

A preliminary evaluation on the effectiveness of a
universal school-based mindfulness intervention to
enhance resilience in adolescents

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Declaration

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This thesis entitled A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in adolescents is submitted in partial fulfilment for the requirements for the Unitec degree of Master of Osteopathy.

CANDIDATE'S DECLARATION

I confirm that:

- This thesis represents my own work.
- The contribution of supervisors and others to this work is consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee

Research Ethics Committee Approval Number: 2015-1056

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Abstract

Background: Mindfulness in schools programs are increasing in use globally and in New Zealand. Mindfulness training is hypothesised to influence resilience as an outcome measure. Several instruments that measure resilience have been used with mindfulness research but an age specific tool has not yet been investigated.

Aims: Primarily, to evaluate adolescent resilience to establish the effectiveness of the Mindfulness in Schools Project ‘.b’ mindfulness training program taught in a New Zealand school environment. Secondly, to test the convergence validity of the Child and Youth Resilience Measure with the Ego Resilience Scale.

Method: To investigate these aims this study used a single cohort design with pre-post measures using The Child and Youth Resilience Measure administered pre-and-post the 9-week mindfulness intervention to gauge changes in resilience. The Ego Resilience Scale was also administered post intervention to establish convergence validity with The Child Youth Resilience Measure.

Results: Data from 87 students were analysed with results from the Child and Youth Resilience Measure and all the subscales showed no significant change in resilience from pre-to-post the mindfulness intervention. Correlations between the Child and Youth Resilience Measure and the Ego Resilience Scale instruments (Pearson’s $r=0.49$, 95% CI 0.23 to 0.65, $p<0.001$) demonstrated good convergent validity.

Conclusions: The findings of this study indicated that mindfulness training in a school environment taught to adolescents from an independent boys’ school had no significant effects on resilience from pre-to-post intervention. This study, however, does demonstrate good convergent validity between the Child and Youth Resilience Measure and Ego Resilience Scale, and it appears sufficiently sensitive to evaluate a mindfulness in schools training program with adolescents.

Keywords: Mindfulness, resilience, MiSP, ‘.b’, Child and Youth Resilience Measure

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List of abbreviations

‘.b’ “Stop-Breathe-Be” (mindfulness course for children and adolescents)

CYRM-28 Child and Youth Resilience Measure-28

ERS Ego Resilience Measure

MBCT Mindfulness-Based Cognitive Therapy

MBCT-C Mindfulness-Based Cognitive Therapy for Children

MBI Mindful Based Interventions

MiSP Mindfulness in Schools Project

Section I: Introduction

Thesis background

Emotional education is becoming a recognised area in schools for adolescent learning. A focus on preparing children for the workforce through education is being shifted to now encouraging the development of competent workers, emotionally intelligent individuals, with the ability to engage actively with the world (Tregenza, 2008). Many schools are implementing programs that foster nurturance of a child's mental, spiritual, social and cognitive well-being (Tregenza, 2008; Yager, 2009).

The effects of stress triggered by events in children's lives has increased the use of wellness promoting programs in schools. Stress can create psychological dysfunction and is becoming significant in influencing early onset of mental illness (Fergusson & Horwood, 2001; Gluckman & Hayne, 2011; Mustillo, Erkanli, Keeler, Angold, & Library, 2003). In New Zealand, mental health conditions are common in children and adolescents who may experience anxiety disorders, depression, conduct disorders and substance abuse (MOH, 2014). Adolescent dysfunction is significantly associated with adult mental illness and is apparent in 50% of all adult conditions (Belfer, 2008).

When challenged by adverse events, some adolescents will succumb to risky and possibly self-destructive behavioural responses, while others will endure and even flourish through these adverse experiences. Those who do well through these challenging times display a trait described as resilience (Rutter, 2006). Resilience has been defined as a process of coping with disruptive, stressful, or challenging life events, in a way that provides the individual with additional protective and coping skills, more advanced than those shown prior to the disruption and that result from the event (Richardson, 2002). The concept of resilience has developed through research viewing it as an innate quality or characteristic (Praisman, 2008), to now understanding it rather as a normative self-righting tendency of an individual through a dynamic developmental process. Resilience is seen not as a fixed attribute, but as an alterable set of processes that can be fostered and cultivated (Masten, 2001).

The encouragement of characteristics such as self-esteem and self-efficacy can help the development of adolescents to overcome challenging situations and to increase resilience (Lerner, Brentano, Dowling, & Anderson, 2002). A technique growing in global use to foster

these qualities is mindfulness. There are many interpretations of the concept and definitions of mindfulness, but it can simply be described as an ability to observe, accept and participate in life's moment-to-moment experiences in a state of loving kindness or balance. Mindfulness is practised through contemplation and meditation. It can be promoted by focusing on everyday activities like walking, listening to music, eating and school tasks. Research now has strong evidence for the positive impact of mindfulness training by adults on mental health (Teasdale et al., 2000), physical health (Davidson et al., 2003) emotional and social skills (Vago & Silbersweig, 2012), and cognitive abilities (Chiesa & Serretti, 2011). Studies have evaluated these outcomes in both clinical and non-clinical samples, providing validity of the effects on a variety of populations and health issues (Baer, 2003; Grossman, Niemann, Schmidt, & Walach, 2004a).

School mindfulness programs are increasing in use and aim to provide children and adolescents with education to develop these recognised benefits (Burke, 2010; Harnett & Dawe, 2012; Zenner, Herrnleben-Kurz, & Walach, 2014). Initial reviews suggest that mindfulness-based interventions are viable with children and adolescences (Burke, 2009; Weare, 2013; Zenner et al., 2014; Zoogman, Goldberg, Hoyt, & Miller, 2014). Mindfulness training is becoming widely researched as being positively influential on stress and anxiety. Mindfulness may help with the ability to cope with hard times in one's life and it is becoming a popular strategy to enhance adolescents' wellbeing (Greenberg & Harris, 2012; Mendelson et al., 2010).

No research to date has used a child specific tool such as the CYRM-28 to evaluate resilience as an outcome of mindfulness training on adolescents. Therefore, the current preliminary research is the first of its type using the CYRM-28 in a single cohort design with pre-post measures to assess the change in psychological resilience during a school taught mindfulness-based intervention (MBI). The aim of this research is to evaluate the effectiveness of the 'b' mindfulness training program on resilience levels in adolescents in a New Zealand school environment. Secondly, to test the convergence validity of the CYRM-28 with the previously used Ego Resilience Scale (ERS) in school taught MBI research.

Summary of thesis

Chapter one is a review of the literature on the topics of mindfulness, resilience, and ways of cultivating resilience in adolescents using mindfulness. A review of self-reported outcomes related to mindfulness and an evaluation of the Child and Youth Resilience Measure is provided. Chapter two is a manuscript which includes an abstract, the method, the results, a discussion and the conclusion of the research. The manuscript has been formatted as per the requirements of the *Child Indicators Research Journal*. Following the body of the thesis is the reference list and appendices. Appendices are listed in the order that they are discussed throughout the thesis.

Section II: Literature Review

Background. There has been a rising level of interest in the benefits of mindfulness for children combined with appropriate tools to measure outcomes and an outcome measure resilience being highlighted in previous research as a suspected positive benefit. Therefore, an exploration of the literature that links resilience and mindfulness training of adolescents is necessary. Literature specifically relating to mindfulness training in schools contributes to the growing research surrounding mindfulness and its efficacy.

Literature search strategy. A literature search was carried out using the databases Science Direct, Google Scholar and PubMed. Keywords used in these searches included mindfulness* mindfulness in schools, resilience, adolescent stress and combinations of these terms. Results of this search were weighted towards including articles that specifically related to mindfulness in schools research and increasing resilience. The ‘cited by’ tool was used to find additional and more recent articles relating to the search terms, and the reference lists of each article was reviewed to identify additional relevant articles. Only those articles published in English with full-text were reviewed. There was no date limit placed on the search.

Structure of the literature review. This review has been divided into two sections. The first section is a background of the historical and scientific aspects of resilience and methods that enhance it. The theory of mindfulness for both adults and adolescents, and application and benefits for adolescents are also explored in this section. The second section is a review of the key salient and seminal studies investigating the Mindfulness in Schools Project (MiSP) curriculum ‘.b’ and its effects on resilience, and the tools to evaluate outcomes.

Background to resilience

This section provides an insight into the concepts of resilience – defining the meaning, philosophy, development, history and speculative psychological functioning related to it. Theories and programs to foster resilience in adolescents are discussed, followed by tools to measure resilience changes for scientific research. In the past it was thought that the brain was fixed and just got more worn out with ageing. Learning and development of the brain’s capacity is now known to continue through the lifetime of an individual. The background and review provide a basis for the study’s purpose of evaluating adolescents who are taught life skills that

help to foster resilience through a school based program and how best to measure resilience in an adolescent population.

Resilience. In the face of stress and adversity, resilience is the capacity to bounce back or cope successfully despite substantial life challenges (Rutter, 1985). The word resilience originated in the 1620s and was described as an "act of rebounding" from the Latin resilience, present participle of resilience "to rebound, recoil". The concept of resilience can be applied to everyday experience as well as adverse events. Psychology literature by leading resilience researchers such as Rutter (1979), Garmezy (1987), Werner (1982), Luthar (1991), Masten (2001) and Ungar (2008) provide insights into how stressful situations are dealt with by resilient people, from day-to-day challenges to disasters.

Research on resilience has developed over the last sixty years but still there is little agreement on a single definition of the concept among scholars due to the variations in constructs described by academics (Dreyer, 2003). Several key researchers in the field of resilience have identified, through longitudinal studies, multiple ideas that they believe form the construct of resilience. Rutter, who studied research on child development, autism, school effectiveness and resilience, suggested that resilience is not related to an individual's superior functioning or psychological traits, but rather it is a normal adaptation given the right resources. He emphasised that the stimulus for these differences is the environment, not the child (Rutter, 2007). Those who do well through these challenging times display a trait described as resilience (Rutter, 2006). Garmezy (1991) believed that resilience is influenced by stress but resilience is an ability for adapting and recovering from stressful encounters when one might originally retreat. He believed factors causing resilience related to a low number of risks and a higher number of protective factors (Garmezy, 1987). Werner described resilience as found in children who "worked well, played well, loved well, and expected well" (Werner, 1982, p. 153). She held an ecological view of resilience, focusing on protective factors that promoted resilience at the individual, family and community level (Werner, 1989). Other researchers defined resilience as "a dynamic process encompassing positive adaptation with the context of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p. 543).

Most recently resilience has been described as a social ecological construct that may provide a person with opportunities to realise his or her potential. This can be defined by the capacity of individuals to navigate their way to resources that sustain well-being, the capacity of the individuals' physical and social ecologies to provide those resources, and the capacity of individuals, their families and their communities to negotiate culturally meaningful ways to

share resources (Ungar et al., 2008). A more recent definition of resilience by Masten is that it is a degree of ability to adapt when stressful life events may impact negatively on their learning and way of living (Masten, 2014). Two core ideas exist that are shared by these theorists - that a person has faced serious risk and has exhibited positive functioning in some way. A significant difference between them is that Ungar believes resilience includes context and culture.

Components of resilience. As discussed, research has developed the concept from originally believing resilience was an innate quality or characteristic (Praisman, 2008), to now understanding it rather as a dynamic developmental process that incorporates the normative self-righting tendencies of individuals. The Project Competence (Garmezy, Clarke, & Stockner, 1961) evaluated children born to parents with schizophrenia and children with diagnosed behavioural conditions and examined their resilience. Garmezy believed resilience included family, friends, and community and shifted the idea of resilience to include consideration of the wider community around an individual to establish influences on resilience. Rutter conducted an empirical study on children known as the Isle of Wight and London study (Rutter, 1979) where he compared children in two different settings and focused on competence. His early work helped establish the theory that resilience is influenced by biology and gene-environment interactions, mental features and includes strength from social relationships. This has influenced research by directing consideration to genetics and environmental pathways of psychopathology, while introducing challenges to young people in order to develop coping skills.

Werner & Smith (1982) conducted the Kauai, Hawaii longitudinal study with 698 infants evaluating the influence of individual, family and community support on risk and resilience. This was followed up in 1985-86 with a study investigating individual attributes, family connections and community involvement (Werner, 1989). Werner discovered that resilience changes over time and her findings have influenced those researching resilience to acknowledge that change is possible with the right resources. Masten participated in Garmenzy's Project Competence (Garmezy et al., 1961) where he concluded that developmental phases had a significant influence on resilience. This influenced researchers to promote competence and to track progress in terms of developmental competence. Lastly, Ungar (2008) conducted a 14-site mixed method study on 1500 youth over five continents to understand resilience. These results initiated his theory that resilience encompasses seven tensions - 1. Access to material, 2. Relationships, 3. Identity, 4. Power and control, 5. Social justice, 6. Cultural adherence, 7. Cohesion.

This created awareness within academia to include all aspects of culture, community, relationships and the individual when intervening to establish resilience and provoked the creation of a new tool the Child and Youth Resilience Measure (Liebenberg, Ungar, & Vijver, 2012; Ungar & Liebenberg, 2011) to measure resilience in child populations. Resilience appears to be not a fixed attribute, but as an alterable set of processes that can be fostered and cultivated (Garmezy, 1987; Luthar et al., 2000; Masten, 2001; Ungar, 2005). All theorists conceptualise protective factors at three levels - the child, the family and the community. These protective factors include effective schools, normal cognitive development (Masten); expressiveness, locus of control (Luthar); intelligence (Garmezy); cultural/spiritual identification, self-efficacy, having a positive role model and mentor (Ungar). They all believe that high-quality social relationships are of importance.

An active prefrontal cortex, the brain's executive centre, is required for these identified attributes of resilience. The pre-frontal cortex regulates emotions, controls empathy, allows individuals to interpret circumstances in constructive and optimistic ways and restrains behavioural impulses. Practical ways to develop the prefrontal cortex is a common concept emerging in research in positive psychology (R. Brown, 2015). Positive psychology is a broad umbrella term that is fundamentally concerned with the scientific understanding and promotion of what makes life go well (Lyubomirsky, King, & Diener, 2005).

Resilience training techniques and outcomes. The context for developing resilience was recently evaluated by analysing the major resilience researchers' work to date, in a literature review by Brown (2015). Brown found no outstanding single predictor of a healthy human response to either everyday challenges or trauma. Evidence suggests that successful resilience in everyday stress has the same components as the aftermath of disaster resilience (Brown, 2015). Everyday challenges and setbacks at home and in schools may therefore provide opportunities to enhance and rehearse resilient responses relevant to both contexts. Educators may find appealing the research that indicates these components can help prepare adolescents for the inevitable stresses of everyday life as well as more major events. Strategies to promote components of resilience have grown globally but appear to vary in effectiveness (Brown, 2015; Khanlou & Wray, 2014).

One program, developed within the strand and practice of positive psychology concerning resilience, is the widely-used Penn Resiliency Program (Gillham et al., 2007). This is a 12-lesson program that has been shown to substantially decrease the incidence of depression and problem behaviours (Brunwasser, Gillham & Kim, 2009). The effectiveness of this intervention

reported outcome measures that are negative in the form of reducing depressive symptoms rather than positive symptoms, like improving self-efficacy or positive functioning. Programs that can be easily integrated into classroom and family activities by passionate teachers appear most beneficial to strengthen the individual's adaptive abilities (Brown, 2015).

Recommendations for training techniques are kept very broad by the theorists. Ungar (2008) suggests that interventions should help children navigate the tensions, while Masten (1994) believes there should be a focus on strength-based programs, both indicate interventions should be implemented at multiple levels. As discussed, theorists now believe resilience is a construct that encompasses not only the child but their environment, however theorists still suggest using interventions that identify and change individual level characteristics of children like coping skills, social competence, problem-solving skills (Masten, 2001; Werner, 1989). Other theorists, however, still advocate the need to encompass the environment and the resources within the environment as the focus of interventions (Ungar, 2005).

Assessing resilience. The measurement of resilience can enable identification of modifiable factors that can be used to inform research and policy initiatives. This can help children and youth develop the capacity they require to cope with adversity during normative and non-normative developmental transitions, as identified in the seminal study by Masten (2001). A literature review by Dreyer (2003) identified that many studies have used descriptive, casual-comparative, or correlational research designs to understand resilience in educational settings. Many studies examined resilience in schools by comparing both resilient and non-resilient students. An example of this is seen in the pilot study by Reyes and Jason (1993) who evaluated factors influencing academic success and failure in Latino adolescent students. They compared 24 resilient 10th grade students with 24 non-resilient 10th grade students and used academic grades and attendance as distinguishing factors. Results discovered higher satisfaction from students who measure as educationally resilient compared to the sample. Interviews revealed the resilient students reported less likeliness of being asked to partake in criminal activity. Others have evaluated particular modifiable factors as seen in the study by Challen, Machin, & Gillham (2014) who evaluated the effectiveness of an 18hr cognitive behavioral group intervention in reducing depressive symptoms in a clinical and non-clinical sample of students in mainstream school in England. Students (N=2,844) aged 11-12 Participants were assigned randomly to the intervention or control group and were assessed using measures of the Children's Depression Inventory (Kovacs, 1992) (depressive symptoms, primary outcome); Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1985) (anxiety); and the Strengths and Difficulties Questionnaire (Goodman, 1997) (behavior). Surveys were at

baseline, post intervention, 1-year follow up and 2-year follow up. Results indicated lower depression symptoms in the treatment group than the control group. This study provides a strong example of the use of correlating multiple measures and using correlative data to understand resilience in a school setting.

Now with theorists understanding that resilience is a multifaceted component new tools have been designed to incorporate gathering data on these domains. A particular tool established to measure resilience in age-specific populations is The Child and Youth Resilience Measure developed in 2011 by the Resilience Research Centre and validated in a variety of child and adolescent populations such as Canada (Liebenberg, Ungar, & Vijver, 2012), New Zealand (Sanders, Munford, Thimasarn-Anwar, & Liebenberg, 2015), Iran (Zand, Liebenberg, & Shamloo, 2016) and China (Mu & Hu, 2016). The CYRM-28 tool assesses resilience and the factors that influence resilience which are 1) individual factors- personal skills, social skills, and peer support, 2) Care giving- both physical and psychological, and 3) Contextual factors contributing to an individual's sense of belonging - assessed as components related to spirituality, culture, and education. The CYRM-28 tool has been designed to assess age specific groups by having different reading age options and images to help younger participants respond (Liebenberg, Ungar, & Vijver 2012). The CYRM-28 also has qualitative features including a questionnaire that has been designed to assist with the survey, specifically allowing for a greater depth of understanding of the experiences and outcomes from the intervention. Recent studies using the child specific CYRM-28 on a New Zealand adolescent population found good validity for the tool and provides confidence in research assessing resilience in the New Zealand context (Sanders et al., 2015).

Background to Mindfulness and its influence as a healthcare intervention

This section provides an insight into the concepts of mindfulness from the beginning of the discipline to current practice. A discussion considering the development of mindfulness programs and effects for children and adolescents follows. Research into mindfulness for children and adolescents is lacking in both the number and quality of publications. The reasoning behind this is described in the current section. The review provides a basis for the project to evaluate the effects of mindfulness taught in a school environment to enhance specific outcome measures with adolescents.

Mindfulness. Mindfulness can be described as a process that leads to a mental state of consciousness in which there is an open, non-judgmental and enhanced attention to moment-to-moment experiences, including the sensations of one's body, one's thoughts and the environment (Brown & Ryan, 2003; Kabat-Zinn, 1994; Sedlmeier et al., 2012). Western societies have taken the practice of mindfulness from Buddhist roots into a mainstream technique for stress management 1. Mindfulness-based Interventions (MBI) are usually shared with adults in the form of Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1982) or Mindfulness-Based Cognitive Therapy (MBCT) (Segal, Williams, & Teasdale, 2002) in the structure of an eight-week program with group sessions and individual home practice.

Research now provides strong evidence for the positive impact of mindfulness training on adults for their mental health (Teasdale et al., 2000), physical health (Davidson et al., 2003) emotional and social skills (Vago & Silbersweig, 2012), and cognitive abilities (Chiesa & Serretti, 2011). Mindfulness has become a widely-practiced and well-validated technique used to increase health by improving adults' immune functions and wellbeing (Davidson et al., 2003; Grossman et al. 2004), by reducing stress (Chiesa & Serretti, 2009), by increasing attentional capacity (Tang et al., 2007), and by promoting personal development with empathy and self-compassion (Shapiro, Schwartz, & Bonner, 1998). Research has evaluated these outcomes in both clinical and non-clinical samples, providing validity of the effects on a variety of populations and health issues (Baer, 2003; Grossman et al., 2004).

Mindfulness is generally believed to be a technique that improves one's ability to pay attention (Baer, 2003; Bishop et al., 2004; Kabat-Zinn, 1994; Segal et al., 2002). Largely, mindfulness-based therapies use a variety of techniques aimed to create mindful attention, with many techniques derived from Buddhist spiritual practices (Semple, Lee, Rosa, & Miller, 2010). Two components that distinguish mindfulness are firstly the orientation of the mind towards the current moment described as being curious, open minded and accepting and secondly the self-regulation of one's attention (Bishop et al., 2004). Researchers theorize this as enhancements in cognitive ability which leads to greater wellbeing and improved mental health. The fundamental principle of mindfulness is to counter the effects of stressors that occur from orienting one's attention toward the past or future which can lead to feelings of anxiety and depression, to reduce these by focusing on the present moment nonjudgmentally and openly (Kabat-Zinn, 2003). Cognitive flexibility (the ability to switch freely from one task to another) and attentional regulation are important skills in decreasing automatic emotional reactivity that

¹ see Sun, 2014, for a historical perspective on the "mindfulness movement".

helps to keep the mind focused on the present moment (Lutz, Slagter, Dunne, & Davidson, 2008). An example of this is when people with depressive symptoms were taught to engage their attention more consciously in order to become aware of their negative thoughts, they showed distinctly improved skills in reacting less to exaggerated emotions which lead to less stressful reactive thoughts (Siegle, Ghinassi, & Thase, 2007).

Neuroscience research supports the idea that mindfulness practice shows an increase in mental health, wellbeing and cognitive function with brain imaging identifying significant increases in blood flow, thickening and activation in the anterior left-side of the brain (Davidson et al., 2003). Research also found meditation can reliably stimulate changes in the prefrontal cortex, an area that controls attention, concentration and emotional regulation (Cahn & Polich, 2006; Davidson et al., 2003; Greeson, Jeffery, 2009).

Mindfulness-based interventions with adolescents. Due to the widespread popularity, use, and research of meditation in adults, the development of MBIs taught in schools has emerged to offer adolescents training to cultivate mindfulness skills that result in the recognised benefits of enhanced mental health, wellbeing and cognitive functioning (Burke, 2010; Harnett & Dawe, 2012; Zenner et al., 2014). A preliminary review of the current research by Burke (2010) found that the research base, at that time, provided encouragement that MBIs are viable with children and adolescents but concluded the evidence is lacking to support the effectiveness of the interventions. A 6-week pilot study was undertaken to examine the viability and tolerability of teaching mindfulness to children. Researchers found children as young as 7-years old could be taught mindfulness-based (Semple 2005). Several systematic reviews evaluating measures from mindfulness programs of acceptance, well-being, and cognitive performance suggest that mindfulness based interventions are viable with children and adolescences (Burke, 2010; Weare, 2013; Zenner et al., 2014; Zoogman, Goldberg, Hoyt, & Miller, 2014).

Mindfulness in schools programs. In the last 10 years, MBIs for youth have been developed globally for example in England (Mindfulness in Schools Project (MiSP, ‘.b’, paws b), in New Zealand (Mindfulness Aotearoa), in Canada (Mindful Education), the USA (Mindful Schools and Mindup), and in India (The Alice Project). Many of these programs have preliminary research that supports usability but most lack robust research that is needed for implementation into mainstream education systems. These MBIs are normally implemented by individual schools in the area of social and emotional education.

As with adults, there are many forms by which mindfulness can be taught to children. The founding school based MBI is the MiSP ‘.b’ (‘dot be’) program, co-developed in 2009 in England by Dr Chris O’Neil with Burnett and Chris Cullen, is a nine-week course integrated into the weekly teaching timetable. The program is most suited to secondary schools and the newly developed ‘paws b’ is aimed at younger children. The Mindfulness in Schools Project (MiSP) provides a consistent curriculum taught to registered teachers globally who are open to teach the course to any school, with increasingly higher use in schools around the world. It has been evaluated in a number of research projects (Hennelly, 2011; Huppert & Johnson, 2010; Kuyken et al., 2013).

Another MBI is the Mindfulness-Based Cognitive Therapy for Children (MBCT-C), developed as a psychotherapy group to help increase social-emotional resilience using mindfulness techniques taught to children ages 9–13 years old. Researchers Lee and Semple created a child specific psychotherapy intervention using techniques and concepts from Buddhism, combined with cognitive therapy techniques. Preliminary research of MBCT-C suggest that mindfulness training may help with reducing anxiety and helping with attention problems (Lee, Semple, Rosa, & Miller, 2008).

Similar results were found in a pilot study by Broderick and Metz (2009) who evaluated the “Learning to BREATHE” curriculum based on the MBSR program with 120 participants and 30 controls aged between 17 and 19. Participants completed demographic information and four different measures at pre-test and post-test that included the Positive and Negative Affect Schedule (Watson et al, 1988), Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004), Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991) and the Somatization Index of the Child Behavior Checklist (Achenbach, 1991). Results indicated increases in self-acceptance, emotional regulation and awareness. Interview feedback suggested a high satisfaction for the course. In current literature, however, no follow up research on this program has been conducted which somewhat reduces the usability of the program. These results were supported by a recent systematic review evaluating the evidence regarding the effects of school-based mindfulness interventions on psychological outcomes. Twenty-four studies were identified and 19 used a controlled design. Considering the small number of strong studies evidence for mindfulness-based interventions needs more evidence (Zenner et al., 2014).

Mindfulness benefits for adolescents. A broad range of outcomes from mindfulness intervention for adolescents have been studied that range from measures of general functioning such as academic performance and social skill (Beauchemin, Hutchins, & Patterson, 2008) to

psychological symptoms including measures of anxiety (Liehr & Diaz, 2010), and depression (Mendelson et al., 2010). A recent meta-analysis by Zoogman et al., (2014) reported that mindfulness interventions with adolescents (2004-2011) show an overall small effect size over the broad range of outcome measures using mindfulness interventions compared to control groups. Beneficial outcomes for clinical samples (subjects in therapeutic programs) appear more promising however with moderate effect sizes reported.

Positive effects on reducing depression, anger and anxiety. Research on adolescent mindfulness has largely focused on ‘at-risk’ youth or the benefits of therapeutic effects (Thompson & Gauntlett-Gilbert, 2008; Zylowska et al., 2008). The most significant findings have been observed in research evaluating outcome measures including depression, anxiety and anger management (Biegel, Brown, Shapiro, & Schubert, 2009; Bögels, Hoogstad, van Dun, de Schutter, & Restifo, 2008; Meiklejohn et al., 2012; Napoli, Krech, & Holley, 2005; Zylowska et al., 2008). The most credible research indicating beneficial results has been seen in some well-designed randomized controlled trials (RCT) indicating that mindfulness based programs may benefit clinical samples of children and adolescents such as attention problems (Semple, Lee, Rosa, & Miller, 2010; Zylowska et al., 2008), anxiety and depression (Beauchemin et al., 2008; Biegel et al., 2009). A small feasibility study of an 8-week mindfulness training program evaluated 24 adults and adolescents with Attention Deficit Hyperactivity Disorder. Results indicate that mindfulness training is a viable intervention in adults and adolescents with Attention Deficit Hyperactivity Disorder and may help emotional regulation and improve attention (Zylowska et al., 2008). These preliminary findings are promising but the small pilot study and specific sample of predominantly white, educated, and middle aged females reduces generalizability of these findings. Further research using a control group and broader samples is necessary to confirm results. Lau & Hue (2011) reviewed a school-based MBI in Hong Kong as a pilot controlled trial on twenty-four 14-16-year-old adolescents with low academic performance, with similar size control groups. Results identified significant decreases in symptoms of depression and increased wellbeing among the adolescents who received the intervention. A robust RCT evaluating depression by Raes et al (2014) assessed the efficacy of a mindfulness program aimed at reducing and preventing depression in an adolescent school based population. This study evaluated adolescents aging from 13-20 in 12 pairs of mindfulness and 12 control groups (N= 408; mindfulness n = 201; control n = 207). The 8-week intervention was a mindfulness group training specifically developed for adolescents that integrated elements of MBCT (Segal et al, 2002) and MBSR (Kabat-Zinn 1990). Students were measured pre-and post-intervention and at a six-month follow up. Results revealed that the mindfulness intervention significantly reduced depression in comparison to the control group at the six-

month follow up. These results suggest that school-based mindfulness programs can help to reduce and prevent depression in adolescents and could be viewed as increasing resilience. As Zoogman et al (2014) meta-analysis found, mindfulness interventions had the most significant improvement in psychological outcomes compared to physiological and cognitive outcomes. The clinical populations showed the most significant improvements compared to non-clinical groups signifying that mindfulness may be a beneficial technique for at-risk adolescents. A follow-up literature review on the same population by Kallapiran, Koo, Kirubakaran, & Hancock (2015) found similar results.

Mindfulness practices to reduce stress. Childhood stress is increasing being managed by the use of mindfulness techniques (Waters, Barsky, Ridd, & Allen, 2015). Research has shown that stress and anxiety have been reduced significantly as an effect of mindfulness training in schools (Liehr & Diaz, 2010; Mendelson et al., 2010; Napoli et al., 2005). Mendelson et al (2010) conducted a pilot randomised controlled trial assessing the feasibility, acceptability, and preliminary outcomes of a 12-week school-based mindfulness and yoga intervention with 97 fourth and fifth graders. Some significant reductions were found on measures of involuntary response to stress. Limitations to this study include a small sample that limited rigorous tests from between group moderations. Also, recruitment methods biased the sample toward more highly motivated students and families who signed consent forms, limiting the generalisability of these findings. A randomised control trial by Van de Weijer-Bergsma, Langenberg, Brandsma, Oort, & Bögels (2014) evaluated the effectiveness of a school-based mindfulness training program to prevent stress and found fewer effects. Early adolescents from three elementary schools participated. Classes were randomized to an immediate-intervention group (N=95) or a waitlist-control group (N=104). Twelve 130-minute sessions were delivered as a program that was modeled after the MBSR and MBCT programs. Results found little prevention effects of the training on stress and mental-well-being directly post intervention but increased positive effects were reported at follow up. Authors noted that children who ruminate more are affected differently by the intervention than children who ruminate less. Even though no significant changes were noted, this study suggests that the training has prolonged effects and may strengthen children's skills over time.

Positive effects on psychological well-being. Non-clinical adolescent populations have also indicated benefit from meditation where therapeutic intervention is not the focus (Beauchemin et al., 2008; Napoli et al., 2005; Wall, 2005), such as evaluations of different mindfulness programs in classroom or year group populations. Additionally, studies have found improvements in cognitive performance (Semple et al., 2010), emotional regulation (Broderick

& Metz, 2009; Joyce, ETTY-Leal, Zazryn, & Hamilton, 2010; Schonert-Reichl & Lawlor, 2010), well-being (Hennelly, 2011; Huppert & Johnson, 2010), and blood pressure (Gregoski, Barnes, Tingen, Harshfield, & Treiber, 2011). A recent literature review by Zenner et al (2014) that evaluated student well-being, social competence and academic achievement, in relation to a mindfulness program, supported these findings indicating significant results. These results were supported by a recent systematic review evaluating the evidence regarding the effects of school-based mindfulness interventions on psychological outcomes. Twenty-four studies were identified as robust enough for this review, but only nineteen studies used a controlled design. Some current research, however, indicates that the majority of the effects of meditation upon student outcomes are small (Waters et al., 2015). Considering the small number of strong studies identified, evidence for MBIs in schools needs more robust research to confirm these outcomes (Zenner et al., 2014).

Positive effects on attention and executive function. Research on mindfulness with adolescents in school settings has focused on assessing learning and associated cognitive processes, such as attention, focus and executive function. A randomised controlled trial by Semple et al (2010) evaluated 25 children from low income and ethnic minority backgrounds who participated in a MBCT-C and found that participants who completed the program showed fewer attention problems than the control group and those improvements were maintained at three months following the intervention. A feasibility study of a 5-week school based MBI by Beauchemin et al (2008) evaluated 34 adolescents with diagnosed learning disabilities who were identified as having higher levels of anxiety, school related stress, and fewer optimal social skills than their peers. Results showed significant improvements, with participants who completed the program demonstrating decreased state and trait anxiety, enhanced social skills, and improved academic performance. The results indicate again that an improvement in psychological outcomes can be demonstrated to follow mindfulness training. The small participant number and lack of control group however reduce the viability of these results.

An argument for mindfulness training to increase resilience

Mindfulness and resilience may have an important relationship. Growing evidence exists that suggests that mindfulness training can help adolescents improve multiple features of resilience such as insight, fear modulation, self-efficacy and coping, that may together be seen as a flexibility to adapt to stress and maintain emotional regulation (Brandtstädter & Renner, 1990). It appears that resilience can be learned at any point across a lifespan and is an ongoing process of responding to challenging life events and not giving up (Gillespie, Chaboyer, & Wallis,

2007). Such attributes have been evaluated as positive results measured from mindfulness training with adolescents (Broderick & Metz, 2009; Hennelly, 2011; Huppert & Johnson, 2010; Kuyken et al., 2013; Wall, 2005). Mindfulness techniques help build the prefrontal cortex, an area associated with empathy and personal awareness, which can influence resilience factors such as family and community connectedness (Siegle et al., 2007). Other influential factors of resilience such as well-being, increased self-care, self-awareness and a sense of connectedness to nature have been evaluated as outcomes measured positively in MBI in schools research as seen by Wall (2005) who evaluated an adapted 5-week school-based MBI course based on the MBSR program and Tai Chi to a small number of 11-13 year olds. Another aspect to resilience, theorised by Garmenzy (1987), is an ecological view of resilience based on the idea that protective factors occur at the individual and familial levels, and external to the family, all influencing resilience. Recent research highlighted that children who were more mindful or who had a more mindful parent reported lower levels of stress (Waters, 2016) suggesting that research into how to promote mindfulness in families is a promising area for reducing stress and enhancing resilience.

Theoretical functioning of mindfulness to enhance resilience. Mindfulness practices are congruent with much of the positive psychology theory that has focused on evidence for the benefits of positive emotions and how to increase them (Sheldon & Lyubomirsky, 2006). Positive psychology is a broad umbrella term that is fundamentally concerned with the scientific understanding and promotion of what makes life go well (Lyubomirsky et al., 2005). It is concerned with interpersonal aspects of well-being and mindfulness is one intervention that has been shown to promote a range of outcomes including improvements in social and emotional competence such as kindness and gratitude (Schonert-Reichl & Lawlor, 2010). This quasi-experimental study evaluated the effectiveness of the 10-lesson Mindfulness Education program developed using research and theory in the area of mindfulness and its relation to well-being (Brown & Ryan, 2003) and positive psychology (Lyubomirsky et al., 2005). Teacher ratings of classroom social and emotional competence were collected, as well as data from 246 students in the 4th to 7th grades evaluating six Mindfulness Education program classrooms and six control classrooms. The students completed pre-and-post-test self-report measures assessing optimism, general and school self-concept. Results identified significant increases in optimism and teacher-rated social and emotional competence post intervention in participants. A limitation to this study was that analyses were conducted at the individual student level and the control was analysed as a classroom, which may have caused statistical bias for the intervention. These results appear promising for establishing a research based mindfulness curriculum that provides skills to improve well-being.

It has been theorised that mindfulness could help children to have a clear mental space to understand the resources they can bring to a situation and/or to view a situation as less demanding. This is created by training them to have a non-judgmental view and to embrace acceptance towards stressful thoughts and feelings (Bishop et al., 2004). An ongoing longitudinal study by Bethell, Newacheck, Hawes, & Halfon (2014) examined adverse childhood experiences of adults. Results indicate significant associations between adverse childhood experiences and chronic diseases, quality of life, life expectancy. Adults with adverse childhood experiences were found to have a lower ability of engaging at school and reported higher rates of chronic disease. Authors evaluated the longitudinal participants with data from the 2011-12 USA National Survey of children's health participants. They found that "staying calm and in control when faced with a challenge," (Bethell et al., 2014, pg. 1) for children ages 6-17 can reduce the negative impact of adverse childhood experiences.

Resilience is having the ability to overcome stressful situations, therefore learning skills to reduce stress can be considered to enhance the ability to be resilient. The value of positive functioning is seen through the practice of mindfulness by learning to respond rather than to react, which could enhance the sense of autonomy or self-determination through the increased ability to make choices. Increased choice can lead to a greater sense of self-efficacy. The awareness and recognition of our thoughts and feelings, that include sensitive ones, may have direct benefits for emotion regulation, which is a key part of resilience (Huppert & Johnson, 2010). Therefore, mindfulness education in school may be a significant way to enhance resilience in adolescents to help them cope with stress throughout life.

Clinical studies of effectiveness

Studies examining the effects of MiSP curriculum training on well-being and resilience in adolescents

Mindfulness in schools literature. Literature investigating the effects of MBI on resilience has been conducted in various clinical and non-clinical populations evaluating constructs of resilience that include: emotional well-being (Hennelly, 2011; Huppert & Johnson, 2010; Kuyken et al., 2013; Liehr & Diaz, 2010; Napoli et al., 2005), positive and constructive emotions or affect (Broderick & Metz, 2009; Mendelson et al., 2010; Schonert-Reichl & Lawlor, 2010), social skills and positive relationships (Beauchemin et al., 2008;

Mendelson et al., 2010) and self-concept and self-esteem (Franco, Mañas, Cangas, & Gallego, 2011; White, 2012).

For this review three salient works that have used a MiSP curriculum are reviewed. Two that evaluate resilience and that have been critically reviewed in two systematic literature reviews (Zenner et al., 2014; Zoogman et al., 2014) and the third is a recent strong study investigating the MiSP curriculum. The studies identified are two that specifically examined resilience using the MiSP curriculum. The third examines associated qualities of resilience such as well-being and mental health but with a primary focus to gain acceptability of the 8-week MiSP curriculum. All papers used different methods - Study 1. A preliminary controlled trial using a 4-week MiSP curriculum examining resilience and well-being (Huppert & Johnson, 2010), Study 2. A controlled mixed method longitudinal study using an 8-week MiSP curriculum examining resilience and well-being (Hennelly, 2011), Study 3. A non-randomised controlled trial validating usability of the 8-week MiSP 'b' curriculum while measuring well-being and mental health (Kuyken et al., 2013).

Overview of reviewed studies. The literature search revealed that in general, studies in mindfulness in schools program and for adolescents are methodologically weak and the quality of reporting is poor. The two studies reviewing resilience within this part of the review, have been identified as moderate to high quality methodology (Weare, 2013; Zenner et al., 2014; Zoogman et al., 2014) and resemble research that incorporates evaluating the concept of resilience that is within the main study reported in section II of this thesis. The third study has not been critiqued in the most up to date literature reviews as publication was later than the inclusion search dates, but due to the strong methodology this paper and the outcomes providing stronger evidence for the usability of the 'b' curriculum with specific well-being and psychological outcomes, has been reviewed.

The three studies utilise measures of well-being and mental health to gauge the effects of MiSP with all three studies measuring affective-emotional, cognitive-evaluative, and psychological aspects of well-being using the Warwick-Edinburgh Mental Well-being Scale (Tennant et al., 2007). Two studies measured resilience with specific standardized outcomes for resilience using the Ego-Resilience Scale (Block & Kremen, 1996), and/or measures that contained depression as a subscale the Perceived Stress Scale (Cohen et al., 1994) and the Center for Epidemiologic Studies Depression Scale (Coyle & Roberge, 1992). Additionally, primary outcomes for the study were measured with the following measures: Mindfulness-Cognitive and Affective Mindfulness Scale-Revised (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2006). These

three studies utilised versions of the MiSP course within the school curricula using a 5-week course (Huppert & Johnson, 2010), 8-week course (Henelly, 2011) and a 9-week course (Kuyken et al, 2013).

Study 1.

Huppert, F. A., & Johnson, D. M. (2010). A controlled trial of mindfulness training in schools: The importance of practice for an impact on well-being. *The Journal of Positive Psychology*, 5(4), 264-274.

Huppert & Johnson (2010) in a preliminary controlled trial evaluated 155 fourteen and fifteen-year-old male students from two independent boys' schools. The aim of the study was to advance the understanding of the effects of mindfulness training on resilience and psychological well-being. They administered a four-week MiSP curriculum modified from the MBSR program, measuring pre-and post-intervention, comparing changes on the variables in classes that received the mindfulness intervention with control classes that had not. Both qualitative and quantitative measures were used, using standard scales for adults since there were no age-specific tools at that time. Significant improvements were reported in measures of mindfulness and psychological well-being but minimal changes were found in resilience.

Some limitations of this study were observed. This study included only male participants, it lacked random allocation to the intervention and control groups, only used subjective measures and had no long-term post intervention evaluation. Also, the curriculum was a preliminary adaptation of the MBSR course. It consisted of four 40-minute sessions and encouraged participants to do 8minutes per day of individual practice, compared to adult courses where they receive eight 2-hour sessions of training and encouraged to practice for 40 minutes per day. Additionally, a lack of age specific tools, such as the ERS, may have lacked sensitivity to gauge accurate results even though the baseline phase indicated that in terms of distributional properties the measures appeared to perform well in adolescent samples.

Study 2.

Henelly, S. (2011). The immediate and sustained effects of the .b mindfulness program on adolescents' social and emotional well-being and academic functioning. Unpublished MA diss., Oxford Brookes University.

A follow-on study by Hennelly (2011) of Huppert and Johnson's (2010) research, conducted a controlled mixed method longitudinal study that evaluated 68 adolescent students aged between 14 and 16 from typical, mixed-gender secondary schools who participated in either the 8-week 'b' MiSP curriculum or the control class of an optional activity. Participants completed pre-course, post course and six month follow up questionnaires to assess immediate and sustained changes in mindfulness, ego-resilience and well-being. These results found significant differences between participants and the control group's mindfulness, well-being and resilience, with longer term effects showing even greater impact than immediate effects. Gender differences were noted and found female participants had significantly larger changes than males and female controls. Prolonged effects were also noted in participants and increased scores at each point were observed, whereas controls decreased. Male participants' ego-resilience reduced at assessment 2 immediately post intervention, then increased to higher than origin by the 6-month retest. This study also found differences between year groups with the eldest year 12 participants experiencing a significant improvement in ego-resilience, whereas younger students did not. A distinguishing factor is that this group volunteered to take the mindfulness training which may have influenced the adherence to practice more frequently. Qualitative investigations revealed participants experienced a sense of increased self-awareness and emotional self-regulation.

While these findings are similar to Huppert & Johnson (2010), this study reported larger effect sizes in ego-resilience and with longer sustained effects. Literature on resilience and mindfulness is severely limited in number and there are few papers to compare findings with. Potential changes in resilience results could be due to the length of the curriculum extending from 4-weeks to 8, a mixed gender population, and a 6-month post intervention retest. Also, the majority of the research on mindfulness with children evaluates only up to three months post intervention (Weare, 2012; Zenner et al., 2014; Zoogman et al., 2014), which makes these findings promising in understanding whether positive effects are sustained over time. A strength of Hennelly's (2011) research is the use of a robust curriculum and teaching training program which may reduce the inconsistency of homogeneity of course delivery that may occur from a variety of teachers through many schools.

A limitation to be aware of is that the main researcher was strongly committed to both the mindfulness research and practice. The author of the study was also directly involved in the delivery of the 'b' program to one of the schools and was therefore not blinded to which participants were in the control and MBI groups. This involvement by the author may represent a potential conflict of interest between the delivery and outcomes assessment as completed by the same personnel. Also, her research used the same child non-specific tools.

Study 3.

Kuyken, W., Weare, K., Ukoumunne, O. C., Vicary, R., Motton, N., Burnett, R., ... & Huppert, F. (2013). Effectiveness of the MiSP program: non-randomised controlled feasibility study. *The British Journal of Psychiatry*, 203(2), 126-131.

Kuyken, Weare, Ukoumunne, Vicary, Motton, Burnett, ... & Huppert, (2013) conducted the first non-randomised controlled study evaluating the effectiveness of the MiSP curriculum. A total of 522 adolescents between 12-16 years participated in the MiSP intervention or a usual class curriculum control group. Acceptability of the MiSP was the primary evaluation and examined using a feedback questionnaire immediately after the end of the MiSP curriculum. Other evaluations measured were; well-being using the Warwick-Edinburgh Mental Well-being Scale (Tennant et al., 2007); mental health, evaluating stress and depression using the ten-item Perceived Stress Scale and the eight-item Centre for Epidemiologic Studies Depression Scale; mindfulness measured with a five-question survey about sustained use of mindfulness practice in the three months following completion of the MiSP curriculum. Assessment of outcomes at pre, post and three months post intervention were evaluated. Results indicated high acceptability and at the 3 month follow up reports by 80% of the participants had applied the practices to their daily life with varied usage. Initial results on the impact of the MiSP on well-being and mental health found little evidence of a difference between the intervention group and controls post-completion. Strong evidence of lower depression scores in the intervention group however were reported after adjusting for gender, age and ethnicity. At 3-month follow up, the adjusted analysis showed evidence of lower stress, increased well-being and lower depression scores in the intervention compared with the control group. The improvements reported in the psychological measures corroborate the results of Huppert & Johnson (2010) and Hennelly (2011) in regards to the relationship between practicing mindfulness and reports of improved well-being.

The same weakness applies to this study where no randomization occurred which may have influenced adherence by students to their chosen group. Also, as this study only gathered self-reported information, the understanding of other causative or associated factors are unknown, limiting the confidence that mindfulness training is the sole cause for outcomes reported.

Mindfulness in schools research limitation and future recommendations

Limitations identified within the studies discussed and reviewed, are outlined below. It is important to note that these limitations are also synonymous with the majority of MBI in schools related research as demonstrated in MBI in schools reviews between 2010-2015. Most mindfulness based interventions in school research studies have to date shown little use of controlled trials, control groups, randomisation of school selection and participants. Major weaknesses that have been highlighted by many literature reviews is that many studies have been pilot studies, have small numbers and have only examined short term effects using a wide range of outcome measures (Kallapiran et al., 2015; Waters et al., 2015; Weare, 2013; Zenner et al., 2014; Zoogman et al., 2014). Very few trials have used a universal intervention and only one by Kuyken et al. (2013) has been completed to date of the MiSP curriculum.

As discussed, research suggests that mindfulness shows particular promise for clinical samples of adolescents who suffer with high levels symptoms of depression and anxiety (Joyce et al., 2010), with some of the greatest effect sizes shown in clinical samples compared with non-clinical samples (Mendelson et al., 2010; Raes et al., 2014; Sibinga et al., 2011; Zoogman et al., 2014). Future research is suggested to evaluate mental health outcomes such as depression and bio-behavioral measures of stress reactivity and/or resilience (Kallapiran et al., 2015; Kuyken et al., 2013b; Zoogman et al., 2014). Existing research has highlighted areas for development for future projects. These include longer follow up measures to evaluate prolonged benefits (Waters et al., 2015; Zenner et al., 2014; Zoogman et al., 2014), student questionnaires and interviews and the use of mixed method approach to increase validity of outcome measures (Weare, 2013; Zenner et al., 2014).

Generalisability of clinical effectiveness studies to the New Zealand context

Although the samples from these three research projects were non clinical and not classified as at risk youth, childhood and adolescence itself entails emotional, psychological and physiological changes, and can be a period of academic and inter-personal pressures (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001), and although the majority of adolescents reach young adulthood in good health, they are vulnerable to emotional challenges that may hinder the development of their full potential due to self-doubt. Resilience appears to

be an alterable set of characteristics and mindfulness training may be a way to help adolescents foster these skills and potentially overcome adverse changes with promising outcomes.

Considering these sample groups were from countries of close social context it can be assumed the generalization of results will be applicable to the New Zealand population.

Conclusion

Resilience is not only an individual trait but is influenced by family, friends and the community and has been shown to change over time. When adolescents face adversity, the ability to have resilience through this time is essential for healthy personal development. Mindfulness training in schools may be one way to provide adolescents with skills to increase the individual component to resilience. Previous studies have evaluated mindfulness interventions and measured resilience in combination with other variables, so research focusing specifically on resilience as the primary outcome is necessary. The use of a well validated, modern and child specific tool such as the CYRM-28 (Ungar & Liebenberg, 2012) should be examined for tool sensitivity with previously used tools such as the ERS (Block & Kremen, 1996) to establish supportive convergence validity for validation of future use with mindfulness based interventions in schools research assessing resilience. If mindfulness programs in school can help improve aspects of resilience and help adolescents overcome adversity experienced at school, home or in the community, better outcomes for youth in New Zealand could be expected by the wider use of validated mindfulness programs in schools. This chapter has reviewed the relevant literature surrounding resilience, mindfulness interventions in school and the influence of mindfulness training on adolescents to improve resilience, as well as the CYRM-28 and MiSP curriculum used in the present study.

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Section III: Manuscript

Note: The following manuscript was prepared in accordance with the Instructions for Authors for the Child Indicators Research Journal [see website instructions for authors- http://www.springer.com/social+sciences/wellbeing+%26+quality-of-life/journal/12187?detailsPage=pltc_i_1060315]. The required word limit and references have been exceeded to provide full evaluation and discussion of the results to aid examination of the thesis. Reference to thesis appendices are identified by square brackets.

A preliminary evaluation on the effectiveness of a universal school-based mindfulness intervention to enhance resilience in adolescents

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Abstract

Mindfulness in schools programs are increasing in use globally and in New Zealand. Mindfulness training is hypothesised to influence resilience as an outcome measure. Several instruments that measure resilience have been used with mindfulness research but an age-specific tool has not yet been investigated. The primary is to evaluate adolescent resilience to establish the effectiveness of the Mindfulness in Schools Project ‘.b’ mindfulness training program taught in a New Zealand school environment. Secondly, to test the convergence validity of the Child and Youth Resilience Measure with the Ego Resilience Scale. To investigate these aims this study used a single cohort design with pre-and-post measures using The Child and Youth Resilience Measure administered pre-and-post the 9-week mindfulness intervention to gauge changes in resilience. The Ego Resilience Scale was also administered post-intervention to establish convergence validity with The Child Youth Resilience Measure. Data from 87 students completing the Child and Youth Resilience Measure and all the subscales showed no significant change in resilience from pre-to-post the mindfulness intervention. Correlations between the Child and Youth Resilience Measure and the Ego Resilience Scale instruments (Pearson’s $R=0.49$, 95% CI 0.23 to 0.65, $P<0.001$) demonstrate good convergent validity. The findings of this study indicated that mindfulness training taught in a school environment to adolescents from an independent boys’ school had no significant effects on resilience from pre-to-post intervention. This study, however, does demonstrate good convergent validity between the Child and Youth Resilience Measure and Ego Resilience Scale, and it appears sufficiently sensitive to evaluate a mindfulness in schools training program with adolescents.

Keywords: Mindfulness, resilience, MiSP, ‘.b’, Child and Youth Resilience Measure

Introduction

Mindfulness has been defined as “the awareness that emerges through paying attention on purpose, in the present moment and non-judgmentally to the unfolding of experience” (Kabat-Zinn, 2003; p.145). Mindfulness training is associated with a positive impact for adults on mental health and reducing depressive symptoms (Ma & Teasdale, 2004; Teasdale et al., 2000), physical health (Davidson et al., 2003) emotional and social skills (Vago & Silbersweig, 2012), and cognitive abilities (Chiesa & Serretti, 2011). School taught Mindfulness-based interventions (MBI) are becoming widely used and aim to educate adolescents with skills to develop these recognised benefits for adults (Burke, 2010; Harnett & Dawe, 2012; Zenner, Herrnleben-Kurz, & Walach, 2014). Literature is increasing that identifies mindfulness practice can produce skills to reduce stress and anxiety on adolescents in school and to cope with difficult life events, and it is becoming a popular strategy to enhance adolescents’ wellbeing (Greenberg & Harris, 2012; Mendelson et al., 2010).

A variety of MBIs taught in schools have been developed. An international MBI by the Mindfulness in Schools Project (MiSP) created the ‘.b’ (‘dot be’) curriculum, developed in England, is packaged as a nine-week course integrated into the weekly teaching timetable. The ‘.b’ program provides a consistent curriculum globally and has been used in a number of research projects (Hennelly, 2011; Huppert & Johnson, 2010; Kuyken et al., 2013). A broad range of outcomes from mindfulness intervention for adolescents has been studied that range from measures of general functioning such as academic performance and social skills (Beauchemin, Hutchins, & Patterson, 2008) to psychological symptoms where most findings have been observed including measures of anxiety (Liehr and Diaz, 2010), depression (Mendelson et al. 2010; Biegel, Brown, Shapiro, & Schubert, 2009; Meiklejohn et al., 2012; Napoli, Krech, & Holley, 2005; Zylowska et al., 2008) and anger management (Bögels, Hoogstad, van Dun, de Schutter, & Restifo, 2008).

In the face of stress and adversity, resilience is the capacity to bounce back or cope successfully despite substantial life challenges (Rutter, 1985). Resilience is expressed with characteristics of rebounding and carrying on, showing a sense of self-determination and a pro-social attitude (Dyer & McGuinness, 1996). Resilience has been measured in adults practising mindfulness, with results of resilience highlighted as increasing at completion of the training (Meiklejohn et al., 2012). Along with similar outcomes of emotional well-being, resilience has also been investigated in children practising mindfulness (Huppert & Johnson, 2010; Hennelly, 2011; Holland, 2012).

Resilience has been the subject of increasing research interest, and new self-report tools have been established to measure resilience in age specific populations. The Child and Youth Resilience Measure (CYRM-28) is a tool recently developed by the Resilience Research Centre and validated in a variety of child and adolescent populations (Liebenberg, Ungar, & Vijver, 2012). There is a gap in the literature that has not used an age specific and mixed method tool to evaluate outcomes in research on a school taught mindfulness based intervention. Therefore, the aim of this study is to evaluate the effectiveness of the ‘.b’ mindfulness training on resilience levels in adolescents in a New Zealand school environment using the CYRM-28 and to test the convergence validity of the Child and Youth Resilience Measure with the previously used Ego Resilience Scale (ERS). This quantitative survey study is an investigation into the effects of an mindfulness based intervention evaluating resilience in an early adolescent school based population and hypothesises that mindfulness training will have a positive increase on resilience levels. Two resilience specific tools were used to evaluate pre-post intervention resilience levels and to establish convergence validity for a recently developed resilience tool CYRM-28.

Method

Design and procedure. The study was a single cohort design measuring pre-post changes in psychological resilience during a primary school based ‘.b’ program using a pragmatic approach to reflect the real world experiences (Schwartz & Lellouch, 1967). This study received ethics approval from the Institutional Research Ethics Committee under the application 2015-1070 [see thesis appendix A]. The study was registered with the Australian New Zealand Clinical Trials Registry (ANZCTR) and allocated the ACTRN: ACTRN12616001123437 [see thesis appendix B].

Participants. This study was conducted in one cooperating independent boys’ school in a New Zealand city. Participation in the universal ‘.b’ program and research project was open to all consenting students who met the following eligibility criteria: Inclusion criteria were: 1. Enrolment in the school; 2. Valid permission granted by parent or legal guardian for any student under 16 years of age; 3. English reading competency considered by class teacher to match the level of the questionnaire. Participants and parents received verbal and written presentations and the opportunity to ask questions.

An information evening for the research project and mindfulness program for parents was provided by the mindfulness teacher and researcher. Participant information forms [see thesis

appendix C] and parent information forms [see thesis appendix D] were supplied to all interested parties. An option for parents to opt their child out of the study was provided. Students who opted out of the research could maintain participation in the mindfulness curriculum but were not asked to complete the study measures. Alternative activities were provided by the school if full opt out was elected. Both participant and parent were required to sign a participant consent form [see thesis appendix E] and parental consent form [see thesis appendix F].

All participants were encouraged to continue with their extracurricular education and personal practices of emotional management. If any significant changes occurred throughout the program, participants were asked to inform the researcher, teacher or trusted informant to help researchers establish confounding factors that may influence the effects of mindfulness training.

‘.b’ Mindfulness intervention. There is a growing number of mindfulness in schools programs available. The ‘.b’ curriculum created by the MiSP is one of the founding mindfulness in schools courses that has a robust curriculum evaluated and is revised yearly to improve effectiveness and functionality for teachers and students. It has an increasing global network of trained ‘.b’ teachers and is becoming widely used in many countries. Due to the ‘.b’ credibility and availability, participants were enrolled in a 9-week ‘.b’ program. Participants were required to attend a 1 hour scripted lesson once a week led by a qualified MiSP teacher. Lessons were divided into instruction and practice in mindfulness meditation skills including discussions about paying attention, mindful moving, stress, gratitude, home practice tasks and mindfulness building activities [see thesis appendix F for additional details of the ‘b’ curriculum]. Home activities were set at a maximum of 15 minutes per day with a minimum of one exercise per week. Additional informal practice of being mindful in everyday activities was encouraged.

Workbooks and reading material were provided to support home practice. Participants were encouraged to attend all classes and practice mindfulness daily.

The MiSP teacher was a registered and experienced Mindfulness Based Stress Reduction (MBSR) and MiSP practitioner, who completed training for MBSR in 2009 and MiSP in 2012. Consistent with best practice the therapist has a personal 10-year history of mindful-meditation practice and practices often to fulfil the requirements as a mindfulness teacher for these programs. The practitioner was also a practising osteopath with a doctoral qualification in musculoskeletal medicine.

Outcome measures. Assessment of the specific outcome effects of the MiSP training was undertaken using the CYRM-28 (Liebenberg, Ungar, & Van de Vijver, 2012; Ungar & Liebenberg, 2011) [see thesis appendix G] and the ERS (Block & Kremen, 1996) [see thesis appendix H]. Approval by the authors was granted for use of the CYRM-28 in this research [see thesis appendix I]. The ERS [see thesis appendix J] was approved for use by the American Psychology Association [see thesis appendix K]. The validated ERS in mindfulness research was used to compare results with the preliminary use of the CYRM-28 that has been previously used in investigations of resilience in adolescents (Ungar & Liebenberg, 2011).

1) Child and Youth Resilience Measure. Resilience was measured using the CYRM-28 - a 28 item measure that has been used with youth from ages 10–23 years (Ungar et al., 2008). The CYRM-28 tool was designed by the Resilience Research Centre and has reliability and validity contained in a number of publications and aims to be applicable to global populations (Liebenberg, Ungar, & LeBlanc, 2013; Liebenberg et al., 2012). The CYRM-28 is a tool that measures the resources available to individuals that may bolster their resilience. The resources are identified as 1) individual factors- personal skills, social skills, and peer support, 2) Care giving- both physical and psychological, and 3) Contextual factors contributing to an individual's sense of belonging- components related to spirituality, culture, and education. Examples of sample items from both individual and contextual domains are as follows: “Do you strive to finish what you start?” (individual), and “Do you feel supported by your friends?” (contextual). The 28-items are rated on a 5-point scale from 1= Does not describe me at all to 5=Describes me a lot, with higher scores indicating higher levels of resilience. The CYRM-28 incorporates both cultural homogeneity and heterogeneity in how individuals, families and communities support successful development of resilience among youth (Liebenberg, Ungar, & Vijver, 2012). The specificity of this age-appropriate tool designed for youth from ages 10-23, increases usability with age-specific language relating to reading competency designed appropriately for each age group.

This tool has not been used before to measure outcomes from a mindfulness intervention or with any MBI in schools research, therefore sensitivity to resilience outcomes from mindfulness training with adolescents is unknown but hypothesised to be valid due to the age and outcome specificity of this tool.

2) Ego Resilience Scale. Resilience was also measured using ERS (Block & Kremen, 1996) - a 14 item measure that has been used with adults and adolescents. The scale is normally used as a measure of psychological resilience, defined as the capacity to adapt to fluctuating

stressors and changing demands (Tugade & Fredrickson, 2004). The 14 item scale consists of answers on a 4-point Likert scale, ranging from 1 (does not apply at all) to 4 (applies very strongly). Sample items include “I enjoy dealing with new and unusual situations” and “I get over my anger at someone reasonably quickly”. It has been shown to have good reliability and validity with a moderately sized (N=104) student sample (Block & Kremen, 1996). This tool has no age specific reading competency, but has been used in other countries with similar economic, educational and social contexts for adolescents of the same age to the ones proposed for this research (Hennelly, 2011; Huppert & Johnson, 2010). The scale was found to have good reliability in two studies evaluating resilience from a MiSP (Hennelly, 2011; Huppert et al., 2010).

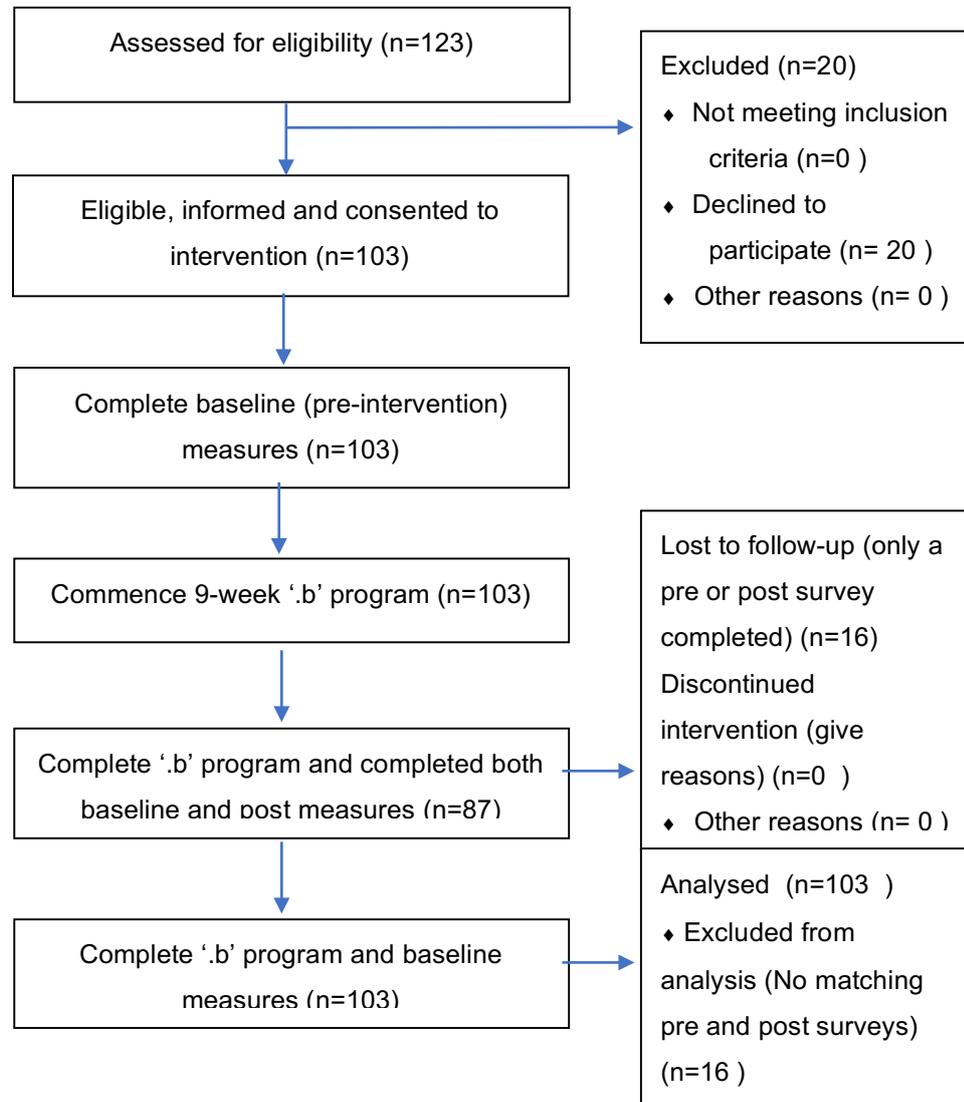
Statistical methods. Raw data were extracted from paper questionnaires and tabulated in a spreadsheet. Missing, spoiled, or incomplete responses were identified. Raw data were explored for assumptions of normality using the Shapiro-Wilk statistic and inspection of P-P and Q-Q plots. Based on exploration of normality, and given that the sample size was $n > 30$, all statistical tests employed were considered robust to breaches of normality (Field, 2009). Paired sample t-tests were used to check for systematic difference between baseline and Week 10. To interpret the magnitude of effect between baseline and Week 10 for total CYRM Cohen’s d was calculated. To compare the baseline score on CYRM-28 total and subscales with the CYRM-28 normative data for low risk youth (Liebenberg et al., 2013, 2012; M. Ungar & Liebenberg, 2011) one sample t-tests were calculated. Pearson’s correlation coefficients were calculated for the total of CYRM-28 and ERS as a measure of convergent validity (Streiner & Norman, 2003). Acceptable convergent validity was operationally defined as a correlation for total scores in the sample of at least ‘moderate’ magnitude. Data were analysed using IBM SPSS statistics v22 (IBM Corp., Armonk, NY) and Hopkins descriptors for magnitude of effect were used to interpret the magnitudes of Cohen’s d and Pearson’s r (Hopkins, Marshall, Batterham, & Hanin, 2009).

Results

In total, 123 volunteers were assessed for eligibility. The CYRM-28 were administered by hard copy to 103 participants prior to the scheduled commencement date. The CYRM-28 and ERS were then administered to 103 participants and collected by hard copy post completion date. In total 16 participants were excluded due to incompleteness of both pre-and-post survey completion. The sample comprised 103 participants recruited (103 male, mean age 11) and the final sample consisted of 87 participants analysed (Table 1).

There were no reported psychological reactions to the '.b' program either during the intervention or at the time of Week 10 follow-up. All participants were attentive in exploring the proposed benefits of mindfulness, attended most classes and adhered as best as possible to the homework.

Table 1. Flow of participants through the trial



Child Youth Resilience Measure-28. Table 2 shows the main effects for the CYRM-28 between pre-and post-intervention. There was no substantial change in the CYRM-28 score between pre-intervention and post intervention. Also, no statistically significant change was evident between pre-and-post intervention for the three subscales of CYRM-28 measuring individual factors, relationship and contextual factors.

Child and Youth Resilience Measure normative data correlation. Comparing our baseline for this sample of the CYRM-28 with the CYRM-28 normative data revealed there were no significant difference and all comparisons were associated with ‘trivial’ effects (Hopkins et al., 2009). Table 3 shows the comparative data results of the research results with the CYRM normative data.

Correlation of Child and Youth Resilience Measure and the Ego Resilience Scale. Table 4 shows the correlation between the total CYRM-28 and ERS was ‘moderate’ (Pearson’s $r=0.49$, 95% CI 0.23 to 0.65, $p<0.001$) indicating good convergent validity (Streiner & Norman, 2003).

Table 2 - Pre-and-post statistical analysis results of the CYRM-28

	Pre-Mean (SD)	Post- Mean (SD)	Mean Difference	Standard Deviation	95% CI Difference	P-Value	Cohens d	Hopkins Descriptor
CYRM Score	108.01 (15.52)	108.66 (15.16)	-0.64	15.5	-3.95-2.67	0.70	0.04	‘trivial’
Individual Score	42.4 (6.21)	42.8 (5.94)	-0.35	6.3	-1.68-1.0	0.61	0.06	‘trivial’
Relationship Score	28.8 (3.93)	28.40 (4.88)	.37	4.2	-0.53-1.27	0.42	0.02	‘trivial’
Context Score	36.82 (6.93)	37.48 (6.66)	-0.67	6.9	-2.155- 0.822	0.38	-0.10	‘trivial’

Table 3. Normative data correlation between pre-intervention results compared to CYRM normative data

	Pre Mean (SD)	Normative Mean (SD)	Mean Diff.	SD	95% CI Diff.	P-Value	Cohens d	Hopkins Descriptor
CYRM Score	108.01 (15.52)	111.98 (15.11)	-3.99	15.52	-7.30- 0.68	0.019	-0.25	Trivial
Individual Score	42.4 (6.21)	44.79 (6.21)	-2.37	6.21	-3.69- 1.04	0.001	-0.38	Trivial
Relationship Score	28.8 (3.93)	29.27 (5.17)	-0.50	3.94	-1.34- 0.34	0.239	-0.13	Trivial
Context Score	36.82 (6.93)	37.92 (6.39)	-1.10	6.94	-3.56	0.142	-0.16	Trivial

Table 4. Correlation of CYRM and the ERS

		ERS Score	10W CYRM Score
Total ERS			
Pearson Correlation		1	.489**
Sig. (2-tailed)			.000
N		83	83
Bootstrap	Bias	0	-.001
	Std Error	0	.090
	95% Confidence Lower	1	.299
	Interval Upper	1	
10W CYRM Score			
Pearson Correlation		.489**	1
Sig. (2-tailed)		.000	
N		83	83
Bootstrap	Bias	-.001	0
	Std Error	0.90	0
	95% Confidence Lower	.299	1
	Interval Upper	.654	1

Discussion

Overview. The primary aim of this preliminary observational pre-post study was to evaluate resilience levels in adolescents taught to develop mindfulness techniques through completion of the ‘.b’ curriculum in a New Zealand school environment. The mindfulness in schools program was observed to have had no significant influence on overall resilience nor in the subcategories. A secondary aim was to examine convergent validity of the CYRM-28 and ERS. The magnitude of correlation between instruments shows acceptable convergent validity. The correlation between the ERS and CYRM-28 in this adolescent sample supports previous findings unrelated to mindfulness training by Sanders, Munford, Thimasarn-Anwar, & Liebenberg, 2015. Sanders et al (2015) investigated the psychometric properties of the CYRM-28 on a sample of at-risk New Zealand youth and found good overall validity on this group.

This is the first study that has evaluated the use of the CYRM-28 when investigating the effects of a mindfulness in schools program on adolescents. Three other studies have evaluated the effects of the mindfulness training program ‘.b’, used in this study, to evaluate the effects on adolescent resilience (Hennelly, 2011; Holland, 2012; Huppert & Johnson, 2010) and used the ERS and well-being tools to evaluate the effects. We used the CYRM-28 due to the age specificity of the tool and the wide range of constructs it uses to evaluate resilience. As this tool, has shown good convergence validity it is recommended for future use evaluating mindfulness in schools outcomes with adolescents.

Resilience, the ability to bounce back – Child Youth Resilience Measure. Against expectations, participants did not evidence significant increases in resilience from pre-to-post intervention. The baseline scores, however, compared favorably to the CYRM-28 normative reference data for similar ages from a Canadian sample (Liebenberg et al., 2012). Due to the highly-functioning sample it is unsurprising that resilience scores did not significantly increase post the mindfulness training and may illustrate a ‘ceiling effect’ (Cramer, Duncan, Howitt, Dennis Laurence, 2005) where mindfulness training no longer influenced resilience due to the upper end score at baseline demonstrated compared to the CYRM normative data.

Due to the recent publication of the CYRM-28 there appears to be no reference data available other than the Canadian data. The CYRM-28 normative data used Canadian samples and has been shown in some sub categories to not relate specifically to New Zealand culture (Sanders et al., 2015). The social skills cluster of questions relates more closely to cultural resources than to individual aspects of resilience than that seen in the Canadian population but overall the New

Zealand data of at-risk participants for the CYRM-28 appears to have a similar pattern (Sanders et al., 2015). These small differences may influence results in the subcategory scores and overall resilience.

The CYRM-28 is only one measure of resilience and other measures are available such as the ERS (Block & Kremen, 1996). The ERS has been used in several studies evaluating outcomes from a MiSP curriculum (Hennelly, 2011; Holland, 2012; Huppert & Johnson, 2010). The CYRM-28 tool was selected for use here as it includes a broad range of resilience concepts that help identify more influences of resilience and age specificity to encourage greater response (Liebenberg, Ungar, & Vijver 2012). The ERS does not include some key concepts such as community and cultural connectedness and is designed for all ages which can result in reduced responsiveness from younger participants. An advantage of the CYRM-28 tool is that it has both qualitative and quantitative measures, a 28-item questionnaire and 10-item guided interview. The guided interview helps to gauge a deeper understanding of the contributions and experiences that influence resilience. A third item of the CYRM-28 that contributes to a greater understanding of resilience is the Person Most Knowledgeable (PMK) tool which is designed to assess parents/caregivers and teachers, evaluating their perspective on a child, providing a richer wealth of knowledge to grasp the influences on that child's resilience. Due to these reasons, this tool appears appropriate to use again in similar future research.

In comparison to studies that evaluated a MiSP curriculum measuring resilience using the ERS, this study had similar findings to Huppert and Johnson (2010), where little change was observed in resilience post a MiSP intervention. Similarities in methodology may have contributed with both studies using independent boys' school samples and taking measures only at pre-and-post intervention. Studies that found significant increases in resilience post the MiSP curriculum used mixed gender samples and noted female participants had significantly larger changes than males and female controls (Hennelly, 2011; Holland, 2012). It is likely that mindfulness practices are more readily accepted by females (Samuelson, Carmody, Kabat-Zinn, & Bratt, 2007) and the potential openness to psychological interventions may influence each gender's results. With this understanding, it is hopeful that we found a small positive effect with adolescent boys. Research that used prolonged follow-up measures reported more significant improvements with longer term effects on resilience than immediate effects (Hennelly, 2011).

Older students have been reported to have had more significant results, such as the study by Hennelly (2011) which noted differences between year groups with the eldest year 12 (aged 15-18) participants who experienced a significant improvement in ego-resilience, whereas younger

students did not. Older participants, however, volunteered to take the mindfulness training and may have been adhering to practice more frequently. Participants in this study were aged 11-12 and with the mindfulness training as part of their curriculum. More significant improvements in resilience therefore may be detected if mindfulness is taught at an older age and offered as a voluntary option.

Lastly, while no changes in resilience as measured by the CYRM-28 were observed, there may be other benefits associated with mindfulness practice within the school environment such as improved cognitive function (Franco, Mañas, Cangas, & Gallego, 2011; Napoli et al., 2005; Semple, Lee, Rosa, & Miller, 2010), psychological well-being (Broderick & Metz, 2009; Hennelly, 2011; Huppert & Johnson, 2010; Joyce, Ety-Leal, Zazryn, & Hamilton, 2010; Lau & Hue, 2011; Schonert-Reichl & Lawlor, 2010; Wall, 2005) and mental health (Beauchemin, Hutchins, & Patterson, 2008; Biegel et al., 2009; Bögels et al., 2008; Joyce et al., 2010; Lau & Hue, 2011; Mendelson et al., 2010). We did not measure these for practical reasons as the project was attached to an existing curriculum program that limited time for data collection. Also, significant improvements in clinical populations (e.g. depressive symptoms or psychological dysfunctions) may have been established (Beauchemin et al., 2008; Biegel et al., 2009; Zylowska et al., 2008) but this was beyond the capability of measurement in this study.

Child Youth Resilience Measure sensitivity to '.b' compared to the Ego Resilience Scale. The results of this study showed good convergence validity, a parameter that tests the constructs that both the ERS and CYRM-28 are theoretically measuring resilience, and are both in fact related (Streiner & Norman, 2003). These results are similar to Sanders et al., (2015) who investigated the convergent validity of the CYRM-28 on a New Zealand population evaluating the positive association of measures that assess general well-being and measures of positive parent/caregiver relationships using the Satisfaction with Life and the Strengths and Difficulties Questionnaire (SDQ) Prosocial. Sanders et al., (2015) identified acceptable convergent validity and concluded the construct validity of the CYRM-28.

The moderate correlation between CYRM-28 and ERS scores in this sample might indicate these tools address the same underlying constructs related to resilience but they do measure different aspects of resilience as they have different theoretical underpinnings. The ERS was designed by Block & Kremen (1996) based on the theory that resilience is a dynamic process influenced by personality traits and the ego, whereas the CYRM-28 is based on the individual but incorporates the wide influence of the environment that the person is in, which contributes to resilience (Liebenberg et al., 2012).

Research Limitations. This study was conducted in a non-clinical setting. Use of the CYR28 is designed for adverse/high risk populations, whereas the sample group are of low risk as indicated by the baseline results compared to the CYRM-28 normative data. In addition to the general highly functioning sample, there are other limitations that include no prolonged measures examined due to logistical constraints inherent in this study. Previous research indicates that significant improvements in resilience occur at 3-6 month post mindfulness training (Hennelly, 2011).

Thirdly, there is an inability to generalise the findings of the study due to – a lack of baseline data points; a male only sample; a high decile school; a specific age range of only 11-12 year olds; a small sample size; and the intentional selection of a school interested in the mindfulness program, which may have influenced the adherence to the mindfulness training. This demographic has had little research conducted but initial studies have found similar outcomes (Huppert & Johnson, 2010). A follow-up study from Huppert & Johnson (2010) which used a mixed gender and public school sample concluded significant improvements. Research conducted on female only samples of similar characteristics found similar results in constructs of resilience such as improved emotional well-being (Broderick & Metz, 2009), indicating a higher generalisability.

The scope of this work was to look at one measure only. This restricted the ability to assess other outcomes of mindfulness and provides no insight to the effects of mindfulness training in a school environment to the skill of mindfulness. Also, the lack of assessing for adverse experiences, such as emotional problems, limited the ability to highlight when resilience may be shown.

Implications for different groups. The implications for different groups include mindfulness practitioners, researchers and schools. Resilience is a process that comes and goes at different times in one's life depending on the adversity one is experiencing (Luthar, Cicchetti, & Becker, 2000; M. Ungar, 2005; Werner, 1982). Judged on the implications that the CYRM did not measurably improve resilience over a 10-week timeframe, this study evaluated a low-risk population. Due to limitations of this study detail was not gathered to evaluate adversity, which could leave assumptions that this non at-risk population may not have experienced changes in adversity over the 10-weeks, therefore the need for resilience is reduced and will result in less remarkable changes in measures. Also, as resilience features both the individual and the environment (M. Ungar, 2013), this research only investigated individual constructs and

leaves open much investigation to other components that contribute to one's resilience such as the school, home and community environments.

Additionally, these results should not deter schools, teachers or mindfulness practitioners as research has found school-based meditation to be beneficial in many cases such as reduced depressive symptoms (Lau & Hue, 2011; Mendelson et al, 2010), reduced anxiety (Liehr & Diaz, 2010) and in a recent literature review that evaluated student well-being, social competence and academic achievement 61% of the results were significant (Waters, Barsky, Ridd, & Allen, 2015). The majority of the effects of meditation upon student outcomes, however, are small and align with the results of this study (Waters et al., 2015).

The correlation use of the ERS in previous mindfulness in schools research (Hennelly, 2011; Holland, 2012; Huppert & Johnson, 2010) and the convergence validity provide preliminary confidence the CYRM is an effective tool to examine mindfulness interventions that evaluate resilience as an outcome measure. Further correlations need to be investigated in other sample groups such as female populations and clinical samples to confirm the convergence validity. Both the CYRM-28 and the ERS show sensitivity evaluating the effects of mindfulness programs for adolescents, however the CYRM-28 was designed to be more specific for the adolescent population and engages with a multitude of components that contribute to resilience.

Recommendations for further study/ future discussion. To further investigate the effects of mindfulness training on resilience this research could be replicated in a larger population of adolescents that includes mixed gender, age variance and clinical samples. This study used only one measure due to limitations of practicality and time constraints, but ideally other components of the CYRM tool could be used to measure resilience that include the PMK and collection of qualitative data using the CYRM 10-Question participant interview. Further research with the same sample evaluating their transition to secondary school would be informative. As the transition to high-school can be stressful time (Compas, Wagner, Slavin & Vannatta, 1986) researching resilience at this point could highlight if mindfulness training has an effect on adolescent resilience.

Also, mindfulness should be assessed using a well validated tool such as the Cognitive and Affective Mindfulness Scale-Revised (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2006) as it is a more direct measure of the outcome that mindfulness training is meant to do. This measures the ability to regulate attention, awareness, and acceptance of experience. A battery of outcome measures may have positively occurred, such as improved emotional well-being

(Hennelly, 2012), reduced depressive symptoms (Lau & Hue, 2011; Mendelson et al, 2010), reduced anxiety (Liehr & Diaz, 2010), improved cognitive function (Semple et al, 2012) that are just not measured in this research as this study did not measure the right outcomes.

Conclusion

The findings of this study indicate that mindfulness training in a school environment taught to adolescents from an independent boys' school had no significant effects on resilience from pre-to-post intervention. However, this study did demonstrate good convergent validity for the CYRM-28 and appears sensitive to evaluate a mindfulness in schools training program with adolescents.

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Appendices

Appendix A - Ethics approval



Eve Skogstad
23 Tui Street
Point Chevalier
Auckland

22.10.15

Dear Eve,

Your file number for this application: **2015-1070**

Title: **A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in children.**

Your application for ethics approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been approved for the following period:

Start date: 22.10.15

Finish date: 22.10.16

Please note that:

1. The above dates must be referred to on the information AND consent forms given to all participants.
2. You must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.

You may now commence your research according to the protocols approved by UREC.

We wish you every success with your project.

Yours sincerely,

Sara Donaghey
Deputy Chair, UREC

cc: Elizabeth Niven
Cynthia Almeida

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Tel +64 9 849 4180
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277 Broadway
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North Harbour
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Waitakere campus
5-7 Ratanui St
Henderson
Auckland 0612
New Zealand

Appendix B - ANZCTR registration letter

Dear Eve Skogstad,

Re: A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in children

Thank you for submitting the above trial for inclusion in the Australian New Zealand Clinical Trials Registry (ANZCTR).

Your trial has now been successfully registered and allocated the ACTRN: ACTRN12616001123437

Web address of your trial: <http://www.ANZCTR.org.au/ACTRN12616001123437.aspx>

Date submitted: 8/08/2016 3:05:13 PM

Date registered: 18/08/2016 11:21:43 AM

Registered by: Eve Skogstad

Principal Investigator: Eve Skogstad

****Please note that as your trial was registered after the first participant was enrolled, it does not fulfil the criteria for prospective registration and will therefore be marked as being Retrospectively Registered on our website.****

If you have already obtained Ethics approval for your trial, please send a copy of at least one Ethics Committee approval letter to info@actr.org.au or by fax to (+61 2) 9565 1863, attention to ANZCTR.

Note that updates should be made to the registration record as soon as any trial information changes or new information becomes available. Updates can be made at any time and the quality and accuracy of the information provided is the responsibility of the trial's primary sponsor or their representative (the registrant). For instructions on how to update please see <http://www.anzctr.org.au/Support/HowToUpdate.aspx>.

Please also note that the original data lodged at the time of trial registration and the tracked history of any changes made as updates will remain publicly available on the ANZCTR website.

The ANZCTR is recognised as an ICMJE acceptable registry (<http://www.icmje.org/faq.pdf>) and a Primary Registry in the WHO registry network (<http://www.who.int/ictrp/network/primary/en/index.html>).

If you have any enquiries please send a message to info@actr.org.au or telephone +61 2 9562 5333.

Kind regards,
ANZCTR Staff
T: +61 2 9562 5333
F: +61 2 9565 1863
E: info@actr.org.au
W: www.ANZCTR.org.au



Appendix C – Information sheet for participants



Department of Osteopathy
Unitec New Zealand
Carrington Road
Mt Albert, Auckland

Information sheet for participants

A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in children

Osteopaths at Unitec are doing a research study and would like to ask for your help. Research means finding out more about something. It is a way we try to find out the answers to questions.

Why is this project being done?

Some children have noticed some benefits from using mindfulness training taught at school. Teachers don't always know why some **children do better with their studies or** **and want to know if mindfulness can help in other ways.** We would like you to help us find out more about this.



Why have I been chosen to take part?

We ask students from a school that is being taught the .b mindfulness classes.

What do I have to do to take part?

You don't have to do much. Before you start the mindfulness classes, you will be asked to fill out a survey on the school computer, then we will get you to fill out the same survey when you have finished the mindfulness classes.

We also ask you to have a short interview with the researcher to answer some questions about growing up. This will help us understand how you feel about the way you learn and deal with difficult situations that happen sometimes.

Will joining in help me?

We cannot promise the study will help you feel the same as others, but what we discover might help other children who may benefit from using mindfulness training at school.

Do I have to take part?

You do not have to take part. You can say no and no one will be cross or upset. If you say yes, but later change your mind then that's ok as well. Just tell your parents or the teacher. They will not be cross with you and you will still get the mindfulness training with the rest of your class.

Will anyone find out if I am on this study?

Your name and the things about you will be kept a secret – only the people who are doing the research will be able to see this information

Did anyone else check the study is OK to do?

Before any research is allowed to happen, it has to be checked by a group of people called a Research Ethics Committee. They make sure that the research is fair. The mindfulness and resilience project has been checked by the UREC - Unitec Research Ethics Committee

What do I do now?

Take time to decide whether or not you want to take part, and please ask us if there is anything that you do not understand.

If you have any questions that the person who looks after you cannot answer, you can email us at drpenney@integrativepaincare.co.nz or eve-nz@windowslive.com. We will try to answer your question or will speak to an appropriate person.



Appendix D- Parent information sheet

Department of Osteopathy
Unitec New Zealand
Carrington Road
Mt Albert, Auckland

Information sheet for parents/ legal guardians

A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in children

About this research project

Your child has been invited to take part in a research project investigating the efficacy of a school based mindfulness program, to help evaluate the effects on individual resiliency.

It will involve the full participation of your child in the 9 week .b program, completion of a resilience survey online at school pre, post and three months post completion of the course. It will also involve an optional single 10-minute interview post course and will be audio recorded.

Mindfulness in schools programmes are increasing in use and aim to provide children and adolescents globally the education to develop the recognised skills of enhancing cognitive performance, emotional regulation, well-being, depression, and blood pressure.

Resilience has been chosen in this research, as it is an important process that helps in dealing with disruptive, stressful, or challenging life events, in a way that provides the individual with additional protective and coping skills.

Encouraging characteristics of efficacy, self-esteem and perseverance can assist the development of children and youth to overcome challenging situations they may face through academia, extra curricular activities and in social events.

This study aims to evaluate whether learning mindfulness techniques so that in the face of challenge or adversity, the involvement of awareness and control of thoughts and feelings are active, and positive relationships that encompass empathy can increase resilience and kindness can be fostered.

The key survey has been written by leading research experts in resilience and designed specifically for children. This will be completed online via survey monkey at school, timetabled into the curriculum of the .b course and will not take time from other school activities.

A short 10-minute individual interview, as a follow on from the survey, will be conducted post completion of the .b course. The audio recordings will be transcribed by Scribie (a transcription company). Scribie have a confidentiality policy for their employees and have also signed Unitec's confidentiality agreement. The anonymised data provided may be used in any publications of this research project.

Confidentially

All of your child's information will be kept strictly confidential. Survey monkey and Scribie, the transcription company, will have access to the survey results and audio recordings in order to transcribe them. Scribie have signed Unitec's confidentiality agreement. The researcher and her two supervisors will have access to the audio recordings and transcripts to allow the relevant data analysis to be conducted. Finally, the anonymised data provided may also be used in any publications of this research project.

Koha

On completion of the interview the researcher would like to give your child a \$ movie voucher to acknowledge their time and effort in participating.

Consent

If you agree for your child to participate, you as the parent/guardian asked to sign consent form. This does not stop you from changing your mind if you wish to withdraw your child from the project. However, because of our schedule, any withdrawals must be done within 10 working days after we have collected complete the last data collection.

Who can I contact?

If you would like to discuss this research project or if you have any further questions please feel free to contact one of us:

Principal researcher:

Eve Skogstad

Tel: 027 550 6466

Email: eve-nz@windowlive.com

Mindfulness Teacher:

Dr Nick Penney

Research supervisor:

Dr Elizabeth Niven

Tel: 021 654 935

Email: eniven@unitec.ac.nz

Research co supervisor:

Dr Lucy Patston

UREC REGISTRATION NUMBER: 2015-1070

This study has been approved by the UNITEC Research Ethics Committee from 22-10-2015 to 22-10-2016. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the URE Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix E- Child consent form



Department of Osteopathy
Unitec New Zealand
Carrington Road
Mt Albert, Auckland

CHILD ASSENT TO PARTICIPATE IN RESEARCH

A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in children

1. My name is Eve Skogstad and I am an Osteopath student who would like your help with her research on mindfulness training in schools.
2. We are asking you to take part in a research study because we are trying to learn more about mindfulness practice and how it might help you deal with difficult situations at school with your education and friendships.
3. If you agree to be in this study your teacher and Eve will ask you to fill out a survey on the school computer before starting the mindfulness course and the same one 10 weeks later when the classes have finished. Also if you agree, we ask you also to have a short talk with Eve to answer some questions about how you feel when dealing with school, friendships and difficult situations.
4. This research will be of no danger to you and at any time you feel uncomfortable, you can let your teacher or Eve know, and you may stop.
5. If you participate in the research, you may learn some ways to help you concentrate better in class and to help you when you feel nervous with sports or music performances, exams or with friends.
6. Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say "yes" you can still decide not to do this.
7. If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.
8. You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can call me 0275506466, email eve-nz@windowslive.com or ask me next time.
9. Signing your name at the bottom means that you agree to be in this study. You and your parents will be given a copy of this form after you have signed it.

Name of Subject

Date

Appendix F- Parent consent form



Department of Osteopathy
Unitec New Zealand
Carrington Road
MtAlbert, Auckland

Informed Consent Form for Parent/ Legal Guardian of Kings School Boys Participating in the Research Project

A pilot evaluation on the efficacy of a universal school-based mindfulness intervention to enhance resilience in children

Informed Consent Form for (Participants Name): _____

I have had the research project explained to me and I have both read and understood the information sheet given to me. I was given the chance to discuss my questions with regards to this project with Nick Penney (.b mindfulness teacher) and Eve Skogstad (researcher) and I am satisfied with the answers given.

I understand that I don't have to have my child be part of this research project should I chose for them not to partake and may withdraw their participation at any time prior to the completion of the research project and may withdraw from the study up to ten working days after receiving a copy of an overview of anonymised survey results and my child's interview transcript.

I understand that everything my child says is confidential and none of the information my child will give can identify them and that the only persons who will know what they have said will be the researcher, her two supervisors and Scribie (the transcription company) will have access to the audio recording(s) and transcript. I understand that Scribie have signed Unitec's confidentially agreement and that Scribie will not retain the audio recordings after completing the transcript. I understand that the audio recordings and interview transcripts will be stored securely for a period of ten years and then be destroyed. I also give my permission for my anonymised data to be used in any publications of this research project.

I understand that I can be sent a copy of the completed manuscript once the thesis has been examined. I have been given the researcher and her two supervisors contact details and know who I should contact should I have any queries.

I have been given sufficient time to consider everything and I give my consent to be a part of this project.

Principal researcher: Eve Skogstad. Tel: 027 5506466. E: eve-nz@windowslive.com

Parental consent name: _____

Parental consent signature: _____ **Date:** _____

The research project was explained by: _____ **Date:** _____

UREC REGISTRATION NUMBER: 2015-1070

This study has been approved by the UNITEC Research Ethics Committee from 22.10.15 to 22.10.16. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix G- ‘.b’ teaching curriculum

The ‘.b’ course is a nine-week program that follows a teaching outline that follows:

Lesson One: Direct attention: Paying attention- Training the muscle of your mind

Skills-Directing your attention, Exploring and investigating what you find

Practices- ‘Aiming and sustaining’ attention on breathing for 2 minutes, Counting the number of breaths in a minute

Lesson Two: Accept and Calm: Taming the animal mind- Cultivating curiosity and kindness

Skills- Calming the mind by ‘anchoring’ it in the body, Relaxing and breathing with experiences, even difficult ones

Practices- FOFOC: A body scan with Feet on Floor, Bum on Chair, Anchoring your mind in the sensations of the body

Lesson Three: Deal with worry: Recognise worry- Noticing how your mind plays tricks on you

Skills- Recognising what our minds do that makes us worry: we Interpret, we ruminate, we catastrophise, ‘Un-worrying’ via a 7/11, Using meditation to help us sleep

Practices- 7-11, Meditation (lying down body scan)

Lesson Four: Be here now- From reacting to responding

Skills- Stepping out of ‘auto-pilot’ mode, Savoring the pleasant, Responding to the unpleasant rather than reacting

Practices- . b, Mindful mouthful, Sitting like a statue for 15 minutes

Lesson Five: Move mindfully- Moving Mindfully

Skills: Moving mindfully, Bringing mindfulness to daily activity, Aspiring to ‘flow’ or be ‘in the zone’

Practices: Mindful Walking, Mindful tooth brushing, Showering, eating etc.

Lesson Six: Step back- Stepping back: Watching the thought-traffic of your mind Skills: Seeing thoughts as traffic that flows through the mind, Identifying ‘thought-buses’ that pass through your mind, Recognising that you don’t have to ‘get on the bus’ of difficult thoughts

Practices: Observing thought-traffic, Practising staying at the bus stop, rather than getting taken for a ride

Lesson Seven: Befriend the difficult- Befriending the difficult

Skill: Understanding stress, Recognising your stress signature, Responding to stress and difficult emotions rather than reacting to them

Practices: Breathing with stress/ letting it be

Lesson Eight: Take in the Good- Taking in the good: Being present with your heart

Skills: Appreciation of what is good in life, Recognising how even the ordinary can be experienced as 'good' if we are more fully aware of it

Practices: 'Taking in the good'- Gratitude Practice

Lesson Nine: Pulling it all together

Revision: What have you found most useful? In what ways do these skills help change your life for the better? What advice would you give yourself to make the most of what you have learned?

Appendix H- Survey one- Child Youth Resilience Measure

To what extent do the sentences below describe you? Circle one answer for each statement.

	Not at All	A Little	Some -what	Quite a Bit	A Lot
1. I have people I look up to	1	2	3	4	5
2. I cooperate with people around me	1	2	3	4	5
3. Getting an education is important to me	1	2	3	4	5
4. I know how to behave in different social situations	1	2	3	4	5
5. My parent(s)/caregiver(s) watch me closely	1	2	3	4	5
6. My parent(s)/caregiver(s) know a lot about me	1	2	3	4	5
7. If I am hungry, there is enough to eat	1	2	3	4	5
8. I try to finish what I start	1	2	3	4	5
9. Spiritual beliefs are a source of strength for me	1	2	3	4	5
10. I am proud of my ethnic background	1	2	3	4	5
11. People think that I am fun to be with	1	2	3	4	5
12. I talk to my family/caregiver(s) about how I feel	1	2	3	4	5
13. I am able to solve problems without harming myself or others (for example by using drugs and/or being violent)	1	2	3	4	5
14. I feel supported by my friends	1	2	3	4	5
15. I know where to go in my community to get help	1	2	3	4	5
16. I feel I belong at my school	1	2	3	4	5
17. My family stands by me during difficult times	1	2	3	4	5
18. My friends stand by me during difficult times	1	2	3	4	5
19. I am treated fairly in my community	1	2	3	4	5
20. I have opportunities to show others that I am becoming an adult and can act responsibly	1	2	3	4	5
21. I am aware of my own strengths	1	2	3	4	5

22. I participate in organized religious activities	1	2	3	4	5
23. I think it is important to serve my community	1	2	3	4	5
24. I feel safe when I am with my family/caregiver(s)	1	2	3	4	5
25. I have opportunities to develop skills that will be useful later in life (like job skills and skills to care for others)	1	2	3	4	5
26. I enjoy my family's/caregiver's cultural and family traditions	1	2	3	4	5
27. I enjoy my community's traditions	1	2	3	4	5
28. I am proud to be a citizen of _____ (insert country)	1	2	3	4	5

Ungar, M., and Liebenberg, L. (2011). Assessing resilience across cultures using mixed-methods: Construction of the Child and Youth Resilience Measure-28. *Journal of Mixed Methods Research*, 5(2), 126-149.

Liebenberg, L., Ungar, M., and Van de Vijver, F. R. R. (2012). Validation of the Child and Youth Resilience Measure-28 (CYRM-28) Among Canadian Youth with Complex Needs. *Research on Social Work Practice*, 22(2), 219-226.

Appendix I- Child Youth Resilience Measure approval letter



May 27, 2015

To Whom It May Concern:

The Resilience Research Centre (RRC) encourages the use of the CYRM-28 and the CYRM-12 including versions of the CYRM adapted for use with younger children and adults. There is no cost to reproduce the measure for research purposes. This letter gives the user permission to use the CYRM as long as the following terms are met:

- a) no changes are made other than those authorised by the RRC
- b) the authors are credited (see Liebenberg, Ungar & Van de Vijver, 2012; Ungar & Liebenberg, 2011)
- c) the measure is not sold.

Both Dr.'s Liebenberg and Ungar give permission to Eve Skogstad to use the measure for her Master's research project.

Regards,

A handwritten signature in black ink, appearing to read "Linda Liebenberg".

Linda Liebenberg, PhD
Co-Director,
Resilience Research Centre
Dalhousie University

A handwritten signature in black ink, appearing to read "Michael Ungar".

Michael Ungar, Ph.D.
Co-Director,
Resilience Research Centre
Dalhousie University

Appendix J- Survey two- Ego Resilience Scale

The Ego Resilience Scale				
Please read the below statements about yourself and indicate how well it applies to you by circling the answer to the right from 1 (does not apply at all) to 4 (applies very strongly). Let me know how true the following characteristics are as they apply to you generally:				
Characteristics About You	Does not Apply at All		Applies Very Strongly	
	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
1. I am generous with my friends.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
2. I quickly get over and recover from being startled.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
3. I enjoy dealing with new and unusual situations.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
4. I usually succeed in making a favourable impression on people.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
5. I enjoy trying new foods I have never tasted before.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
6. I am regarded as a very energetic person.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
7. I like to take different paths to familiar places.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
8. I am more curious than most people.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly

9. Most of the people I meet are likable.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
10. I usually think carefully about something before acting.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
11. I like to do new and different things.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
12. My daily life is full of things that keep me interested.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
13. I would be willing to describe myself as a pretty “strong” personality.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly
14. I get over my anger at someone reasonably quickly.	1 Does not apply at all	2 Applies slightly	3 Applies somewhat	4 Applies very strongly

Source: (J. Block & Kremen, 1996) Scoring Interpretation

Score	47-56	35-46	23-34	11-22	0-10
Level of Resilience	Very High Resiliency Trait	High Resiliency Trait	Undetermined Trait	Low Resiliency Trait	Very Low Resiliency Trait

Appendix K - Ego Resilience Scale permission letter



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