The Impact of Psychological Health on Academic Performance:

A Longitudinal and Cross-Sectional Study

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Abstract

A child's education should prepare them to meet the challenges of the world. Identifying factors that determine academic performance is paramount as success sets a pathway for lifelong opportunities. Intellectual ability fails as the sole predictor of academic outcomes, therefore additional factors must exist. Positive emotions have been linked to attaining skills that foster academic performance (Fredrickson, 2004) suggesting well-being may have predictive value. Limited studies exist investigating the relationship between well-being and academic performance. Cross-sectional methodology is commonly employed leaving findings based on longitudinal design under researched. The present study conducted at Blackwood High School aims to narrow this gap by investigating well-being and academic performance incorporating a longitudinal design. Respondents were 327 South Australian middle and high school students (n=163 males, 164 females) who completed surveys of well-being and ill-being analysed against academic grades. Well-being was found to explain 5 to 6% of the variance in academic performance with the domain of Perseverance the most significant predictor. Given intelligence is a well-established predictor which cannot be taught, this finding is meaningful as Perseverance can be learnt through positive education programs. These results can be applied to positive education within schools as they offer educators an avenue for simultaneously improving the well-being of students and their academic performance. It is hoped these results will inspire further investigations and guide future positive psychology programs.

Declaration

“This thesis contains no material which has been accepted for the award of any other degree or 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.”

October 2018

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CHAPTER 1 - Introduction

A child's education should prepare them to meet the challenges of the world. Schools are increasingly recognising that learning is no longer just about the acquisition of facts and that a student's psychological well-being is an important factor in child development. An education that encompasses this balance may ensure students achieve to the best of their ability, essential in today's economy where achievement shapes future careers and social opportunities (Heaven & Ciarrochi, 2012).

Psychological science has provided a platform for research into academic achievement, its interest largely fueled by the social importance of academic outcomes and the obvious link to cognitive functioning (Peters & Woolley, 2015; Poropat, 2009; Rosander & Bäckström, 2014; Salanova, Schaufeli, Martínez, & Bresó, 2010; Valiente, Swanson, & Eisenberg, 2012). Intellectual ability is one of the most documented predictors of academic performance (Barton, Dielman, & Cattell, 1972; Laidra, Pullmann, & Allik, 2007) but it fails to account for 100% of the difference in student grades. The degree to which it accounts for differences defies consensus with estimates ranging from 49% (Duckworth & Seligman, 2005) to 81% (Deary, Strand, Smith, & Fernandes, 2007).

As intellectual ability fails as the sole predictor of academic performance, other contributing factors must exist. Measures of ill-being such as depression or anxiety, have long been considered as possible factors with several studies demonstrating measures of ill-being negatively correlate with academic performance (Allgood-Merten, Lewinsohn, & Hops, 1990; Gumora & Arsenio, 2002; Valiente et al., 2012). Results of these studies indicate negative psychological states (ill-being) may contribute to poor academic performance. Conversely, the presence of positive emotions (well-being) has been found to have long term benefits to an individual including improved physical health (Hoyt, Chase-Lansdale, McDade, & Adam, 2011) and increased life expectancy (Chida & Steptoe, 2008). The

majority of literature concerning well-being and academic performance employ cross-sectional study design (Cadime et al., 2016; Rüppel, Liersch, & Walter, 2015). The current study aims to narrow the knowledge gap which currently exists within the literature regarding a deficit of longitudinal study designs.

1.1 Defining Well-being

Attempts at expressing the nature of well-being have focused on its dimensions rather than a definition (Dodge, Daly, Huyton, & Sanders, 2012; Huppert, 2017) giving rise to a number of broad definitions. The definitions of hedonia and eudaimonia rely on concepts dating back to Aristotle and Aristippus (Huppert & So, 2013). Hedonic well-being focuses on the subjective experiences of happiness where a person experiences positive emotions frequently and negative emotions infrequently. Eudemonic well-being moves away from a focus on happiness towards positive functioning (Gregory & Brinkman, 2015). Other researchers regard well-being as requiring both hedonic and eudaimonic components and believe both are necessary for the perception of well-being (Huppert & So, 2013; Seligman, 2011).

1.2 The Dual-Factor Model of Mental Health

Historically, well-being was regarded as the opposite to ill-being but it is now accepted they are distinct constructs and not extremes on a continuum (Greenspoon & Saklofske, 2001). Consistent with this view, the World Health Organisation (WHO) defines health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 1948). Greenspoon and Saklofske (2001) proposed a Dual-Factor Model of Mental Health which defines mental health as having two psychometrically distinct but correlated continua of mental illness and positive mental health. They suggest high levels of well-being can occur in people co-experiencing ill-being. This model has been supported empirically with findings from large scale meta-analysis indicating

the absence of ill-being failed to guarantee well-being (Sin & Lyubomirsky, 2009). Despite being separate constructs, negative correlations between well-being and ill-being are consistently reported in adolescent populations (Halliday, 2014; Kern, Benson, Steinberg & Steinberg, 2016; Branson, 2015).

1.2.1 Academic Performance and The Broaden-and-Build Theory

The idea of well-being can be understood in terms of the Broaden-and-Build Theory which posits that experiencing positive emotion (well-being) generates broad thought-action repertoires that ultimately build intellectual and social resources (Fredrickson, 2001). Positive emotions have been linked to attaining skills that foster academic achievement (Fredrickson, 2004). The theory suggests positive emotions can enhance academic performance by encouraging student exploration and broadening potential problem solving methods. Students with high levels of well-being may believe if they exert effort, they can succeed at school (Howell, 2009). A positive emotional state may broaden students' focus of attention and promote creative thinking compared to those in negative or neutral mood states (Fredrickson & Branigan, 2005). Negative mood states or emotions are commonly associated with behaviour problems in the classroom, lower achievement in school and poor peer relations (Roeser, Eccles, & Strobel, 1998). The Broaden-and-Build Theory links both positive and negative emotions to academic achievement as it suggests an increase in positive or decrease in negative emotional states contribute to student outcomes.

1.3 Mental Health in an Australian Adolescent Population

Adolescence is the developmental period between 12 to 18 years of age, a particularly important stage of life as many life-long health related behaviours are established during this time (Department of Health, 2015). Epidemiological evidence reveals half of lifetime mental disorders begin in adolescence (Kessler et al., 2007) and prevention or early intervention may help prevent or reduce the severity of adult psychological ill-being (McGorry et al., 2011).

The impact of ill-being is widespread throughout the Australian population with the 2015 Nationwide Survey into the Mental Health of Australian Children & Adolescents reporting 15.9% of male and 12.8% of female adolescents were assessed as having a mental disorder (Hafekost et al., 2016). Aside from the individual cost, ill-being has a significant economic cost to the Australian community. In 2016, The National Mental Health Commission estimated the national cost of mental health to Australia exceeds six billion dollars annually (NMHC, 2016). Mental health is listed as the third largest burden of disease (AIHW, 2011) therefore any positive interventions to reduce ill-being have value to the individual and the Australian community.

1.4 Mental Health in Australian Schools

The majority of adolescents in Australia attend school. Since 2010, it has been mandatory for students to complete Year 10 and participate in full time education or training until the age of 17 (DFAT, 2018). Student numbers are increasing in Australia with nearly 4 million students enrolled in 2017 (ABS, 2017). Results from a 2015 Department of Health report found school performance in all subjects markedly poorer for those with a mental disorder than those without giving weight to the importance of decreasing ill-being to optimise academic performance. Consequently, schools that traditionally placed emphasis on academic achievement alone have shifted towards developing the whole person, including their well-being (Spengler et al., 2015). This is being achieved by incorporation of intervention such as positive education programs into school curriculums.

1.5 Positive Education; Schools' Dual-aims of Increasing Academic Achievement and Student Well-being

Positive education seeks to promote the well-being of students by integration of positive psychological elements into educational practices (Chaves & Tames, 2017; Seligman, Ernst, Gillham, Reivich, & Linkins, 2009). Interventions are theoretically

underpinned by positive psychology which aims to shift the focus of psychology from working within a disease model of human functioning to include a focus on well-being (Copeland, Nelson, & Traughber, 2010; Norrish & Vella-Brodrick, 2009; Seligman & Csikszentmihalyi, 2000). Additionally, it aims to prevent ill-being by providing individuals with skills that "buffer" against it (Seligman, 2002). Benefits of positive education are suggested to include greater life satisfaction and increased learning and creativity (Seligman et al., 2009; Waters, 2011). Schools can teach the skills of well-being and academics in parallel without compromising either (Seligman et al., 2009).

1.6 The Role of Positive Psychology Interventions in Schools

Positive education often includes Positive Psychology Interventions (PPIs) which attempt to increase well-being through deliberate changes to cognitions, feelings and behaviors (Parks, Schueller, & Tasimi, 2013). A recent meta-analysis examining 51 PPIs (n=4,266) found they significantly increased well-being and decreased depressive symptoms (Sin & Lyubomirksy, 2009). A separate meta-analysis examining 213 PPIs (n=270,034) administered to students from Reception to Year 12 found students enrolled in PPIs ranked over 11% higher on achievement tests compared to other students (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). This evidence suggests PPIs can increase both well-being and academic achievement concurrently. Importantly, research suggests involving students in the development and implementation of a PPI increases their engagement and participation in the activity (Halliday, Kern, Garrett, & Turnbull, 2018; Norrish & Vella-Brodrick, 2009; Seligman et al., 2009) leading to enhanced outcomes.

Critics of PPIs highlight the need for more research into their effectiveness (Kristjánsson, 2012). Coyne and Tennen (2010) suggest PPIs could be harmful in certain situations. For example, sufferers of depression who fail to identify any benefits of participation may interpret this as a failure exacerbating their depressive symptoms. The lack

of universal agreement about PPIs has led to assertions that continued empirical research is essential to ensure the application of PPIs does not overtake the scientific evidence supporting it (Norrish & Vella-Brodrick, 2009).

1.7 What is Well-being? The Lack of Consensus Concerning the Components of Well-being

As studies into PPIs increase, so does the importance that any perceived increases to well-being can be reliably measured. As discussed previously, well-being currently lacks a standard definition therefore disagreement exists regarding how best to measure it. Numerous models exist each operationalising the concept in terms of different components. Ryff & Keyes (1995) propose six components, Diener et al. (2010) propose eight, while Huppert & So (2013) propose ten (Table 1). This lack of consensus on the basic components of well-being restricts inter-study comparison and generalisability highlighting the need for a universally accepted measure.

Table 1

Well-being Domains of Three Influential Models with Similarities Italicised

Diener et al. (2010)	Huppert & So (2013)	Ryff & Keyes (1995)
Positive relationships	*Positive relationships*	*Positive relationships with others*
Purpose/Meaning	*Meaning*	*Purpose in life*
Engagement	*Engagement*	Self-acceptance
Optimism	*Optimism*	Autonomy
Competence	*Competence*	Environmental mastery
Social relationships	Vitality	Personal growth
Self-respect	Positive emotion	
Social contribution	Self-esteem	
	Emotional stability	
	Resilience	

1.7.1 PERMA Model

This research is grounded in Martin Seligman's (2011) well-being theory which incorporates both hedonic and eudemonic components. It defines well-being in terms of five constructs; Positive Emotion, Engagement, Relationships, Meaning and Achievement (PERMA) (Table 2). The five constructs have three essential properties; they contribute to well-being, they can be conceptualized as ends in themselves, and they can be defined and measured independently of the other constructs (Seligman, 2011).

Table 2

Definitions of the Seligman (2011) PERMA Model

PERMA Domain	Definition
Positive Emotion	Subjective feelings of happiness and satisfaction with life
Engagement	Being absorbed in a task
Relationships	Dedicating time to nourishing relationships, directly increasing the perception of well-being
Meaning	The perception of meaning in life and working on goals that transcend the self
Accomplishment	Establishing and reaching goals that provide motivation

Critics of the PERMA model claim it is biased towards western culture and lacks sufficient empirical support (Donaldson, Dollwet & Rao, 2015; Held, 2004). Despite the criticisms, PERMA has gained traction in the well-being discourse (Kern et al., 2016) and has a growing empirical literature base (Goodman, Disabto, Kasdan & Kauffman, 2018; Tansey et al., 2018; Roncaglia, 2017).

1.7.2 EPOCH Model; Measuring Adolescent Well-being

While several models exist to measure well-being in an adult population, adolescent specific measures remain in their infancy. Kern et al. (2016) revised certain components of the adult specific PERMA model to ensure developmental appropriateness for adolescents to create the EPOCH model (Figure 1). EPOCH consists of five domains; Engagement, Perseverance, Optimism, Connectedness, and Happiness (Table 3). The EPOCH model has been chosen to measure well-being in the current study as it targets the population of interest.

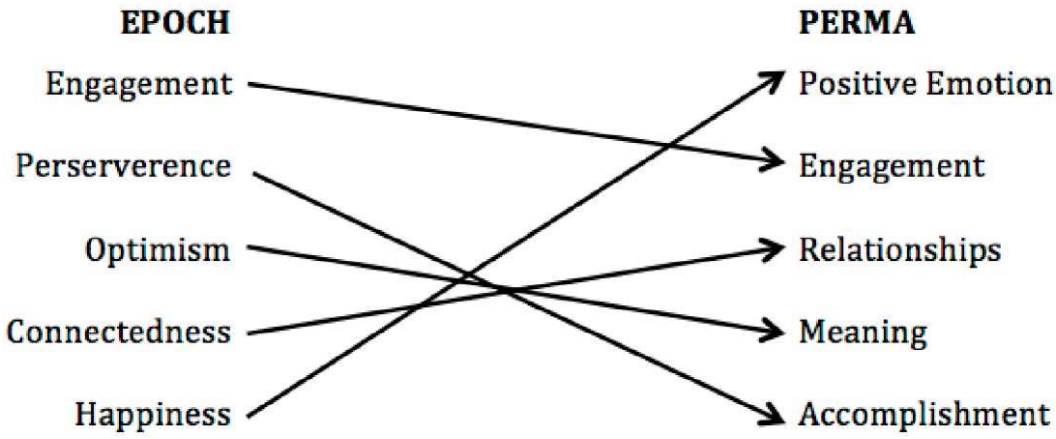

Figure 1. The adolescent EPOCH model mapped on to the adult PERMA model

Table 3

Definitions of the Kern et al. (2016) EPOCH Model

EPOCH Domain	Definition
Engagement	The capacity to become absorbed in and focus on what one is doing
Perseverance	Ability to pursue ones goal to completion even in the face of obstacles
Optimism	Hopefulness and confidence about the future
Connectedness	Having satisfying relationships with others
Happiness	A steady state of positive mood and feeling content

1.7.3 Support for the EPOCH Measure of Adolescent Well-being

In creating the EPOCH measure, Kern et al. (2016) found a significant negative relationship between Depression and each EPOCH domain, and between Anxiety and each EPOCH domain except for Engagement. This validates the idea that the EPOCH measure captures dimensions that generally occur in the absence of severely negative psychological states. Further support for the EPOCH measure was provided by the Halliday (2014) and Branson (2015) findings of negative correlations between measures of ill-being (Depression, Anxiety and Stress) and each well-being domain within the EPOCH measure. Furthermore, each EPOCH domain related to academic performance with Perseverance bearing the strongest relationship suggesting EPOCH reflects a factor underlying academic achievement (Kern et al., 2016).

1.8 Striving Towards a Universal Increase in Well-being

Mental illness is the largest non-fatal burden of disease in Australia (AIHW, 2011). While vast resources are dedicated to improving the mental state of those living with a psychological disorder, it has been hypothesised that benefits exist to universally increasing the well-being of an entire population (Huppert, 2005). This perspective suggests universal increases in well-being leads to reduction of psychological symptoms across an entire population (Figure 2).

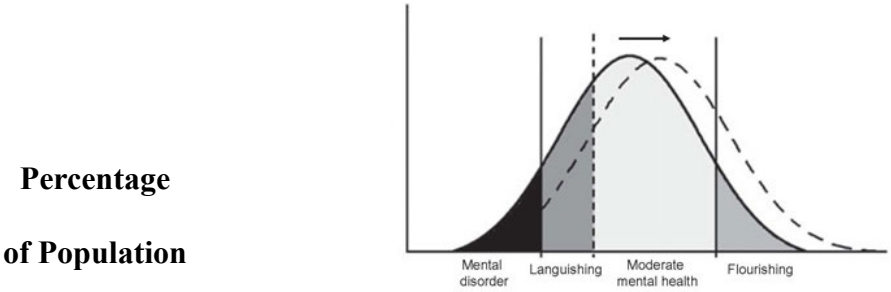

Figure 2. Effect of shifting the mean of the mental health spectrum based on model of Huppert & So (2009).

To ensure benefits are as widespread as possible, universal rather than targeted approachs are being adopted in school environments. PPIs are delivered to class or year groups in an attempt to shift the mean of the mental health spectrum rather than target an intervention at the individual student level (Seligman, 2011).

1.9 Potential Factors Impacting Relationships between Well-being and Academic Achievement

Schools wishing to improve student well-being along with academic achievement need to understand the dynamic factors at play. This allows schools with limited time or financial resources to tailor PPIs to provide maximum global benefits to students. Studies into the relationship between well-being and predicting or improving academic achievement remain largely unrepresented in the literature. The current study aims to contribute a better understanding of this issue by focusing on two possible factors which impact both psychological state and academic achievement; gender and year level in schools.

1.9.1 Gender as a Possible Mediating Factor between Well-being, Ill-being and Academic Achievement

During 2015, over 70% of telephone calls made to the Australian Kids Helpline came from females, with mental health the most reported concern followed by emotional well-being (Kids Helpline, 2015). Despite being vulnerable to higher rates of ill-being, female adolescents consistently outperform males academically (Pomerantz, Altermatt, & Saxon, 2002). This finding is well-replicated in both longitudinal (Allgood-Merten et al., 1990; Hankin, Mermelstein, & Roesch, 2007) and cross-sectional studies (Bluth & Blanton, 2015; Bluth, Campo, Futch, & Gaylord, 2017; Carvalho, 2016; Fischer, Schult, & Hell, 2013) and occurs despite findings reporting the same general intellectual ability for both genders (Steinmayr & Spinath, 2008). This similarity in functional intellect could be considered

surprising given gender differences have been found both physiologically and psychologically.

Biological differences including brain organisation, hormones and genetics have all been studied as factors impacting gender differences in academic performance (Kimura & Hampson, 1994). A longitudinal study spanning 25 years found females performed better academically and achieved more post-school qualifications than their male counterparts (Gibb, Fergusson and Horwood, 2008). Furthermore, females have been found to exhibit higher levels of school engagement than males (Pomerantz et al., 2002) and attribute greater importance to their academic performance (Berndt & Miller, 1990).

Although the relationship between gender and ill-being has been extensively researched, the impact of gender on well-being still requires investigation (Huppert, 2009). Given the lack of gender inequality in intellectual ability, gender differences in academic performance have increased interest in understanding the factors underlying this disparity.

1.9.2 Academic Timetable as a Possible Mediating Factor between Well-being, Ill-being and Academic Achievement

It appears many students achieve stable academic grades throughout their school years (Beatty, Walmsley, Sackett, Kuncel, & Koch, 2015; Kemple, Segeritz, & Stephenson, 2013; Salanova, Martinez, & Llorens, 2012). Despite this, levels of psychological health do not necessarily follow the same pattern. Results of longitudinal studies suggest a general decline in student engagement (Simons-Morton & Crump, 2003; Wang & Eccles, 2012) and a reduction in academic motivation throughout high school which appears non-gender specific (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). A possible contributing factor to psychological health are fluctuations in academic based pressures. Blackwood High recognises these pressures may impact student well-being and address the issue on their website stating; *"Course selection requires making wise decisions and deciding future*

options can be a challenging and difficult process" (Blackwood High School, 2018). Academic performance may be especially critical for Year 12 students as future study and career opportunities often rely on university admission.

Changes in engagement and motivation over the school year could be a reflection of changing levels of well-being or ill-being causing behavioural and academic changes. An aim of the current study involved investigating this suggestion by analysing reported psychological states using longitudinal data collected over the course of a year.

1.10 The Current Study

The overarching aim of the current study is to explore the relationship between well-being, ill-being and academic performance in a sample of adolescents at Blackwood High School. The relationship between well-being and academic performance is largely under researched and although studies are emerging in this area, they largely employ cross-sectional methodology (Cadime et al., 2016; Rüppel et al., 2015). The current study presents an opportunity to expand prior research by examining the predictive ability of well-being on academic performance incorporating longitudinal methodology. The current study may inform the implementation of more effective PPIs benefiting students and schools alike. Research aims and hypotheses are outlined in Table 4.

Table 4

Aims and Hypotheses for the Current Study

Aim 1:	*To describe current levels of well-being and ill-being at Blackwood High with comparison to normative samples*
Aim 2:	*To investigate psychological health as a predictor of academic performance*
Hypothesis 1:	It is expected that well-being would be negatively correlated with Ill-being
Hypothesis 2:	It is expected that well-being would be positively correlated with both concurrent academic performance and performance at the 6-month follow-up. Specifically, it is expected that higher rates of well-being will correlate with higher rates of academic performance
Hypothesis 3:	It is expected that ill-being would be negatively correlated with both concurrent academic performance and performance at the 6-month follow-up. Specifically, it is expected that higher rates of ill-being will correlate with lower rates of academic performance
Aim 3:	*To investigate if differences exist between gender and year level in terms of academic performance*
Hypothesis 4:	There will be a significant difference between males and females in regards to well-being, ill-being, and academic performance. Specifically, it is expected females will experience greater ill-being and males will experience greater well-being
Hypothesis 5:	There will be a significant difference between year levels in regards to well-being, ill-being, and academic performance. Specifically, it is expected students in senior school will experience greater levels of ill-being than those in middle school
Aim 4	*To compare the relative predictive strength of well-being and ill-being on academic performance*

CHAPTER 2 - Method

2.1 Setting

The current study was undertaken at Blackwood High School, a South Australian Government school. The Index of Community Socio-Educational Advantage (ICSEA) score provides an indication of the socio-educational backgrounds of students. Blackwood High scores 1068, close to the Australian average of 1000 (Australian Curriculum Assessment and Reporting Authority, 2016). The study was conducted in the context of a joint initiative between The University of Adelaide and Blackwood High who have been tracking student well-being since 2014.

2.2 Participants

All Year 8 to 12 students were invited to participate in the online questionnaire. Students under 13 years of age were excluded from participating.

2.2.1 Response Rate

Parental consent was sought and 43.1% of students gained permission to participate (416 from a possible 965) with a completion rate of 98.3% (409 of the 416). Students absent on the day of data collection were not subsequently requested to complete the questionnaire.

2.2.2 Demographics

All participants were aged between 13 and 18 years (M = 14.6 years, SD = 1.4) consisting of 49.85% females and 50.15% males, close to the national population figure of 51% female, 49% male (ABS, 2016). 11.63% of participants came from English as a second language background, less than the national figure of 21% (ABS, 2016) (Table 5).

Table 5

Demographic Characteristics of Current Sample

Characteristics	*n*	%
Gender		
Male	163	49.85
Female	164	50.15
Age		
13	100	30.58
14	67	20.49
15	66	20.18
16	52	15.90
17	41	12.54
18	1	0.31
Year Level		
8-10	229	70.03
11-12	98	29.94
Language Background		
English	289	88.37
Language other than English	38	11.63

Note. N=327

2.2.3 Analysis of Statistical Power

For this study, the sample size, power, and alpha level were known therefore post-hoc sensitivity analysis was undertaken using the Gpower computer program (Faul, Erdfelder, Lang, & Buchner, 2007). Given a sample size of 327 and 80% power, a small effect size would be detected at alpha ≤.05 for all statistical tests conducted (Appendix A). This suggests results were able to detect small, statistically significant effects within the data.

2.2.4 Total Well-being and Total Ill-being

Principal Component Analysis (PCA), a dimension-reducing technique, was used to identify the latent variable 'Total Well-being' from the five EPOCH subscales (Table 6) and

'Total Ill-being' from the three DASS-21 subscales (Table 7). Using PCA to calculate total well-being and ill-being scores is more robust than using the mean of individual subscales as it avoids problems of multicollinearity (Jolliffe, 2005).

Table 6

Principal Component Analysis: Total Well-being

Domain	**Component**
Engagement	.78
Perseverance	.74
Optimism	.87
Connectedness	.78
Happiness	.87

Note. N=327. 'Total Well-being' explained 65.65% of variance in the five well-being domains

Table 7

Principal Component Analysis: Total Ill-being

Domain	Component
Depression	.90
Anxiety	.92
Stress	.92

Note. N=327. 'Total Ill-being' explained 83.63% of variance in the three ill-being domains

2.3 Measures

In 2017, Blackwood High students completed a number of psychological and health related measures in the online questionnaire (Appendix B). Two measures were extracted for

this study; the EPOCH scale measuring well-being (Kern et al., 2016) and the DASS-21 scale measuring ill-being (Lovibond, 1995). These are described in detail below.

2.3.1 Measuring Well-being (EPOCH)

Well-being was defined and measured using the 20-item EPOCH Measure of Adolescent Well-Being (Appendix C). EPOCH quantifies respondents' levels of well-being in the specific domains of Engagement, Perseverance, Optimism, Connectedness, and Happiness. Each domain consisted of four questions e.g., 'I finish whatever I begin' (Perseverance) or 'I feel happy' (Happiness). Participants responded on a five-point Likert scale from 1 "Almost never" or "Not at all like me" to 5 "Almost always" or "Very much like me". EPOCH subscale scores were calculated with higher scores indicating greater well-being. Kern and her colleagues reported high internal consistency for each subscale (Chronbach's alpha .75-.87) concluding the measure appears psychometrically sound. Chronbach's alpha for the current sample also displayed acceptable internal consistency (Table 8).

Table 8

Internal Consistency of EPOCH Subscales in the Current Sample

Subscale	**Chronbach's α**
Engagement	.85
Perseverance	.86
Optimism	.82
Connectedness	.85
Happiness	.82

Note. N=327

2.3.2 Measuring Ill-being (DASS-21)

Ill-being was defined and measured using the 21-item DASS-21 (Lovibond, 1995) which records respondents' emotional states in regards to Stress, Depression and Anxiety (Appendix D). Each domain consists of seven questions and participants indicate the extent to

which individual experience correspond to statements about the past week, e.g., 'I found it difficult to relax'. Participants responded on a four point Likert scale from 0 "Did not apply to me at all" to 3 "Applied to me very much or most of the time". Scores were summed for each of the domains as per instructions, with higher scores indicating greater intensity of the emotional state. Participants were then classified into severity categories based on their scores. For example, 'mild' indicates the person was above the population mean but below the typical severity of people seeking professional help for mental health concerns (Lovibond, 1995). This measure has demonstrated good internal consistency and validity for use in adolescents (Szabo, 2010). Additional support for the DASS-21 validity was provided by Tully, Zajac, & Venning (2009) who reported high internal consistency for Depression (α = .88), Anxiety (α = .79), and Stress (α = .84) in a study involving a South Australian adolescent population (*N* = 4039), aged 12 to 18 years. Chronbach's alpha for the current sample also displayed acceptable internal consistency (Table 9).

Table 9

Internal Consistency of DASS-21 Subscales in the Current Sample

Subscale	**Chronbach's α**
Stress	.85
Depression	.85
Anxiety	.87

Note. N=327

2.3.3 Measuring Academic Performance

Consistent with most previous studies, a Grade Point Average (GPA) was calculated for each student to indicate overall academic performance (Bilge, Tuzgol Dost, & Cetin, 2014; Cadime et al., 2016; Iachini, Brown, Ball, Gibson, & Lize, 2015; Peters & Woolley, 2015). A GPA provides a cumulative score for students and converts conventional

alphanumeric (A, B, C, D, E) letter grades into a corresponding four point scale rating e.g., A = 4 points and B = 3 points.

Academic grades follow the International Baccalaureate Middle Years Program (IBMYP) framework at Blackwood High School for Years 8 to 10 with a possible score range from 7 to 1. Years 11 to 12 follow the South Australian Certificate of Education (SACE) framework graded on an A to E letter grade system. After consultation with the Blackwood High IBMYP coordinator and secondary discussions with an Associate Professor at the School of Education at The University of Adelaide, all scores were converted to a standardised GPA score displayed in Table 10.

Table 10

Conversion of Year 8-12 Grades to a GPA Score

Year 8-10 IBMYP Grade	**Converted Score**	**Year 11-12 SACE Grade**	**Converted Score**
7	4	A	4
6	4	B	3
5	3	C	2
4	3	D	1
3	2	E	0
2	1		
1	0		

2.4 Procedure

Well-being and ill-being data was extracted from a questionnaire conducted in 2017 while Semester 1 and 2 academic results (linked to student identification number) were obtained to undertake the data linkage process. Data linkage describes a method of bringing together information about the same sample population from different sources to create a new richer dataset (Emery & Boyle, 2017). The well-being and ill-being dataset was then linked to

the newly collected academic results data. Utilising such data minimised the burden both on Blackwood High and students to provide extraneous information.

2.4.1 Well-being and Ill-being Data Collection

The collection of psychological data involved a 105-item questionnaire (Appendix B) administered to students using SurveyMonkey software via a school held license. Teachers and staff supervised data collection which took approximately 30-45 minutes to complete and was conducted during Care Group time in July 2017. Non-participating students were given an alternate non-classwork activity. All supervisors were provided with a script to keep instructions consistent and enhance the quality of measurement. A school counsellor was available in case of adverse reaction to the content of the questionnaire although no events were reported (See Appendix B for Adverse Events Protocol).

The first page of the questionnaire provided students with a summary regarding confidentiality, their ability to withdraw at any time, and information regarding where help could be accessed if required. The survey comprised six sections; Demographic Information (5 items), EPOCH (20 items), DASS-21 (21 items), Physical Activity Questionnaire – Adolescents (36 items), Cleveland Adolescent Sleepiness Questionnaire +Adolescent Sleep-Wake Scale (18 items) and Adolescent Coping Orientation for Problem Experiences (5 items). Short comments were provided throughout to indicate participant's progress e.g., 'You're almost done' and encouragement e.g., 'Good work!'.

2.4.2 Academic Results Data Collection

Acquisition of academic result data was facilitated by a meeting attended at Blackwood High in March 2018 to discuss the study methodology. The author worked closely with the Data Manager at Blackwood High to construct the de-identified output file to ensure it contained necessary variables for analysis. As the Data Manager could only provide academic results by Years 8, 9 and 10 separately, and Years 11 and 12 collectively, the

decision was made to also combine Year 8, 9, and 10 data to create a 'Middle School' cohort and use the combined Year 11 and 12 data to create a 'Senior School' cohort. Academic results were obtained for both Semester 1 and 2 and categorised as *Concurrent* (Semester 1; January to July 2017) and *6-month follow-up* (Semester 2; July to December 2017).

2.4.3 Ethics Approval

Procedures were approved by the University of Adelaide School of Psychology: Human Research Ethics Subcommittee (Appendix E) and the Department of Education and Child Development Research Unit (Approval Number: 2018-0024; Appendix F).

2.4.4 Study Design

The study utilised both longitudinal and cross-sectional design for quantitative analysis. Data analysis was conducted using Statistical Package for Social Sciences (SPSS) Version 23.0 (SPSS Inc., 2015). One sample t-tests were used to compare the Blackwood High sample to similar cohorts to investigate Aim 1. A correlation matrix was constructed to assess the relationships between well-being, ill-being and academic performance addressing Aim 2. ANOVA were used to investigate the effects of gender and year level in terms of academic performance while independent sample t-tests were performed generating post-hoc analysis for Aim 3. To investigate Aim 4, a repeated measures ANOVA was run comparing academic performance and performance at the 6-month follow-up between genders. Finally, regression analysis were used to examine the relative contributions of total well-being and ill-being to academic performance at both the concurrent and 6-month follow-up mark.

CHAPTER 3 - Results

3.1 Preliminary Analysis

3.1.1 Data Screening

Data from 89 participants were removed from the initial 416 responses as part of the data screening process. Participants were removed due to failure to respond to multiple questions (*n*=50), participant departure of the school prior to Semester 2 completion (*n*=16) and failure to complete the survey (*n*=7). Participants who failed to display variation in response selection (*n*=11) were also removed as intentionally false data threatens study validity (Fan et al., 2006). Students who identified as Gender Diverse (*n*=5) were removed as the sample size was too small to conduct meaningful analysis therefore the final data set consisted of 327 participants.

3.1.2 Data Cleaning

Descriptives, histograms, and QQ Plots were visually examined to assess data distribution and reveal outliers for all variables. Initial Shapiro-Wilk analysis indicated all variables were normally distributed and inspection of QQ Plots showed a close to normal distribution. Eight outliers with high total ill-being scores were identified using Tukey's outlier labelling rule but retained nonetheless as responses were deemed to be neither random nor arbitrary. No variables showed multicollinearity indicated by a linear relation among two or more variables (Alin, 2010) as $r \leq .9$ (Appendix G). The result of assumption testing will be reported only where violations occur to create a concise account of results.

3.2 Aim 1: To Describe Current Levels of Well-being and Ill-being at Blackwood High with Comparison to Normative Samples

3.2.1 Well-being Comparison

Well-being data from this study were compared to Kern et al. (2016) who measured well-being in 3,239 participants aged 10 to 18 (Figure 3).

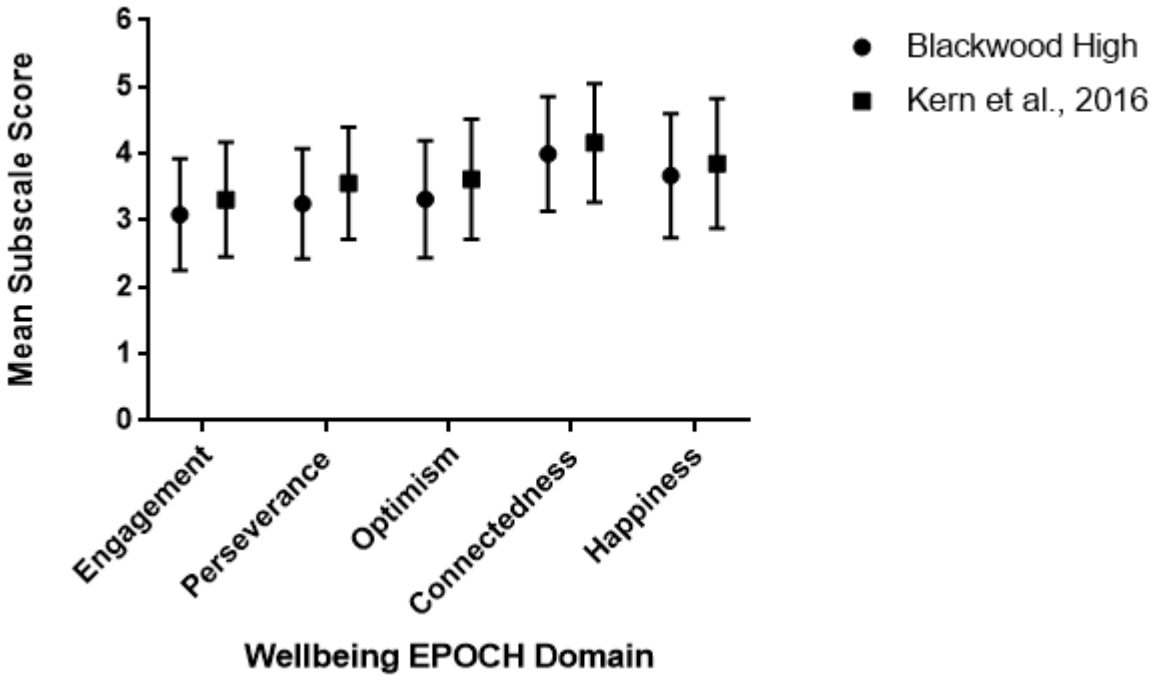

Figure 3. Comparison of well-being data between the current study's sample and that of Kern et al. (2016). Error labels indicate one standard deviation. *Note.* Blackwood High *N*=327, Kern et al. (2016) *N*=3,239

Blackwood High did not significantly differ from Kern et al. (2016) on Connectedness ($t(327) = -.09$, $p > .05$, $d = .05$) or Happiness ($t(327) = -1.36$, $p > .05$, $d = .07$), however scores were significantly lower in Engagement ($t(327) = -4.80$, $p < .001$, $d = .28$), Perseverance ($t(327) = -6.3$, $p < .001$, $d = .35$) and Optimism ($t(327) = -4.35$, $p < .001$, $d = .24$) (Table 11).

Table 11

Comparison of Blackwood High Data to that of Kern et al. (2016)

	Blackwood High		Kern et al. (2016)		
	M	*SD*	*M*	*SD*	*M Difference*
Engagement	3.09	.84	3.33	.86	-.22
Perseverance	3.25	.83	3.54	.84	-.29
Optimism	3.32	.88	3.53	.90	-.21
Connectedness	4.00	.86	4.04	.89	-.04
Happiness	3.67	.93	3.74	.97	-.07

Note. Blackwood High *N*=327, Kern et al. (2016) *N*=3,239

3.2.2 Ill-being Comparison

Ill-being data from this study were compared to Tully et al. (2009) who measured ill-being in 4,039 South Australian participants aged 12 to 18 (Figure 4).

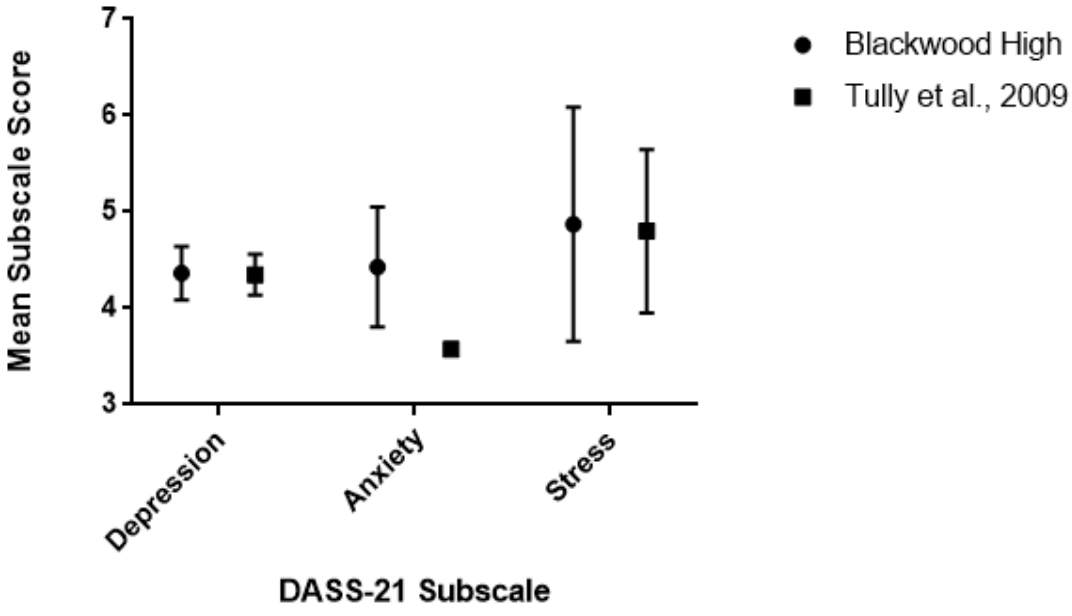

Figure 4. Comparison of Blackwood High Ill-being data to that of Tully et al. (2009). Error labels indicate one standard deviation. *Note*: Error bars for Anxiety are smaller than the symbol of the mean. *Note*. Blackwood High N=327, Kern et al. (2016) N=3,239

Blackwood High did not significantly differ to Tully et al. (2009) on Depression ($t(327) = 1.56$, $p > .05$, $d = .08$) or Stress ($t(327) = 1.49$, $p > .05$, $d = .08$) however the score was significantly higher for Anxiety ($t(327) = 5.96$, $p < .001$, $d = .35$) (Table 12).

Table 12

Comparison of Blackwood High Data to that of Tully et al. (2009)

	Blackwood High		Tully et al. (2009)		
	M	*SD*	*M*	*SD*	*M Difference*
Depression	4.56	4.17	4.20	4.50	.36
Anxiety	4.87	4.00	3.50	3.60	1.32
Stress	5.73	4.01	5.40	4.20	.33

Note. Blackwood High *N*=327, Tully et al. (2009) *N*=4,039

The proportion of students who fall within each clinical category of the DASS-21 are presented in Figure 5. 19% of students in the current study fall into this category for Anxiety, 9% for Depression and 1% for Stress. The 'Severe/Extreme' category is the top clinical category which suggests clinically significant levels of emotional disturbance which could impact academic performance. Visual examination of Figure 5 reveals the majority of students fall within the 'Normal/Mild' range. This suggests the significant difference observed for Anxiety between the data in this study and Tully et al. (2009) could be driven by the 'Severe/Extreme' score of 19% of the students.

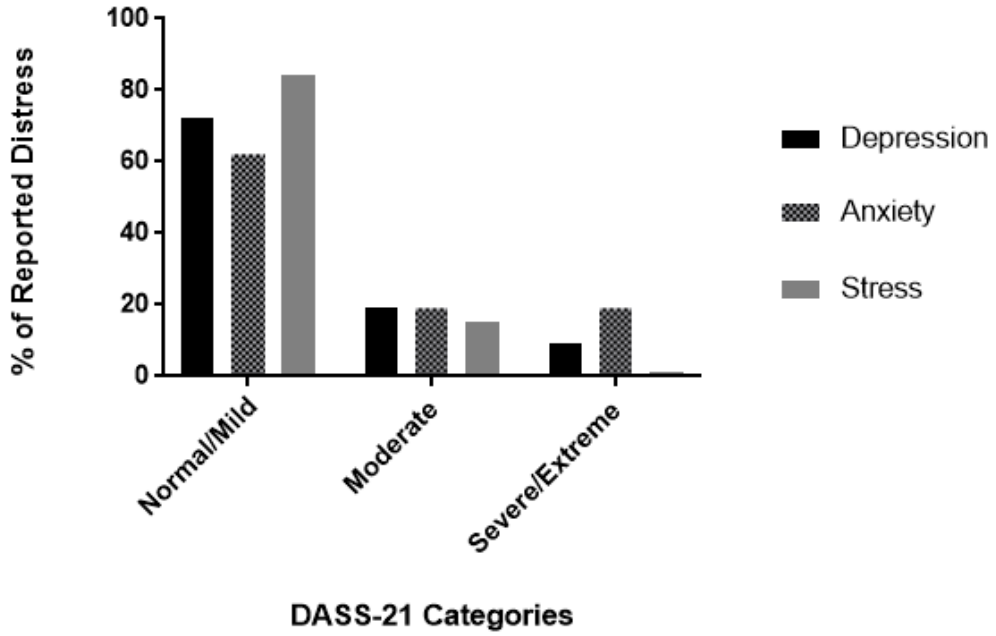

Figure 5. Percentages of students who fall within the DASS-21 categories for each of the sub-scales. *Note. N*=327

3.3 Aim 2: To Investigate Psychological Health as a Predictor of Academic Performance

3.3.1 Hypothesis 1 - It is Expected that Well-being would be Negatively Correlated with Ill-being

Based on findings at Blackwood High by Branson (2015) and Halliday (2014), it was hypothesised that well-being would be negatively correlated with ill-being. Supporting this hypothesis a significant moderate negative correlation between total well-being and total ill-being was found (r = -.43, p <.001) (Table 13).

Table 13

Pearson Product-Moment Correlation Matrix between Measures of Well-being and Ill-being

	1	2	3	4	5	6	7	8	9	10
1. Engagement	-	.49**	.59**	.47**	.63**	.78**	-.30**	-.16**	-.22**	-.25**
2. Perseverance		-	.58**	.47**	.50**	.74**	-.31**	-.24**	-.22**	-.28**
3. Optimism			-	.59**	.74**	.87**	-.48**	-.33**	-.36**	-.43**
4. Connectedness				-	.64**	.78**	-.30**	-.23**	-.17**	-.25**
5. Happiness					-	.87**	-.59**	-.40**	-.43**	-.52**
6. Total Well-being						-	-.49**	-.34**	-.35**	-.43**
7. Depression							-	.74**	.74**	.90**
8. Anxiety								-	.77**	.92**
9. Stress									-	.92**
10. Total Ill-being										-

Note. N=327, **p* <.05 (two-tailed), ***p* <.001 (two-tailed).

3.3.2 Hypothesis 2 - It is expected that Well-being would be Positively Correlated with Both Concurrent Academic Performance and Performance at the 6-month Follow-up

Each well-being subscale positively correlated with academic performance (Table 14) supporting the Broaden-and-Build Theory that a positive mental state is linked to academic performance. A significant positive relationship was found between total well-being and academic performance for both concurrent (r=.23, p <.001) and 6-month follow-up performance (r=.24, p <.001) suggesting measures of psychological well-being at Semester 1 may have predictive power 6 months later at Semester 2. Based on these findings, the hypothesis was supported as higher rates of well-being were correlated with higher rates of academic performance.

Table 14

Pearson Product-Moment Correlation Matrix between Measures of Well-being with Concurrent and 6-month Follow-up Academic Performance

	Concurrent Academic Performance	6-month Follow-up Academic Performance
Engagement	.01	.11
Perseverance	.28**	.31**
Optimism	.20**	.18**
Connectedness	.19**	.18**
Happiness	.16**	.18**
Total Well-being	.23**	.24**

Note. N=327, *p <.05 (two-tailed), **p <.001 (two-tailed).

3.3.3 Hypothesis 3 - It is expected that Ill-being would be Negatively Correlated with Both Concurrent Academic Performance and Performance at the 6-month Follow-up

Previous studies have indicated students with higher rates of ill-being exhibit lower rates of academic performance (Gumora & Arsenio, 2002; Valiente et al., 2012) therefore it was hypothesised that ill-being would negatively correlate with both concurrent academic performance and performance at the 6-month follow up. Support for this hypothesis was found at the 6-month follow up (r= -.12, p <.5) with a marginal significant negative effect, but not at the concurrent mark (r= -.09, p >.05) (Table 15). It was concluded that lower rates of ill-being were correlated with lower rates of academic performance but only at the six-month follow-up.

Table 15

Pearson Product-Moment Correlation Matrix between Measures of Ill-being with Concurrent and 6-month Follow-up Academic Performance

	Concurrent Academic Performance	6-month Follow-up Academic Performance
Depression	-.13*	-.15**
Anxiety	-.08	-.09
Stress	-.05	-.10
Total Ill-being	-.09	-.12*

Note. N=327, *p <.05 (two-tailed), **p <.001 (two-tailed).

3.4 Aim 3: To Investigate if Differences Exist between Gender and Year Level in Terms of Academic Performance

3.4.1 Hypothesis 4 – There will be a Significant Difference between Males and Females in Regards to Well-being, Ill-being and Academic Performance

Previous studies have indicated gender differences exist for well-being, ill-being and academic performance (Allgood-Merten et al., 1990; Bluth & Blanton, 2015; Bluth et al., 2017; Pomerantz et al., 2002). In order to fully explore the relationships between these variables, several statistical analysis were utilised including 2x3 ANOVA, Repeated Measures ANOVA and Independent Samples t-test. Preparation of variables for analysis involved division of the range of possible well-being and ill-being scores into low, medium and high categories. Academic performance was based on Semester 1 grades as they were recorded concurrently with psychological measures.

3.4.1.1 ANOVA between Gender, Wellbeing and Academic Performance

An ANOVA was performed to investigate gender and well-being on academic performance. The main effects for gender and well-being were significant however the interaction effect was not (Table 16).

Table 16

ANOVA Assessing Gender and Well-being on Academic Performance

Effect		*p*	Partial η^2
Gender	$F(1,327) = 16.14$	.00**	.05
Well-being	$F(2,326) = 10.06$	.00**	.06
Gender x Well-being	$F(2,326) = 1.68$	.19	.01

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed)

3.4.1.2 Independent Samples t-test Comparing Gender on the Domains of Well-being

To generate post-hoc analysis concerning gender differences on the domains of well-being, independent samples t-test analysis was performed. Results showed significant mean differences on Engagement, Optimism and Happiness supporting the hypothesis (Table 17; Figure 6). Males experienced greater well-being evidenced by higher Means on Engagement (Male: *M=3.23, SD=.82;* Female: *M=2.94, SD=.83)* Optimism (Male: *M=3.45, SD=.83;* Female: *M=3.19, SD=.83)* and Happiness (Male: *M=3.83, SD=.86;* Female: *M=3.52, SD=.97)* (Detailed Analysis Appendix H).

Table 17

Post-Hoc Analysis Comparing Males and Females on the domains of Well-being

Domain		*p*	*M Difference*
Engagement	$t(325) = 3.17$	.002*	.29
Perseverance	$t(325) = .45$	.650	.04
Optimism	$t(325) = 2.75$	.006*	.26
Connectedness	$t(325) = -.71$	.479	-.07
Happiness	$t(325) = 3.04$	.003*	.31

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed)

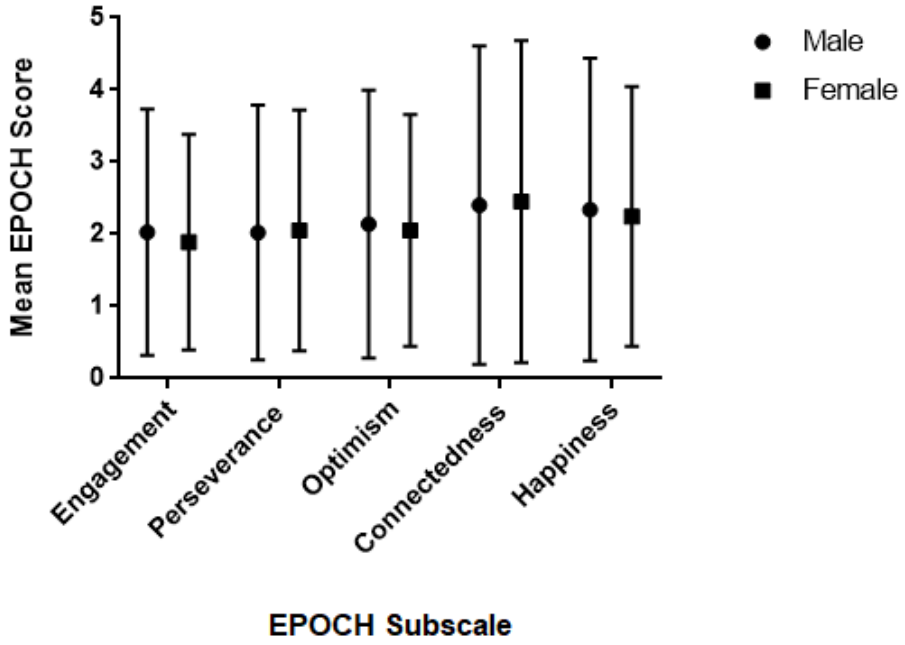

Figure 6. Mean EPOCH scores by Gender. Error Labels Indicate One Standard Deviation.

Note. N=327

3.4.1.3 ANOVA between Gender, Ill-being and Academic Performance

An ANOVA was performed to investigate gender and ill-being on academic performance. The main effects for gender and ill-being were significant however the interaction effect was not (Table 18).

Table 18

ANOVA Assessing Gender and Ill-being on Academic Performance

Effect		*p*	*Partial* η^2
Gender	$F(1,327) = 7.00$	.01*	.02
Ill-being	$F(2,326) = 3.66$	.03*	.02
Gender x Ill-being	$F(2,326) = .01$	1.0	.00

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed)

3.4.1.4 Independent Samples t-test Comparing Gender on the Domains of Ill-being

To generate post-hoc analysis concerning gender differences on the subscales of ill-being, independent samples t-test analysis was performed. Results showed significant mean

differences on all domains; Depression, Anxiety and Stress supporting the hypothesis (Table 19; Figure 7). Females experienced greater ill-being evidenced by higher means on Depression (Female: *M=6.99, SD=4.11;* Male: *M=4.47, SD=3.49)* Anxiety (Female: *M=5.48, SD=3.40;* Male: *M=3.64, SD=3.71)* and Stress (Female: *M=5.94, SD=4.19; M*ale: *M=3.79, SD=3.47).*

Table 19

Post-Hoc Analysis Comparing Males and Females on the domains of Ill-being

Domain		*p*	*M Difference*
Depression	*t*(325) = -5.98	.00**	-2.52
Anxiety	*t*(325) = -4.08	.00**	-1.84
Stress	*t*(325) = -5.06	.00**	-2.15

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed)

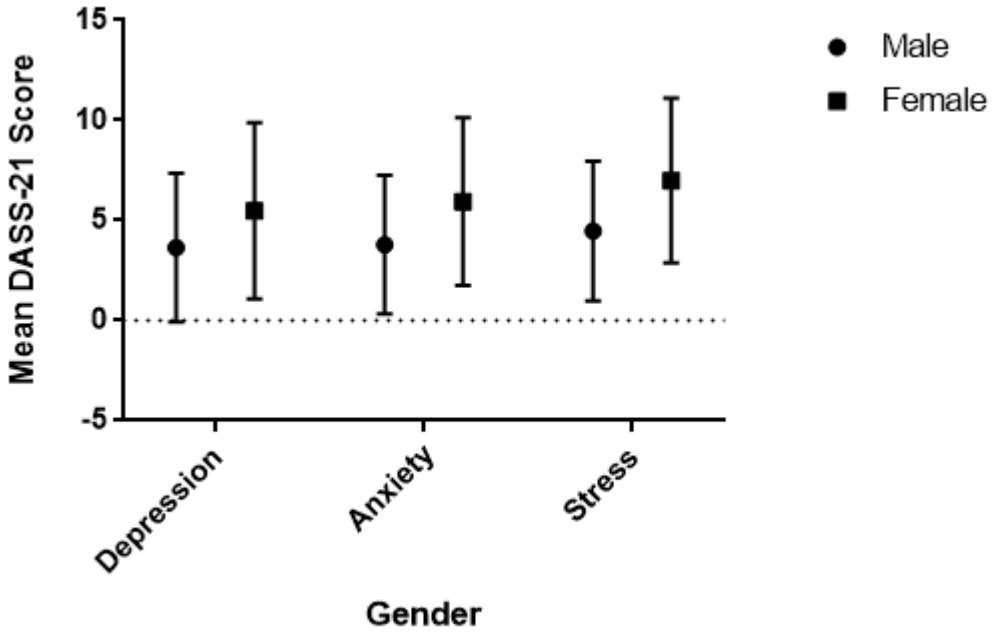

Figure 7. Mean DASS-21 scores by gender. Error labels indicate one standard deviation.

Note. N=327. Y axis is represented below zero as the standard deviation fell on zero.

3.4.1.5 Comparing Concurrent Academic Performance and Performance at the 6-month Follow-up between Genders

A Repeated Measures ANOVA was then conducted to directly compare concurrent academic performance with performance at the 6-month follow-up across genders. Results suggest a significant main effect for gender ($F(1,325)= 8.55$, $p < .05$, Partial $\eta^2 = .03$) but not academic performance ($F(1,325)= 0.35$, $p = .55$, Partial $\eta^2 = .00$). Females were found to perform higher academically than males for both the concurrent analysis (Female M=3.18, SD=.54; Male M=2.85, SD=.57) and analysis at the 6-month follow-up (Female M=3.12, SD=.62; Male M=2.80, SD=.62) (Figure 8).

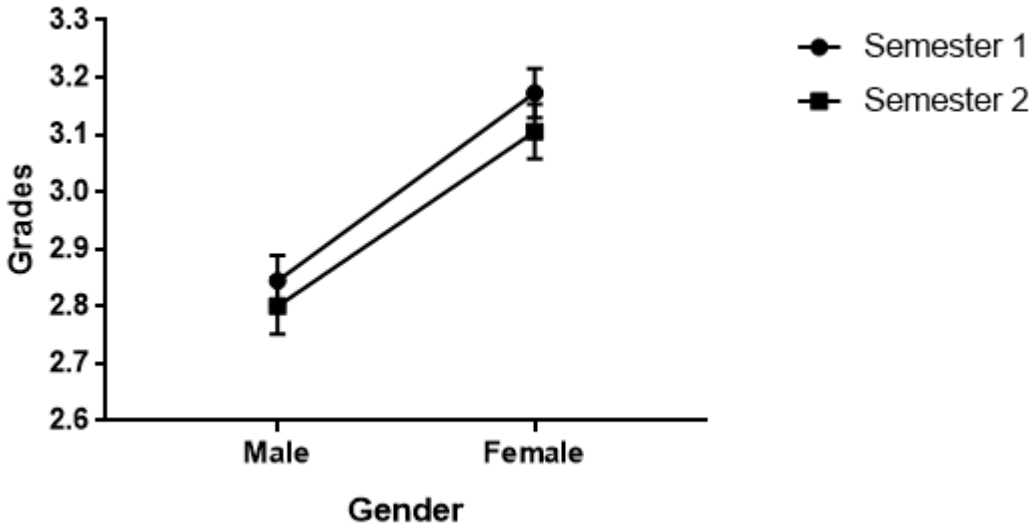

Figure 8. Comparison between concurrent academic performance and performance at the 6-month follow-up between genders. *Note. N*=327

3.4.2 Hypothesis 5 – There will be a Significant Difference between Year Levels in regards to Well-being, Ill-being, and Academic Performance.

Previous studies have indicated year level differences may exist for well-being, ill-being and academic performance (Jacobs et al., 2002; Simons-Morton & Crump, 2003).

Furthermore fluctuations in academic based pressures may also contribute to year level differences.

3.4.2.1 Correlations between Year Level, Well-being and Academic Performance

Investigation of year level differences within the total well-being and academic performance relationship suggested year level is not related to well-being (r= -.05, p >.05) or academic performance (r=-.08, p >.05). Support was not found for this hypothesis as no significant relationship was found suggesting no age related effects exist.

3.4.2.2 Correlations between Year Level, Ill-being and Academic Performance

Investigation of year level differences within the total ill-being and academic performance relationship suggested year level is not related to ill-being (r= -.06, p >.05) or academic performance (r= -.08, p >.05). Support was not found for this hypothesis as no significant relationship was found suggesting no age related effects exist.

3.5 Aim 4: To Compare the Relative Predictive Strength of Well-being and Ill-being on Academic Performance

Regression analysis was employed to investigate the influence of total well-being and ill-being to concurrent academic performance and performance at the 6-month follow-up.

3.5.1 Concurrent Academic Performance

Semester 1 grades were examined to investigate the concurrent predictive power of total well-being and total ill-being on academic performance. Results indicated the overall regression model was significant (F(2,324) = 8.96, p <.001, R^2 = .05) with variables accounting for 5% of the variance in concurrent academic performance. Although total ill-being and academic performance are significantly correlated at Semester 1, only total well-being made a significant contribution to the prediction of concurrent academic performance (Table 20).

Table 20

Total Well-being and Total Ill-being Contributing to Concurrent Performance

Variable	B	SE_B	β
Constant	3.00	.03	
Total Well-being	.14	.04	.23**
Total Ill-being	.01	.04	.01

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed).

3.5.2 Six month Follow-Up Academic Performance

Semester 2 grades taken at the 6-month follow-up were examined to investigate the predictive power of total well-being and total ill-being on academic performance. Results indicate the overall regression model was significant ($F(2,324) = 9.56$, $p < .001$, $R^2 = .06$) with the variables accounting for 6% of the variance in Semester 2 grades. Although total ill-being and academic performance are significantly correlated at Semester 2, only total well-being made a significant contribution to the prediction of academic performance at the 6-month follow-up (Table 21).

Table 21

Total Well-being and Total Ill-being Contributing to Performance at the 6-month Follow-up

Variable	B	SE_B	β
Constant	2.95	.03	
Total Well-being	.14	.04	.22**
Total Ill-being	-.02	.04	-.03

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed).

3.5.3 Isolating the Well-being Relationship with Academic Performance

As shown in the previous two analysis, total ill-being did not contribute to the prediction of academic performance and was therefore not included in this supplementary analysis. A regression was conducted which investigated the contribution of the individual well-being subscales to predictive academic performance at Semester 2 (Table 22).

Table 22

Well-being sub-scales Contributing to Academic Performance at the 6-month Follow-up

Variable	B	SE_B	β
Constant	2.13	.20	
Engagement	-.80	.05	-.10
Perseverance	.24	.05	.31**
Optimism	-.02	.06	-.03
Connectedness	.04	.05	.05
Happiness	.06	.06	.08

Note. N=327. **p* <.05 (two-tailed), ***p* <.001 (two-tailed).

Assessment of the well-being subscales and Semester 2 grades produced a significant regression model ($F(5,326) = 7.37$, $p < .001$, $R^2 = .10$) however Perseverance was the only significant contributor and therefore identified as the strongest predictor ($t(5,326) = 4.58$, $p < .001$, SEM = 05).

CHAPTER 4 - Discussion

The present study built upon four years of measuring well-being in students at Blackwood High. It aimed to establish the current levels of well-being and ill-being and compare them to normative samples assessing the validity of comparative inference. The relationship between psychological health and academic performance was explored along with gender and year level differences. Finally, the ability of well-being and ill-being to predict academic performance was investigated. To the author's knowledge, this is the first study investigating the relationship between adolescent well-being and academic performance incorporating a longitudinal design. The results produced novel findings but also contributed to a well-established body of research demonstrating psychological and academic differences. Results, implications, limitations and future directions are discussed below in terms of research aims.

4.1 Aim 1: To Describe Current Levels of Well-being and Ill-being at Blackwood High with Comparison to Normative Samples

The EPOCH domains Connectedness and Happiness coupled with the DASS-21 domains Depression and Stress did not differ from normative samples however students demonstrated lower levels of Engagement, Perseverance, and Optimism along with higher levels of Anxiety than the comparison cohorts. This could indicate students at Blackwood High differ from the comparison study although alternate explanations are offered below.

4.1.1 Current Levels of Well-being Compared to the Normative Sample

The differences observed between the results of this study and the Kern et al. (2016) study in the EPOCH domains Engagement, Perseverance and Optimism may be partially attributable to the characteristics of the comparison study. Female participation in this study was 50.2% compared to a lower percentage of 41.8% in the comparison study. Female participants in this study scored lower than males across Engagement, Perseverance and

Optimism. This potentially reduced the scores for the EPOCH domains as there were 8.4% more females in this study than in the Kern et al. (2016) study. This difference in sample characteristics may have contributed to the statistical differences observed.

An equally plausible explanation lies within the EPOCH measure itself. Samples used to create the measure included participants from Australia, China and America. The extent to which the measure was adapted to take into account different cultural values and beliefs is unclear. Highlighting the intrinsic importance of cross-cultural adaptation; a study comparing national differences in well-being across China and America found marked variations between the two nations. The Chinese population reported lower well-being than their American counterparts (Diener, Suh, Smith, & Shao, 1995) which suggests a potential cross-cultural impact on the comparison data. Nonetheless, students in the current study scored highest in Connectedness and lowest in Engagement consistent with both Kern et al. (2016) and Branson (2015) indicating comparative inference is still viable.

4.1.2 Current Levels of Ill-being Compared to the Normative Sample

Depression and Stress were not statistically different to the Tully et al. (2009) comparison sample however students reported higher levels of Anxiety than the comparison. This high Anxiety level is consistent with past research at Blackwood High undertaken by Branson in 2015. The comparison sample consisted of South Australian students aged 12 to 18 years. Gender was more closely aligned to this study as female participation was 53% compared to 50.2% in this study. Data collection occurred in the first Semester for both studies making time of collection an unlikely factor to explain the high level of Anxiety in this study. The difference is possibly driven by the fact that 19% of students at Blackwood High were categorised as having ‘Severe/Extreme’ levels of Anxiety resulting in a higher mean score.

This difference could be explained by a nation-wide increase in public awareness around mental health issues. Recent government-funded Australian health initiatives have aimed to provide a heightened understanding of mental health to destigmatise mental health problems (Commonwealth of Australia, 2009; Mental Health Commission, 2012). Students at Blackwood High could have had exposure to these initiatives and may have felt more comfortable in responding openly and honestly to the questionnaire.

To summarise Aim 1, the elevated levels of Anxiety coupled with lower levels of Engagement, Perseverance and Optimism limits the external generalisability beyond Blackwood High. This study still provides insights into student ill-being that Blackwood High can draw upon when constructing their curriculum and making decisions regarding PPIs. As ill-being has a direct financial cost, the use of PPIs in an effort to reduce Anxiety levels could have a direct benefit to both students and the broader Australian community.

4.2 Aim 2: To Investigate Psychological Health as a Predictor of Academic Performance

Overall, higher rates of well-being corresponded to lower rates of ill-being, and levels of well-being behaved as a predictor of academic performance however ill-being did not.

4.2.1 Higher Well-being Linked to Lower Ill-being

As anticipated and consistent with other studies (Branson, 2015; Halliday, 2014), the first hypothesis that well-being would negatively correlate with ill-being was supported. A negative relationship was found between well-being and ill-being, meaning as well-being increased ill-being decreased. This finding has practical implications as it suggests PPIs that focuses on increasing well-being may simultaneously decrease ill-being.

4.2.2 Higher Well-being Linked to Academic Performance at Both Time Points

The second hypothesis was supported with results showing well-being positively correlated with both concurrent academic performance and performance at the 6-month

follow-up. This is in line with the Broaden-and-Build theory that experiencing positive emotions (well-being) generates broad thought-action repertoires that ultimately build intellectual and social resources (Fredrickson, 2001). Students who reported higher levels of well-being achieved higher rates of academic success.

4.2.3 Higher Ill-being Linked to Academic Performance Only at the 6-month Follow-up

Hypothesis three which predicted higher rates of ill-being would correlate with lower rates of concurrent academic performance and 6-month follow-up performance was not supported. While ill-being did correlate with academic performance at the 6-month follow-up, it did not influence performance at the concurrent time point. Although this issue is outside the scope of the current study, it may be of interest to future researchers as results are inconsistent with previous findings that students with high levels of ill-being report lower rates of academic performance (Gumora & Arsenio, 2002; Valiente et al., 2012).

One credible explanation relates to views emerging within the literature questioning the use of the DASS-21 in an adolescent population. Detractors suggest it lacks the ability to differentiate between the three states of Depression, Anxiety and Stress (Runions, & Zubrick, 2017). Some researchers propose the three states are largely indistinguishable in adolescents and rather than measuring three discriminable emotion dimensions as it does in adults, the DASS-21 may measure one single distress dimension in adolescents (Hashim, Golok, & Ali, 2011; Patrick, Dyck, & Bramston, 2010; Shaw, Campbell).

One proposal is that adolescents may not have developed adult like emotional states as assessed in the DASS-21. This idea was highlighted in an Australian study by Shaw et al. (2017) involving close to 3,000 students aged 12 to 18 years which found most of the variation was explained by the dominance of a single general factor while the subscales lacked specificity across all age groups. The study proposed the DASS-21 is a reliable

measure of ‘general distress’ in adolescents but advocate for the use of bi-factor models to differentiate the dimensions of complex constructs using scales such as the DASS-21. The well-being data for this study was collected prior to the publication of the Shaw et al. (2017) article release however future studies could consider this when designing their study.

4.3 Aim 3: To Investigate Gender and Year Level as a Predictor of Academic Performance

Overall, gender but not year level behaved as a predictor of academic performance.

4.3.1 Gender Differences between Well-being, Ill-being and Academic Performance

A significant difference was found between genders in regards to well-being, ill-being and academic performance. Females displayed higher levels on all ill-being measures while males displayed higher levels on the well-being measures of Engagement, Optimism, and Happiness. Despite reporting higher levels of ill-being, females scored higher in both concurrent academic performance and performance at the six-month follow-up. As Perseverance was the main factor influencing academic performance, it would be plausible that females would score higher than males in Perseverance. However results did not confirm Perseverance differences between genders highlighting an area which requires further investigation.

For both genders, academic performance at the six-month follow-up was significantly lower than when measured concurrently. One possible explanation was proposed by Wang and Eccles (2012) who suggest academic motivation declines throughout middle-school for both genders. Another plausible explanation as provided by Blackwood High is that both genders were under pressure at the 6-month follow-up to make critical academic decisions regarding upcoming course selection possibly impacting academic performance.

4.3.2 Year Level Displayed No Relationship with Well-being, Ill-being or Academic Performance

No significant difference was found between year levels (middle and senior-school) in regards to well-being, ill-being or academic performance therefore hypothesis five was not supported. A recent meta-analysis investigating the transition between primary and secondary school found students experienced increased anxiety and depression resulting in reductions of academic performance (Hanewald, 2013). By extension, it is possible that stress felt when transitioning from primary to middle school is equivalent to student stress felt when transitioning from middle to senior school thereby negating any statistical differences in the data.

4.4 Aim 4: To Examine the Relative Predictive Strength of Well-being and Ill-being on Academic Performance

Psychological health has predictive strength at both the concurrent and 6-month follow-up marks. Subsequent analysis found well-being to be the sole contributor with ill-being failing as a predictive factor. This finding adds a unique contribution to the literature highlighting the value of the current study. Well-being predicted 5% of the variance in concurrent academic performance and 6% at the six-month follow-up. While acknowledging the finding is modest, it is striking considering the large explanatory power of intellectual ability which accounts for over 50% (Colom, Escorial, Shih, & Privado, 2007) and past academic performance which accounts for up to 43% (Salanova et al., 2012). These results suggest measures of psychological well-being taken at the end of Semester 1 may have predictive power 6 months later.

The EPOCH domain Perseverance was the foundation of the well-being relationship with academic performance, consistent with the finding by Kern et al. (2016). Perseverance may map onto Conscientiousness, one of the personality traits in the Five-Factor Model

(FFM) as Conscientiousness has been shown to predict academic performance (Rosander & Bäckström, 2014). Empirical evidence surrounding the role personality traits play in academic achievement is mixed for all traits within the FFM except Conscientiousness which is consistently positively associated with academic achievement (Komarraju, Karau, Schmeck, & Avdic, 2011; Rosander & Bäckström, 2014). A meta-analysis by Poropat (2009) found Conscientiousness held the highest correlation with academic performance, only slightly lower than that for intelligence. Conscientiousness predicts around 6% of the variance in high school grades (Rimfeld, Kovas, Dale, & Plomin, 2016), similar to the percentage of explanatory power found in this study for Perseverance.

Measures of ill-being are most commonly considered as predictors of academic performance in the literature (Brännlund, Strandh, & Nilsson, 2017; Valiente et al., 2012). Contrary to this, the current study found well-being rather than ill-being exhibited a relationship with academic performance. Given the field of well-being is gaining prominence, additional evidence is needed before more definite conclusions can be drawn. In practice, it suggests PPIs focusing on well-being potentially give students a chance of increasing academic performance.

4.5 Implications for Positive Education and PPIs

Results of this study have real-world implications for positive education and provide valuable insights into the implementation of PPIs in schools. This study may help schools in their endeavour to develop student well-being. The current study offers evidence that higher levels of well-being correspond to lower levels of ill-being. This suggests that while addressing problem ill-being is clearly necessary, a focus on well-being could also be beneficial. Addressing ill-being may be especially relevant for females who reported significantly higher Depression, Anxiety and Stress scores. Assessing the five EPOCH domains individually found Perseverance to be the primary contributor to the relationship

between well-being and academic achievement. Armed with this knowledge, a student's ability to pursue ones goal to completion even in the face of obstacles appears vital for academic achievement, therefore PPIs specifically aimed at enhancing Perseverance would give the student the best chance to increase their academic performance.

Results indicate year level played no role in the well-being relationship with academic performance. This suggests that no particular year level has a greater need, therefore PPIs could be targeted at all year levels which may in turn create higher universal levels of well-being. It is possible that if a PPI was employed in the first half of the year, it could assist in counterbalancing the decrease in grades observed at the 6-month follow-up.

4.6 Methodological Strengths

The robust study design was one of this study's primary strengths as it investigated well-being in relation to academic performance incorporating a longitudinal component. Longitudinal studies are more powerful than cross-sectional studies and are effective in determining variable patterns over time allowing a greater degree of causal inference to be made (Rindfleisch, Malter, Ganesan, & Moorman, 2008).

It is important to the scientific endeavour that results be replicable (Andrew & Christian, 2014) therefore the reproduction of findings by Halliday (2014) and Branson (2015) significantly contributes to the body of well-being literature. The results also provide fresh insights into the complex role well-being and gender have on academic performance. Males reported higher rates of well-being and while females reported higher ill-being, overall they also had a higher level of academic achievement. The study identified that regardless of gender or year level, students with higher levels of well-being had higher levels of academic success. Furthermore, the results indicated that academic performance of both genders decreased over the school year.

This study also adds to the body of research conducted at Blackwood High since 2014 and addresses research questions of particular importance to the school. Blackwood High promotes its commitment to continually investigate how to best achieve well-being for its students and ensure any PPIs are tailored specifically to their school community. As this study was practical rather than theoretical, the findings can be implemented quickly to benefit current student cohorts. Blackwood High can utilise recommendations from this study to develop the well-being of its students to assist in meeting this commitment.

4.7 Limitations and Methodological Considerations

While the results are compelling, there are limitations to the generalisability of the findings presented here. Firstly, although Blackwood High ranked close to the Index of Community Social-Education Advantage (ICSEA) average, the external validity is limited by considering students from only one school. Considering the current sample displayed significantly differences to the comparison sample between well-being and ill-being, the study should be replicated using several other school samples before considering generalising to a nationwide school population.

The ethical requirement to gain parental/guardian consent may have introduced selection bias. By only including students who obtained consent, it cannot be guaranteed that the sample was representative of the general population as they potentially differed from those who did not obtain consent. The differences may have been on variables measured in the well-being scale such as Conscientiousness or Engagement which would bias results of this study.

Finally, it is reasonable to conceive that fatigue effects may have been a factor. The survey contained 105 items with DASS-21 and EPOCH measures situated towards the end, therefore the students may have attended to these questions with decreased accuracy (Gonzalez, Best, Healy, Kole, & Bourne, 2011).

4.8 Future Research Directions

4.8.1 Incorporation of Past Academic Performance Data

Previous research indicates a student's past academic performance is associated with future performance (Beaujean et al., 2011; Kemple et al., 2013; Salanova et al., 2012). Collection of previous years' academic data may have been advantageous as statistical analysis could have been performed assessing the impact of well-being on academic performance but controlling for past results. This would support and strengthen the finding of the predictive ability of well-being on academic performance. Collection of such data was considered an administrative burden for the school and therefore out of scope for this study however future studies are needed to explore such interactive effects.

4.8.2 Incorporation of Personality Trait Data

Personality trait data could be collected in future research to investigate if the EPOCH domains map onto the domains of the FFM. If Perseverance like Conscientiousness maps onto academic performance, it is entirely possible additional overlaps exist between the two measures. Considering the relationship between Perseverance and academic performance, future research could examine how students high in Perseverance differ from their counterparts. Perhaps they study or engage with school material differently or see difficulties as a challenge rather than an obstacle. A deeper understanding of this difference may allow PPIs to be tailored to incorporate this effect in an effort to increase academic performance.

4.8.3 Gender Diversity

While students who identified as gender diverse were excluded from the current sample due to an insufficient population (n=5), separate analysis revealed they exhibit higher levels of ill-being and lower levels of well-being than their counterparts at Blackwood High. This is in line with previous findings that in general, gender diverse people's mental health and well-being is markedly worse than that of the general population (Mustanski, Garofalo &

Emerson, 2010). It is important to note that the research does not indicate that poorer mental health is inherent to being gender diverse, rather poorer mental health and ill-being is caused by stigma, social exclusion, discrimination, and bullying (Ryan et al., 2010). This finding warrants further investigation with a larger population as these students are potentially at risk of decreased academic performance. This could be performed in conjunction with qualitative approaches which allow deeper investigation into the experiences of gender diverse students.

4.9 Conclusions

There are several points of interest that can be taken from the reported results. For example, well-being predicts 5 to 6% of variance in academic performance with Perseverance the most significant predictor. Perseverance can be learned through positive education programs, unlike intelligence which although a strong predictor of academic performance cannot be taught. Even small increases gained through PPI programs may have cumulative effects in performance over a student's academic life. The intricacy in understanding gained from the current study has clear applications for positive education within schools. The results offer educators an avenue for simultaneously improving student well-being and educational achievement. On the basis of these findings, it would be reasonable of schools to run programs that promote well-being.

It is hoped that results of this research will inspire further investigations concerning well-being and academic performance to guide future PPI programs. A future where students are given every opportunity to increase their well-being may help lay the foundation for a generation with lower levels of ill-being. The long-term benefits may well carry forward into other spheres of life and provide a positive impact on the personal and social success of Australia for years to come.

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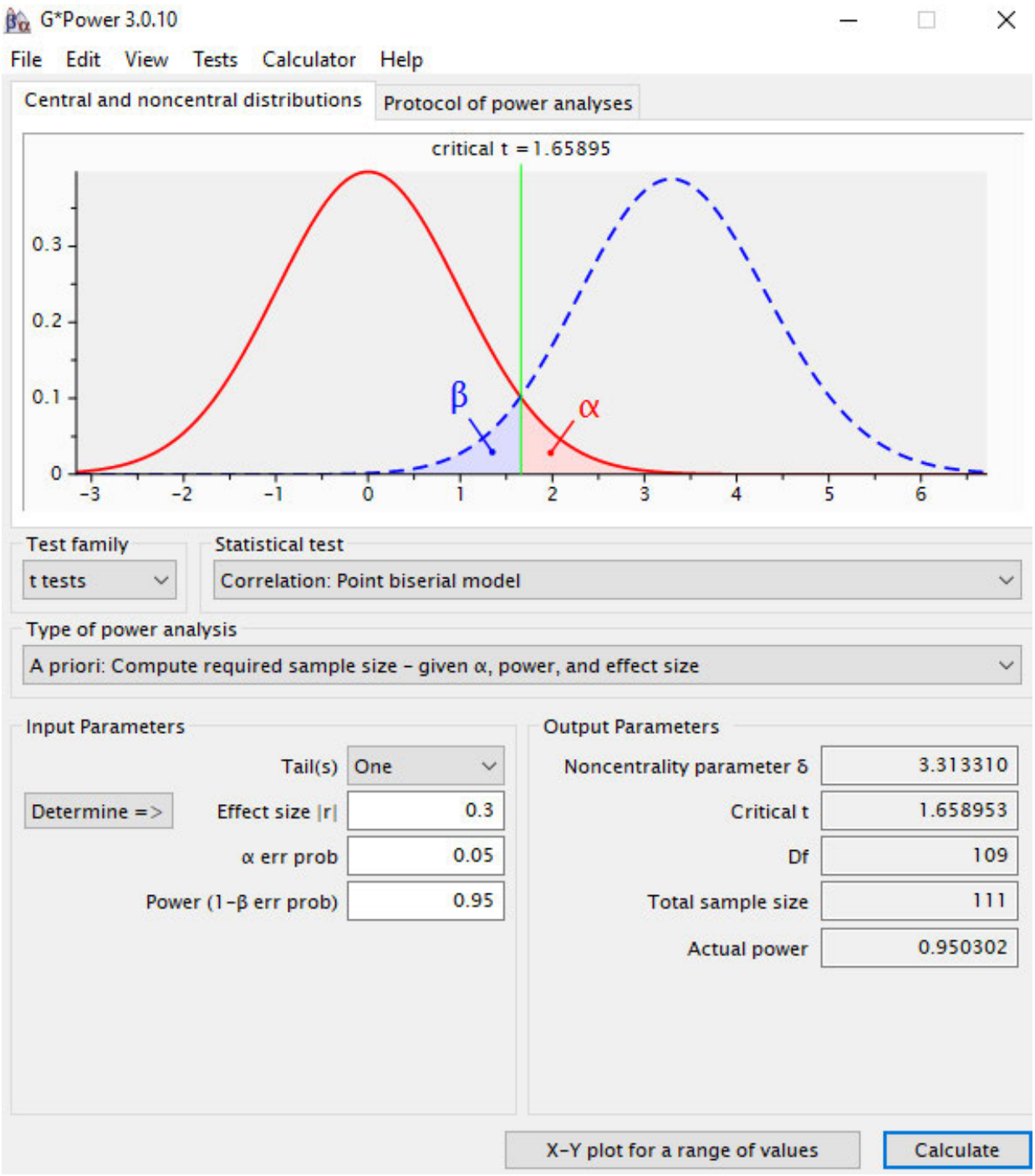
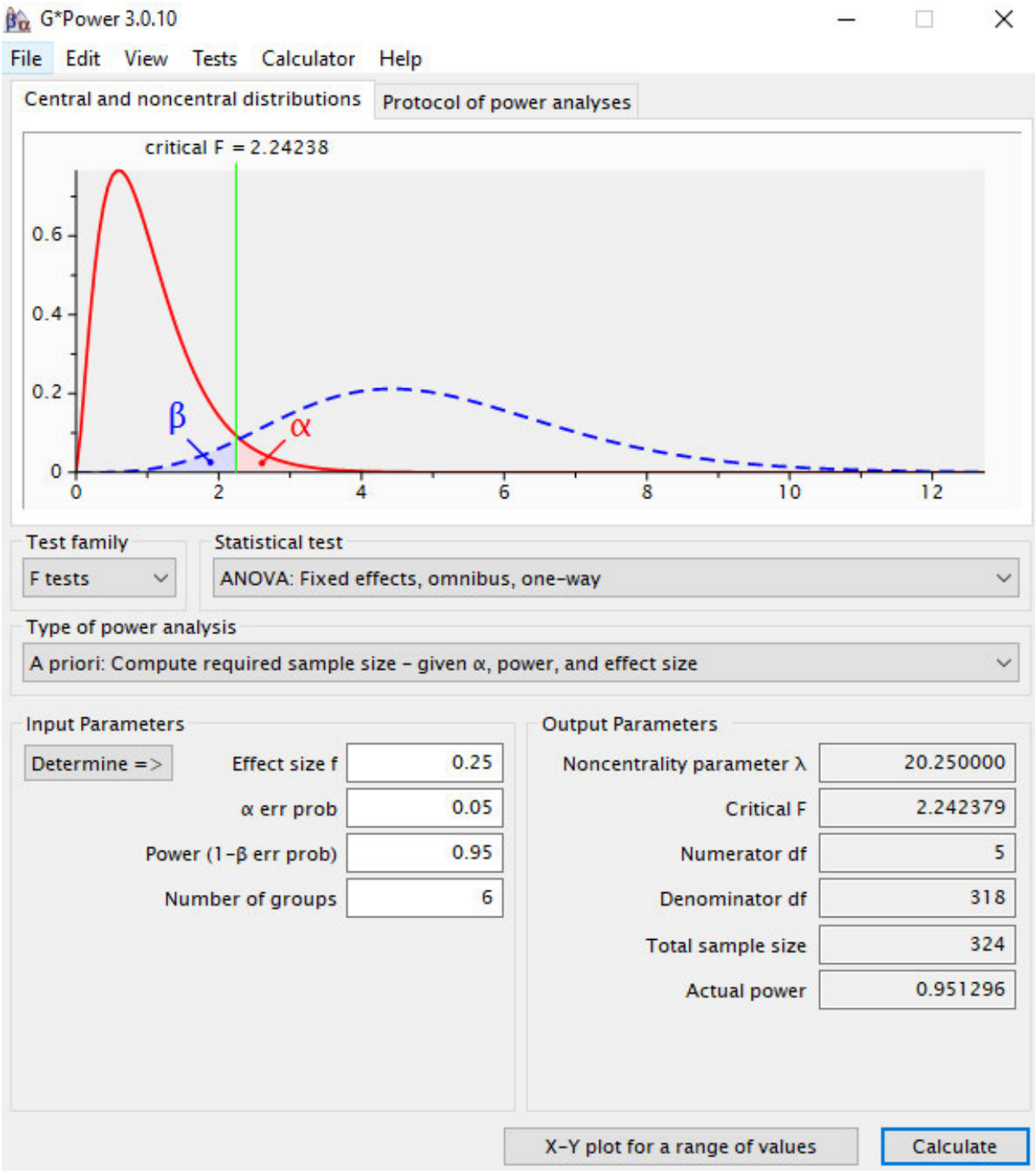
Appendix A: Power Analysis

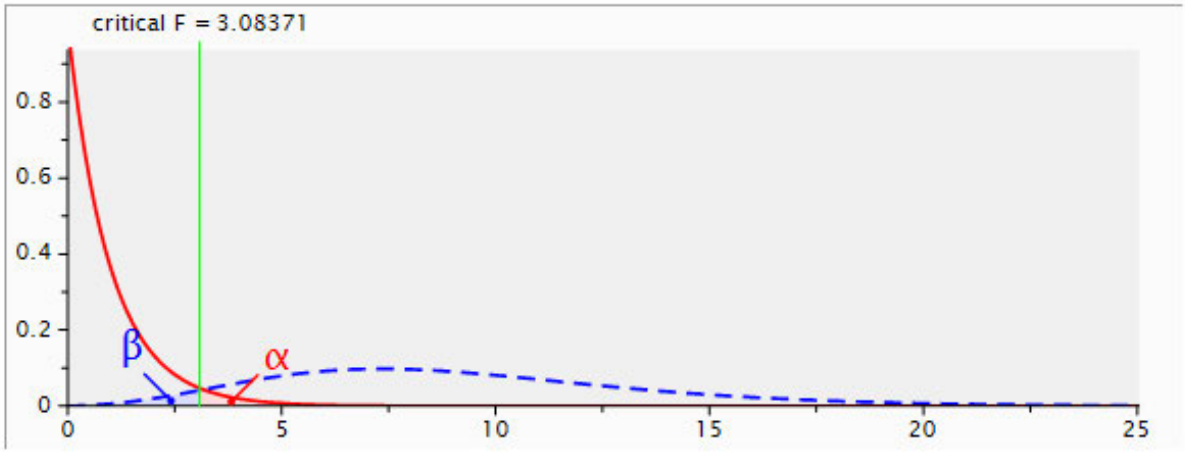



G*Power 3.0.10
File Edit View Tests Calculator Help
Central and noncentral distributions
Protocol of power analyses
critical F = 2.24238
0.6
0.4
0.2
0
β
α
0 2 4 6 8 10 12
Test family
F tests
Statistical test
ANOVA: Fixed effects, omnibus, one-way
Type of power analysis
A priori: Compute required sample size – given α, power, and effect size
Input Parameters
Determine =>
Effect size f 0.25
α err prob 0.05
Power (1-β err prob) 0.95
Number of groups 6
Output Parameters
Noncentrality parameter λ 20.250000
Critical F 2.242379
Numerator df 5
Denominator df 318
Total sample size 324
Actual power 0.951296
X-Y plot for a range of values
Calculate

G*Power 3.0.10

File Edit View Tests Calculator Help

Central and noncentral distributions | Protocol of power analyses



Test family: F tests

Statistical test: Multiple Regression: Omnibus (R^2 deviation from zero)

Type of power analysis: A priori: Compute required sample size – given α, power, and effect size

Input Parameters

Determine =>	
Effect size f^2	0.15
α err prob	0.05
Power (1–β err prob)	0.95
Number of predictors	2

Output Parameters

Noncentrality parameter λ	16.050000
Critical F	3.083706
Numerator df	2
Denominator df	104
Total sample size	107
Actual power	0.951856

X-Y plot for a range of values | Calculate

Appendix B: Questionnaire

BLACKWOOD HIGH SCHOOL

THE UNIVERSITY OF ADELAIDE AUSTRALIA

Measures of Blackwood High School

This questionnaire will help Blackwood High School understand the things that help you do well, feel good and enjoy your life. It will only take approximately 15 – 25 minutes to complete. Please be honest; it is private and there are no wrong answers. And thanks for doing it.

We need to tell you:

- We treat your information with absolute confidentiality - individuals will not be identified, data will only be examined on an aggregate basis. Data may be linked to other outcome data held by the school without re-identification.
- You can withdraw at any time, but your participation and honest answers will help your school to better teach you. If you decide not to do it, your teacher will give you another activity to complete.

If you experience any emotional distress from answering the questions, you can speak to one of the school's Student Counsellors, your Care Group teacher, your Year Level Leader or you can contact The Kids Helpline on 1800 55 1800 or at www.kidshelp.com.au

Consent page

By checking the button below, I agree that;

- **I have read the above information**
- **I voluntarily agree to participate**
- **I understand I am free to withdraw at any time without penalty**
- **I am at least 13 years of age today**

AGREE

Next

Part 1 of 5: This is a just a bit of background information about you.

STUDENT ID* .....

AGE TODAY* .....

GENDER IDENTITY* Male | Female | Gender diverse✧

DO YOU SPEAK A LANGUAGE OTHER THAN ENGLISH AT HOME?* Yes | No

✧Here *gender diverse* includes (but is not limited to) transsexual, intersex, gender fluid, androgynous, non-binary, and 'unsure'.

Part 2 of 5: This part is about your general health.
Pay careful attention to the *time span* that each question is asking you about.

The following questions are about your sleep.

1. Figure out how long you usually sleep for *on a normal 'school night'* (i.e Sun, Mon, Tue, Wed, Thu) and fill it in here. [Do not include the time you spend in bed awake.]

_____hours* and _____minutes*

2. Now think about how long you usually sleep for *on a weekend night* (i.e. Fri, Sat) and fill it in here. [Do not include the time you spend in bed awake.]

_____hours* and _____minutes*

3. *During a usual week,* I fall asleep during my morning classes. *

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

4. *During a usual week,* I go through the whole school day without feeling tired.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

5. *During a usual week,* I fall asleep during the last class of the day.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

6. *During a usual week,* I feel drowsy if I ride in a car for longer than five minutes.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

7. *During a usual week,* I feel wide-awake the whole day.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

8. *During a usual week,* I fall asleep at school in the afternoons. *

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

9. *During a usual week* I feel alert during my classes.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

10. *During a usual week,* I feel sleepy in the evening after school.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

11. *During a usual week,* I feel sleepy when I ride in a bus to a school event like an excursion or sports game.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

12. *During a usual week,* in the morning when I am in school, I fall asleep.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

13. *During a usual week,* when I am in class, I feel wide-awake.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

14. *During a usual week,* I feel sleepy when I do my homework in the evening after school.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

15. *During a usual week,* I feel wide-awake the last class of the day.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

16. *During a usual week,* I fall asleep when I ride in a bus, car, or train.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

17. *In a usual week, d*uring the school day there are times when I realize that I have just fallen asleep.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

18. *During a usual week,* I fall asleep when I do schoolwork at home in the evening.*

Never (0 times permonth).....
Rarely (less than 3 times per month).....
Sometimes (1-2 times per week) .....
Often (3-4 times per week) .....
Almostevery day (5 or more times per week) .....

This next part is about your level of physical activity *in the last 7 days*. Physical activity is not only sport, it is defined as "any bodily movement produced by skeletal muscles that requires energy expenditure". Of course this includes sports, but also games or other activities that make you move around, breathe hard, sweat or make your body feel tired. Remember that there are no right and wrong answers — this is not a test.

---

19. Physical activity in your spare time: Have you done any of the following activities in the *last 7 days (last week)*? If yes, how many times? (Mark only one option per row.)*

	None	1-2	3-4	5-6	7 times or more
Football / Rugby	.....	.....	.....	.....	
Netball	.....	.....	.....	.....	
Tennis	.....	.....	.....	.....	
Swimming	.....	.....	.....	.....	
Cricket	.....	.....	.....	.....	
Soccer	.....	.....	.....	.....	
Basketball	.....	.....	.....	.....	
Athletics	.....	.....	.....	.....	
Baseball, softball	.....	.....	.....	.....	
Rowing/canoeing	.....	.....	.....	.....	
Skateboarding	.....	.....	.....	.....	
In-line skating	.....	.....	.....	.....	
Kicking the footy / playing catch	.....	.....	.....	.....	
Tag or similar	.....	.....	.....	.....	
Walking for exercise / transport	.....	.....	.....	.....	
Bicycling for exercise / transport	.....	.....	.....	.....	
Aerobics /weights or resistance training	.....	.....	.....	.....	
Jogging or running	.....	.....	.....	.....	
Dance	.....	.....	.....	.....	
Volleyball	.....	.....	.....	.....	
Table tennis	.....	.....	.....	.....	
Other:					
_____	.....	.....	.....	.....	
_____	.....	.....	.....	.....	

20. In *the last 7 days*, during your *physical education (PE) classes*, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)*

I don't do PE .....
Hardly ever .....
Sometimes .....
Quite often .....
Always .....

21. In *the last 7 days*, what did you normally do *at lunch* (besides eating lunch)? (Check one only.)*

Sat down (talking, reading, doing schoolwork).....
Stood around or walked around .....
Ran or played a little bit .....
Ran around and played quite a bit .....
Ran and played hard most of the time .....

22. In *the last 7 days*, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)*

None .....
1 time last week .....
2 or 3 times last week .....
4 times last week .....
5 times last week .....

23. In *the last 7 days*, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)*

None .....
1 time last week .....
2 or 3 times last week .....
4 or 5 last week .....
6 or 7 times last week .....

24. *Last weekend*, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)*

None .....
1 time .....
2 — 3 times .....
4 — 5 times .....
6 or more times .....

25. Which one of the following describes you best for the *last 7 days*? Read all five statements before deciding on the one answer that describes you in the last week.*

All or most of my free time was spent doing things that involve *little physical effort* .....
I *sometimes* (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) .....
I *often* (3 — 4 times last week) did physical things in my free time .....
I *quite often* (5 — 6 times last week) did physical things in my free time .....
I *very often* (7 or more times last week) did physical things in my free time .....

26. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.*

	None	Little bit	Moderately	Often	Very often
Monday	.....	.....	.....	.....	.....
Tuesday	.....	.....	.....	.....	.....
Wednesday	.....	.....	.....	.....	.....
Thursday	.....	.....	.....	.....	.....
Friday	.....	.....	.....	.....	.....
Saturday	.....	.....	.....	.....	.....
Sunday	.....	.....	.....	.....	.....

27. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)*

Yes .....
No .....

28. If Yes, what prevented you? _____

Think about your physical activities described above in the previous questions, however much or however little you do, in both summer and winter. Remember to think of what you do in school time, any activities after school, on the weekends and how you get to school if you walk or bike some of the way.

29. We need your best guess of the time you spend doing physical activity *in a typical week*.

..... minutes per week

Part 3 of 5: Great, you're going well! This part is about how good you feel in general.

Please read each of the following statements and indicate how much each statement describes you.

1. **When something good happens to me, I have people who I like to share the good news with.***

Almost never	Sometimes	Often	Very Often	Almost Always

2. **I finish whatever I begin.***

Almost never	Sometimes	Often	Very Often	Almost Always

3. **I am optimistic about my future.***

Almost never	Sometimes	Often	Very Often	Almost Always

4. **I feel happy.***

Almost never	Sometimes	Often	Very Often	Almost Always

5. **When I do an activity, I enjoy it so much that I lose track of time.***

Almost never	Sometimes	Often	Very Often	Almost Always

6. **I have a lot of fun.***

Almost never	Sometimes	Often	Very Often	Almost Always

7. **I get completely absorbed in what I am doing.***

Almost never	Sometimes	Often	Very Often	Almost Always

8. **I love life.***

Almost never	Sometimes	Often	Very Often	Almost Always

9. **I keep at my schoolwork until I am done with it.***

Almost never	Sometimes	Often	Very Often	Almost Always

10. **When I have a problem, I have someone who will be there for me.***

Almost never	Sometimes	Often	Very Often	Almost Always

11. **I get so involved in activities that I forget about everything else.***

Almost never	Sometimes	Often	Very Often	Almost Always

12. **When I am learning something new, I lose track of how much time has passed.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

13. **In uncertain times, I expect the best.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

14. **There are people in my life who really care about me.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

15. **I think good things are going to happen to me.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

16. **I have friends that I really care about.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

17. **Once I make a plan to get something done, I stick to it.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

18. **I believe that things will work out, no matter how difficult they seem.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

19. **I am a hard worker.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

20. **I am a cheerful person.***

Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

Part 4 of 5: You've done most of it now, keep it up!

These questions are about how you have been feeling in the past week. Please indicate the choice which best describes how you have felt *in the last 7 days*.

- **There are no right or wrong answers. Do not spend too much time on any statement.**

0 NEVER Did not apply to me at all	1 SOMETIMES Applied to me to some degree, or some of the time	2 OFTEN Applied to me to a considerable degree, or a good part of time	3 ALMOST ALWAYS Applied to me very much, or most of the time

	Never	Sometimes	Often	Almost always
1. I found it hard to wind down.*	0	1	2	3
2. I was aware of dryness of my mouth.*	0	1	2	3
3. I couldn't seem to experience any positive feeling at all.*	0	1	2	3
4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion).*	0	1	2	3
5. I found it difficult to work up the initiative to do things.*	0	1	2	3
6. I tended to over-react to situations.*	0	1	2	3
7. I experienced trembling (eg, in the hands).*	0	1	2	3
8. I felt that I was using a lot of nervous energy.*	0	1	2	3
9. I was worried about situations in which I might panic and make a fool of myself.*	0	1	2	3
10. I felt that I had nothing to look forward to.*	0	1	2	3
11. I found myself getting agitated.*	0	1	2	3
12. I found it difficult to relax.*	0	1	2	3
13. I felt down-hearted and blue.*	0	1	2	3
14. I was intolerant of anything that kept me from getting on with what I was doing.*	0	1	2	3
15. I felt I was close to panic.*	0	1	2	3
16. I was unable to become enthusiastic about anything.*	0	1	2	3
17. I felt I wasn't worth much as a person.*	0	1	2	3
18. I felt that I was rather touchy.*	0	1	2	3
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat).*	0	1	2	3
20. I felt scared without any good reason.*	0	1	2	3
21. I felt that life was meaningless.*	0	1	2	3

Part 5 of 5 – Good work! You're almost done.

Please indicate how much you agree with the following statements as they apply to you *over the last month*. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	not true at all	rarely true	sometimes true	often true	true nearly all the time
1. I am able to adapt when changes occur.*	0	1	2	3	4
2. I can deal with whatever comes my way.*	0	1	2	3	4
3. I try to see the humorous side of things when I am faced with problems.*	0	1	2	3	4
4. Having to cope with stress can make me stronger.*	0	1	2	3	4
5. I tend to bounce back after illness, injury, or other hardships.*	0	1	2	3	4
6. I believe I can achieve my goals, even if there are obstacles.*	0	1	2	3	4
7. Under pressure, I stay focused and think clearly.*	0	1	2	3	4
8. I am not easily discouraged by failure.*	0	1	2	3	4
9. I think of myself as a strong person when dealing with life's challenges and difficulties.*	0	1	2	3	4
10. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.*	0	1	2	3	4

You're done! Thanks so much ☺

STUDENT INFORMATION SHEET

PROJECT TITLE: **Wellbeing, Stress and Physical Activity**
PRINCIPAL INVESTIGATOR: Professor Deborah Turnbull
STUDENT RESEARCHERS: Amber Halliday, Victoria Branson
STUDENTS' DEGREE: PhD

Dear Students,
You are invited to participate research which aims to investigate wellbeing, stress and physical activity in students at Blackwood High School. Similar surveys of students have been conducted in the last few years and the information has been valuable in understanding needs of students at the school.

What is involved?
You will be asked to complete two online surveys during the year. The first survey will be on wellbeing and physical activity and will take between 15 and 25 minutes during care group time in term 2. The second survey will be on factors involved in adolescent stress and will take place during a dedicated lesson in term 3.

What's in it for me?
Benefits for all BHS students include the gathering of quality evidence for most effective wellbeing curriculum for Blackwood High School to help students feel good and function well.

Stuff we need to tell you;

- There will be no individual identification of students, but de-identified data may be linked to other outcome data held by the school.
- Participation in this project is completely voluntary and you can withdraw from the online questionnaire at any time without penalty. You will be given an alternative activity to complete.
- While there are few foreseeable risks, support will be available if any participant experiences any distress. For example BHS Counsellors will be on hand during the administering of the questionnaire.
- De-identified raw data from this project will be securely stored on University of Adelaide servers and kept for 5 years as per the Australian Code for the Responsible Conduct of Research.
- Findings from this project may be published in academic journals or the mainstream media (without any identifying information).
- Further information including complaints and assistance is on the back on this sheet.

[redacted]

Ok, so now what?
You don't have to do anything yet - your parent/guardian will be contacted for their consent and your teachers will let you know the rest. Thank you for your participation!

[redacted]

Letter to Parents

PROJECT TITLE: **Wellbeing, Stress and Physical Activity**
PRINCIPAL INVESTIGATOR: Professor Deborah Turnbull
STUDENT RESEARCHER: Amber Halliday and Victoria Branson
STUDENTS' DEGREE: PhD

Dear Parents and/or Caregivers,
Your child is invited to participate in a research project which aims to investigate wellbeing, stress and physical activity in students at Blackwood High School. Similar surveys of students have been conducted in the last few years and the information has been valuable in understanding needs of students at the school.

What is involved?
Your child[1] will be asked to complete two online surveys during the year. The first survey will be on wellbeing and physical activity and will take between 15 and 25 minutes during care group time in term 2. The second survey will be on factors involved in adolescent stress and will take place during a dedicated lesson in term 3. Non-participating students will be given an alternate non-classwork activity.

There is no individual re-identification of students. Participation in this project is completely voluntary and your child can withdraw from the online questionnaire at any time without penalty. Data may be linked to other outcome data held by the school. If students choose to participate, they give their consent at the beginning of the questionnaire.

What's in it for my son/daughter?
Benefits for all students include compiling quality evidence for the most effective wellbeing curriculum for Blackwood High School to help students feel good, function well, build resilience and positive character.

Essential information;
While there are few foreseeable risks, support will be available if any participant experiences any distress – for example BHS Counsellors will be on hand during the administering of the questionnaire and information about contacting The Kids Helpline on 1800 55 1800 or at www.kidshelp.com.au is provided at the beginning of the questionnaire – further information is on the back on this sheet. De-identified raw data from this project will be securely stored on University of Adelaide servers and kept for 5 years as per the Australian Code for the Responsible Conduct of Research. Findings from this project may be published in academic journals or the mainstream media (without any identifying information).

Who do I contact if I have questions about the project?
Questions or concerns about the project can be directed to Deputy Principal David Garrett, Assistant Principal Lee Knight or researchers Amber and Victoria on 8313 5007 or amber.halliday@adelaide.edu.au and victoria.branson@adelaide.edu.au. If you wish to speak with an independent person, contact details are on the back of this sheet.

So now what?
Please fill out the consent form and have your child return it to the school. Thank you for your cooperation.

[redacted]gy

[1] If your child is younger than 13 years of age on the day of the questionnaire, they will not be required to participate and will be given an alternative activity so they can remain within the class.

Consent Form

Dear Parent/Guardian,

[redacted]

In signing this form I confirm that;

- I have read the attached Information Sheet for Parents and understand the project to my satisfaction. My consent is given freely.
- Although I understand that the purpose of this research project is to improve the quality of positive education at Blackwood High School, it has also been explained that involvement may not be of any direct benefit to my son/daughter/guardianee.
- I have been informed that, while information gained during the study may be published, he/she will not be identified and his/her personal results will not be divulged.
- I understand that he/she is free to withdraw from the project at any time and that this will not adversely affect him/her.

CONSENT
I give consent for .....(student name)'s involvement in this project.
Parent/Guardian Signature: *Date:* / /
Parent/Guardian Printed Name:.....
Relationship to participant: .....
Participant's date of birth: / /

2017 Adverse Events Protocol[2]

What is an adverse event?

An adverse event (AE) here is any untoward occurrence in a student who has been completing the online surveys of Wellbeing, Physical Activity and Stress. An AE can be any unfavourable and unintended sign, symptom, or disease temporally associated with the use of an intervention, whether or not it is causally related to the intervention.

What adverse event is the most likely in this scenario?

There is relatively low risk of adverse events in the completion of online surveys, but some concepts may be challenging and may result in students feeling some degree of *emotional distress*.

What does that look like?

Emotional Distress	
Agitation	Agitation is characterized by a state of restlessness associated with unpleasant feelings of irritability and tension.
Anxiety	Anxiety is characterized by apprehension of danger and dread accompanied by restlessness, tension, and physiological arousal (increased heart rate for example).
Confusion	Confusion is characterized by a lack of clear and orderly thought and behaviour.
Depression	Depression is characterized by melancholic feelings of grief or unhappiness
Restlessness	Restlessness is characterized by an inability to rest, relax or be still.

What should I do?

Written information has been given to all students and it is also present in the preamble of the online surveys.

- In the case of an AE, students can temporarily but immediately cease the activity.
- Teachers can advise students on where to go for help;
  Students can speak to their care group teacher, one of the school's Student Counsellors, a University of Adelaide researcher, their Year Level Leader or they can contact The Kids Helpline on 1800 55 1800 or at www.kidshelp.com.au
- If any psychological distress or social harm continues, steps should be made to cease the online survey for that student in a sensitive fashion.
- Report it – any event that you consider to be such an adverse event, whether causally related to the online survey or not, needs to be reported in writing to David Garratt. Include details of what happened, what action was taken and whether the AE was *not* related, *likely* related or *clearly* related to the survey.

[2] Reference: National Statement on Ethical Conduct in Human Research (2007) (Updated May 2015)

Appendix C: EPOCH Measure

The EPOCH Measure of Adolescent Well-being

Margaret L. Kern, Lisbeth Benson, Elizabeth A. Steinberg, Laurence Steinberg
University of Pennsylvania and Temple University

Measure Overview

In his 2011 book *Flourish*, Dr. Martin Seligman, Distinguished Professor of Psychology at the University of Pennsylvania and founder of the field of positive psychology, defined 5 pillars of wellbeing, PERMA (positive emotion, engagement, relationships, meaning, accomplishment). In applying this model to youth, we adjusted the model to be developmentally appropriate. The resulting model consists of five different positive characteristics that together support higher levels of well-being: engagement, perseverance, optimism, connectedness, and happiness.

E = Engagement

Engagement refers to being absorbed, interested, and involved in an activity or the world itself. Very high levels of engagement are known as a state called "flow", in which you are so completely absorbed in an activity that you lose all sense of time.

P = Perseverance

Perseverance refers to having the tenacity to stick with things and pursue a goal, despite any challenges that occur. You finish things that you start, even if it takes awhile. When the going gets tough, the tough get going.

O = Optimism

Optimism refers to having a sense of hope and confidence about the future. It involves generally taking a favorable view of things. Negative events are seen as temporary and specific to the situation – believing that things will work out in a good way.

C = Connectedness

Connectedness refers to feeling loved, supported, and valued by others. It's more than simply having people in your life, but also feeling close to others.

H = Happiness

Happiness is a general feeling of happiness, cheer, and contentment with life. You might not feel happy all the time, but you tend to feel generally content with life.

Use of the Measure

Items are presented below. The questions can be grouped together, but note the two sets of response options.

The measure is **freely available for noncommercial research and assessment purposes, after registering** (please complete the form at https://docs.google.com/forms/d/1eamBshwjtJyQDsWG72qum8Czi_J2IlZ3Q7r5FE5ojEA/viewform?usp=send_form). In the future, we will have an online portal for taking the measure and receiving results and insights, but at this point, we cannot provide assistance with administering or scoring the measure.

For commercial purposes, please contact the University of Pennsylvania Center for Technology Transfer

Scoring EPOCH

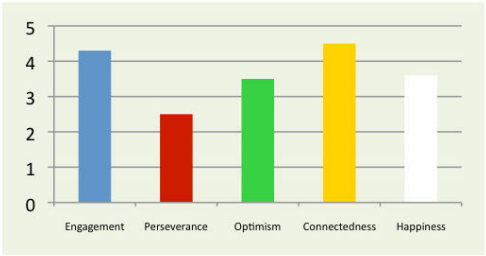
Item	Question
C1	When something good happens to me, I have people who I like to share the good news with.
P1	I finish whatever I begin.
O1	I am optimistic about my future
H1	I feel happy.
E1	When I do an activity, I enjoy it so much that I lose track of time.
H2	I have a lot of fun.
E2	I get completely absorbed in what I am doing.
H3	I love life.
P2	I keep at my schoolwork until I am done with it.
C2	When I have a problem, I have someone who will be there for me.
E3	I get so involved in activities that I forget about everything else.
E4	When I am learning something new, I lose track of how much time has passed.
O2	In uncertain times, I expect the best.
C3	There are people in my life who really care about me.
O3	I think good things are going to happen to me.
C4	I have friends that I really care about.
P3	Once I make a plan to get something done, I stick to it.
O4	I believe that things will work out, no matter how difficult they seem.
P4	I am a hard worker.
H4	I am a cheerful person.

Across domains, each item is scored on a 1 to 5 scale (almost never/ not at all like me = 1; almost always/ very much like me = 5). Scores are computed for each domain as the average of the four items, and results can be presented as a profile across domains (see sample image below). That is:

Engagement = mean(E1,E2,E3,E4).
Perseverance = mean(P1,P2,P3,P4)
Optimism = mean(O1,O2,O3,O4)
Connectedness = mean(C1,C2,C3,C4)
Happiness = mean(H1,H2,H3,H4)

Sample Scoring Presentation

We are working on the best way to display scores. To date, we have used bar graphs:



This is a survey about you! Please read each of the following statements. Circle how much each statement describes you. Please be honest - there are no right or wrong answers!

When something good happens to me, I have people who I like to share the good news with.	Almost never	Sometimes	Often	Very Often	Almost Always
I finish whatever I begin.	Almost never	Sometimes	Often	Very Often	Almost Always
I am optimistic about my future	Almost never	Sometimes	Often	Very Often	Almost Always
I feel happy.	Almost never	Sometimes	Often	Very Often	Almost Always
When I do an activity, I enjoy it so much that I lose track of time.	Almost never	Sometimes	Often	Very Often	Almost Always
I have a lot of fun.	Almost never	Sometimes	Often	Very Often	Almost Always
I get completely absorbed in what I am doing.	Almost never	Sometimes	Often	Very Often	Almost Always
I love life.	Almost never	Sometimes	Often	Very Often	Almost Always
I keep at my schoolwork until I am done with it.	Almost never	Sometimes	Often	Very Often	Almost Always
When I have a problem, I have someone who will be there for me.	Almost never	Sometimes	Often	Very Often	Almost Always
I get so involved in activities that I forget about everything else.	Almost never	Sometimes	Often	Very Often	Almost Always
When I am learning something new, I lose track of how much time has passed.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
In uncertain times, I expect the best.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
There are people in my life who really care about me.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
I think good things are going to happen to me.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
I have friends that I really care about.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
Once I make a plan to get something done, I stick to it.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
I believe that things will work out, no matter how difficult they seem.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
I am a hard worker.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me
I am a cheerful person.	Not at all like me	A little like me	Somewhat like me	Mostly like me	Very much like me

Thank you!

Appendix D: DASS-21 Measure

DASS21

Name: Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree or a good part of time
3 Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

DASS-21 Scoring Instructions

The DASS-21 should not be used to replace a face to face clinical interview. If you are experiencing significant emotional difficulties you should contact your GP for a referral to a qualified professional.

Depression, Anxiety and Stress Scale - 21 Items (DASS-21)

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.

Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.

The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The assumption on which the DASS-21 development was based (and which was confirmed by the research data) is that the differences between the depression, anxiety and the stress experienced by normal subjects and clinical populations are essentially differences of degree. The DASS-21 therefore has no direct implications for the allocation of patients to discrete diagnostic categories postulated in classificatory systems such as the DSM and ICD.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) are as follows:

NB Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score.

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. (2nd Ed.)Sydney: Psychology Foundation.

Appendix E: University of Adelaide Ethics Application

TO WHOM IT MAY CONCERN:

Background

As part of my thesis, *Wellbeing and Academic Success: The Impact of Psychological Health on Academic Outcomes*, for my honours degree, I wish to use previously collected data for a different purpose than was originally stated. Victoria Branson (PhD/Masters of Psychology (Clinical) candidate) and Amber Halliday (PhD candidate) have worked with Blackwood High School since 2014, collecting data annually for various research projects. I hope to use data collected in 2017, in addition to academic data I will collect in 2018 to investigate the relationship between wellbeing and academic success. I am seeking an amendment to the application submitted to the School of Psychology Human Research Ethics Subcommittee in 2017 (Code Number 17/04) to add myself as an investigator on this project. The ethics application fully details this project and information on it was given to participants 2017. In addition, the school is supportive of data being used in this way.

National Statement on Ethical Conduct in Human Research (2007) - Updated May 2015, section 2.3.10

a. This research is low-risk. The measures used in data collection did not carry a risk beyond inconvenience, and there is no further data collection required.
b. The benefits from the research justify any risk of harm associated with not seeking consent.
c. It is impracticable to obtain consent for this project in retrospect.
d. There is no known or likely reason for thinking that participants would not have consented if they had been asked.
e. There is sufficient protection of participants' privacy; all data are anonymous.
f. There is an adequate plan to protect the confidentiality of data as outlined in previous applications for ethical approval.
g. Data are anonymous but results may have significance for the participants' welfare. Thus information arising from the research will be made available to them in general terms eg. a plain language report in the school newsletter.
h. There were no financial benefits to participants.
i. The waiver is not prohibited by State, federal, or international law.

It is with the above information that I submit an amendment to the HREC.

Kind regards,

Nicole Tape

University of Adelaide Ethics Approval

Ethics Amendment - Nicole Tape Inbox x

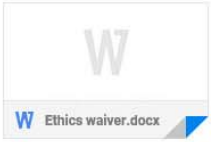
Nicole Tape <nicole.tape@student.adelaide.edu.au> Thu 1 Mar, 14:44
to Paul, Deborah, Matthew

Hi Paul,

As discussed, please find attached the letter requesting my name be added to Amber Halliday's ethics application (Code Number 17/04) as an investigator. It outlines that I wish to use the data she collected in 2017 for my thesis.

If you require any further information, please let me know.

Many thanks,
Nicole Tape



Paul Delfabbro <paul.delfabbro@adelaide.edu.au> 1 Mar 2018, 15:13
to Matthew, Nicole, Deborah

Thanks Nicole

That looks thorough and I am happy to approve this amendment.

regards

Paul

Appendix F: DECD Ethics Application

Department for Education and Child Development Research Application Form

Instructions to applicants

You must complete this form if:

- You are seeking approval to approach DECD sites and/or students, clients or staff, to conduct a research project, and/or who wish to access administrative data sets owned or managed by the Department for Education and Childhood Development for research purposes.
- You would like to submit an initial **expression of interest** for feedback on a proposed project– complete Sections 1-3 only.

You do not need to complete this form if:

Condition A:

- ☐ you are a DECD employee
- ☐ you want to conduct research in your own site/neighbouring site
- ☐ your research project is part of the 'normal business' of a school (eg implementing improvement activities, professional development or review processes)
- ☐ your research will only involve surveys, observations and/or the evaluation of educational programs or practices

➔ If you meet all of the conditions above, your project can be directly approved by the individual principal, director or site manager.

Condition B:

- ☐ you are conducting a research project across more than one State or Territory

➔ Please submit a national research project application – go to AARE.

For queries about completing this application form:

- Refer to the Conducting research with DECD staff, students and data procedure
- Contact the Business Intelligence Unit by email at DECD.ResearchUnit@sa.gov.au or by telephone: (08) 8226-1206.

To submit this application form:

- Email this completed application form and all supporting documents to DECD.ResearchUnit@sa.gov.au

Contents page

Research project reference numbers

Project title

Wellbeing and Academic Success: The Impact of Psychological Health on Academic Outcomes

DECD reference number(s) (if applicable)

Developmental trends in wellbeing: A longitudinal analysis of wellbeing, ill-being, and physical activity in adolescents (Reference CS/17/000750-1.2)

Evaluating a new measure of stress (Reference CS/17/000747-1.14)

HREC reference number(s) (if applicable)

Developmental trends in wellbeing: A longitudinal analysis of wellbeing, ill-being and physical activity as a function of gender (Code Number: 17/04)

Evaluating a new measure of stress (Code Number: 17/65)

Funding

This research is not funded

Consultation with DECD

If you have you discussed this project with any staff, sites or business units within the Department for Education and Child Development, please add their details below.

The school requested this project be undertaken by the University at a meeting in late 2017 as a follow on to the research conducted by Amber Halliday and Victoria Branson.

A meeting was held on Wednesday the 7th of March, 2018 at Blackwood High School (BHS) where Shauna Thompson (Deputy Principal), the BHS Wellbeing Team, and Deborah Turnbull, Victoria Branson and Nicole Tape from the University of Adelaide were in attendance.

At the meeting, this project was discussed in detail and the school agreed to provide the required data including 2017 student academic achievement scores and absentee figures. The data will have all student identification removed, but will be coded in a way so it can be matched with the students 2017 wellbeing and illbeing scores. Kerrie Leong, the IT Data Manager was identified as the person at BHS who will assist in the data collection process.

Contact details

Lead investigator/researcher details

Name	Nicole Tape
Faculty / Department	Psychology
Organisation / University	The University of Adelaide
[redacted]	[redacted]
Postal address	The University of Adelaide North Tce, Adelaide, SA 5000
If student researcher, please specify degree being sought	Honours of Psychology

Details of associate researcher (or supervisor)

Name	Professor Deborah Turnbull
Faculty / Department	Psychology
[redacted]	[redacted]
Postal address	North Tce, Adelaide, SA, 5000

Project team details

Title and name	Role on this project	Agency/Institution	DCSI or Relevant Working with Children Clearance Included?
Professor Deborah Turnbull	Supervisor	The University of Adelaide	No
Ms Nicole Tape	Investigator	The University of Adelaide	No
Ms Victoria Branson	Researcher	The University of Adelaide	Yes
Ms Amber Halliday	Researcher	The University of Adelaide	Yes

Project summary

What are your aims or objectives?

The project's aim is to investigate the relationship between student wellbeing at Blackwood High School and their academic success.

What methodology will you use for this project?

- BHS hosted research projects in 2014, 2015, 2016, and 2017 where data was collected using measures for wellbeing (EPOCH) and ill-being (DASS-21). Data collected in 2017 will be used in this project and compared to students' 2017 mid-year and end of year academic grades.
- There will be no burden on students for this study as the required data will be collated by the schools IT Data Manager, Kerrie Leong. Required data includes academic results and absentee data. It will have all identifiable information besides coding data removed prior to being emailed to Nicole Tape for analysis.
- The summary below has been drafted for the school to include in their next newsletter. It advised parents that the study will be undertaken, and gives them the opportunity to opt out if they have any concerns:

  'A University of Adelaide Honours student, Nicole Tape will be conducting research at the school this year looking at the impact of student wellbeing on their academic success. She will be using wellbeing data which was collected in 2017 by a University PhD student, Amber Halliday and linking this to students 2017 academic achievement grades. Student attendance rates and elective subject choices will also be provided as part of this project.
  Parents previously consented to the data that was collected being linked to academic performance. The University has requested that the school compile this information and provide it to them in a de-identified form to ensure student's identity remains anonymous in the study. We ask that any parent who does not wish for this to occur to please contact the Data Manager, Kerrie Leong. Once the study is complete, the University will share with us their findings and we hope use the results to better understand the impact wellbeing is having on student's success at school, and ways we can help students to flourish.'

Using this methodology, what results or findings will you obtain/create?

We are interested in the following research questions:

1. Are there gender and year level differences in adolescents' wellbeing, illbeing and academic success?
2. Is there a relationship between wellbeing, illbeing and academic success?
3. Does wellbeing predict academic success in some subjects more than others?
4. Does the relationship between wellbeing and academic success change over time?

How will this information address your aims/objectives?

This longitudinal data is valuable when looking at causation as wellbeing levels may predict academic success. We expect to use statistical techniques including correlation analysis and 2x3 ANOVA to analyse the data.

How will the research benefit children and young people, in the short-or long-term?

In the short term, their school will be better informed about the prevalence of wellbeing and ill-being of students who undertook the survey in 2017. In the long term, analysis of this data can reveal the relationship of wellbeing, ill-being and academic success and may help to better inform and target any interventions the school makes to improve young people's mental health.

Briefly, what do previous studies or evidence show about your research aims/objectives?

Wellbeing has a consistent positive relationship with academic achievement in students (Ruppel & Walter, 2015). With the growing popularity of school-based adolescent programs for mental health, this study aims to examine the relationship between wellbeing, illbeing and attendance levels on academic outcomes. This may assist in identifying students best suited to early intervention programs to improve both their wellbeing and academic outcomes.

The research will take place at BHS, a medium to large sized government secondary school close to the Australian average of community socio-educational advantage. Previous studies at the site have found gender differences in wellbeing and ill-being (Halliday, 2014) with females having lower wellbeing and higher levels of depression, anxiety and stress. This is consistent with previous research findings in Australia, however little research has been conducted using longitudinal data or with the newly created EPOCH scale to measure wellbeing.

Understanding the relationship between mental health and academic outcomes is vital for well-informed action.

Halliday, A. (2014). Understanding wellbeing: a cross-sectional study of physical health behaviours, mental illness and wellbeing in adolescents. Unpublished thesis. University of Adelaide

Ruppel, F., & Walter, U. (2015). The influence of psychological well-being on academic success. Journal of Public Health, 23, 15-24.

What, if any, risks to staff, children and young people or families will arise from the project?

There is minimal risk involved in this project. There is a small time burden on BHS staff to collate the required data but no there is no risk to students as they will not be involved.

What measures will be taken to address the risks above?

Staff time burden; administrative time burden will be reduced with data being e-mailed to the University. Nicole Tape will also meet with the IT Data Manager to ensure only necessary data is collected to reduce time.

Project details

Instructions

Complete the relevant sections as follows:

- You are seeking access to administrative data held by the Department for Education and Child Development – **complete Section A**
- Children and young people and/or adults will be asked to participate in your research project – **complete Section B**

Section A – complete if administrative data is required

Complete this section if you are seeking access to administrative data held by the Department for Education and Child Development as part of your project.

An External Data Service Request Form must also be submitted to the DECD Research Unit, together with this application form.

Personal information

Will your project require any personal information? Personal information is defined within the Information Privacy Principles (IPPS) Instructions PC012

Why is it necessary to have access to personal information? What measures will be taken to protect privacy and the security of this information?

Student's personal information is not required for this project. All names will be removed by the school prior to being sent to the current researchers for analysis.

The wellbeing data collected in 2017 was re-identifiable so it can be matched to their academic outcomes by code only. No identifiable information will be given to the University.

Data management

How will you receive, transfer, store, access and manipulate the data? Who will have access to the data? What security measures will be in place? What will happen in the event that the researchers or investigators leave the project?

The data will be received electronically in and Excel spreadsheet in a de-identified form. All records will be stored in password protected areas as follows: 1. Professor Turnbull and Nicole Tapes University accounts under their MyUni logins, and on Nicole Tapes personal computer. This raw data will not include any personal student information. The data will be kept in confidence for five years as per Section 2 of the Australian Code for the Responsible Conduct of Research.

In the event that the researchers or investigators leave the project, the data will be remain stored at The University of Adelaide in a password protected area.

Data disposal/destruction/retention

At the conclusion of the project, how will the data be managed or destroyed? How will you ensure that the data is not accessed or used without future approvals from DECD?

This data will be kept in confidence for five years as per Section 2.1 of the Australian Code for the Responsible Conduct of Research. At the conclusion of the project, the final dataset(s) will be encrypted

and archived in a secure network folder within the School of Psychology at the University of Adelaide. This will ensure that the data is not accessed or used without future approvals from DECD.

Section B – complete if children, young people or adults will participate

Complete this section if children and young people and/or adults will be asked to participate in your research project.

Research participants

How many participants do you require for your research project? Provide a brief rationale with reference to your research aims/questions. Who will be eligible (and/or not eligible) to participate in this research?

Participant group and eligibility criteria	Number of participants required	Rationale

Recruitment

How will participants be recruited for this research? Specify the steps below.

Activity/step	Who will do this	Materials required	Attachment number

Consent

Describe the procedure for obtaining consent of participants and when necessary, from parents or guardians for their children. If you are seeking approval for an 'opt-out' consent protocol, provide reasons for this (refer to 4.2 Conduct of research section in the Conducting research with DECD staff, students and data procedure

<Please add your response here.>

Collection of personal information

Will your project require the collection of any personal information? Personal information is defined Personal information is defined within the Information Privacy Principles (IPPS) Instructions PC012

If yes, what information will be collected? Why is it necessary to collect personal information? What measures will be taken to protect privacy and the security of this information?

<Please add your response here.>

Administrative support required from DECD for the project

Type of activity	Who will do this	Time required	When and where will the activity take place

What will participants be asked to do?

Type of activity	Participants (number and type)	Time required	When and where will the activity take place

List of instruments/assessments/questionnaires

Name	Reason for including this measure	Attachment number

Protection from harm: intrusive or sensitive issues

Provide detail on any questions or issues with the potential to be intrusive, upsetting or incriminating for participants. Outline the strategies to be put in place to address potential issues.

<Please add your response here.>

Strategies to maintain confidentiality

Outline how you will ensure the confidentiality of information provided and protect the anonymity of participants and sites in relation to data collection and storage, publication/reporting of results. If applicable, describe and justify any limitations to confidentiality and anonymity with reference to your research aims/questions.

<Please add your response here.>

Ethical approval

Tick the appropriate box below and add further information if necessary.

Document type	Attached
Information sheets If applicable, please attach information sheets for each category of participant, for site leaders or managers who may be asked to participate and for parents/guardians.	☐ Yes ☐ No Comment:
Consent forms If applicable, please attach consent forms for each category of participant and/or for parents/guardians.	☐ Yes ☐ No Comment:
Letter to sites If you intend to approach sites/schools for your research, please attach a draft letter to the person responsible for the site (e.g., school principal) asking for their permission to conduct the project on the site. This letter should include information outlining the research project, any sensitive issues that may arise as a result of participation, what resources or input will be required from the site, who the participants will be, the time required and include relevant consent and information sheets as attachments.	☐ Yes ☐ No Comment:
Human Research Ethics Committee approval Please attach a copy of all Human Research Ethics Committee applications, amendments and letters of approval. Please note that DECD will only approve research proposals which may involve more than low risk to participants if it receives a copy of a final approval letter from a Human Research Ethics Committee.	☐ Yes ☐ No Comment:
Public Liability Insurance Please attach a copy of your institution or organisation's public liability insurance policy.	☐ Yes ☐ No Comment:
Working with children clearance If applicable, please attach evidence of any Child-Related Employment Screening clearances. Any researcher that will have any contact with children or students, or access to personal information must provide a copy of a signed clearance letter or official confirmation of a Department for Communities and Social Inclusion Child-Related Employment Screening check dated within three years. "Contact with a child or young person" may involve:	☐ Yes ☐ No Comment:

• any form of oral communication, whether face to face, by telephone or otherwise • any form of physical contact • and any form electronic or digital communication (e.g., email, video-conference) "Access to confidential or personal information" may involve access to: • names, addresses, email addresses; and/or • any data that personally identifies participants arising from surveys (online or paper based), interviews and focus groups. It is the responsibility of the researchers to ensure the check is current for the duration of a research project. Researchers who hold a current teacher registration with the Teachers Registration Board of South Australia may present a copy of their certificate or official notification from the Teacher Registration Board website. Go to the Department for Communities and Social Inclusion Child-Related Employment Screening for further information.	

Researcher agreement

By signing this document:

- I declare the information provided in this application to be true and correct.
- I agree to notify the Business Intelligence Unit of any major changes or adverse events affecting the conduct of the project.
- I agree to only undertake the project in line with this application and any conditions or amendments agreed in writing with the Business Intelligence Unit.
- I agree to obtain appropriate consent and maintain confidentiality of information in accordance with Information Privacy Principles. This includes not revealing any personal information that may identify a person without the consent of the individuals concerned (or their guardians, for children and young people aged under 18).
- I agree to abide by site child protection processes for reporting child abuse and neglect.
- I agree to maintain appropriate Child-Related Employment Screening checks for all required project staff for the duration of the project.
- I agree to notify the Business Intelligence Unit immediately if I become aware that any person involved in conducting the project is charged (regardless of the outcome of the charges) or sentenced with any criminal offence or have any complaints related to their behaviour with children at any time since the date of their Child-related Employment Screening check.
- I agree to maintain appropriate public liability insurances.
- I agree to provide DECD, through the mailbox DECD.ResearchUnit@sa.gov.au, with a copy of any planned publication (including manuscripts, reports, public presentations or presentations to government or academic audiences (not including DECD personnel or closed university meetings) at least 30 days prior to publication.
- I agree that if DECD, in its absolute discretion, informs me in writing that a proposed publication would disclose personal information, I will not to publish the information until such a time as the publication can be modified to DECD's satisfaction.
- I agree to give prior notification to the DECD Media Unit of any planned media coverage of the project.
- I agree to ensure that all data records will be either destroyed or kept in a secure environment as per the conditions set out in this application.
- I agree to have a summary of the research project published in DECD internal communications and/or included on the DECD public website.

Dated this 14..... day of ..March..... 20..18

[redacted]

Name	Simon Miller	Name	Julia Morris

DECD Ethics Approval

Government of South Australia
Department for Education

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Tel. +61 8 8226-0809
Education.ResearchUnit@sa.gov.au
www.education.sa.gov.au

Reference No: 2018-0024

Ms Nicole Tape
The University of Adelaide
Level 5, Hughes Building
North Terrace
ADELAIDE SA 5000

Dear Ms Tape

Your research project *"Wellbeing and Academic Success: The Impact of Psychological Health on Academic Outcomes"* has been reviewed by a senior officer within our department.

I am pleased to advise you that your application has been approved, subject to the following conditions:

- That a copy of any final reports, presentations or manuscripts accepted for publication be submitted to the Education.ResearchUnit@sa.gov.au mailbox 30 days prior to their publication.
- That the Department for Education is notified when findings are to be released to other government or nongovernment agencies or to participating sites.
- That a copy of the de-identified data file is provided to the Department for Education.

Please contact Betty Curzons in the Business Intelligence Unit for any other matters you may wish to discuss regarding your application (Tel. (08) 8226 0809 or email: Education.ResearchUnit@sa.gov.au).

I wish you well with your research.

[redacted]

EXECUTIVE DIRECTOR, SYSTEM PERFORMANCE

19 /4/2018

Government of South Australia
Department for Education

System Performance
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Adelaide SA 5000
GPO Box 1152
Adelaide SA 5001
DX 541
Tel. +61 8 8226-0809
Education.ResearchUnit@sa.gov.au
www.education.sa.gov.au

REFERENCE NO: 2018-0024
RESEARCHER: Ms Nicole Tape
RESEARCH BODY: The University of Adelaide

Dear Principal/Director/Site Manager

The research project titled *"Wellbeing and Academic Success: The Impact of Psychological Health on Academic Outcomes"* has been reviewed centrally and granted approval for access to Department for Education sites. However, the researcher will still need your agreement to proceed with this research at your site.

The Researcher(s) whose names appear below are the only persons permitted to conduct research on your site:

Name	Clearance Type	Expiry Date
Amber Halliday	DCSI Child-Related Employment Screening	12/12/2019
Victoria Branson	DCSI Child-Related Employment Screening	13/12/2019

The Researcher(s) whose names appear below are permitted to conduct research on your site on the condition that they have no contact with children or access to personal information or identifiable data.

- Ms Nicole Tape
- Professor Deborah Turnbull

Please contact Betty Curzons in the Business Intelligence Unit for any other matters you may wish to discuss regarding your participation (Tel. (08) 8226 0809 or email: Education.ResearchUnit@sa.gov.au).

Yours sincerely

[redacted]

Ben Temperly
EXECUTIVE DIRECTOR, SYSTEM PERFORMANCE

19/4/2018

Appendix G: Pearson Product-Moment Correlation Matrix between Measures of Well-being, Ill-being, Concurrent and 6-month Follow-Up Performance

	1	2	3	4	5	6	7	8	9	10	11	12
1. Engagement	-	.49**	.59**	.47**	.63**	.78**	-.30**	-.16**	-.22**	-.25**	.01	.11
2. Perseverance		-	.58**	.47**	.50**	.74**	-.31**	-.24**	-.22**	-.28**	.28**	.31**
3. Optimism			-	.59**	.74**	.87**	-.48**	-.33**	-.36**	-.43**	.20**	.18**
4. Connectedness				-	.64**	.78**	-.30**	-.23**	-.17**	-.25**	.19**	.18**
5. Happiness					-	.87**	-.59**	-.40**	-.43**	-.52**	.16**	.18**
6. Total Well-being						-	-.49**	-.34**	-.35**	-.43**	.23**	.24**
7. Depression							-	.74**	.74**	.90**	-.13*	-.15**
8. Anxiety								-	.77**	.92**	-.08	-.09
9. Stress									-	.92**	-.05	-.10
10. Total Ill-being										-	-.09	-.12*
11. Concurrent											-	.84**
12. 6-month Follow-up												-

Note. N=327, **p* <.05 (two-tailed), ***p* <.001 (two-tailed).

Appendix H: Descriptive Statistics According to Gender and Middle or Senior School

	Gender				**Middle / Senior School**			
	Male (*n*=163)		**Female** (*n*=164)		**Middle** (*n*=229)		**Senior** (*n*=98)	
	M	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
Engagement	3.23	0.82	2.94	0.83	3.09	0.85	3.08	0.80
Perseverance	3.27	0.78	3.23	0.87	3.29	0.82	3.15	0.84
Optimism	3.45	0.83	3.19	0.91	3.30	0.88	3.35	0.88
Connectedness	3.96	0.84	4.03	0.87	3.98	0.86	4.04	0.84
Happiness	3.83	0.86	3.52	0.97	3.70	0.93	3.60	0.92
Total Well-being	0.12	0.94	-0.12	1.04	0.01	1.01	-0.03	0.99
Depression	3.64	3.71	5.48	4.40	4.34	3.93	5.06	4.65
Anxiety	3.79	3.47	5.94	4.19	4.73	3.81	5.17	4.40
Stress	4.47	3.49	6.99	4.11	5.62	3.91	5.98	4.25
Total Ill-being	-0.29	0.85	0.29	1.05	-0.04	0.96	0.09	1.09
Semester 1 Grade	2.85	0.57	3.17	0.54	3.01	0.50	3.01	0.74
Semester 2 Grade	2.80	0.65	3.11	0.62	2.60	0.57	2.94	0.78

Note. N=327, **p*<.05 (two-tailed), ***p*<.001 (two-tailed). Gender dummy coded 0=male, 1=female