A Randomized Controlled Trial of Strong Minds: A School-Based Mental Health Program
Combining Acceptance and Commitment Therapy and Positive Psychology

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Abstract

To date most early intervention programs have been based on emotion regulation strategies that address dysfunctional cognitive appraisals, problem-solving skills, and rumination. Another emotion regulation strategy, ‘acceptance’ training, has largely been overlooked. To examine the efficacy of this strategy, a school-based mental health program combining positive psychology with acceptance and commitment therapy (Strong Minds) was evaluated in a randomized controlled trial with a sample of 267 Year 10 and 11 high school students in Sydney, Australia. Mixed models for repeated measures examined whether the program led to reductions in symptoms amongst students who commenced the program with high depression, anxiety, and stress scores, and increased wellbeing scores amongst all students. Results demonstrated that compared to controls, participants in the Strong Minds condition with elevated symptom scores ($n=63$) reported significant reductions in depression ($p=.047$), stress ($p=.01$), and composite depression/anxiety symptoms ($p=.02$) with medium to strong effect sizes (Cohen’s $d=0.53$, 0.74 , and 0.57 respectively). Increased wellbeing ($p=.03$) in the total sample and decreased anxiety scores ($p=.048$) for students with elevated symptoms were significant for Year 10 students with medium effect sizes (Cohen’s $d=0.43$ and 0.54 respectively). This study tentatively suggests that including the emotion regulation strategy of acceptance in early intervention programs may be effective in reducing symptoms and improving wellbeing in high school students. Further research to investigate the generalizability of these findings is warranted.

Keywords: Acceptance and Commitment Therapy; Positive Psychology; Adolescent; Mental Health; School; Early-Intervention

A Randomized Controlled Trial of Strong Minds: A School-Based Mental Health Program Combining Acceptance and Commitment Therapy and Positive Psychology

Mental illnesses are increasingly being recognized as a global public health issue and are a leading cause of disability in high-income countries (Vos & Mathers, 2000). Although mental illnesses contribute more to DALYs than physical health problems, only 5 percent of health spending is directed towards improving mental health in high-income countries (World Health Organization, 2013). Whilst the focus has generally been on the treatment of mental disorders, it may be more prudent to place early intervention, which is more cost-effective (Access Economics, 2009), at the forefront of public mental health initiatives. Approximately 50 percent of adult mental disorders begin by the age of 14 years (Kessler et al., 2005) suggesting that early intervention at the adolescent level may prevent adult mental health problems from emerging. Early intervention can also address the high rates of adolescent mental health problems, which are found to be higher than for all other age groups (Australian Bureau of Statistics, 2008).

Emotion regulation has been cited as instrumental to psychological health and wellbeing as far back as Freud (1946). Emotion regulation is the ability to monitor, evaluate, and modify emotional reactions (Thompson, 1994). Evidence suggests that emotion regulation has a causal role in the development of almost all mental illnesses, particularly in the disorders of mood, anxiety, substance use, eating, and personality (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Berking & Whitley, 2014; O'Driscoll, Laing, & Mason, 2014). Longitudinal data suggests that poor emotion regulation precedes the onset of depression and not vice versa (Aldao et al., 2010). There are likely countless techniques to regulate emotions although the literature commonly refers to four emotion regulation strategies, three are considered to be generally adaptive and one generally maladaptive

(Aldao et al., 2010). Adaptive emotional regulation strategies are: (a) 'reappraisal' which involves modifying an interpretation of a situation to reduce its emotional impact; (b) 'acceptance' whereby an individual accepts their emotional experience, as opposed to avoiding or suppressing them; and (c) 'problem-solving' where a situation is modified in order to reduce its emotional impact. For example, an individual may reframe a difficult task as a 'challenge' rather than 'impossible' (reappraisal), accept the feelings of anxiety that accompany the task, and find solutions to resolve the problem. The maladaptive emotion regulation strategy is 'rumination' whereby negative thoughts or memories are repeatedly replayed. For example, in facing a difficult event an individual may replay the event in their mind while focusing on failure. A meta-analysis of 114 studies found that the strategies of poor acceptance and rumination were positively correlated with anxiety, depression, disordered eating, and substance-related disorders (Aldao et al., 2010). A negative association was found for the strategies of acceptance, problem-solving, and reappraisal with these same four psychopathologies.

Most young people are underequipped to manage the emotional impact of stressors. The ability to regulate emotions follows other developments in the cognitive, social, and physiological domains, gradually emerging from infancy to adulthood (Zeman, Cassano, Perry-Parrish, & Stegall, 2006). Adults are better equipped than their younger counterparts due to their experiences in learning and practicing emotion regulation strategies (Garnefski, Legerstee, Kraaij, Van Den Kommer, & Teerds, 2002). While younger children may have even less experience than adolescents, they may benefit from the external emotion regulation provided by their parents (e.g., a parent consoling an upset child; Zeman, Cassano, Perry-Parrish, Stegall, 2006). Adolescents are at a precarious stage where they are more likely to reject the emotion regulation provided by their caregivers but have not yet gained sufficient experience and practice in dealing with stress. In addition, neurological and hormonal

changes during this period compound the difficulties adolescents experience in dealing with stress (Arnsten & Shansky, 2004; Saz, Bittencourt-Hewitt, & Sebastian, 2015; Susman et al., 1987). Learning emotion regulation strategies is therefore likely to benefit this population and improve rates of emerging mental health disorders.

Most early intervention programs for adolescents teach emotion regulation strategies based on the techniques espoused in Cognitive-Behavioral Therapy (CBT). For programs focused on addressing depression symptoms these include: (a) re-interpreting negative cognitions; (b) engaging in pleasant activities; (c) teaching problem-solving skills; and (d) enhancing social skills (Stice, Shaw, Bohon, Marti, & Rohde, 2009). The outcomes from these programs have been mixed and a meta-analysis has found that less than half significantly reduced depression symptoms (Stice et al., 2009). Whilst some researchers have attributed these disappointing results to the lack of statistical power in several studies, this is insufficient to fully explain these findings. Reported means in some trials, even those that reported statistical significance, suggest no clear advantage for the early intervention condition (e.g. Horowitz, Garber, Ciesla, Young, & Mufson, 2007; Merry, McDowell, Wild, Bir, & Cunliffe, 2004; Quayle, Dziurawiec, Roberts, Kane, & Ebsworthy, 2001). A notable omission in most early intervention programs for adolescents is the focus on the emotion regulation strategies of acceptance. An evaluation of an early intervention program that addresses this component in adolescents is indicated.

Acceptance and Commitment Therapy (ACT), developed by Hayes, Strosahl, and Wilson (1999), combines mindfulness with behavioral principles and an understanding of personal values (see Hayes, 2004). Mindfulness is the purposeful direction of attention to the present moment with an open-minded and curious attitude. The direct attention component of mindfulness assists individuals in understanding their emotional experiences while an open-minded attitude reduces the tendency to withdraw from the emotional experience, which

tends to occur when the emotion is judged to be undesirable. Shying away from the emotional experience drives avoidance behaviors whilst staying present with the emotion facilitates acceptance. Mindfulness has been found to reduce emotional reactivity (Britton, Shahar, Szepsenwol, & Jacobs, 2012), improve behavioral inhibition (Forman et al., 2007), and improve the ability to differentiate and label emotions (Creswell, Baldwin, Naomi, Eisenberger, & Lieberman, 2007; Hill & Updegraff, 2012). In addition, mindfulness has been found to reduce rumination, thought suppression, and the frequency of negative thoughts (Brefczynski-Lewis et al., 2007; Frewen, Evans, Maraj, Dozois, & Partridge, 2008). ACT applies the concept of mindfulness to thoughts, feelings, physiological sensations, and memories. ACT teaches skills and techniques to notice and accept these experiences rather than continue their old patterns of avoidance. ACT also encourages individuals to clarify their personal values and engage in behaviors that are consistent with these values in order to help them regulate their emotions. Randomized controlled trials have found that in adults ACT decreases: depression (Öst, 2014), psychotic symptoms (Bach & Hayes, 2002; Bach, Hayes, & Gallop, 2012; Gaudiano & Herbert, 2006; White et al., 2011), panic disorder, generalized anxiety disorder, and social anxiety (Arch et al., 2012; Avdagic, Morrissey, & Boschen, 2014), obsessive-compulsive disorder (Twohig et al., 2010), drug and nicotine dependence (Hernández-López, Luciano, Bricker, Roales-Nieto, & Montesinos, 2009; Luoma, Kohlenberg, Hayes, & Fletcher, 2012), borderline personality disorder (Gratz & Gunderson, 2006; Morton, Snowden, Gopold, & Guymer, 2012), chronic pain (Hann & McCracken, 2014; Veehof, Oskam, Schreurs, & Bohlmeijer, 2011; Weineland, Arvidsson, Kakoulidis, & Dahl, 2012; Wetherell et al., 2011), and improves weight control (Forman et al., 2007; Juarascio, Forman, & Herbert, 2010; Lillis, Hayes, Bunting, & Masuda, 2009). Research evidence for the application of ACT with adolescents is less extensive although four randomized controlled trials have found that it can reduce depressive symptoms, unsafe

sexual behaviors, chronic pain, anxiety, and stress (Hayes, Boyd, & Sewell, 2011; Livheim et al., 2014; Metzler, Biglan, Noell, Ary, & Ochs, 2000; Wicksell, Melin, Lekander, & Olsson, 2009).

Positive psychology (PP) comprises a number of constructs that have been found to contribute to subjective wellbeing such as gratitude, mindfulness, and social relationships. The relationship of these constructs to wellbeing varies according to different models, although mindfulness remains a core component (Lyubomirsky, 2007; Seligman, 2011). In high school students, subjective wellbeing has been associated with better academic performance, less behavioral problems, and greater school engagement (Antaramian, Huebner, Hills, & Valois, 2010). Higher subjective wellbeing is also associated with superior peer, parental, and teacher relationships and higher levels of self-esteem and self-efficacy (Gilman & Huebner, 2006). In adolescents, PP interventions have been shown to decrease depression and stress symptoms and increase overall wellbeing (Manicavasagar et al., 2014; Norrish & Vella-Brodrick, 2009). While ACT promotes mindfulness as a means to manage negative thoughts and emotions, PP promotes mindfulness to increase positive emotions in order to improve subjective wellbeing. In this sense, they are complementary emotion regulation approaches that target both positive and negative emotions.

The growing evidence for targeting emotion regulation strategies for both positive and negative emotions in adolescents led to the development of a program that combined PP with ACT, the Strong Minds program, which was evaluated in a sample of high school students using a randomized controlled trial. The aim of the program was three-fold: (a) to improve subjective wellbeing for all participants; (b) to reduce symptoms of anxiety and depression for those who began the program with elevated symptoms (i.e., treatment of psychopathology); and (c) to reduce the likelihood of symptoms emerging in participants who began the program with low levels of anxiety and depression (i.e., prevention of

psychopathology). Depression and anxiety symptoms were measured using the Depression Stress Anxiety Scale – Short Form (DASS-21) which examines symptoms related to depression (depression subscale), generalized anxiety (stress subscale), and other anxiety disorders such as panic and social anxiety (anxiety subscale). A program that could be delivered to all students, regardless of their level of depression and anxiety symptoms, would reduce the costs and difficulty associated with multiple programs. The current study reports on the first two aims: improving subjective wellbeing and reducing existing symptoms of psychopathology. The research question we sought to answer was: does the delivery of an early intervention program that specifically targets acceptance lead to reductions in symptoms of anxiety and depression in those with elevated symptoms and does it lead to improved subjective wellbeing for all participants. It was hypothesized that amongst students who began the program with high levels of anxiety and depressive symptoms, participants in the Strong Minds condition would demonstrate greater reductions in symptoms than those observed in the control condition. Furthermore, we hypothesized that there would be a greater increase in subjective wellbeing for participants in the Strong Minds program compared to students in the control condition.

Method

Participants

Participants were drawn from an independent Episcopalian high school in Sydney, Australia. The school was selected for the study after a school staff member in a management position approached the research group enquiring about early intervention programs that would be easily delivered and evaluated. Students were drawn from Years 10 and 11 – in the Australian system ‘high school’ comprises the 6 years of school prior to university with Year 12 being the final year. The school had 320 students aged 15 to 18 years with a mean age of 16.37 years. The school involved in this trial was of mixed sexes, although only admitted

boys in the past, which was reflected in the disproportionate numbers of boys in this study. The school performs well academically in comparison with other high schools in Australia and is ranked in the top 100 out of 660 schools in the state of New South Wales (Matrix Education, 2015). On a measure of socio-demographic characteristics (Australian Curriculum Assessment and Reporting Authority, 2014), 76% of the students were in the top quartile of socio-economic advantage (www.myschool.edu.au). In order to participate in the study, students under the age of 16 years were required to provide parental- and self-consent, while for those 16 years or older, self-consent alone was sufficient. All students who agreed to participate were included in the study (i.e. there were no exclusion criteria). Students that declined to participate in the study still attended the condition to which they would have been allocated as the school decided it was part of the required curriculum. However, they did not complete any of the self-report assessments. From the 320 students in Year 10 and 11, 269 (84.1%) provided baseline data and consent forms. Of those who did not provide consent and baseline questionnaires, 14 were under the age of 16 years and did not provide parental consent. The remaining 36 were either absent on the day that consent and baseline measures were completed or chose not to participate. From the 269 who provided baseline data, two participants' data were discarded as they reported swapping questionnaires with each other. The data from the remaining 267 participants were retained for the analysis with 139 in the Strong Minds condition and 128 in the control condition. The age and sex of these students is provided in Table 1. Of the 267 who completed the baseline measures, 221 completed the post-intervention questionnaire battery (82.8%). A participant was considered as having completed the post-intervention ('completer') if at least one measure of the assessment battery was completed.

Interventions

The Strong Minds condition.

This program was developed by two of the authors (RB and VM) and drew on the principles of PP and ACT. The ACT component instructed students in six areas which are considered core to ACT: Values, Committed Action, Contact with Present Moment, Observer-self, Acceptance of Emotions, and Thought Defusion. ‘Values’ is the identification of one’s values or the personality qualities one wishes to espouse. ‘Committed action’ is taking action that is consistent with one’s values. ‘Contact with present moment’ is present-moment awareness. ‘Observer-self’ is the notion that thoughts, feelings, and body sensations may pass but the self remains constant. ‘Acceptance of emotions’ is the acceptance rather than avoidance of negative emotions. ‘Thought Defusion’ is where negative thoughts are regarded as incidental internal dialogue. The PP components were derived from a report by two Australian PP experts which was commissioned for a previous PP project. They had identified 11 components based on a review of the literature that they considered to be important for subjective wellbeing: mindfulness, gratitude, kindness, character strengths, flow, optimism, hope, meaning, social relationships, healthy lifestyles, and goals. From this report, four components were selected for the current research project based on three factors: (a) an additional review of the research indicated that they were important for subjective wellbeing; (b) they did not contradict the message of ACT; and (c) they were considered to be relevant to young people. Mindfulness was already largely covered by the ACT component. Gratitude was not retained because a recent study found that when the quality of the control group was considered, the benefits disappeared. Character strengths was not included because a review of the evidence found that while certain traits have been linked to higher wellbeing there was little to support promoting character strengths led to increases in wellbeing. Flow was not included as it was considered to be an application of mindfulness to

activities. Optimism was not included as it was considered to contradict the key notion of ACT which was that negative thoughts are a normal phenomena and the best way to manage their potential effect is to place less importance them. Hope was considered to be useful but a review of previous hope interventions suggested when it is taught it resembles problem-solving which was an emotion regulation strategy that was important not to include. Goals were not included because it was decided that it can easily make adolescents feel there is a pressure to perform and succeed in order to be happy. Meaning, kindness, social relationships, and healthy lifestyles were all retained. A review of healthy lifestyles suggested that it comprises healthy eating, engaging in regular exercise, obtaining adequate sleep, and managing stress. Exercise and managing stress were retained while sleep and healthy eating were not due to their low relevance for adolescents. For social relationships, the skills of assertiveness (how to obtain one's needs in interpersonal interactions while being considerate of others' needs) and how to make and retain friends were selected due to relevance to this age group. The PP components of Strong Minds are presented in Table 2, along with details of the individual ACT sessions.

Total contact time for the program was 8.0 hours, comprising 16 half hour sessions spread over 3 months. During this period, workshops were mostly conducted twice a week but other competing commitments for students and holidays meant that there were also breaks between sessions. Of the 16 sessions, the first 9 were based on ACT and the following sessions were based on PP. The program was delivered face-to-face by the lead author (RB) who was a registered psychologist. A research assistant was present during the workshops to assist with the practicalities of delivery. The aim of the sessions was to educate students about the concepts and to encourage them to apply these concepts to their lives. The facilitator used verbal explanations, metaphors, personal examples, videos, experiential exercises, and images during the Strong Minds sessions. An example of an experiential

exercise was mindfully eating a sultana to facilitate understanding of mindfulness. A PowerPoint presentation was used to deliver key points or images about the material. Each lesson did not follow a rigid format. Rather, during each lesson the facilitator aimed to ensure that the concepts were adequately explained and that students were instructed in how they could be used. Due to the large group size, the workshops were delivered in a lecture-style manner.

The control condition.

Students in the control condition continued to attend their usual 'Pastoral Care' classes. Pastoral Care aimed at assisting students face challenges in their lives such as managing social media and engaging in volunteer work. The Pastoral Care classes delivered to Year 10 students taught students about: (a) social justice at school, in Australia, and globally; and (b) cyber issues such as managing online harassment and the long-term consequences of online activity. For Year 11 students, Pastoral Care classes covered: (a) social justice at school, in Australia, and globally; (b) drugs; and (c) safe behavior while celebrating. School staff members facilitated Pastoral Care classes and remained with the group for the duration of the study. Classes comprised between 15 and 20 students and the material was delivered using class discussions. Strong Minds was delivered during the time-slot allocated to Pastoral Care classes. The length, duration, and total number of Pastoral Care sessions were the same as for the Strong Minds condition.

Measures

The Depression, Anxiety, and Stress Scale – Short form (DASS-21).

The DASS-21 comprises three symptom-based subscales (Depression, Anxiety, and Stress) of seven items each (Lovibond & Lovibond, 1995). Participants respond to each item on a four-point Likert scale (0 = 'not at all' to 3 = 'most of the time'). Summed scores for each scale range from 0-42 with more severe symptoms indicated by higher scores. This

study utilized total scores in addition to subscale scores. In an adolescent population, the DASS-21 is reported to have a Cronbach's alpha of .87 for Depression, .79 for Anxiety and .83 for the Stress subscales (Szabó, 2010). Cronbach's alpha was .90 for the Depression subscale, .83 for Anxiety, .86 for Stress, and .94 for DASS-Total score in our sample of students. The DASS-21 subscales are useful to assess clinical significance as high scores are correlated with DSM-IV diagnoses (Brown, Chorpita, Korotitsch, & Barlow, 1997). The DASS-Depression score is associated with Major Depressive Disorder; DASS-Stress scores are related to Generalized Anxiety Disorder; and DASS-Anxiety scores to the other anxiety disorders. To assist in interpreting the DASS-21, Lovibond and Lovibond (1995) created ranges of scores that fell into five DASS-21 categories that each related to a percentile norm from an Australian population: (a) Normal= 0-77th percentile; (b) Mild=78-86th percentile; (c) Moderate=87-94th percentile; (d) Severe=95-97th percentile; and (e) Extremely Severe=98-100th percentile.

Flourishing Scale (FS).

The FS is a brief 8-item measure of subjective wellbeing that emphasizes the behavioral and cognitive view-of-self components of wellbeing (Diener et al., 2010). Items of the FS assess quality of social relationships, purpose and meaning in life, engagement and interest in activities, self-respect, self-efficacy, and optimism. Each item is rated on a 7-point Likert scale that ranges from 'strongly agree' to 'strongly disagree'. Summed scores deliver scores ranging from 8 (lowest level of wellbeing) to 56 (high wellbeing). Psychometric analysis of the scale indicates that it has a single factor structure with loadings ranging from .72 to .81 and that it correlates negatively (-0.60) with the Centre for Epidemiological Studies Depression Scale 8 (Hone, Jarden, & Schofield, 2014). The mean score for those aged 18 to 20 years old in a normal population was 42.71 (SD=7.96) and the Cronbach's alpha was .87 (Hone et al., 2014). Cronbach's alpha for the FS in this sample was .87.

Procedure

Recruitment and setting.

Several weeks before the Strong Minds program commenced, all students in Year 10 and 11 were informed of the aim of the study. Parental consent forms were distributed to students by the school during class. An a priori power analysis was not conducted as the sample was 'opportunistic', with the Strong Minds program delivery organized before the evaluation study was designed. Students were invited to complete self-consent forms and baseline questionnaires one week prior to the start of the workshops. Each session of the Strong Minds program was delivered in an amphitheater. For two-thirds of the program, Year 10 and 11 students were combined for the presentation of materials and for the other third they were instructed separately (due to external commitments for Year 10). One week after the conclusion of the workshops, the researchers returned to the school to distribute the post-intervention questionnaires, which were completed by students in their tutorial groups. The researchers returned on two other occasions to collect completed questionnaires from students who were absent on previous collection days.

Design and randomization.

This was a randomized controlled trial with no blinding. The control group comprised Pastoral Care which was 'treatment as usual'. This study reports on baseline and post-intervention data. Cluster randomization was conducted, with tutorial groups (8 in each Year) being randomized to receive either the intervention or control condition. A staff member of the school who was independent from the research group conducted the randomization process. Tutorial groups were listed alphabetically by the tutorial group name. For Year 10 the first four groups on the list were allocated to the Strong Minds condition and for Year 11 the last four groups on the list were allocated to the Strong Minds condition.

Treatment fidelity and quality assurance.

The facilitator (RB) was a board-approved psychologist with masters-level qualifications in clinical psychology (6 years university training in psychology). He had approximately 2 years' experience in clinical psychology (using a variety of approaches including ACT) and had previously led a number of small-group interventions. He had specific training in ACT and PP and received regular supervision during the delivery of the program from experienced ACT practitioners and a senior researcher in PP.

In order to assess adherence to ACT, an independent clinical psychologist experienced in ACT scored the audiotaped workshop sessions using an adherence scale specifically developed for this study but based on previous ACT fidelity measures (McGrath et al., 2005; Morris, 2011). A new scale was developed because existing scales were designed for individual therapy and inappropriate for the group format of this study. The adherence scale comprised nine items: Fusion, Mindfulness, Values, Committed Action, Accepting Emotions, Self-as-Context, Generalization, Stance of Facilitator, and Use of Metaphors. The adherence scale was scored on a 4-point Likert scale where 1= minimal; 2=satisfactory; 3=high; and 4=very high. Neither the control condition nor the PP sections in this study were recorded and rated on a scale of fidelity. Scores ranged for the nine components from 2.6 for generalization to 3.6 for values and the mean across all components was 3.0 (high).

Statistical Analysis

Statistical analysis was conducted using SPSS 22.0 software package. An intention-to-treat approach, specifically, Mixed Model for Repeated Measures (MMRM) analyses were used to compare whether there were differential changes in the outcome scores over time for the intervention group compared to the control group. These models accounted for a discrete effect of time as a repeated measure, while clustering by tutorial group was included as a random effect. MMRM uses all available data under the missing at random assumption.

Degrees of freedom were estimated using Satterthwaite's correction. To examine clinical significance, Generalized Linear Mixed Models (GLMM) for binary outcomes was used.

Baseline differences between the groups were examined using a series of independent samples *t*-tests. Independent samples *t*-tests were also used to compare the baseline characteristics of participants who completed the questionnaire battery at post-intervention compared to those who did not ('drop-outs').

Universal effects analyses examined two questions: (a) whether the program was effective at reducing symptoms in participants with elevated symptoms at baseline; and (b) whether the program was effective at increasing wellbeing across the entire sample. To examine the first question, the analysis was limited to individuals with a baseline DASS-Total score of 50 as previous Australian normative data for that age group suggests that this score was indicative of a diagnosable depressive or anxiety disorder (Kessler et al., 2012; Tully, Zajac, & Venning, 2009). To estimate effect sizes, Cohen's *d* formula, d_{ppc2} , from Morris (2008) was used. A positive number for the DASS-21 scales represents a decrease from baseline to post-intervention (i.e., an improvement in symptoms) while for the FS a positive number indicates that there was an increase from baseline to post-intervention (i.e., an improvement in wellbeing).

Results

Baseline comparisons

Differences in age and baseline DASS-21 and FS scores for the two conditions, Strong Minds and control, were examined using a series of *t*-tests. Sex differences were examined using a Chi-square test for goodness of fit. Effect sizes were calculated using Cohen's *d*. No significant differences on baseline scores or demographics were found (see Table 1).

The results of the analysis that compared dropouts to completers are presented in Table 3. It was found that compared to completers, drop-outs were 5 months younger, reported significantly higher levels of depressive symptoms, anxiety symptoms, and stress symptoms. There were no significant differences in sex distribution or subjective wellbeing. The percentage of dropouts in the control condition (9.0%) did not differ significantly from the Strong Minds condition (8.2%), $\chi^2(1) = .22, p = .64$.

Program Adherence

The scores for the nine components of the adherence scale ranged from 2.6 for generalization to 3.6 for values, and the mean across all components was 3.0 (high).

Universal Effects of the Program

The observed means for the DASS-21 in the high baseline individuals and for the FS for all participants are presented Table 4 and by Year in Table 5. Commencing with the base model that examined Time $\times$ Condition, relevant factors (sex and year group) were added to investigate influence. Year group was retained because it had a significant effect on outcome. The best fitting covariance structure was selected using Akaike's Information Criterion (AIC). When the mixed model was run with Year $\times$ Condition $\times$ Time, significant differences were found across all the measures except DASS-Anxiety. The effect of Condition $\times$ Time was significant for DASS-Depression, DASS-Stress, and DASS-Total (see Table 6). The significant interaction of Time $\times$ Condition $\times$ Year suggests that there was a differential effect of Time $\times$ Condition for Year 10 and Year 11 students. Thus, the analysis was rerun for each group separately and the results presented in Table 7. These results indicate that there were significant differences between the control and Strong Minds condition for all DASS-21 scores and the FS score for Year 10. On the other hand, for Year 11 none of the differences on the DASS-21 or the FS were statistically significant. Given the interaction of year group,

further analyses reported effect sizes and clinical significance for combined and separate year groups.

Clinical Significance

The clinical significance of the results was explored using the clinical categories of the DASS-21 described in the methods section. Table 8 presents the allocation of participants to the DASS-21 categories. The GLMM for binary outcomes compared the number of participants that fell in either the 'Severe' and 'Extremely Severe' ranges of the DASS-21 in the Strong Minds and control conditions from baseline to post-intervention. The results, presented in Table 9, indicate a significant difference on the DASS-Anxiety and DASS-Stress variables.

Discussion

The aim of the present study was to evaluate a new early intervention program, Strong Minds, which combines ACT with PP. It sought to examine two questions: (a) compared to the control condition, does Strong Minds reduce symptoms of participants who begin the program with elevated symptoms (i.e. is it effective as an early intervention); and (b) compared to a control condition, does Strong Minds increase wellbeing across all participants. When Year 10 and Year 11 were examined together, there was a statistically significant reduction of depression scores, stress scores, and DASS-Total scores for the Strong Minds condition compared to the control condition. The size of this effect following Cohen's (1988) convention was large for stress scores and medium for depression and DASS-Total scores. These results suggest that our first hypothesis was supported by the findings. Improvements in symptom scores for the Strong Minds condition were clinically meaningful when percentiles were examined and reached statistical significance for the DASS-Anxiety and DASS-Stress subscales.

The observed changes in the present study are similar in magnitude to the changes observed in other early intervention programs utilizing CBT. Stice, Shaw, Bohon, Marti, and Rohde (2009) found a medium effect size across CBT early intervention for high-risk adolescents. Likewise, in Neil and Christensen's (2007) systematic review, most significant findings had effect sizes that ranged from 0.30 to 0.50, although not all these studies are comparable in design and analyses.

Hayes et al.'s (2011) study of ACT for depressed adolescents found an effect size of 0.38 at post-treatment, indicating a greater difference between the conditions in the current study. The reasons for this difference are not clear but could be due to their choice of control condition. Hayes et al. (2011) used a CBT intervention for the control condition and given CBT is an evidence-based treatment for depression, smaller differences would be expected than for the present study, which did not provide an evidence-based treatment to the control condition. The type of control condition selected in an outcome trial is known to significantly affect the effect size observed (Klein, Jacobs, & Reinecke, 2007).

Overall, these results are encouraging and tentatively endorse the combination of ACT and PP as an early intervention program for youth. These results suggest that there is merit in teaching young people skills in the emotion regulation technique of acceptance. Many early intervention programs have concentrated on limited emotion regulation strategies such as problem-solving and cognitive appraisal to address anxiety and depression in young people. The results of this study indicate that increasing acceptance also appears to be important. Given the complexity of emotion regulation, it is not surprising that there may be several effective methods for emotion regulation in early intervention programs. However, increasing acceptance may be more relevant to younger populations. Research has found that meta-cognitive ability (the ability to think about thinking), which contributes to the ability to

modify cognitive appraisals, increases with age (Weil et al., 2013). Thus, non-cognitive approaches may be more effective with younger populations compared to adults.

The ideal future direction of a program such as Strong Minds is to embed it into school curriculum and make it a standard part of the educative experience. The large group format makes this more feasible and not only does it lower costs and increase ease of implementation, it also avoids the need to select students based on pre-existing symptoms which risks creating stigma amongst students. If the present results are replicated in a larger trial, a 'train-the-trainer' model should be considered for widespread dissemination whereby individuals are trained in the material and given the necessary resources to deliver it.

Differences between the conditions failed to reach statistical significance on the measure of wellbeing. A significant pre- post-difference in wellbeing scores with a medium effect size was observed only for Year 10 students. Interpreting such results is inherently difficult but it may be related to the increasing amount of responsibility and concerns in students from Year 10 to Year 11. Year 11 participants were studying for their final high school exam (which determines entry into university) and also romantic relationships become more relevant to this Year group, both of which can create additional stress. Year 11 students' focus on these activities may translate in a reluctance to engage in learning new material outside of their academic curriculum. While these speculations are plausible, it cannot be ruled out that these differences were not due to issues specific to our program. In addition to the non-significant findings for wellbeing, it was noted that amongst Year 11 participants, the control group reported greater decreases in anxiety symptoms and total psychopathology symptoms compared to control. While not statistically significant, it is possible that for Year 11 students, for whom the program did not appear to result in improvements, they did try and use the techniques taught but found them less useful than old

strategies. It is also possible that it is simply statistical variation but regardless it would be beneficial to examine if this effect is repeated in future research.

An analysis of dropouts versus completers indicated that students who did not complete the post-intervention measures had significantly higher symptoms of anxiety and depression than those who did. They were also significantly more likely to be younger. A number of explanations are plausible to account these findings. Firstly, students with higher symptoms at the start of the program may have been more likely to miss school, either as a direct result of their symptoms or because these students may have also had more problems outside of school. By missing more school days, they would have been more likely to be absent for the post-intervention questionnaires. Secondly, these students may have been less engaged with school activities and so chose not to complete the post-intervention questionnaires. Previous studies have also found that younger participants are more likely to drop out of a mental health intervention, as are participants with higher depressive symptoms (Christensen, Griffiths, & Farrer, 2009; Nicholas et al., 2010). The reason for the age-related higher dropout from this intervention is unclear although older students may have been more mature and engaged in school and so were more likely to complete school related tasks. It is also possible that older students were more diligent in attending school in preparation for their final high school exam.

Limitations of the Study

The findings of this study should be interpreted with consideration of its limitations. First, the group sizes in the psychopathology analyses were small ($n = 63$) given they comprised of participants with high baseline symptom scores. Whilst the results are encouraging, a larger randomized controlled trial would further support the results. Second, there was no blinding of participants to their condition allocation. Third, school studies carry many inherent uncontrolled factors that can influence the results, particularly in studies with

small sample sizes. Exams that occur during the program, additional classes or workshops that students participate in, or additional support by the school counselor are not unusual in school-based studies and have the potential to confound results. Likewise, students may have missed particular workshops due to non-attendance or competing activities. This study was limited in that the data on such events were not systematically collected. Fourth, without analysis of process variables such as emotional acceptance, the possibility that it was a confounding variable that accounts for the change cannot be excluded. The design of the study did not allow differentiation of the effects of the ACT content from the PP component and so it is not possible to determine which of these was responsible alone or in combination. It would be useful for future research that seeks to examine ACT and PP to consider a component analyses study. Fifth, reasons for dropping out were not systematically collected during the trial which limits the inferences that can be made on the participants who dropped-out. It would be desirable for future studies to collect such information when conducting similar trials. Sixth, the control condition was not assessed for adherence to the curriculum using an objective measure such as audio-recordings and so it is not possible to state with certainty that the material taught was exactly the same as outlined in the curriculum. The study was also limited by the self-report outcome measures and by the participant sample – an independent school that is relatively affluent and high achieving compared to the national average.

Implications for Research

These findings from the current study suggest that there is merit in further investigation of the potential of acceptance-based emotion regulation strategies in early intervention. The findings support the benefit of combining ACT and PP for this purpose. Given it is the first time ACT and PP have been combined, this study opens possibilities to expand the repertoire of school-based programs that are available. A larger-scale study of

Strong Minds appears warranted given the findings of this feasibility study. It would be beneficial for future research to consider if the previous training of the facilitator (e.g., psychologist or mental health worker) significantly affects the outcomes of the program. It would also be of interest for a larger trial to consider examining the effectiveness of Strong Minds in more diverse socio-economic populations.

The findings observed in the current study indicate that early intervention should consider large group delivery which has numerous advantages over small group programs. Future programs may need to find a way of improving school attendance during the delivery of early intervention programs to improve outcomes. Future research should also examine an approach to early intervention that incorporates both cognitive appraisal and problem-solving together with acceptance strategies. It is plausible that the more emotion regulation techniques are included in a prevention program, the better the outcomes may be.

Conclusion

The current study trialed a new approach to student mental health by combining PP and ACT into an early intervention program. The results demonstrated a statistically significant reduction in symptoms of stress, depression, and total psychopathology for participants who began the program with elevated symptoms. In addition, a reduction in anxiety for high symptom Year 10 students and increases in wellbeing for all Year 10 students were observed. The results from this feasibility study suggest that PP and ACT hold promise in the field of early intervention for young people.

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Table 1

Baseline characteristics of participants

<u>Condition</u>	<u>Strong Minds</u>	<u>Control</u>	<u>p-value</u>	<u>Cohen's <i>d</i></u>
Age (years), mean (SD)	16.37 (0.65)	16.34 (0.64)	.64	.06
Sex (males), n (%)	87 (63%)	75 (59%)	0.50	.08
Baseline depression score, n	139	128		
Mean (SD)	11.3 (10.0)	11.3 (10.0)	.98	.002
Baseline anxiety score, n	139	128		
Mean (SD)	9.6 (8.4)	9.4 (8.6)	.85	.02
Baseline stress score, n	139	128		
Mean (SD)	13.7 (9.2)	14.0 (8.9)	.82	.03
Baseline total DASS score, n	139	128		
Mean (SD)	34.6 (25.0)	34.6 (24.4)	.99	.001
Baseline FS score, n	138	122		
Mean (SD)	41.2 (9.0)	42.8 (7.2)	.12	.20

Table 2

Overview of the Strong Minds program

Session 1	Introduction to program; myths of happiness; introduction to values	Session 9	Applying all ACT components using the example of bullying
Session 2	Values	Session 10	Assertiveness part 1
Session 3	Committed action	Session 11	Assertiveness part 2
Session 4	Utility of emotions and the mind as a problem-solving machine	Session 12	Kindness
Session 5	Emotional avoidance and acceptance	Session 13	Introduction to wellbeing; being human; meaning; managing stress
Session 6	Thought Fusion and Defusion	Session 14	Relationship between money and happiness; and physical exercise
Session 7	Contact with present moment	Session 15	Social relationships
Session 8	Contact with present moment and observer self	Session 16	Final session – wrap up and students sharing how workshops have helped

Table 3

Completers and dropouts, means and standard deviations

<u>Condition</u>	<u>Completers</u>	<u>Drop-outs</u>	<u>p-value</u>	<u>Cohen's <i>d</i></u>
Age (years), mean (SD)	16.43 (0.64)	16.01 (0.56)	<.001	.50
Sex (males), n (%)	137 (62%)	25 (54%)	.37	.12
Baseline depression score, n	221	46		
Mean (SD)	10.5 (9.4)	15.0 (11.8)	.02	.30
Baseline anxiety score, n	221	46		
Mean (SD)	8.9 (8.2)	12.3 (8.9)	.01	.31
Baseline stress score, n	221	46		
Mean (SD)	13.2 (8.8)	16.8 (9.7)	.02	.30
Baseline total DASS score, n	221	46		
Mean (SD)	32.6 (23.8)	44.1 (26.9)	.004	.36
Baseline FS score, n	217	43		
Mean (SD)	42.4 (8.0)	40.0 (9.0)	.08	.22

Table 4

Observed means and standard deviations for combined years

	<u>Strong Minds</u>		<u>Control</u>	
	<u>Baseline</u>	<u>Post</u>	<u>Baseline</u>	<u>Post</u>
<u>DASS Scales</u>				
n	30	24	33	22
Depression-Mean (SD)	25.83 (8.46)	20.17 (9.73)	24.30 (7.72)	23.00 (11.69)
Anxiety-Mean (SD)	21.04 (8.93)	19.00 (9.55)	20.58 (7.69)	18.64 (11.32)
Stress-Mean (SD)	27.00 (6.70)	20.67 (8.38)	24.79 (6.08)	23.24 (9.33)
Total-Mean (SD)	73.88 (17.72)	59.83 (23.64)	69.67 (14.51)	64.88 (29.78)
<u>FS</u>				
n	138	115	122	102
Mean (SD)	41.23 (8.96)	42.82 (7.66)	42.82 (7.23)	43.10 (8.68)

Table 5

Observed means and standard deviations for Year 10 and Year 11

	<u>Year 10</u>				<u>Year 11</u>			
	<u>Strong Minds</u>		<u>Control</u>		<u>Strong Minds</u>		<u>Control</u>	
	<u>Baseline</u>	<u>Post</u>	<u>Baseline</u>	<u>Post</u>	<u>Baseline</u>	<u>Post</u>	<u>Baseline</u>	<u>Post</u>
n	15	11	14	8	15	13	19	14
DASS-Depression								
Mean	27.07	19.64	22.71	27.00	24.60	20.62	25.47	20.71
(SD)	(8.31)	(9.95)	(7.43)	(12.33)	(8.72)	(9.91)	(7.91)	(11.11)
DASS-Anxiety								
Mean	22.09	20.91	20.71	24.25	20.00	17.38	20.47	15.43
(SD)	(9.05)	(10.86)	(7.71)	(9.47)	(9.01)	(8.38)	(7.89)	(11.33)
DASS-Stress								
Mean	27.60	18.73	22.29	26.75	26.40	22.31	26.63	21.24
(SD)	(6.60)	(7.76)	(4.07)	(7.63)	(6.98)	(8.83)	(6.73)	(9.87)
DASS-Total								
Mean	76.76	59.27	65.71	78.00	71.00	60.31	72.58	57.38
(SD)	(19.46)	(26.25)	(11.03)	(27.46)	(15.93)	(22.28)	(16.29)	(29.32)
FS								
Mean	34.33	37.91	36.31	32.88	32.27	33.69	34.73	34.58
(SD)	(10.62)	(11.29)	(6.32)	(10.18)	(9.07)	(7.96)	(6.44)	(9.61)

Table 6

Linear mixed modeling Time × Year × Condition results, type III fixed effects

<u>Outcome</u>	<u>DF*</u>	<u>F</u>	<u>P</u>	<u>Cohen's d</u>
DASS-Depression				
Time × condition	1,56	4.32	.04	0.53
Time × Year × Condition	1,56	5.22	.03	
DASS-Anxiety				
Time × condition	1,52	0.89	.35	0.01
Time × Year × Condition	1,52	3.80	.06	
DASS-Stress				
Time × condition	1,55	8.25	.006	0.74
Time × Year × Condition	1,55	12.22	.001	
DASS-Total				
Time × condition	1,56	5.82	.02	0.57
Time × Year × Condition	1,56	9.80	.003	
FS				
Time × condition	1,224	2.49	.116	0.16
Time × Year × Condition	1,224	6.29	.01	

*DF=Degrees of Freedom (decimals were rounded to the nearest whole number)

Table 7

Linear mixed modeling Time $\times$ Condition results for Year 10 and Year 11, type III fixed effects

<u>Outcome</u>	<u>DF*</u>	<u>F</u>	<u>P</u>	<u>Cohen's d</u>
DASS-Depression				
Year 10	1, 28	5.73	.02	1.44
Year 11	1, 29	0.03	.88	-0.09
DASS-Anxiety				
Year 10	1, 22	4.16	.05	0.54
Year 11	1, 29	0.57	.46	-0.28
DASS-Stress				
Year 10	1, 27	17.16	<.001	2.34
Year 11	1, 29	0.25	.62	-0.19
DASS-Total				
Year 10	1, 26	11.69	.002	1.81
Year 11	1, 29	0.33	.57	-0.27
FS				
Year 10	1,106	5.14	.03	0.43
Year 11	1, 120	.94	.34	-0.06

*DF=Degrees of Freedom (decimals were rounded to the nearest whole number)

Table 8

Mean score category and percentage of participants with high baseline symptoms (n = 63) in the Severe or Extremely Severe category

		<u>DASS-Depression</u>				<u>DASS-Stress</u>				<u>DASS-Anxiety</u>			
		<u>Mean score</u>		<u>% in Severe</u>		<u>Mean score</u>		<u>% in Severe</u>		<u>Mean score</u>		<u>% in Severe</u>	
		<u>range</u>		<u>ranges*</u>		<u>range</u>		<u>ranges*</u>		<u>range</u>		<u>ranges*</u>	
		<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
<u>Years combined</u>													
Strong	Severe	Moderate	67%	42%	Severe	Moderate	73%	38%	Extremely	Severe	60%	67%	
Minds										Severe			
Control	Severe	Severe	67%	59%	Moderate	Moderate	79%	50%	Extremely	Severe	45%	59%	
										Severe			
<u>Year 10</u>													
Strong	Severe	Moderate	67%	36%	Severe	Moderate	73%	27%	Extremely	Extremely	80%	73%	
Minds										Severe	Severe		
Control	Severe	Severe	57%	75%	Moderate	Severe	21%	63%	Extremely	Extremely	64%	88%	
										Severe	Severe		
<u>Year 11</u>													
Strong	Severe	Moderate	67%	46%	Severe	Moderate	47%	46%	Extremely	Severe	67%	62%	
Minds										Severe			
Control	Severe	Severe	74%	50%	Severe	Moderate	63%	43%	Extremely	Severe	91%	43%	
										Severe			

* Either 'Extremely Severe' or 'Severe range' respectively

Table 9

Generalized Linear Mixed Models for binary outcomes Time $\times$ Condition $\times$ Year results, fixed effects

<u>Outcome</u>	<u>DF</u>	<u>F</u>	<u>P</u>
DASS-Depression			
Time $\times$ condition	1, 101	1.78	.19
Time $\times$ Year $\times$ Condition	1, 101	1.68	.20
DASS-Anxiety			
Time $\times$ condition	1, 101	3.87	.05
Time $\times$ Year $\times$ Condition	1, 101	3.99	.048
DASS-Stress			
Time $\times$ condition	1, 101	7.35	.008
Time $\times$ Year $\times$ Condition	1, 101	7.06	.009