.8
Numeracy						
Abnormal (*n*=31)	3.2	0.1-16.7	19.4	7.5-37.5	77.4	58.9-90.4
Borderline (*n*=115)	5.2	1.9-11.0	19.1	12.4-27.5	75.7	66.8-83.2
Normal (*n*=569)	1.2	0.5-2.5	14.6	11.8-17.8	84.2	80.9-87.1

Emotional Problems (Youth Reported)

Youth-reported SDQ Rating	Naplan Rating					
	Below National Minimum Standard		At National Minimum Standard		Above National Minimum Standard	
	%	95%CI	%	95%CI	%	95%CI
Writing						
Abnormal (*n*=67)	11.9	5.3-22.2	17.9	9.6-29.2	70.1	57.7-80.7
Borderline (*n*=46)	13.0	4.9-26.3	19.6	9.4-33.9	67.4	52.0-80.5
Normal (*n*=602)	17.8	14.8-21.1	16.3	13.4-19.5	65.9	62.0-69.7
Grammar						
Abnormal (*n*=67)	7.5	2.5-16.6	11.9	5.3-22.2	80.6	69.1-89.2
Borderline (*n*=46)	6.5	1.4-17.9	10.9	3.6-23.6	82.6	68.6-92.2
Normal (*n*=602)	6.8	4.9-9.1	20.3	17.1-23.7	72.9	69.2-76.4
Spelling						
Abnormal (*n*=67)	3.0	0.4-10.4	7.5	2.5-16.6	89.6	79.7-95.7
Borderline (*n*=46)	0.0	0.0-7.7	10.9	3.6-23.6	89.1	76.4-96.4
Normal (*n*=602)	6.3	4.5-8.6	11.8	9.3-14.6	81.9	78.6-84.9
Reading						

Abnormal (*n*=67)	4.5	0.9-12.5	13.4	6.3-24.0	82.1	70.8-90.4
Borderline (*n*=46)	8.7	2.4-20.8	10.9	3.6-23.6	80.4	66.1-90.6
Normal (*n*=602)	3.2	1.9-4.9	15.8	13.0-18.9	81.1	77.7-84.1
Numeracy						
Abnormal (*n*=67)	3.0	0.4-10.4	16.4	8.5-27.5	80.6	69.1-89.2
Borderline (*n*=46)	4.3	0.5-14.8	21.7	10.9-36.4	73.9	58.9-85.7
Normal (*n*=602)	1.7	0.8-3.0	15.0	12.2-18.1	83.4	80.2-86.3