Maximizing potential:

The effectiveness of Project K on self-efficacy, resilience, and connectedness

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ABSTRACT

This longitudinal study aimed to investigate changes in self-efficacy, resilience, and connectedness to school in students participating in Project K, a positive youth development programme. Eighty secondary school students were recruited from five schools across New Zealand. These formed two groups: a Project K group made up of 49 students, and a comparison group made up of 31 students. Over fourteen months, six waves of measurement were completed by Project K participants and four waves of measurement were completed by a comparison group. Self-efficacy was measured using the Project K Self-Efficacy Questionnaire, while resilience was measured using the Resilience Scale, and connectedness to school was measured using the Hemingway Adolescent Connectedness Scale. Preliminary analysis confirmed variance in individual and group data indicating more complex multilevel analysis would be beneficial in investigating changes in self-efficacy, resilience, and connectedness to school. As expected, the Project K group began with lower self-efficacy than the comparison group. However, after controlling for differences in initial status, Project K participants improved at a faster rate over the course of the programme than the control group. Gender difference in initial self-efficacy scores were noted, with females having higher self-efficacy than males, however these initial differences were unrelated to rates of change over time. Project K participants had lower resilience at the start of the study but after controlling for the initial group differences, the Project K group was found to improve at a faster rate when compared to the comparison group. There was no difference between groups at the start of the programme, or in rate of change over time in the connectedness to school variable, and no relationship between gender and changes in resilience or connectedness to school scores over time. To conclude, implications for future research and practice are discussed.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDIX FIGURES

LIST OF TABLES

LIST OF APPENDIX TABLES

LIST OF APPENDICES

CHAPTER ONE:
YOUTH DEVELOPMENT IN NEW ZEALAND AND PROJECT K

Worldwide, there is an increasing government focus on maximising the benefits of investment in youth development so that young people are successful in meeting the milestones associated with adolescence (Jacobsen et al., 2002). Successful negotiation of these milestones means that youth maximise their potential and avoid choices that might negatively affect their future. In New Zealand, the Ministry of Youth Development formed the Youth Development Strategy Aotearoa in 2002, in order to promote the development of young people aged 12–24 years. The strategy has three aims: to ensure that all young people have opportunities to establish positive connections in their social environments; to ensure that government policy and practice reflect a positive youth development approach; and to ensure that all young people have access to a range of development opportunities. Beneath the three aims sit four goals. These are: adopting a strengths-based approach for youth development; developing quality relationships with youth through skilled staff; ensuring youth participation through opportunities to actively engage; and developing knowledge about youth development through research. This strategy guides the investment and direction of youth development in New Zealand.

The bulk of the funding for the Youth Development Strategy Aotearoa targets structured programmes. This strategy attempts to reach a balance between reducing problem behaviours and promoting a strengths-based approach, aiming to build strengths in youth so that they are able to resist engaging in behaviours that will place them at risk. The strategy combines a prevention approach and promotion of positive youth development with a holistic competence-based view of youth. The current research investigates the effectiveness of one positive youth development programmes designed and run in New Zealand – Project K.

Setting the scene: Project K

Project K beginnings

In 1996, Graeme Dingle, a well-known New Zealand mountaineer, and Jo-anne Wilkinson, a lawyer, founded Project K. Prior to this, Graeme Dingle had spent a number of years climbing some of the most challenging mountains, including a year-long traverse of the Himalayas and a two-year circumnavigation of the Arctic. On his return to New Zealand he was

concerned to hear about the high rates of youth engaging in risky behaviours and this concern prompted him to start thinking about what could be done to improve the outcomes for New Zealand youth. This led to the founding of the Sir Edmund Hillary Outdoor Pursuits Centre in the North Island of New Zealand, and later in the founding of Project K (Dingle, 2005). In establishing Project K, extensive research was undertaken to identify a suitable structure and components, and Project K now includes an adventure education component, a community component, and a year-long mentoring component. At the same time, research was undertaken to identify the gaps in youth development programmes in New Zealand, and this research indicated that there were few programmes aimed at youth who are considered 'moderately at risk' (Deane, 2012; Dingle, 2005; Dingle & Wilkinson, 2011). Project K was established to assist this group, focusing on young people aged 13-15 who are identified as having low self-efficacy.

What is Project K?

Project K (www.fyd.org.nz) is a national multi-site youth development programme delivered through local licensees across New Zealand. In 2010, 15 Project K programmes were delivered at 15 participating schools; only one school was in the South Island. The programme is community-driven in the sense that licensees have their own board, staff, and volunteers, and the programme can be adapted to suit the local community, although the core structure must be preserved.

Governance, research, and evaluation are centralised at the Foundation for Youth Development National Support Office in Auckland. Project K is owned by The Foundation for Youth Development, and is run alongside Stars (a peer-mentoring programme run in select schools for all year 9 students); Kiwi Can (a school-wide values-based programme for primary and intermediate schools); and Male Youth New Direction (a mentoring programme for high risk young male offenders). Project K, the flagship programme, aims to improve social, psychological, and physical well-being in 13–15 year old students identified as having low self-efficacy, but who do not demonstrate high risk behaviours. Participants are identified through their scores on Moore's (2005) Project K Self-efficacy Questionnaire, which includes academic, social and help-seeking self-efficacy subscales. The number of programmes that operate throughout the year depends in part on the funding available. Programme quality is maintained through ongoing monitoring and evaluation.

Each Project K programme runs over 14 months and has three components: a three week residential Wilderness Adventure, a non-residential 10-day Community Challenge, following which students are paired for 12 months with a mentor (Moore, 2005). Students attend all three components. Each programme accommodates twelve students, ideally with an equal number of males and females.

Wilderness Adventure. To begin with, participants spend two days being inducted into the programme and then undertake their Wilderness Adventure. The outdoor adventure camp lasts between two and three weeks and involves experiential learning, in which participants learn skills such as goal setting, teamwork, problem solving, and leadership. During the Wilderness Adventure, students engage in a number of challenge-based activities such as abseiling, kayaking, hiking, and cycling.

The Community Challenge. The next component of the programme, the Community Challenge, encourages participants to transfer what they have learnt in the Wilderness Adventure to their communities, and undertake a community project. This can be run over different periods of time, but students have to meet with their project groups 10 times, either by meeting on 10 consecutive days, twice a week for five weeks, or once a week for ten weeks. Project K participants are encouraged to connect with and meet key members of their communities, and to visit local organisations. An example of a Community Challenge could be raising money, or volunteering, for a charity. During the Community Challenge component, workshops are presented to participants on issues relating to adolescent well-being such as sex, drugs, alcohol, and driving.

Mentoring Partnership. Adult mentors are carefully screened and selected by Project K, and attend two days of intensive training. At the end of the Community Challenge, mentors and Project K participants attend a matching day, and spend one day together engaging in activities to get to know each other. At the end of the day, mentors and Project K participants are asked to select the top three people they would like to be paired with. Strong preference is given to the young person's selection. Mentors and participants aim to meet bi-monthly face to face, and to stay in phone or text contact each week. The focus of the mentoring partnership is to assist with goal setting and achievement, and participants complete a journal, which is reviewed by the mentor at three, six, and twelve months. Each month, a mentor coordinator runs a training evening for mentors to review any concerns and to provide support. Group activities involving

all Project K participants and mentors are arranged during the twelve-month period. Each Project K programme ends with a graduation ceremony.

Prior research

The current research project forms part of an ongoing research programme into Project K. The largest research evaluation to date on Project K began in 2004, in which the Foundation for Youth Development, in collaboration with the Ministry of Social Development, undertook a randomised control trial (RCT) investigating the effectiveness of Project K. The research ran across eight programmes, between 2004–2007, and aimed to test the validity and reliability of the Project K Self-efficacy Questionnaire, which is used to select participants, and also included a Health and Lifestyle Questionnaire. Participants were 456 students from Years 9, 10, and 11 from one New Zealand secondary school. Key findings from the RCT were that the Project K participants had higher academic and social self-efficacy scores at the end of the programme when compared to a control group, and these changes were maintained at the one-year follow up (Qiao & McNaught, 2007). A number of other research projects have evaluated Project K using the data collected between 2004-2007 and some relevant findings are discussed below.

Warren (2005) evaluated changes in family cohesion, happiness, and goal directed activities between Project K participants and a comparison (non-randomised) group drawn from three schools. Interviews were completed pre-programme, after the Community Challenge, and one-year after completion of the programme. Warren found that on average, happiness and family cohesion increased through the Wilderness Adventure and Community Challenge, and the increase in happiness was maintained one-year post programme. In addition, the Project K students reported taking part in more goal directed activities when compared to the comparison group. During the interview, participants reported enjoying the Wilderness Adventure the most and the Community Challenge the least, but they also reporting feeling they had gained most from the Mentoring Partnership as it helped them set and achieve goals, and engage in new activities and experiences.

O'Neill (2005) evaluated the Project K mentor training programme, and found that mentors and youth self-reported high scores on all relevant skills at the end of the training, and that the Project K mentor training programme met recommended best practice guidelines.

In 2011, the University of Auckland undertook a research project on Māori students' experiences with Project K (Hollis, Deane, Moore, & Harre, 2011). This research used a narrative interview approach to gather information about the perspectives of Māori students. The research found that participants' perceptions of their ability improved over the course of the programme, and participants also reported related positive changes in their lives. Participants identified a number of features that assisted with the change, including having challenging goals, getting support and guidance from role models, and gaining the skills to achieve their goals. In addition, participants identified a number of uncomfortable cultural issues that Project K needed to address such as altering one of the drop off points, which was at Fantail Bay. Fantails are associated with death in Māori culture, and some of the participants felt uncomfortable stopping at a location with fantails circling overhead (Hollis et al., 2011).

In 2012, Deane conducted a mixed-method evaluation of Project K using a theoretical framework called the Thoughtful Evaluation model, which focused on balancing the programme's scientific credibility with its emphasis on stakeholder empowerment. Key findings using the 2004–2007 RCT data revealed that Project K was effective at improving academic and social self-efficacy from pre- to post-programme, and these changes were maintained one year post-programme. Using focus groups the short, intermediate, and long-term outcomes of Project K were identified.

To date, evaluation research has demonstrated Project K's ability to improve all domains of self-efficacy, the central outcome measure of the programme. Further outcomes include positively influencing academic achievement, peer relationships, ability to ask for help, good career choices, perceptions of social competence and family cohesion, and a reduction in risk behaviours. The present research will build on earlier research, which has demonstrated Project K's ability to influence self-efficacy, and extend the evidence base by investigating additional assets such as resilience and connectedness.

Thesis overview

The following chapters review relevant research on Project K, youth development, risk and protective factors, developmental assets, resilience in youth, positive youth development, and key outcomes. Chapter One sets the scene and outlines the Project K programmes and presents relevant research. Chapter Two looks at adolescent development in the context of risk factors, protective factors, and developmental assets. Chapter Three introduces positive youth

development programmes and then moves on to the characteristics of effective programmes; it concludes with a discussion on issues with the evidence base. Chapter Four revisits Project K, introduces the logic model, and moves on to highlight the core components of this programme. Chapter Five highlights key outcomes for Project K and identifies self-efficacy, resilience, and connectedness to school as the variables of interest in the current study.

Chapter Six introduces the current study, research questions, and methods. The general aim is to investigate whether participation in Project K can influence an adolescent's scores on measures of self-efficacy, resilience, and connectedness to school. The suggestion is that positive youth development programmes, such as Project K, can promote developmental assets, which in theory will improve positive outcomes for youth. The study takes place with 49 students taking part in Project K and 31 students who form a comparison group. Chapter Seven presents the results. Chapter Eight presents a discussion of the findings, links to the literature review, and includes explanations of the study's results; it concludes with a discussion on directions for future research and a concluding statement.

CHAPTER TWO:
ADOLESCENT DEVELOPMENT AND WELL-BEING

Adolescence is associated with many changes, including changing schools, physical changes, shifts in identity, cognitive changes, social/emotional changes, and others. Successful negotiation of key developmental tasks associated with this period can be challenging. Changes include a shift in social connectedness as family ties lessen and peer connections strengthen, which places increased demands on interpersonal skills. Adolescents become more susceptible to negative influences from peer groups, and as a result can engage in behaviours that jeopardise their future (McLaren, 2002). As highlighted by developmental theories such as Erikson's (1963) theory of psychosocial development, adolescents move towards autonomy and self-identity as they try to balance the development of their own identity, while still relying on family to provide support and the resources needed for positive development. This can create conflict with parents, for instance in relation to political and religious orientation, and can result in alienation from their family of origin (De Goede, Branje, & Meeus, 2009). As identity shifts, youth can fail to make connections with their community leading to poor participation as a community member and becoming more susceptible to engaging in risky behaviours (Bond et al., 2007; Bonny, Britto, Klostermann, Hornung, & Slap, 2000). Finally, experiences of exclusion can lead to alienation and cause adolescents to either withdraw from, or rebel against, mainstream society (Sukkyung et al., 2008). Many of these key developmental tasks place significant demands on developing social and emotional skills.

Adolescent well-being is the ability to acquire knowledge, skills, values, experiences, and social connections that enable youth to negotiate challenges, connect with others, avoid risky behaviours, and thrive (Diener, 2009; Eccles & Gootman, 2002). Scales, Benson, Leffert, and Blyth (2000) demonstrated that participation in positive youth development programmes predicted thriving behaviours in youth across a range of ethnic groups. At a similar time, Lerner, Fisher, and Weinberg (2000) identified indicators of adolescent well-being as being represented by the extent to which youth expressed the 'Five Cs' (5Cs). The 5Cs include:

- Competence in cognitive, academic, social and vocational areas;
- Confidence or positive self-beliefs that include self esteem, self concept, self efficacy, identity, and belief in the future;

- Connections to family, peers, and community;
- Character e.g. positive values, integrity, morality, and compassion;
- Commitment and caring.

This approach has been extended to include Contribution, in order to recognise that well-being extends beyond individuals, to include positive contributions to extended ecological systems such as family, school, and community. Reseach by King et al. (2005) established that the 5Cs (or 6Cs) matched the general concepts that parents, practitioners, and youths used to express thriving during adolescence.

Risk factors

Adolescence is a period associated with increased probability of participation in risky (Office of the Prime Minister's Science Advisory Committee, 2011). Research on factors that impact on adolescents is divided into risk and protective factors (Durlak, 1998). This division provides a way of classifying and understanding the many factors that influence an adolescent's health and behavioural outcomes (Durlak, 1998; Roth, Brooks-Gunn, Murray, & Foster, 1998). Risk factors increase the likelihood of engaging in risky behaviours and are associated with increased negative outcomes, such as school failure, physical injury, youth pregnancy, and mortality (Durlak, 1998; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Pollard, Hawkins, & Arthur, 1999). Pollard et al. (1999) investigated 20 risk factors and eight protective factors in 78,710 adolescents across five common domains: individual, family, peers, schools, and community. Pollard et al. demonstrated that students with higher aggregated risk scores had a greater prevalence of problem behaviour. They also found that students who had high-risk scores had low protection scores (r = -0.66).

In general, the research on risk factors is unanimous in finding that the greater the number of risk factors and the less the number of protective factors, the greater the likelihood an adolescent will engage in risky or problem behaviours (Durlak, 1998; Jessor et al., 1995; Pollard et al., 1999; Resnick, 2000; Rutter, 1979; Werner & Smith, 1992). These include behaviours that cause physical injury (e.g. fighting, suicide, motor vehicle accidents) and behaviours that have cumulative negative outcomes (e.g. alcohol and drug use, risky sexual behaviours, unhealthy eating behaviours); these behaviours compromise adolescent well-being (Fraser & Galinsky, 2004; Resnick, 2000; Rew & Horner, 2003). A deficits approach to youth development has led to many programmes focusing on reducing risk, but a number of limitations to this approach have

emerged. Risk factors are more useful at predicting outcomes for groups of people, than at an individual level (Durlak, 1998 ; Hawkins, Arthur, & Catalano, 1995; Pollard et al., 1999; Rutter, 1990; Werner & Smith, 1992). Not all youth exposed to risk are negatively affected, and around one third of children who have been disadvantaged while growing up will become well-functioning adults (Werner, 1971). The thriving of some children under adverse conditions has led researchers to seek other explanations for positive adaptation, and researchers have turned their attention to a preventative approach through developing young peoples' strengths. This has led to the emergence of the Positive Youth Development philosophy. Rather than focusing on risk factors, the current study draws from the literature on building strengths, including protective factors and developmental assets.

Protective factors and development assets

Protective factors have a dual affect. They are associated with improved well-being (Resnick, 2000; Rew & Horner, 2003; Ungar & Liebenberg, 2008) and with decreased likelihood of negative outcomes (Durlak, 1998; Jacobsen et al., 2002; Masten, 1989). Protective factors are internal or external resources that moderate or buffer against risky behaviours and outcomes (Durlak, 1998; Fraser & Galinsky, 2004; Jessor et al., 1995). Researchers have consistently identified three broad categories of protective factors related to negative outcomes for adolescents. These categories include *individual characteristics*, *social bonding*, and *healthy beliefs* (Pollard et al., 1999; Rutter, 1990; Werner & Smith, 1992). There is significant research support for individual protective factors focusing on building competence (Masten, Best, & Garmezy, 1990), resilience (Dumont & Provost, 1999; Garmezy, 1991), and self-efficacy (Karademas, 2006). There is also support in the literature for the protective role of social bonding for adolescents who have at least one close relationship within the family, and social support from one adult outside the family (Durlak, 1998; Pollard et al., 1999). Having healthy beliefs about issues, such as alcohol and substance use, and sexual behaviours, is also important. These three categories together form the basis from which adolescents draw the internal and external resources that provide them with the support needed for developing the skills and competencies that will enable them to make a successful transition to adulthood.

The ability of protective factors to influence the incidence of negative outcomes has been demonstrated in longitudinal research by Rutter (1979). This research indicated that enhancing protective factors through intervention programmes reduces problem behaviours, suggesting

protective factors are acting in opposition to risk factors. Empirical research measuring risk and protective factors indicated protective factors act as buffers against risk, and therefore moderate the negative effects when an individual is exposed to risk (Jessor et al., 1995; Pollard et al., 1999; Resnick, 2000; Ungar & Liebenberg, 2008). For example, connectedness to others can buffer adolescents against risk factors such as parental marital conflict (Durlak, 1998). However, difficulties with specifically determining the causal relationship between protective factors and positive well-being outcomes has been evident in much of the research on developmental assets.

Protective factors and development assets are similar in their focus on building strengths to increase positive outcomes for youth. The definition of "assets" and "protective factors" was initially unclear, and led to the terms being used interchangeably in the literature. This created confusion, with many practitioners and scholars making no distinction between the two. However, there is an important difference. Protective factors are conceptualised as part of the relationship with risk factors, so that they buffer or reduce risk. However, assets are conceptualised as factors that have a prior statistical correlation with positive outcomes, without reference to the presence of risk factors (Scales & Leffert, 1999). Assets are individual and environmental factors that promote positive youth outcomes, such as school achievement, through the reduction of involvement in health compromising behaviours (Leffert et al., 1998).

The Search Institute conducted the first large-scale research into developmental assets in the form of a longitudinal study. This study of 6,000 sixth to twelfth grade students investigated the effects of gender, grade, and levels of assets on seven indicators: school success, leadership, valuing diversity, physical health, helping others, delay of gratification, and overcoming adversity (Scales, Benson et al., 2000). This work formed the basis of an extensive list of 40 Developmental Assets necessary for healthy development. The assets are split into 20 external assets (e.g. support, empowerment, boundaries and expectations, constructive use of time) and 20 internal assets (e.g. commitment to learning, positive values, social competencies, and positive identity). This study had a significant impact, and has informed and shaped international policies on positive youth development (Benson, 2006; Scales & Leffert, 1999).

Assets are the building blocks that enable young people to grow into healthy, caring, and responsible adults (Benson, 1993). Eccles and Gootman (2002), building on the Developmental Assets framework, conducted one of the most rigorous and extensive reviews of the literature on asset building in adolescents. Their research reviewed empirical studies that linked personal and

social assets to: (a) indicators of current positive youth development, (b) future positive adult development; and (c) studies designed to change specific assets. From this review, they identified 28 core assets associated with adolescent well-being. They grouped the assets into the four broad categories of physical health, cognitive development, psychological and emotional development, and social development. The findings demonstrated that the higher the number of assets an adolescent has, the more likely he or she will report positive outcomes. While a strong asset in one category can compensate for few or no assets in other categories, adolescents are more likely to thrive if they have assets in all four categories. Further evidence came from Roth (2004) who corroborated the links between assets and positive outcomes in the research by the Search Institute on Developmental Assets, and the research on asset grouping proposed by Eccles and Gootman (2002).

Additionally, researchers have correlated increased numbers of assets with decreased participation in risky behaviours (August, Realmuto, Hektner, & Bloomquist, 2001; Battistich, Schaps, & Wilson, 2004; Battistich, Solomon, Watson, Solomon, & Schaps, 2002; Ewert & Yoshino, 2007; Jelicic, Bobek, Phelps, Lerner, & Lerner, 2007; Masten, 2001; Ministry of Youth Development, 2009; Resnick, 2000; Roth et al., 1998). The predictive links with well-being, and correlations with decreases in risky behaviours, underscore the importance of enhancing assets for youth (Eccles & Gootman, 2002; Masten et al., 1990; McLaren, 2002; Rea & Callister, 2009; Rutter, 1999). For these reasons, Developmental Assets have become one of the most widely used approaches to youth development during adolescence (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004).

Developmental Assets research has a number of key findings that are fundamental to positive youth development. First, a central finding is that when an asset is present there is a greater statistical probability that an adolescent will achieve “developmental thriving” such as school achievements, helping others, and overcoming stress (Benson, 2002; Scales, Benson et al., 2000). Second, development of assets may occur through external factors, such as positive relationships with family, peers, community, school, or faith-based groups, or through internal factors such as beliefs, attitudes and values. Third, the number of assets varies greatly between adolescents (Benson, 1993). Finally, the development of these assets is dependent on the opportunities and support adolescents have from family, community, and school environments (Benson & Saito, 2000; Connell, Alberti, & Smith, 2001). These findings highlight the role the

environment and people closest to youth have in influencing the development and utilisation of assets, and provide empirical support that assets can be changed and enhanced. This precipitated significant interest, particularly by programme developers, in assets in the field of youth development.

Unsurprisingly, controversy exists on where to focus interventions. Some advocate for focusing solely on Development Assets and protective factors (Pollard et al., 1999), as the deficits approach (focusing on risk factors) was seen to be producing poor results (Rutter, 1990). Rutter and others argued that youth were being provided with skills to address their deficits, with little consideration given to building their strengths, or of the environment they were living and functioning in (Connell et al., 2001). Additionally, targeting risk factors has been criticised for its emphasis on a young person's deficits. Building on these findings, Resnick's (2000) resilience research indicated that building strengths, rather than decreasing risk, could lead to positive outcomes or thriving (Ministry of Youth Development, 2009). However, others argued that adopting a perspective that solely focuses on developing assets, and ignores important risk factors, does not provide a complete picture for policy makers when addressing youth well-being. This controversy has not been resolved, with many youth development programmes continuing to focus on risk reduction. However, there is increasing recognition of the benefits of positive youth development and building assets, with empirical evidence supporting this approach.

CHAPTER THREE:
POSITIVE YOUTH DEVELOPMENT

Positive youth development can be conceptualised as a process of preparing youth to face the challenges of adulthood. This is done through integrated activities and experiences that assist youth to become competent in various domains such as social, physical, moral, cognitive, and emotional domains. Positive youth development aims to help youth develop internal resources and skills to cope with challenges (Carnegie Council on Adolescent Development, 1992). Positive youth development is a strengths-based approach that provides overall direction for programmes and other services provided in the community for youth. Positive youth development can be defined as an ongoing and dynamic growth process that enables youth to meet their essential needs of caring relationships, connections to community, and basic safety, while at the same time building youth skills (assets), which include social, personal, academic, and vocational skills (Eccles & Gootman, 2002). The ultimate aim is the development of a self-confident adult who becomes a responsible and contributing member of society.

Urie Bronfenbrenner's (1979) ecological development theory has made an important contribution to the understanding of adolescent development. This ecological approach to development highlights the relationship between multiple social systems in a young person's life. Bronfenbrenner's model nests the ecological environments in three layers in relation to their proximity to the adolescent. He called the settings closest to the individual the *microsystem* (e.g. family, school, and neighbourhood). The *mesosystem* refers to the interactions between family, school, and peers, and is a relationship between *microsystem*. The *exosystem* is the larger social system including formal and informal social structures more removed from an adolescent, but which can still influence an adolescent's development positively or negatively (e.g. a parent's involvement in the community could influence home life). According to Bronfenbrenner, development can only be understood through understanding the continuous interactions between the environment and the individual.

Positive youth development has adopted an ecological approach by recognising that multiple *mesosystems* influence adolescent development. Cahill, DuPree, Pitts, and Thomases (2002) highlight that positive youth development programmes play an important mediating role

through creating connections to positive social groups and to larger environments (*exosystems)* where youth can develop positive values and skills.

Positive youth development programmes

Underlying a strengths-based approach to youth development are a number of core principles. These include a belief that young people have the potential strengths and capabilities to overcome challenges, that change in young people is inevitable, that youth have the desire to succeed, and that positive change can occur, especially if youth know that there are people who care about them and their success (Hammond, 2010).

Agreement on a standard definition of *positive youth development programmes* is elusive (Catalano, Gavin, & Markham, 2010; Roth et al., 1998). There are a number of possible reasons for this. First, the types of programmes included in the research may cover community and clinical populations. Second, programmes have different goals, emphasis, and structure. Third, some programmes have a broad approach (for example enhancing protective factors), and others focus specifically on improving academic achievement, or reducing bullying or school dropout.

Researchers and scholars are also in disagreement about what components a definition should include. Some agree on the objectives or purpose (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2002), with others focusing on overarching principles, or characteristics of youth development programmes (Roth & Brooks-Gunn, 2003a).

A common purpose

One group of scholars has proposed that a definition of positive youth development programmes lies in agreeing on a common purpose or set of goals. Catalano et al. (2002) conducted a large-scale literature review, and combined this review with consultation with leading experts. From this review, they concluded that positive youth development programmes should aim to achieve the following goals:

- Bonding
- Resilience
- Social competence
- Emotional competence
- Cognitive competence
- Behavioural competence

- Moral competence
- Self-determination
- Spirituality
- Self-efficacy
- Clear and positive identity
- Positive belief in the future.

In addition to goals, positive youth development programmes should encompass the following processes and components:

- Recognition for positive behaviour
- Opportunities for prosocial involvement
- Fostering prosocial norms.

To date, at least two significant rigorous reviews have been conducted confirming the predictive validity of these constructs for positive youth development (Catalano et al., 2010; Lerner, Almerigi, Lerner, & Theokas, 2005). There is now some agreement among researchers that the 15 constructs listed above provide the basis for moving towards an operational definition of positive youth development programmes (Catalano et al., 2004; Eccles & Gootman, 2002; Ministry of Youth Development, 2009). In the context of the present research, positive youth development programmes, such as Project K, are those that promote positive development of skills, attributes, competencies, and values, in order to assist young people in becoming healthy, caring, and responsible adults (Benson & Saito, 2000; Roth & Brooks-Gunn, 2003a).

Characteristics of effective positive youth development programmes

Roth and Brooks-Gunn (2003a) identified three necessary key characteristics that distinguished effective positive youth development programmes from other youth programmes. The three characteristics are: (a) programme components/activities; (b) programme goals; and (c) programme atmosphere.

Programme components / activities

Programme activities focus on building competence (Roth et al., 1998). Skill-building activities provide opportunity for youth to practise their skills and talents such as leadership skills, social skills, and other life skills (Ministry of Youth Development, 2009; Roth & Brooks-Gunn, 2003a; Roth et al., 1998). Activities need to provide challenges for the adolescents, but

participants need to feel supported to face new challenges (Larson, 2000; Roth et al., 1998). Another important consideration in relation to activities is to introduce youth to new experiences, people, cultures, ideas, and communities (Catalano et al., 2004; Roth & Brooks-Gunn, 2003a). Many programmes also include links to educational achievement. These links can be explicit, such as having organised homework time, or implicit, such as encouraging students to attend and remain in school. Examples of the most common activities in positive youth development programmes are mentoring and adventure education.

Programme goals

For programmes to be successful, a clear programme logic model is needed to identify goals and outcomes (Eccles & Gootman, 2002; Ministry of Youth Development, 2009; Roth & Brooks-Gunn, 2003a). Programme goals provide a clear direction for the programme through outlining expected outcomes and describing the specific change expected from those participating in the programme. Goals can be a combination of changes in the environment and in the individual e.g. increased positive connections (Catalano et al., 2004; Roth & Brooks-Gunn, 2003a), increased self-efficacy (Paxton & McAvoy, 1998), and increased well-being (Ruini et al., 2009). Goals and outcomes can generally be classified by youth development frameworks, such as Lerner et al.'s 5Cs approach (2000), and Eccles and Gootman's (2002) personal and social assets, with an overarching goal of building strengths and improving well-being.

Changes occur at different times during programmes, and it is important to have measures in place to monitor short-term and long-term change. Immediate changes can occur while the programme is operating, and include changes in the skills and attitudes that form the basis for achieving the programme's end goal (e.g. improved well-being). Intermediate outcomes are measured shortly after a programme's completion, and generally involve changes in behaviour resulting from the newly acquired knowledge and skills. Longer-term outcomes are the ultimate goals of the programmes, and relate to meaningful changes in the lives of the adolescents. Evaluating these outcomes requires ongoing follow-up studies measuring outcomes after the programme. Effective programme goals and outcomes should be flexible enough to respond to changes, should fit with the current social and political climate, and ultimately should have an important part to play in the current economy by reducing the costs of poor youth

outcomes and increasing the benefits of successful youth development (Ministry of Youth Development, 2009).

Programme atmosphere

The atmosphere created by those running the programme impacts on programme effectiveness. Roth and Brookes-Gunn (2003b), in a meta-analysis of youth development programmes, identified supportive and caring attitudes by the employees running the programme as one of the most important aspects of programme effectiveness. Roth and Brookes-Gunn (2003b) and Catalano et al. (2002) propose a definition that uses five dimensions as surrogate measures of atmosphere. These are: (a) promoting the development of supportive relationships with a youth centred focus; (b) empowering adolescents through meaningful roles and responsibilities; (c) clearly communicating expected positive behaviours; (d) providing occasions for acknowledgment; and (e) providing stable and longer duration services, with programmes lasting longer than nine months producing better outcomes (Catalano et al., 2004; Roth & Brooks-Gunn, 2003a). Although this concept appears important for effective outcomes, many of the programme evaluations they reviewed provided incomplete information relating to programme atmosphere, and therefore empirical evidence to support this remains limited. However, programme atmosphere needs to be further explored to understand its impact on programme effectiveness.

Issues with the evidence base

Almost a decade ago, Roth et al. (1998) suggested that there is a need to focus on programme evaluation. Benson and Saito (2000) noted that early successes in this field encouraged those designing the programmes, and those making the policy, to focus on strengthening youth assets. In light of this, a need has emerged for rigorous research to define and shape the approaches taken, and to improve the quality of research findings.

A recent New Zealand report released in 2011 and written by a taskforce led by Sir Peter Gluckman, the Prime Minister's Chief Science Advisor, reviewed the scientific literature on youth development, to assist in better understanding issues for New Zealand youth and how to improve outcomes. This report makes a strong case for early interventions to improve outcomes for New Zealand youth, and corroborates the need for rigorous monitoring and evaluation to

ensure interventions are effective (Office of the Prime Minister's Science Advisory Committee 2011).

Despite issues gaps in research, a number of robust evaluations have indicated that positive youth development is a viable approach to help youth thrive. Early empirical support for positive youth development programmes came from a number of large-scale research projects (Benson & Saito, 2000). One such project was the impact evaluation by Grossman and Tierney (1998) on the *Big Brothers Big Sisters* programme. This study employed an experimental design with random selection and assignment. The programme consisted of one-on-one mentoring for 10 to 16 year-olds in the community or the school environment. The study demonstrated that mentoring significantly reduced risky behaviours such as drug and alcohol use, and school violence. The study also found improvements in academic achievement, school attendance, and parental relationships (Benson & Saito, 2000; Grossman & Tierney, 1998).

Roth et al. (1998) evaluated 60 prevention and intervention programmes that incorporated positive youth development objectives. Of these programmes, only 15 met their criteria of having a positive youth development focus, an experimental or quasi-experimental design, and including youth with no current problem behaviours. From these 15 programmes, they identified three groups. These were asset-building programmes, programmes to reduce problem behaviours and increase assets, and prevention programmes. Roth et al. concluded from their review that programmes that focused on asset building demonstrated more positive outcomes than the other approaches. However, Eccles and Gootman (2002) disputed their claim, suggesting that the evidence for this conclusion was weak because of the correlational design of many of the research studies, in which cause and effect were difficult to determine. In addition, Roth et al. claim longer-term programmes were more effective than shorter-term programmes. However, this claim was poorly substantiated in their research. Finally, like Catalano et al. (2002), Roth et al. concluded that the programmes that are more effective include those that partner the adolescent with a caring adult. This claim has the strongest support. Despite these criticisms, the review conducted by Roth et al. is significant because: (a) it focused on community-based programmes rather than school based programmes, where much of the research had focused prior to this; and (b) they conducted rigorous evaluations before determining programme effectiveness. Although findings need to be interpreted with some caution, their research

provides a comprehensive evaluation of the effectiveness of community-based positive youth development programmes (Eccles & Gootman, 2002).

Building on this, Catalano et al. (2002) evaluated 77 youth development programmes. They excluded any programmes that treated clinical disorders or behavioural problems. Catalano et al. found 25 of the programmes met the three inclusion criteria of addressing positive youth development concepts, having strong evaluation designs, and producing behavioural changes. A partial explanation for the low number of programmes meeting these criteria was the high number of evaluations that did not meet experimental or quasi-experimental design criteria. This made it impossible to evaluate whether these programmes were effective. The evaluated programmes were found to improve youth outcomes through improved social skills, quality of relationships, self-control, problem-solving ability, cognitive competence, self-efficacy, and academic achievement (Catalano et al., 2002).

From this review, Catalano et al. (2002) concluded that effective programmes have a number of common themes that cover both process and outcome aspects. Process aspects include clear messages about expectations of positive behaviour, recognition of positive behaviours, good structure and consistent programme delivery, and duration of at least nine months. Outcome aspects include increased competence, improved self-efficacy, and healthy connectedness to adults and peers. Eccles and Gootman (2002) have built on this review and mapped the social and personal assets model on to Catalano et al.'s work. Eccles and Gootman found a high degree of association between the social and personal assets and the common themes identified by Catalano et al.

Regardless, a decade later the debate around evaluation research on positive youth development programmes continues, with the gap between research and practise still evident. There are a number of reasons for this. First, many programmes lack follow up studies and ways to track long-term outcomes. Second, there is often a disconnect between the measures used by programmes and the approaches or indicators of positive youth development. A move towards standardised measures will enable a more reliable comparison of outcomes across different programmes. Third, there are difficulties relating to the quality of the evaluations conducted by the programmes. This means that few programme evaluations are comprehensive enough to enable rigorous evaluation of their effectiveness. The difficulties with the evidence indicate that a gap remains between research and practise (Catalano et al., 2002; Catalano & Hawkins, 2002;

Eccles & Gootman, 2002; Hattie, Marsh, Neill, & Richards, 1997; Roth et al., 1998). A thorough programme evaluation of positive youth development programmes already operating is necessary.

In Chapters Four and Five the literature review turns to a discussion of key characteristics of the effective programmes identified in Chapter Three in the context of Project K, a positive youth development programme currently operating in New Zealand, and the focus of this research.

CHAPTER FOUR:
PROJECT K COMPONENTS

As outlined in Chapter One, Project K is a positive youth development programme designed and run in New Zealand. An essential part of programme evaluation is to identify the programme's underlying logic model and its intended outcomes, and to use robust methodologies and standardised measures to evaluate effects. A programme logic model is defined as:

> a picture of how your program works – the theory and assumptions underlying the program…This model provides a road map of your program, highlighting how it is expected to work, what activities need to come before others and how desired outcomes are achieved. (W.K. Kellogg Foundation, 1998, p. 35)

The logic model for Project K was evaluated by Deane (2012) to determine the inputs, processes, and outcomes of Project K (Deane, 2012; Deane, Harre, & Moore, 2009; Kettner, Moroney, Moroney, & Martin, 2007); extensive stakeholder input was sought. Focus groups were conducted with staff from eight Project K programmes, and this information was combined with a review of four essential programme documents, a review of six previous research projects, and an extensive literature review of positive youth development. A graphical depiction of the Project K logic model is below.

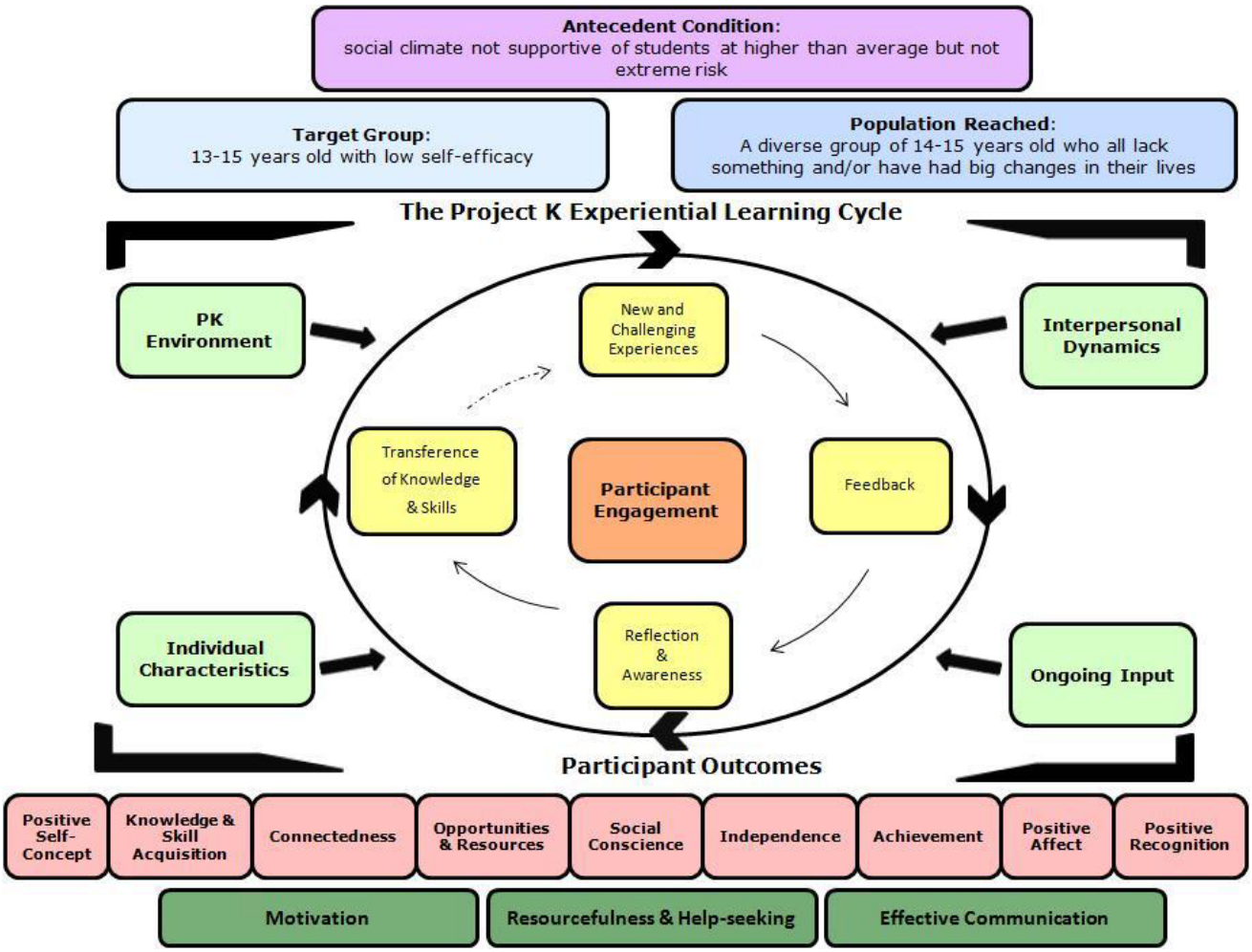

Figure 1. Project K preliminary logic model showing: antecedent condition (purple), characteristics of the target group (blue), the influencing factors (light green and orange), key programme processes (yellow), short-term outcomes (pink), and intermediate outcomes (dark green) (Deane, 2012, p. 128).

Central to achieving the intended outcomes of Project K, as identified in the yellow boxes in Figure 1, are the three programmes components: Wilderness Adventure, Community Challenge, and Mentoring. These are each discussed in turn.

Experiential learning and adventure education

The Wilderness Adventure, a form of adventure education, is informed by experiential learning theory that views learning as a process. This theory positions the learner (adolescent) as having an active and central role in their education, and this active role allows them to make connections between their actions and consequences (A. Y. Kolb & Kolb, 2008; D. A. Kolb, 1984). This approach is holistic and engaging for youth, as it encompasses emotional, physical, cognitive, and social aspects through a number of common goals and features. Common goals in

adventure education programmes include developing opportunities for belonging, competence, agency, and compassion (Carver, 1996). Common features include an outdoor or wilderness environment, a small group of participants (generally less than 16), challenging tasks, powerful interactions often focused on group problem solving, trained staff (Brendtro & Strother, 2007), and a duration of between two to four weeks (Hattie et al., 1997).

Process and components associated with change

A century ago, John Dewey (1910) suggested that challenge and adventure activities create powerful learning environments. Early understandings of the process of change in adventure education came from Walsh and Golins (1976) who put forward a model for understanding "the Outward Bound process", an internationally recognised outdoor education programme. This process of change requires seven key components: a motivated learner, a prearranged physical environment including new and challenging aspects, a prearranged social environment of between 7-15 people, key problem solving tasks, a state of adaptive dissonance that enables adaption through coping and thriving, and the development of mastery and competence leading to the transfer of new learning. McKenzie (2003), while exploring how students learned in adventure education programmes, confirmed Walsh and Golins's (1976) model and added to this by identifying essential components associated with positive programme outcomes. These included the qualities of the course activities (challenge, learning new skills, being responsible and having fun), the physical environment (a wilderness setting, unfamiliar environment), the instructors (expectations, role models, instructor feedback and competence), and the group (working together, relationships and interactions with other group members, relying and taking care of other members, trying new behaviours).

Walsh and Golins's (1976) model remains one of the most widely accepted for understanding the process of change in adventure education. The unfamiliarity of the context, combined with challenges, is central in the process of change, and can assist youth in developing self-awareness and self-concept (McKenzie, 2003; V. Walsh & Golins, 1976). This can also generate a sense of cognitive dissonance motivating youth to take action (McKenzie, 2003; Sibthorp, 2003; V. Walsh & Golins, 1976). Activities that support this, and provide youth with an opportunity to step outside of their 'comfort zone' (Martin, 2001), create an opportunity to feel a sense of achievement and mastery when difficult tasks are accomplished.

Essential to facilitate the process of change are programme instructors. Spragg (1984), and later Martin (2001), underscore the important role of feedback and review following the completion of activities, to embed new learning and to facilitate a transfer of learning to other contexts. Further support came from Dyson (1995), Hattie et al., (1997), and McKenzie (2003), who indicated that instructors' interpersonal skills, expectations, feedback, and personalities can increase learners' self-concept, motivation, and interpersonal skills. McKenzie also linked instructor role models and information provided by instructors to increases in self-awareness, confidence, motivation, interpersonal skills, and concerns for the environment. Similarly, Goldenberg, McAvoy, and Klenosky (2005) suggested that feedback and review can occur through talking in groups and through time alone writing down experiences. Giving youth time alone following activities to reflect on learning assists with integration and transfer into everyday life.

Effectiveness of adventure education

Empirical research supports the positive effects of adventure education. Hattie et al. (1997) found that outdoor education influences awareness of self and others. Neill and Richard's (1998) meta-analysis of adventure education included over 12,000 participants from 96 studies and revealed small to medium impacts on self-confidence, self-concept, and locus of control. Martin's (2001) investigation of Outward Bound programmes in New Zealand, the Czech Republic, and Australia concluded that these programmes improve self-confidence and interpersonal relationships. More recently, Sibthorp's (2003) study included transfer of learning, and demonstrated that students learnt transferable life skills from feedback from instructors and peers, and through observation of others.

Adventure education has demonstrated its ability to build Developmental Assets in youth. Paxton and McAvoy (1998), in a study of 68 participants aged 18-29 years participating in a 21 day Outward Bound course, demonstrated an increase in self-efficacy scores between pre- and post-test measures, and at a six month follow-up. In later research, Neill and Dias (2001) demonstrated that controlled exposure to challenges for 44 young adults in a 22 day Outward Bound course in New Zealand resulted in significant gains in resilience scores when compared to a control group. Similarly, Brendtro and Strother (2007) found support for the development of courage, resilience, and responsibility in adolescents who had completed adventure education

programmes. Recently, Walsh's (2009) research on an adventure education programme demonstrated significant changes in self-efficacy and hope for the future.

Service learning

The Community Challenge draws primarily from the United States literature on service learning, which combines other forms of teaching and learning with meaningful community service (Billig, 2000a). Service learning is a method of experiential learning in which youth apply what they have learnt in formal settings, such as the classroom, to real-world community settings and projects (Morgan & Streb, 2001). This type of learning focuses on critical thinking and reflection, and aims to strengthen a sense of community, personal responsibility, and civic engagement. This approach benefits community and youth through combining learning with projects that address real community and societal needs, such as volunteering for community organisations, and implementing projects to improve the environment (Billig, 2004). Although service learning lacks a strong theoretical basis, three elements have been identified by researchers: reflection, youth voice, and meaningful projects that meet community needs (Billig, 2000b; Dymond, Renzaglia, & Eul, 2008).

Service learning shares elements with outdoor adventure education programmes. Reflection, as identified in adventure education, is the process in which youth reflect on and derive meaning from their experiences. Scales, Blyth, Berkas, and Kielsmeier (2000) investigated the effects of service learning on social responsibility and academic success in Grades 6 through 8, in three middle schools, and demonstrated that service learning positively impacted on social responsibility and academic success. Additionally, students with substantial time spent in service learning and reflection, and strong motivation, demonstrated significant increases in self-efficacy. In contrast, Waldstein and Reiher (2001), in a sample of 801 American Grade 9 students, reported no difference in personal development and civic responsibility in students who did not engage in reflection, compared to students who reflected. A proposed explanation was that students who engaged in informal reflection were more likely to take ownership of their development, while enforced reflection that is overly restrictive may detract from the experience and feelings of ownership. These contrasting findings highlight that how reflection is implemented in service learning programmes can impact outcomes.

Giving students a "voice" is another important part of service learning, and refers to giving youth a sense of ownership, leadership, and influence over their communities. Morgan

and Streb (2001), using data from a pre- and post-test survey of 200 high school students, found strong support for the positive effects of service learning on efficacy and personal competence when youth were given a voice in projects. Dymond et al. (2008), in a comprehensive review of the literature, identified student voice as one of the most important elements of successful service learning programmes. The final element of service learning refers to the important link between service learning and an identified and meaningful need in the community (Billig, 2000a). This involves conducting projects that are of value to the community and which incorporate a face to face component (McBride, Pritzker, Daftary, & Tang, 2006). For service learning programmes to be successful, the programmes need to have strong relationships and connections with communities.

In New Zealand, research into service learning is difficult to locate, however, the importance of this approach to learning has been recognised. In 2010, the Ministry of Youth Development coordinated an initiative called Youth Week, through Ara Taiohi, an organisation that supports people who work with youth. Youth Week events are held nationwide, recognising and encouraging young people to make positive changes in their communities. Although the Ministry of Youth Development recognises the importance of building strengths, encouraging youth, and consulting youth in policies relating to youth development, there are very few youth development programmes in New Zealand that include service learning as a component. Before any definitive conclusions can be drawn on effects of service learning on youth outcomes in New Zealand, rigorous research investigating programme processes and elements is needed. This will also help inform the development of youth development programmes that incorporate service learning such as Project K.

Mentoring

It is widely accepted that there are youth in New Zealand who need additional support to rise above challenges; mentoring partnerships can provide this support (Farruggia, Bullen, Dunphy, Solomon, & Collins, 2010). Mentoring partnerships primarily involve matching the mentee with an experienced adult. Of particular importance is the relationship between the mentor and the mentee, which needs to be characterised by mutual respect, trust, and opportunities for growth. Support from a caring adult outside the family can assist adolescents in a number of ways. For example, mentors can help set academic goals, enhance self-efficacy, act

as a role model, provide emotional support, and provide advice and guidance on topics adolescents may be unwilling to discuss with their parents.

Effectiveness of mentoring

Mentoring is an effective component for enhancing positive development for youth, provided best practice guidelines are followed (Farruggia et al., 2010; Jekielek, Moore, Hair, & Scarupa, 2002). Mentoring programmes have demonstrated positive effects on school outcomes (Teasley, 2004), reductions in risky behaviours (Vreeman & Carroll, 2007), improved well-being, and connections to others (Jekielek et al., 2002). Child Trends (2002), in a review of ten youth mentoring programmes in the United States, found that mentored youth had fewer school absences, better attitudes towards school, fewer incidents of violence towards each other, less drug and alcohol use, increased positive attitudes toward adults and helping in general, and enhanced relationships with their parents, compared to those who did not have a mentor. King, Vidourek, Davis, and McClellan (2002) researched the Healthy Kids Mentoring Program, a mentoring programme for fourth-grade students (9-10 years) in the United States, and found significant improvements in pre-test and post-test data in mentored students' self-esteem, and positive connections to school, peers, and family.

DuBois, Holloway, Valentine, and Cooper (2002), in a meta-analysis of 55 evaluations of one-on-one mentoring programmes in the United States, found only modest support for the effects of mentoring for youth not at risk. However, the results provided strong support for mentoring with moderately at-risk youth. They identified a number of best practice guidelines, including good quality relationships between mentor and mentee, providing training and support for mentors, engaging parental help, basing programmes on theory and research, targeting high-risk students, and recruiting mentors with community commitment backgrounds. In addition, the findings demonstrated that programmes with a strong theoretical and empirical base that built strong relationships between mentors and mentees were most effective.

Partnerships that include a one-to-one approach with an adult mentor can be highly successful (De Wit et al., 2007; Herrera, Grossman, Kauh, & McMaken, 2011). DuBois et al. (2002) reported that ongoing mentor training, parental support and involvement, and frequency of contact with mentees were associated with successful programmes. Recently, DuBois, Portillo, Rhodes, Silverthorn, and Valentine's (2011) meta-analysis corroborated these findings,

and indicated that effective programmes targeted more vulnerable youth, matched mentors' educational and occupational backgrounds with programme goals, and took into account similarities between mentor and mentee interests when making matching decisions.

Effective mentoring programmes must have effective mentors, as mentoring is essentially a relationship-based intervention. Effective relationships provide role modelling, are nonjudgmental, and give positive support for successful developmental outcomes (Grossman & Rhodes, 2002). Additionally, these relationships have qualities of both parent-child and peer-peer relationships, which enable the mentee to disclose and seek advice about topics they may not feel able to discuss with either parents or peers (Beam, Chen, & Greenberger, 2002). DuBois et al. (2011) revealed a number of influencing factors on the relationship, which includes the mentees interpersonal history; for youths with histories characterised by rejection, a mentoring relationship based on trust can provide a positive experience. Youth who have higher levels of social competence are likely to find it easier to engage with mentors, and therefore benefit from mentoring programmes. The duration of the mentoring relationship plays a role, with longer duration associated with positive outcomes. In earlier research, Grossman and Rhodes (2002) also found support for the duration of the mentoring relationship, with those continuing for 12 months or greater positively associated with programme effectiveness. Additional essential considerations for creating effective mentors include the selection of potential mentors, quality training of mentors for at least six hours, matching students and mentors, and ongoing support of mentors (Farruggia et al., 2010; Rhodes, 2007). Mentors who have undergone thorough screening and initial training, and who have access to ongoing support, tend to be more effective than those who have not (Farruggia et al., 2010).

DuBois et al.'s (2002) meta-analysis investigated gender differences but did not find mentee gender to be a moderator of programme effects. Similarly, Herrera et al. (2011), in a randomised impact study of Big Brothers Big Sisters with 1,139 students between the ages of 9 to 16 years, found no significant relationship between gender and programme outcomes. However, DuBois et al.'s (2011) meta-analysis revealed that mentoring programmes with a larger proportion of males were more effective. Interestingly, research has consistently revealed that matching mentors and mentees on ethnicity was a predictor of less favourable programme outcomes (DuBois et al., 2002; DuBois et al., 2011).

Research on mentoring in New Zealand provides addtional support for its effectivness. Farruggia et al. (2010) conducted an extensive evaluation of youth mentoring in New Zealand. The results indicated that mentoring programmes that focused on psychological and interpersonal aspects were more effective compared to those focusing on behavioural, educational, cultural, and career aspects. They found that 88% of the programmes included in their review demonstrated some level of effectiveness.

Farruggia et al. (2010), in a review of literature on mentoring programmes in New Zealand, showed that there were 23 active mentoring programmes in New Zealand, and of these only 35% had conducted evaluations examining the effectiveness for mentees, with 31% of evaluations being quantitative, 31% qualitative, and 38% of a mixed-method design. Although the quality of the research was very variable, a number of characteristics of effective programmes were identified. Regional multi-site mentoring programmes tended to be more effective compared to independent programmes. More established programmes with robust evaluation processes were more effective. Generally, programmes that targeted interpersonal and psychological goals were also more successful, and programmes that incorporated mentoring as one component among several were more effective than those that solely focused on mentoring. Programmes with psychological and interpersonal goals, and that were more structured, were more effective than those that were less structured. Finally, mentoring programmes need to adopt effective practices in all three stages – programme planning, execution, and evaluation. Farrugia et al. concluded:

> Effective programmes typically: were more established; had a history of evaluation; utilised principles of best practice; had mentoring as a component of other interventions; had adult mentors; utilised one-to-one or mixed mentoring; were more structured; had greater expectations on the length of the mentor-mentee relationship; worked with low and mixed SES youth; and differentiated researchers from practitioners. (Farruggia et al., 2010, p. 6)

Project K's approach to mentoring acknowledges the importance of effectivementors in programme success. Their approach includes a robust mentor-training programme, and a thorough selection process that includes security checks. A matching day is held where mentors and mentees spend the day getting to know each other before mentees select who they believe will be a good match. Following this, mentors attend monthly training sessions for the duration

of the 12-month mentoring relationship. This focus on mentoring, by Project K, is important, as of those activities associated with positive youth development, the strongest evidence comes from mentoring (Ministry of Youth Development, 2009).

CHAPTER FIVE:
PROJECT K OUTCOMES

Key outcomes for Project K include youth succeeding in the face of challenges (resilience), feeling connected and having positive social relationships at school (connectedness to school), and having the confidence to pursue goals (self-efficacy). The overall purpose of the research was to explore whether Project K, a positive youth development programme, increased self-efficacy, resilience, and connectedness to school. Each will be discussed in turn.

Self-efficacy

Bandura (1997) defines self-efficacy as an individual's perception of their own ability to exert control over behaviour to successfully achieve tasks and goals. Empirical evidence suggests that self-efficacy touches every aspect of a person's life (Pajares, 1996), and can influence adolescents' achievement (Moore, 2005). Self-efficacy beliefs influence the level of achievement, the choices people pursue, and the extent to which they will persevere with things they are competent in, and avoid those in which they are not. Self-efficacy beliefs are extremely powerful, as beliefs about the self foster adolescents' beliefs about their outcomes, and this can become a self-fulfilling prophecy (Pajares, 1996). Self-efficacy beliefs influence motivation, regulation of thought and behaviour, coping with adversity, and vulnerability to stress and depression (Bandura, 1997). Indeed, self-efficacy has been found to have widespread effects on all areas of functioning for youth (Fraser & Galinsky, 2004).

Self-efficacy is an individual asset that influences positive development (Vecchio, Gerbino, Pastorelli, Del Bove, & Caprara, 2007). Bandura, Barbaranelli, Caprara, and Pastorelli (2001) tested self-efficacy beliefs, aspirations, and career trajectories on 272 children and found that high efficacy promotes high aspirations in both children and adults. Pajares (1996) reported that academic self-efficacy influences cognitive strategy use and self-regulation through the use of meta-cognitive strategies. In research conducted on self-efficacy and intelligence, self-efficacy was found to account for 25% of academic performance (Pajares & Urdan, 2006). In a longitudinal study of 650 adolescents, increases in academic and social self-efficacy contributed significantly in predicting well-being over a five year period (Vecchio et al., 2007). Adolescents who develop strong self-efficacy beliefs can better manage their learning and resist social

pressures to engage in risky behaviours that can undermine their academic achievements (Carroll et al., 2009), and therefore have a better chance of successfully completing their education and being prepared for a range of employment opportunities (Bandura et al., 2001).

Self-efficacy and social cognitive theory

Self-efficacy is a core component of social cognitive theory (Bandura, 1977a, 1997), which highlights the role social modelling and personal agency play in shaping human behaviour. Figure 2 demonstrates how human development and growth occur through interactions between personal factors (cognitive, affective, and behavioural), and the environment. Learning occurs through action (observation, imitation, and modelling of other people's behaviours) and feedback through rewarding, reinforcing, or negative consequences. The modelling of prosocial behaviours by competent role models, the opportunity to learn and practise new skills and receive constructive feedback in a safe environment, and opportunities to observe the outcomes of other people's behaviours are essential aspects of development identified by social cognitive theory.

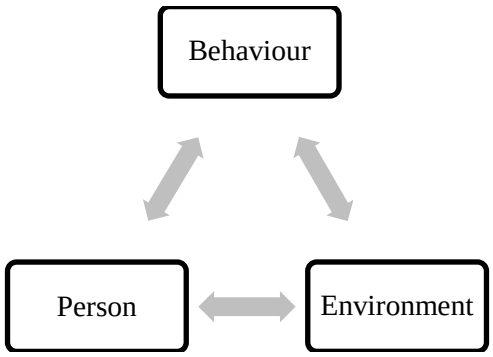

Figure 2. Adapted from Albert Bandura's (1977b) model of reciprocal interaction.

Self-efficacy beliefs are task specific and, in the context of youth development, are commonly split into three domains: academic self-efficacy, social self-efficacy, and help-seeking self-efficacy. Academic self-efficacy refers to a young person's belief in their ability to master their academic activities. Social self-efficacy refers to a young person's perception of their ability to form and maintain peer relationships and social assertiveness in the classroom. Help-seeking self-efficacy refers to the perceived ability to ask for adult help, information, and support. However, self-efficacy beliefs in one domain can influence other domains, especially when the skills to achieve tasks and goals are similar (Bandura, 1977a, 1997). Self-efficacy

beliefs have been shown to be predictive of success and persistence across a range of academic majors (Multon, Brown, & Lent, 1991).

Project K and self-efficacy

The development of self-efficacy comes from four main sources: past performance (mastery), vicarious experiences, verbal feedback and physiological cues (Bandura, 1977a; Pajares, 1996; Pajares & Urdan, 2006). In a review of two school interventions aiming to promote students' self-efficacy, Jerusalem and Hessling (2009) demonstrated that self-efficacy can be systematically increased through the use of these four sources. Positive youth development programmes that include adventure education, community connectedness, and mentoring (the core components of Project K) tap into these sources and appear well suited to developing efficacy beliefs.

Of the four sources, the strongest influence on self-efficacy beliefs is past experiences of mastery, with successful experiences increasing confidence in achieving future tasks (Bandura, 1977a; Pajares, 2002). The Wilderness Adventure component of Project K provides an opportunity for participants to experience competence and mastery when faced with challenging tasks such as abseiling and team leadership. The Mentoring Partnership involves mentors assisting mentees to develop life skills to assist mentees in setting and achieving a range goals. If adolescents believe that past performance is due to their ability and skills they have developed, then they are more likely to have confidence in their ability to succeed in the future.

Vicarious experiences, in which adolescents learn from the actions of role models similar to themselves, also influences self-efficacy beliefs (Bandura, 1977a; Pajares & Urdan, 2006). Britner and Pajares (2006) found that science self-efficacy predicted science achievement, with strong correlations between vicarious experiences and self-efficacy. Additionally, the Wilderness Adventure component provides participants with an opportunity to observe their peers performing challenging tasks and seeing peers achieve, and this is a likely influencer on efficacy beliefs.

Verbal feedback, or telling an adolescent that ‘you can do this’, plays a lesser role in influencing self-efficacy beliefs (Bandura, 1977a). Positive feedback can strengthen self-efficacy beliefs, however it is important that the person providing feedback is credible, and the feedback is believable (Bandura, 1977b, 1997). Project K staff place a strong emphasis on positive

encouragement and all programme components provide opportunities for participants to receive positive encouragement from others, which provides opportunities to influence self-efficacy.

The final and least influential source of self-efficacy beliefs comes from physiological cues (Bandura, 1977a). When faced with challenging situations adolescents are likely to experience emotional arousal and may interpret these signs as anxiety and an indication that they are unable to achieve the task. Mastery of tasks that have previously caused anxiety leads to higher self-efficacy beliefs. Although not a central focus for Project K the opportunity for participants to practise and master tasks despite anxiety can be a further source of self-efficacy beliefs.

Bandura (1977b) argued that self-efficacy beliefs are central in influencing behaviour because we need to believe that we are capable to successfully achieve goals. With this belief, individuals are more likely to set challenging goals and persevere when encountering obstacles. Project K appears well placed to contribute to all four sources of self-efficacy beliefs and to influence self-efficacy levels. The first study hypothesis is therefore proposed as follows:

Hypothesis 1: As students progress through Project K, their overall level of self-efficacy will increase at a faster rate when compared to students in the comparison group.

Gender differences in self-efficacy

Gender differences in self-efficacy have been noted in a number of studies. During adolescence, self-efficacy generally decreases across all domains, however a number of studies report the decrease is overall less for girls when compared to boys (Britner & Pajares, 2006; Vecchio et al., 2007). In a longitudinal study of 650 adolescents, investigating the link between increases in academic and social self-efficacy and well-being, self-efficacy contributed significantly in predicting well-being over a five year period (Vecchio et al., 2007). Further, girls reported higher academic and regulatory self-efficacy beliefs than boys; no differences were noted in social self-efficacy (Vecchio et al., 2007). In a study of American college students, Betz and Hackett (1981) reported that females had higher efficacy for traditional female occupational roles and were less efficacious in roles traditionally dominated by males. Bandura (2001) confirmed this gender difference in self-efficacy.

Prior research on Project K participants has found support for gender differences in self-efficacy. Moore (2005) tested the reliability and validity of the PKSEQ with 456 students from

Years 9, 10, and 11 from one New Zealand secondary school. Boys reported lower levels of social self-efficacy and academic self-efficacy when compared with girls. The reported levels of help seeking self-efficacy of boys and girls did not differ from each other. Deane (2012) found that females had higher levels of academic self-efficacy pre-programme and at one year follow up. The present research will examine rates of change over time in self-efficacy for male and female participants.

Hypothesis 2: Gender will moderate the rates of change for self-efficacy such that rates of change will be higher for females than for males.

Resilience

Most of us face challenges from time to time but each person has the ability to 'bounce back' and continue to thrive. This is resilience. Early research on resilience focused on at-risk children (Werner, 1971) in an attempt to explain why some children thrive when faced with significant adversity (Greenberg, 2006). Werner demonstrated that one-third of these children did not develop unhelpful behaviours, despite significant life stressors, and were able to demonstrate competence and confidence in their lives.

Commonly used terms associated with resilience include psychological resilience, positive adaptation, and emotional resilience. As the concept of resilience gained popularity with the rise of positive psychology, this concept transferred to other settings such as the workplace, sports, and the military. This saw the emergence of terms such as cognitive hardiness, resourcefulness, and mental toughness (Luthans, Youssef, & Avolio, 2007). Despite the wide range of related constructs, there is general agreement across cultures and contexts that resilience includes two central components: (a) exposure to stress or risk; and (b) the demonstration of competence or positive adaptation (Garmezy, 1991; Gordon Rouse, Ingersoll, & Orr, 1998; Masten et al., 1990; Rew & Horner, 2003; Rutter, 1990; Werner & Smith, 1992). Therefore, resilience is defined as the ability to successfully adapt (bounce back) when faced with challenges (Ahern, 2006; Fraser & Galinsky, 2004; Greenberg, 2006).

Research on resilience has demonstrated that challenging life events (risk factors) are not predictive of negative future outcomes (Garmezy, 1991; Masten, 2001; Masten et al., 1990; Masten & Motti-Stefanidi, 2008; Resnick et al., 1997; Rutter, 1990; Werner, 1971, 1982; Werner & Smith, 1992). It is well documented that resilience provides an adaptive way to engage with challenges through enhancing strengths (protective factors and Developmental Assets) and

talents, thereby helping youth adapt to stressful and risky situations (Fraser & Galinsky, 2004). Interventions that build resilience are important, as resilience improves the proximal outcomes for youth, which can influence the distal outcomes (Boutelle, Eisenberg, Gregory, & Neumark-Sztainer, 2009; Nettles, Mucherah, & Jones, 2000; Ong, Bergeman, & Boker, 2009; Resnick, 2000; Resnick et al., 1997). Resilient adolescents are more likely to successfully transition through developmental tasks such as adjustment at school, academic achievement, involvement in extracurricular activities, developing close friendships, and formation of a sense of self (Resnick, 2000). Conversely, low levels of resilience correlate with numerous negative outcomes. Ahern, Kiehl, Sole, and Byers (2006) demonstrated that when protective resilience is low this correlates with low self-efficacy, low self-esteem, increased risk of mental illness, lower levels of connectedness (social support/relatedness), lower levels of persistence, poorer adaption, and less effective coping. Resilience acts as a cumulative protective factor that works in opposition to cumulative risk factors (Garmezy, 1991; Masten, 2001).

Research on building resilience has focused on the identification of factors that allow some adolescents to meet developmental milestones while others are negatively affected by exposure to risk (Rutter, 2000). The particular factors associated with resilience in adolescence have been grouped into individual, social, and environmental factors. Individual factors include traits such as self-efficacy, self-worth, competence, problem solving skills, optimism, and positive expectations. Social factors include positive family support, prosocial role models, connections to extended family, good schools, and prosocial connections to community and organisations e.g. churches. Environmental factors include caring families, quality parenting, and good relationships with parents. The factors have been loosely divided into two groups. Those that are “fixed” and difficult to alter, such as temperament, and those can be changed through intervention e.g. self-efficacy (Battistich et al., 2004; Bond et al., 2007; Boutelle et al., 2009).

Specific strategies to build resilience vary depending on developmental needs. There is agreement on a small number of effective strategies during adolescence (Ahern et al., 2006; The Bridge Child Care Development, 2007). These include at least one prosocial supportive relationship with an adult and a committed mentor or other person outside of the family, along with strong social support networks, positive school experiences and connections, and participation in a range of extra-curricular activities. Additionally, developing a sense of competence and mastery, having opportunity to help others, exposure to challenges that provide

opportunities to develop positive coping and problem solving skills, and the development of self-reflection skills are important for building resilience (Catalano et al., 2004; Resnick et al., 1997). Activities such as adventure education and mentoring tap into strategies that build resilience. There are clear links between the outcomes of positive youth development programmes (e.g. Learner's (2000) 5Cs framework) and resilience. In light of these links, there is strong interest from positive youth development programmes in building and measuring resilience (Buckle, Marsh, & Smale, 2001).

Resilience and Project K

According to the programme logic model, Project K's design achieves a number of outcomes including motivation to succeed when faced with challenges (resilience). In addition, one of the key outcomes of Project K, self-efficacy, has been identified as one of the most important individual factors in resilient youth (Turner, Norman, & Zunz, 1995). Core components of Project K include adventure education and mentoring that focus on developing goal setting, effective problem solving, effective communication, and social skills, which are important strategies for building resilience (Masten et al., 1990; Werner, 1982). During the Wilderness Adventure component, participants are encouraged to face challenging situations and reflect on their experiences. This component provides opportunity for participants to experience a sense of mastery and achievement in a positive and supportive environment. This sense of achievement further contributes to building a positive belief in one's ability to successfully negotiate challenges, a belief that is important for resilience when facing future challenges. The Community Challenge component nurtures resilience by giving participants an opportunity to find a sense of purpose by connecting with their communities through volunteer projects with community partners. Involvement in Project K also widens social support networks by introducing participants to others in the school and wider community. It is clear that Project K has a role to play in building resilience.

Hypothesis 3: As students progress through Project K, average resilience scores will increase at a faster rate when compared to students in the comparison group.

Gender differences in resilience

Research has documented a relationship between gender and resilience. Hunter and Chandler (1999), in a pilot study with a sample of 51 10th and 11th grade students from a high school in New England, found girls perceived themselves as less resilient than boys. Werner and Smith (1992) found that girls demonstrated lower resilience in the second decade of life when compared to boys, and Turner et al. (1995) provided further support for these gender differences during adolescence. However some studies report no differences (Hunter & Chandler, 1999). An extensive New Zealand report titled *Improving the transition: Reducing social and psychological morbidity during adolescence* commissioned by the Prime Minister's office in 2011 reported no New Zealand research existed on building resilience (Office of the Prime Minister's Science Advisory Committee, 2011). It is hoped that including gender might assist in clarifying the relationship between gender and resilience in a New Zealand context.

Hypothesis 4: Gender will moderate the rates of change for resilience such that rates of change will be less for females than for males.

Connectedness

Two major reports on adolescent development in the United States have emphasised the importance of connectedness to community and school. A report by Halperin (1998) released by the William T. Grant Foundation (1988) titled *The Forgotten Half: Pathways to Success for America's Youth and Young Families,* highlighted the importance of connectedness experiences between families, schools, and communities (Eccles & Gootman, 2002; Halperin, 1998). A later report titled *A Matter of Time: Risk and Opportunity in the Non School Hours* by the Carnegie Council on Adolescent Development (1992) emphasised the role of interrelatedness to people and communities. These two reports provided empirical support for the important role of connectedness during adolescence (Eccles & Gootman, 2002), and connectedness is receiving increased attention in the youth development literature.

Definition of connectedness

Broadly, connectedness includes attachment, belonging, relatedness, and social support. This has created difficulties with the definition, as each term carries slightly different meanings. Townsend and McWhirter (2005) reviewed 288 documents on connectedness and concluded that the simplest definition is "when a person is actively involved with another person, object, group,

or environment, and that involvement promotes a sense of comfort, well-being, and anxiety reduction" (p. 193). The connectedness concept reflects behaviours and attitudes that can change and so it is amenable to interventions such positive youth development. Connectedness, like self-efficacy, draws from social cognitive theory, which posits that learning occurs through an interaction between environment, behaviour, and personal factors (Bandura, 1977a). Based on this theoretical framework, connectedness develops through a process of observational learning where youth have the opportunity to interact and observe behaviours and consequences of actions with others in their environments such as peers, teachers, and parents.

Research into connectedness has studied a number of common domains, such as connectedness to community, to parents, to non-parent adults (e.g. teachers), to other social groups, and religious or spiritual connectedness.

Family connectedness refers to closeness and feelings of belonging to the family group. Although adolescence is a period in which individuals are defining their own identity, they still want strong and trusting relationships with family. Parent-child and family connectedness have been defined in a variety of ways, such as self-reported quality of attachment, bonding (children sharing their feelings with their parents), warmth, caring, cohesion (spending family time together), monitoring (parents knowing where the child is), control (setting boundaries), and autonomy (encouraging adolescents to make decisions). Strong parental bonding helps protect youth from engaging in numerous health risk behaviours. Poor levels of family connectedness have been found to be associated with poorer mental health (Carter, McGee, Taylor, & Williams, 2007), while higher levels of parent-child connectedness predicted increased self-esteem and decreased depressive symptoms in males and females, and increased body satisfaction in females over a 5-year period (Boutelle et al., 2009). In survey of 204 secondary school students, McGraw, Moore, Fuller, and Bates (2008) found higher negative affect was associated with lower levels of family, peer, and school connectedness.

Connections to adults other than parents are also important. Much of the empirical research can be found in the literature on mentoring youth (Farruggia et al., 2010; Jekielek et al., 2002). Some of the literature on mentors examines 'natural mentors' who are part of the adolescents' natural environment and may include, for example, teachers, grandparents, aunts, and cousins. There is also literature on formal mentoring programmes in which mentors are volunteers who choose to provide a prosocial model for young people. Evidence suggests that a

relationship with at least one prosocial adult has a strong positive effect on adolescent development, and that connectedness is a protective factor across gender, culture, and socio-economic groups (Resnick, 2000).

The research on connectedness to peers and friends has some contradictory findings, with some researchers finding increased peer connectedness has positive outcomes, while others do not (McGraw et al., 2008; Resnick, 2000). McGraw et al., in a study investigating the relationship between school, peer, and family connectedness and emotional well-being in Year 12 Australian students (492 male, 449 female) from 10 secondary schools in Victoria, found that higher negative effect was associated with lower levels of peer, family, and school connectedness. In contrast, Carter et al. (2007) conducted a survey with a random sample of 652 Year 11 students aged 16 years from all Dunedin secondary schools, and found that connectedness to friends was associated with increased reports of health-compromising behaviours. The researchers suggested that increases in peer pressure as adolescents transition into secondary school can lead to greater risk-taking behaviours (Carter et al., 2007). There is some consensus in the research that there is a positive relationship between the broader category connectedness to peers and prosocial behaviours, while there is less clarity in the relationship between the narrower category of connectedness to friends and prosocial behaviours.

There is growing interest in religious and spiritual connectedness, especially in the United States, although at present there is little research information about this form of connectedness (Benson, Roehlkepartain, & Rude, 2003). However, research on the role that this type of connection plays in the life of adolescents has grown significantly in recent years, (Benson et al., 2003). Spiritual and religious connections are hypothesised to be important during adolescence, as this is a time when youth are seeking belongingness. The primary limitation with the research on religious and spiritual connectedness is the use of single item measures, although religion and spirituality are conceptualised as multidimensional constructs (Hill & Pargament, 2008). For this form of connectedness to provide reliable and valid research, better measures are needed. This will allow researchers and practitioners to have a better understanding of the relationship between spirituality and religious connectedness and adolescent well-being.

Community connectedness (e.g. connectedness to school), refers to adolescents' emotional connections to the community that they live in. Several terms refer to community connectedness, such as collective efficacy, social cohesion, social capital, and community

attachment. Community connectedness is measured as the perception by adolescents that there is a caring adult in the community. Measures of community connectedness focus on collective action, for example how much people work together, and most measures are informed by the social capital construct, of which community identity and efficacy form a large part (Barber & Schluterman, 2008). Adolescents who report strong community connectedness also report lower levels of risk-taking behaviour and higher levels of prosocial behaviours (Whitlock, 2007). More specifically, connectedness to school has emerged as a key area of focus for building protective factors for education achievement and reductions in risky behaviours (Bond et al., 2007).

Connectedness to school and Project K

Given the evidence that connectedness to school is important for positive youth outcomes, there is considerable interest in ways in which it can be developed. Research focusing on connectedness to school emphasises a number of factors: creating a caring environment through a focus on well-being and health, good quality relationships between teachers, students, and peers through action and engagement, and providing access to opportunities outside of school (Blum, 2005; Bond et al., 2007). Project K requires engagement and commitment from teachers and other staff. The school serves as the central meeting place and teachers provide additional academic support to ensure participants do not fall behind in their schoolwork. This conveys a message to participants that teachers are committed to and care about their learning and development.

Hypothesis 5: As students progress through Project K, the average connectedness to school scores will increase at a faster rate when compared to students in the comparison group.

Gender differences in connectedness

There is contradictory evidence on the relationship between connectedness and gender. Dwairy and Achoui (2009), in a cross-sectional survey of 2,884 adolescents from Arab countries, India, France, Poland, and Argentina, found differences in levels of connectedness in gender, socio-economic status, and education. Connectedness in Eastern countries was higher than that in Western ones. Higher levels of connectedness were identified in females, higher socio-economic status groups, and where parents had more education. McGraw et al.'s (2008) findings indicated that females were more likely to report higher levels of peer connectedness. Students reporting

higher peer connectedness were more likely to feel connected to their school as experiences at school are closely tied to experiences with school friends. However, Karcher and Sass (2008) found no differences in connectedness across gender and ethnicity in a sample of 3,927 predominantly Midwestern African-American, Caucasian, and Latino adolescents in the United States. A reason for the disparity in findings relating to ethnicity may be the difference in cultural diversity between the two studies. In contrast, Bonney et al. (2000), in a survey of students from 7th to 12th grades of 8 public schools, reported that males felt more connected to their school than females. Overall, the research suggests that connectedness affects adolescents' well-being but the relationship between gender and connectedness has yet to be clarified (McGraw et al., 2008). Connectedness to school was included in the present study as prior research on Project K suggests that at the end of the programme females report higher levels of social self-efficacy, a construct related to peer connectedness, which may influence school connectedness.

Hypothesis 6: Gender will moderate the rates of change for connectedness to school, such that rates of change will be faster for females than for males.

In summary, resilience is the ability to overcome obstacles or bounce back from challenges. Resilience research has demonstrated a strong link between higher levels of resilience and positive outcomes throughout life. As resilience influences how a young person responds to the challenges that arise both in the short term and in the future, it is clearly linked to positive outcomes across the lifespan; hence resilience is an important measurable outcome for Project K and other Positive Youth Development programmes. Research indicates that resilience levels can be increased through systematically increasing strengths in young people, thereby giving them greater resources to draw upon when facing difficulties. In the current research two strengths namely self-efficacy and connectedness, were selected as outcome measures. Self-efficacy is a young person's belief that they are able to perform tasks and manage situations. When facing challenges, a young person who is able to retain a belief that they can exert control over tasks and situations is more likely to persevere in their effort. It is this belief in their ability to persevere in the face of challenges, which provides the important link to resilience. Connectedness to school relates to a young person's perception that there is a trusted and caring adult in their school community. In New Zealand most youth spend a significant amount of time at school. Interestingly, young people who feel connected to school through having supportive

teachers with clear expectations and standards, tend to be more engaged and more likely to perceive themselves as competent at school. Figure 3 provides a simple diagram of the three outcome measures in the current study. It illustrates how these three variables work together to positively influence outcomes for youth.

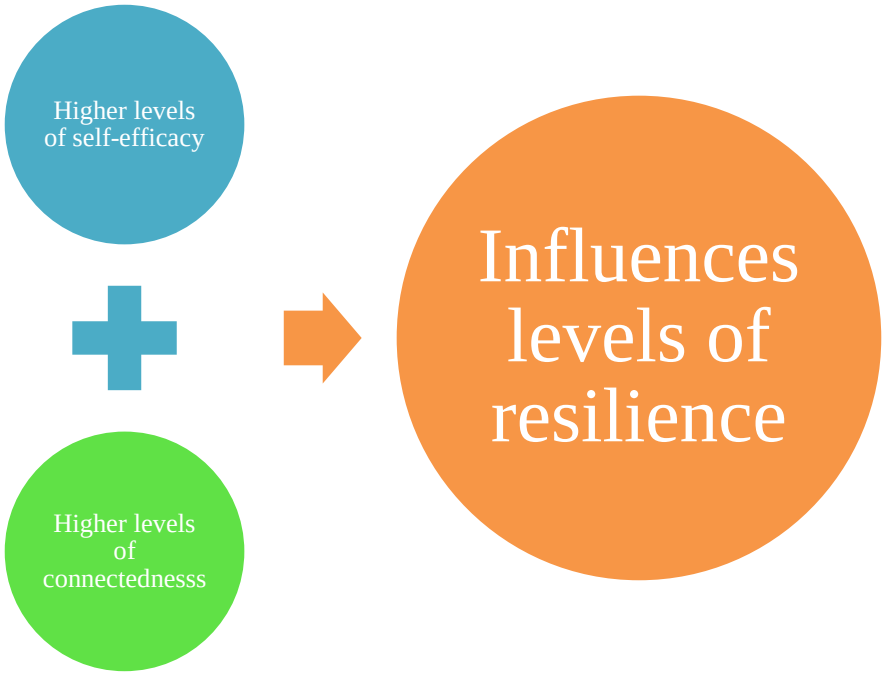

Figure 3. A simple diagram of the three outcome measures in the current study.

CHAPTER SIX:
METHOD

This research aimed to examine whether participation in Project K was related to increased self-efficacy, connectedness to school, and resilience (Appendix A). Ethical approval was gained on 25 June 2010 from the Massey University Human Ethics Committee: Northern for the Project K group (MUHECN 10/045), and on 6 September 2010 for the comparison group (MUHECN 10/064) (Appendix B and Appendix C).

Participants

Project K (intervention) group

Participants in the Project K group were recruited between July and September 2010 from two co-educational schools and two single sex State Boys' schools located in the North Island of New Zealand. The average decile rating of the four schools was 6.2. A self-efficacy questionnaire was administered to all Year 10 students. Three scores were calculated for each student: an academic, social, and help-seeking self-efficacy score. Two teachers completed two screening reports per student. This created nine ratings per student (three self-efficacy scores and six ratings from two teachers). A ranked list of students in descending order with low self-efficacy scores at the top of the list was formed using the total score, with students at the top of the list having the highest priority for participation in Project K. If a student met one or more exclusion criteria (delinquent behaviour, suicidal ideation, self-harm, eating disorders), as agreed by at least two Project K team members, the student was likely to be excluded, as Project K does not target very high-risk youth.

Each Project K cohort was from a different school. Once 10-12 students had been selected using the approach described above, students and their families were invited to a Project K introduction meeting. This meeting provided an overview of the programme, and students and parents who wanted to participate in Project K provided written consent. No information was available on students who were excluded from the Project K cohorts or who chose not to participate.

In the current study, the introduction meetings served an additional purpose, as participant recruitment for the current study occurred at the introduction meetings for four

Project K cohorts. These dates were chosen as the most suitable period of time to begin data collection for the longitudinal study, in order to enable completion within the timeframe specified for doctoral research. All students in these Project K cohorts were invited to participate in this study, and all consented to be part of this research. One month after Project K began two students withdrew (after completing two measures) from the programme, and Project K replaced these students with two new students who also consented to participate in this research. The data collected from the students who withdrew were included in the final data set. Three other participants withdrew at different points, which were three months, six months, and twelve months into the programme, and were not replaced by other students due to the length of time since the programme had begun. Two of these students gave no reason for withdrawing from Project K, and one student withdrew because they changed schools and their new school did not have a Project K programme. Their data were included in the final data set for analysis and all of these students completed more than three measurement points.

The sample size at the start of the study for the Project K group was $n = 47$. The final sample size for the Project K group was $n = 49$. This was made up from 47 students who were approached at the start of the study and two students who were selected into the programme one month after it began. Of these students 63% ($n = 31$) were male and 37% ($n = 18$) were female. Students were 13 or 14 years at the start of the study and 15 or 16 years at the completion of the study. Table 1 provides information on the ethnicity of participants.

Table 1 *Ethnicity of the Project K group participants (n = 49) and the comparison group participants (n = 31)*

Ethnicity	**Project K group %**	**Comparison group %**
New Zealand European / Pakeha	65	74
New Zealand Māori	25	26
Samoan	12	0
Other European	12	0
Cook Island Māori	8	10
Niuean	6	0
Other	6	7
Fijian	4	0
Other Pacific Islands	4	3
Tongan	2	0
South East Asian	2	3
Indian	2	0
Chinese	2	0
Other Asian	0	7

Note: Total percentage does not equal 100 as some participants identified with more than one ethnicity.

Comparison group

This study used a non-equivalent comparison group design, where a group similar to the Project K group served as a comparison group. Although random allocation of participants to each group would have been preferable because it helps to control for factors other than the intervention that may explain differences between groups, non-random allocation was necessary in the current research, as randomisation was not feasible or ethical. The comparison group was selected based on similarity to the Project K group in participant age, school decile, and participant availability during the timeframe of the study. However, differences between groups existed for instance, self-efficacy initial status scores (pre-test) were not used to select comparison group students and comparison group participants were in Year 9 while Project K participants were in Year 10. These differences can pose threats to internal validity and interpretation of results; this limitation is discussed in Chapter Eight.

Participants in the comparison group were recruited in September 2010 from a co-educational state decile 4 high school located in the North Island of New Zealand. The timeframe was important as data collection continued over 14 months and, if started too late, could affect

the completion of this study within the allocated period. Participant recruitment was from two year 9 classes, with students aged 13 years at the start of the study and 15 years at the end. In total, 55 students were approached and 31 (56%) consented to take part in the current research. Self-efficacy scores were not used to include or exclude students. The final sample for the comparison group (n = 31) consisted of 52% (n = 16) male and 48% (n = 15) female participants. Fisher's exact test indicated that the groups did not differ on gender (p = .355) or on the proportion of participants who self-identified as Māori (p = 1.000).

Procedure

Project K

An information pack was sent out to all students in the selected cohorts for Project K, explaining the programme. The information pack included an invitation to attend a meeting run by Project K called "Caregivers Presentation to Consent Meeting" (induction meeting). Parents were requested to bring the information packs to the induction meeting. The packs also included information sheets and consent forms for this study (Appendix F). The researcher (Kirsty Furness) attended all of the initial induction meetings and presented a brief synopsis of the research including how the data would be used. Potential participants and parents who completed the written consent form then completed a survey at the end of the Induction Meeting. Survey One related to self-efficacy, resilience, and connectedness. Survey One was completed at a total of six time points time points during the 14-month programme. Time 1 of the data collection was prior to starting the first core component of Project K (Appendix H).

Comparison group

The comparison group school was invited to participate through a letter to the Principal (Appendix E). Comparison group students were invited to participate through the designated teacher contact at their secondary school. Information packs containing information sheets and consent forms were given to students who took the information packs home to their parents (Appendix G). Once participants and parents received the information pack they had two weeks to decide if they would like to participate. To participate in the study, informed consent was required from students and parents. Those who consented to take part completed the consent forms and returned them to a designated teacher at their school in envelopes provided by the

researcher. Those who provided written consent to the designated teacher at the school within the two weeks then completed Survey One during school time. This survey was identical to those completed by the Project K group. Survey One was completed at four time points during the programme. Data collection for the comparison group and the Project K group occurred in the same year but not on the same time schedule. Table 2 presents the data collection time points for each group.

The rationale for the different number of data collection time points (6 time points in the Project K group; 4 time points in the Comparison group) was that greater change was expected in the Project K group. When using multi-level modelling (MLM), an increased number of time points allows greater precision in the estimation of within-individual change parameters and improves the reliability of the growth parameters by reducing standard errors (Singer & Willett, 2003).

Table 2 *Data collection time points and surveys by group*

Data collections time points	Groups	Measures
Time 1	Project K and comparison group	Survey One
Time 2 Occurred around one month after time 1	Project K and comparison group	Survey One
Time 3 Occurred around two months after time 1	Project K and comparison group	Survey One
Time 4 Occurred around eight months after time 1	Project K group	Survey One
Time 5 Occurred around eleven months after time 1	Project K group	Survey One
Time 6 Occurred around fourteen months after time 1	Project K and comparison group	Survey One

Study measures

Self-efficacy

Self-efficacy was measured by the Project K Self-efficacy Questionnaire (PKSEQ), a 20-item self-report scale specifically designed by Project K, which has not yet been reported in the peer reviewed literature. Scores range from 20 to 120. The questionnaire is intended to measure overall self-efficacy, comprised of three domains. Academic self-efficacy covers participants' self-perceived ability to master academic activities, and included questions such as "How well can you pay attention during class?" (8 items). Social self-efficacy assesses participants' self-perceived ability to form and maintain peer relationships and social assertiveness in the classroom, and included questions such as "How well can you become friends with other people?" (8 items). Finally, help seeking self-efficacy covered participants' self-perceived ability to ask for adult help, information, and support, and included questions such as "How well

can you get school staff to help you, when you have a problem at school?" (4 items). The PKSEQ is scored on a six point scale with 1 = "not well at all" and 6 = "quite well". Moore (2005) reported a three factor structure with a Cronbach's Alpha of .92 for the overall self-efficacy score, .88 for the academic subscale, .85 for the social subscale, and .82 for the help-seeking self-efficacy.

Factor analysis using principal components analysis with direct oblimin rotation found a single-factor structure, explaining 42% of variance. There was no difference between groups in Cronbach's Alpha for the overall scale at Time 1 (α = .92). Table 3 summarises the results of the reliability analysis for each time point; all coefficients were above .85.

Table 3 *PKSEQ reliability, means, and standard deviations for all participants at each time point*

Time	***N***	**α**	***M***	***SD***
1	80	.93	77.84	15.78
2	80	.90	78.36	13.36
3	80	.86	79.79	10.37
4	49	.87	82.43	10.86
5	49	.94	82.74	12.60
6	80	.94	85.30	14.17

Resilience

Resilience was measured by the Resilience Scale, a 25-item scale, which was developed by Wagnild and Young (1993). The scale uses a 7 point Likert response scale from 1 = disagree to 7 = agree. Scores range from 25 to 175. All of the questions were positively worded, for example "I usually manage one way or another" and "When I am in a difficult situation I usually find my way out of it". The higher the overall score, the higher the resilience. The scale has been extensively used and has good psychometric properties (Wagnild, 2009, 2011). Analysis of the Resilience Scale found a one-factor structure, which explained 35% of the variance. Cronbach's Alpha for the Resilience Scale across all time points ranged from .86 to .96 (Table 4).

Table 4 *Resilience Scale reliability, means, and standard deviations for all participants at each time point*

Time	***N***	**α**	***M***	***SD***
1	80	.92	123.65	20.92
2	80	.91	127.41	18.10
3	80	.94	126.51	18.00
4	49	.90	129.33	14.75
5	49	.96	121.79	22.95
6	80	.94	130.74	21.41

Connectedness.

Connectedness was measured by the Hemingway Adolescent Connectedness Scale (HACS), a 57-item self-report scale. The current study focused on the connectedness to school subscale, a 6-item subscale with scores ranging between 6 and 36, because of the link between increased school connectedness and improved academic achievement (Roth et al., 1998) and because this subscale has the strongest empirical support (Anderman, 2002; Bonny et al., 2000; Bowman & Myrick, 1987; Faulkner, Adlaf, Irving, Allison, & Dwyer, 2009; Goodenow & Grady, 1993; Karcher, 2009). Scores ranged from 6 to 36. The subscale asks youth how hard they work ("I work hard at school"), their enjoyment of school ("I enjoy being at school"), and their perception of success at school ("I do well in school"). Difficulties were noted at time four, for which the connectedness to schools subscale had a Cronbach's Alpha of .56. Further analysis revealed that if item 26, a reverse coded item was deleted, internal consistency would increase at all the time points. As recommended by Field (2009) and Karcher and Sass (2008) who observed similar difficulties with item 26, this item was deleted resulting in a significantly improved alpha (Table 5).

Table 5 *HACS connectedness to school reliability analysis for all participants at each time point with missing data imputed and item 26 deleted*

Time	***N***	**α with item 26**	**α without item 26**	***M***	***SD***
1	80	.80	.83	16.95	3.94
2	80	.80	.81	17.18	3.63
3	80	.84	.84	18.21	3.31
4	49	.56	.79	18.84	3.41
5	49	.76	.79	18.55	3.11
6	80	.78	.81	19.61	3.35

Note: The current study used the expectation-maximisation method for imputing missing data. This is discussed in the data analysis section.

Data management

Assumption checks

Three recommended assumptions to check are normality, homogeneity of variance, and linearity (Field, 2009). In addition, Singer and Willett (2003) suggest that the primary assumption to check for multilevel modelling is whether residual plots are normally distributed, and this is done via visual inspection. Pallant's (2011) guidelines for producing the residual plots for visual inspection were followed. The Normal Probability Plots (P-P plots) were inspected to see if they followed a roughly diagonal straight line, which indicates a normal distribution. Scatterplots were checked for normality according to guidelines recommended by Tabachnick and Fidell (2007), who suggest that standardised residuals should be randomly scattered around the centre with no obvious skewing at the top and bottom. Scatterplots were also visually inspected to check whether the residuals were roughly rectangular to determine whether the relationship was linear. Finally, scatterplots were inspected to check whether the residuals were roughly scattered at equal widths across the graph to check the assumption of homoscedasticity. The graphs are presented in Appendix M.

Visual inspection of the P-P plots for self-efficacy, resilience, and connectedness to school demonstrated that the standardised residuals followed a linear diagonal line, indicating a normal distribution. Inspection of the standardised residuals of these variables showed random scattering with no significant skewing to the bottom, providing evidence of normality. All scatterplots were roughly rectangular in shape and in the centre of the scatterplot, indicating no

major violations of linearity. Finally, the spread of the residuals appeared randomly scattered in horizontal lines roughly equal widths apart, which provides support for homoscedasticity.

No obvious violations to the assumptions of linearity, normality, and homoscedasticity were observed for self-efficacy, resilience, and connectedness to school.

Data shape

Within Multilevel Modelling (MLM), determining the change trajectory from the shape of the data is important in order to make a decision about whether change needs to be modelled as linear or non-linear. When there are around three time points of data collection (only four time points in the comparison group) it is simpler to use a common shape across individuals, and to model change as linear, as this makes interpretation of the findings clearer and reduces the risk of over fitting (Singer & Willett, 2003). Based on Singer and Willett's recommendations, visual inspection of the empirical growth plots indicated a linear relationship.

Coding time

For longitudinal research, accurate measurement of time is essential (Singer & Willett, 2003). In considering how to code time, a sensible measure for time is needed that reflects the different spacing between data collection time points. In the present study, time was coded as the number of days since the programme began to reflect the unequal spacing of the measurement points. The first data collection point was coded as 0, so that a person's data collection schedule reflected their own participation points. The *time coded in days* variable was the number of days elapsed since the start, for each point at which data were collected for each individual.

Table 6 *Example of the coding strategy for time in the current study for the Project K group*

Data collection time point	**Time in days**
1	0
2	30
3	95
4	195
5	290
6	380

Note: The time in days column is an example only as each group had slightly different data collection schedules.

Time variant or time –invariant variables

A key step in MLM is to decide whether to model variables as *time-variant* or *time-invariant*. Time-variant variables remain constant over time. Self-efficacy, resilience, and connectedness to school are continuous data that is time-variant, and were therefore modelled as a random effect. Time-invariant variables remain constant over time and are modelled as fixed effects, for example gender and participant group are categorical data that remain constant over time (see Singer & Willett (2003), p. 147 for a more detailed explanation).

Centering

A final consideration was the centering of the time and predictor variables. Centering is simply the linear transformation of a variable by subtracting one variable from another (Enders & Tofighi, 2007). Centering time on the first time point of data collection is the simplest approach, provided this is meaningful. In the case of research into programme outcomes, '0' represents the start point of the programme, so centering around this value was appropriate (Singer & Willett, 2003). Centering is not recommended for categorical data and the two predictor variables in the current study were classified as categorical data (Garson, 2012).

Data analysis

Data was analysed using the IBM Statistical Package for Social Science (SPSS) for Windows, Version 19.0. Parallel analysis was carried using the Parallel Analysis Engine developed by Patil, Singh, Mishra, and Donovan (2008).

Missing data

Two key considerations when dealing with missing data are the amount and type of missing data. Table 7 below shows the percentage of participants who completed the surveys at each time point.

Table 7 *Number and percentage of surveys completed at each measurement point*

	Project K group *n* (%)	**Comparison group *n* (%)**
Time 1	48 (98%)	31 (100%)
Time 2	45 (91.8%)	29 (93.5%)
Time 3	43 (87.8%)	22 (71%)
Time 4	40 (81.6%)	Not collected
Time 5	38 (77.6%)	Not collected
Time 6	43 (87.8%)	30 (96.8%)

Analysis of missing data showed a larger percentage of missing data from *time point nonresponse* (participants not being present at a time point of data collection) than *item nonresponse* (partial data missing) (Schafer & Graham, 2002). Little and Rubin (1987) have written extensively on statistical analysis with missing data, and classify missing data as "missing completely at random" (MCAR), "missing at random" (MAR), or "not missing at random" (NMAR). This classification system can be further simplified to *ignorable* (MCAR and MAR) and *non-ignorable* (NMAR) missing. For ignorable missing data, the reason the data are missing is unrelated to unobserved data, but for non-ignorable situations, the data are missing for reasons related to the unobserved data. The validity of using all available data depends on whether missing data are classed as ignorable or non-ignorable.

Therefore, an important consideration is to determine whether missing data is ignorable (MCAR and MAR). To do this, the percentage of missing data was calculated for each scale at each measurement point (Appendix J). The percentages varied across the scales, and were in line with what was expected with increased percentages of missing data over the course of the research. All of the data were MCAR, except for two time points on the PKSEQ scale. However, it is not possible to test whether these items were missing at random (MAR) or not missing at random (NMAR) (Schafer & Graham, 2002). Furthermore, it has been suggested that "erroneous assumptions of MAR" (Schafer & Graham, 2002, p. 152) only have limited influence on standard errors and estimates, so there was limited risk associated with making the assumption that the items were MAR for the two time points in the PKSEQ scale, and therefore ignorable.

Given that the majority of the missing data appeared consistent with the assumptions of MCAR as demonstrated by the missing value analysis performed by Little's MCAR test, the data met the criteria for expectation-maximisation (EM) estimation. This technique is preferred as it does not reduce the sample size and preserves the variance (Schafer, 1999). In addition, EM is part of the maximisation likelihood approach, which is considered a highly effective method for dealing with missing data in longitudinal studies (Schafer & Graham, 2002). Furthermore, EM is appropriate in longitudinal data with time point non-response (as was the case in this research), as this approach draws on information from across all time points (Schafer & Graham, 2002). Following on from this, EM was used to impute missing data in the current study. The reliability of all scales with missing data and again after missing data had been imputed can be found in Appendix K.

Sample size

Longitudinal research on positive youth development programmes often encounters *attrition* or *time point nonresponse*. These studies are generally characterised by small samples and missing data. Traditional methods of analysis assume there will be no missing data, so participants who do not provide all time points of measurement are excluded. In the current study, the Project K group completed six time points of measurement, while the comparison group completed four time points of measurement. MLM enables the use of this unbalanced data, so that when there are uneven numbers of time points all participants can be included (Allison, 2002; Singer & Willett, 2003; Stride, 2008).

An important consideration is the size of the sample. Maas and Hox (2005) recommended a sample size for a two level model of 30 units (time points) with 30 groups (individuals) for a total of 900 entries (30 x 30 = 900). For the current study the sample size was n = 49 for Project K and n = 31 for the comparisons group, which gives an estimated total of 418 entries ((49 x 6) + (31 x 4) = 418) in a two level model. This is a relatively small sample size for MLM, however it does not preclude the use of MLM (Maas & Hox, 2005).

Preliminary information for model building

Correlations of predictors

Correlations were examined between self-efficacy, resilience, and connectedness to school using Pearson's Correlation Coefficient (2-tailed), to provide an indication of the direction of relationships between the variables in the study and to identify significant relationships, indicating which variables would be important to add when building the models.

T-tests

Gender group comparisons for self-efficacy, resilience, and connectedness to school were carried out using independent-sample t-tests .

Empirical growth plots

Descriptive graphs in the form of empirical growth plots using the raw data were produced for each individual for self-efficacy, resilience, and connectedness to school. The purpose of this visual information was to observe trends in the data and to allowed the inspection of data shape to give an indication of the type of relationship (linear or curvilinear).

Regression

To summarise each individual's trajectory, OLS regression analysis was performed with a) PKSEQ scores over time; b) Resilience Scale scores over linear time; and c) HACS (connectedness to school subscale) scores over linear time. Each regression produced an intercept (Constant) and slope (Beta) for each participant (Appendix L) allowing the longitudinal nature of the variables to be taken into account. Each individual's fitted regression line was then superimposed on their empirical growth plot. Each individual's intercept and slope were used for future correlations.

Multilevel modelling

Over the last few decades MLM has become a flexible and extremely useful tool for statistical analysis and inference (Bryk & Raudenbush, 2002; Kreft & de Leeuw, 1998; Maas & Hox, 2005; Singer & Willett, 2003). Many terms are synonymous with MLM (Field, 2009), such as applied longitudinal data analysis (ALDA; Singer & Willett, 2003), hierarchical linear modelling (HLM; Bryk & Raudenbush, 1992; Bryk & Raudenbush, 2002), random coefficient

models (Longford, 1993), and mixed-effect models (Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006).

Multilevel analysis with longitudinal data has become increasingly popular. It is a complex analysis technique that can handle variables measured at different levels in a hierarchy (Kreft & de Leeuw, 1998). MLM attempts to answer two key questions central to any study on change. The first question asks about the pattern of change over time, while the second question examines the association between predictors and the patterns of change over time. In addition, MLM enables analysis of change at different levels. These two questions are used to specify two statistical models, one for each question.

MLM has a number of statistical advantages over other methods (Luke, 2004). Unlike more traditional methods, such as multiple regression, MLM does not require that all the data link to an individual level unit of analysis. In traditional methods, this disaggregation of predictors results in all of the unmodeled information being lumped into a single error term. This leads to the violation of the assumption that error terms are uncorrelated (Field, 2009; Luke, 2004). Other methods, such as ANOVA, have attempted to address the grouping of individuals (Luke, 2004). However, these methods have difficulties with small sample sizes, handling missing data, and handling unbalanced data sets in which one group has more time points of data collection than another (Luke, 2004).

Although MLM is a flexible approach with a number of advantages there are important criteria that need to be fulfilled to proceed with this approach (Singer & Willett, 2003).

First, there needs to be multiple time points of data. For longitudinal analysis, at least three time points are necessary, but more time points enable improved description of the process of change and the shape of an individual's growth trajectory over time. Singer and Willet (2003) recommend that with only three time points, the assumption should be that growth is linear over time, but with more time points nonlinear growth can be considered.

Second, a sensible measure of time is needed that is both reliable and valid and must fit with outcomes of the research study (Singer & Willett, 2003). The measure of time influences the number and spacing of data collection points. Singer and Willett suggest considering the "cadence" that is most useful for the research outcomes. For example, studies conducted in schools might measure time in students' year/level. It is also important that the spacing of the time points of data collection are in line with the research. For example, one should collect more

data at times where change is expected, and less data where it is not. In addition, each person is not required to have the same number of time points, and in some cases an individual could contribute less than three time points.

Finally, for MLM it is necessary to have a continuous outcome that changes systematically over time. Conceptual and theoretical models need to be taken into consideration when suggesting trajectories of change. For example, positive youth development theory suggests that interventions targeted at developing assets increase the positive outcomes for youth over time. It is also important for outcome measures to have strong psychometric properties. In addition, longitudinal MLM requires *outcome equitability,* which means using the same measure over time and requires outcomes to be valid at each measurement point and for precision to be maintained i.e. to minimise measurement or administration error over time. The current study fulfils all of these criteria.

SPSS uses a MIXED models approach for MLM analysis with underlying statistical techniques involving a series of regressions upon regressions (Kreft & de Leeuw, 1998). At Level 1, change within individuals across time is examined with regression equations applying to each individual. At Level 2, the differences between intercepts (initial status) and slope trajectories between persons are examined, forming group level regression equations. The Level 1 and Level 2 regression equations combine to form an overarching complete group-level equation (Kreft & de Leeuw, 1998).

Specifying the model

The regression equations contain two parts, a *fixed effect* component and *random effect* component. Variables were modelled as fixed effects when the variable remained constant over time, that is, the variable was time-invariant and categorical for each individual. Variables were modelled as random effects when they varied over time within individuals. For example self-efficacy scores were considered time-variant and were modelled as random effects, while gender and participant group were modelled as fixed effects at Level 2 as these variables were constant over the course of the study.

Defining model estimates

Level 1 analysis looks at within-individual change to describe how an individual changes over time i.e. individual growth trajectories. The goal of Level 1 analysis is to describe the shape of each individual's change over time. Level 2 analysis investigates inter-individual differences, looking at between-individual patterns of change. It adds predictors to determine what predicts differences between the individuals in the study. The goals of Level 2 analysis are to detect heterogeneity of change across individuals and to determine the relationship between the shape of individual growth curves and predictors. These two levels of analysis, informed by the two questions about change, are mapped on to complex statistical models (Singer & Willett, 2003).

Table 8 *Multilevel modelling parameters and explanations*

Parameter	Explanation
$\boldsymbol{\pi_{0i}}$	Estimate of the intercept of the true change trajectory for individual i in the population.
$\boldsymbol{\pi_{1i}}$	Estimate of the rate of change (slope) for individual, i, in the population.
$\boldsymbol{\gamma_{00}}$	Estimate of the intercept of the true rate of change for the average individual in the population.
$\boldsymbol{\gamma_{01}}$	Difference in the intercept from individuals in other groups.
$\boldsymbol{\gamma_{02}}$	Difference in the intercept from individuals in other population subgroups while also controlling for additional variables.
$\boldsymbol{\gamma_{10}}$	Estimate for the rate of change experienced by an average individual in the population.
$\boldsymbol{\gamma_{11}}$	Estimate of difference in rate of change between different individuals in different population groups.
$\boldsymbol{\gamma_{12}}$	Estimate of the difference in rate of change for individuals in different groups while also controlling for additional variables.
$\boldsymbol{\sigma_{\varepsilon}^2}$	Estimate of the amount of variance within-individual in the sample.
$\boldsymbol{\sigma_0^2}$	Estimate of between-individual variance in the sample.
$\boldsymbol{\sigma_1^2}$	Estimate of the residual rate of change.
$\boldsymbol{\sigma_{01}^2}$	Covariance.
$\mathbf{R_{\varepsilon}^2}$	Pseudo R statistic for σ_{ε}^2. Pseudo R statistics demonstrate the percentage change between models in terms of the variance components which resulted in a percentage of variance in the dependant variables score that the variable 'time' explained at Level 1 and 2.
$\mathbf{R_0^2}$	Pseudo R statistic for σ_0^2.
$\mathbf{R_1^2}$	Pseudo R statistic for σ_1^2.
Deviance statistic	-2 Log Likelihood statistic, which provides an overall measure of model fit.
Akaike Information Criterion (AIC)	Adjusts the deviance statistic for the number of parameters in the model and provides information on model selection with decreases in the AIC between subsequent models indicating improved model selection.
Bayesian information criterion (BIC)	Adjusts the deviance statistic for the number of parameters in the model and the sample size and provides information on model selection with decreases in the BIC between subsequent models indicating improved model selection.

Model specification

MLM requires detailing the order of entry of variables and building the model step-by-step from the most basic "null" model to a "final" model. In the current study, the decision about the order to enter the variables was guided by theory and by standard MLM analysis strategy (Singer & Willett, 2003; Stride, 2008). Models were produced separately for each of the three dependent variables: self-efficacy, resilience, and connectedness to school.

The null model

The purpose of this model is to provide baseline values for the Pseudo R^2 and goodness-of-fit statistics to compare subsequent models, with reductions from the baseline value indicating an improved model fit. This was done by fitting the grand mean for each of the dependent variables.

Model A: The unconditional means model

Fitting an unconditional means model first was necessary to partition outcome variance across individuals. Although the amount of variance had been investigated using visual inspection of graphs and OLS regression lines in the sample, this step further established whether there was sufficient variation in the self-efficacy, resilience, and connectedness to school data to warrant further analysis. The variance component needed to be non-zero and significant, to provide justification for building subsequent models by suggesting that more variance could be explained by adding predictors. In the current study, self-efficacy, resilience, and connectedness to school were entered into three separate models, to assess variance across participants. To begin with, all parameters were fixed.

Model A also enables the calculation of the relative magnitude of the within-persons and between-persons variance component. This was done by calculating the *intra-class correlation (ICC)* (ρ). In the unconditional means model the calculation for the ICC is given below.

$$\rho = \frac{\sigma_0^2}{\sigma_0^2 + \sigma_\varepsilon^2}$$

This describes the total outcome variance that lies *between-person*s (Singer & Willett, 2003).

Model B: The unconditional growth model

After fitting *Model A,* the unconditional means model, the next step was to fit *Model B,* the unconditional growth model (Singer & Willett, 2003). The unconditional growth model allowed the quantification of the outcome variable across individuals and time. *Model B* introduced *time coded in days* as the only predictor into the Level 1 model, with no Level 2 predictors. This model helps evaluate the baseline amount of change.

Adding predictors

After fitting the two unconditional models, further models were built to include predictors to reduce unexplained variance. The predictors were participant group and gender. The results from each model were compared in an iterative process until a 'final model' of best fit was reached.

Model C - Introducing group. This model introduced group, the main predictor variable in this study. Model C was run separately for each of the dependent variables: self-efficacy, resilience, and connectedness to school.

Model D – Introducing gender. This built on the previous models and looked at the effects of controlling for gender.

Finally, within each model, Pseudo R^2 and goodness-of-fit statsitcs are calculated to estimate model fit. These estimates give an indication of model fit and enable comparisons with subsequent models. Signifcant reductions in the variance components across models will be observed by improvements in the Pseudo R^2 statistic. Deviance, Akaike Information Criterion (AIC), and Bayesian information criterion (BIC) offer additional information on model fit. These can be calculated and compared to published thresholds and when significant for the associated degrees of freedom, the new model can be considered an improvement compared to the previous model (Singer & Willett, 2003).

CHAPTER SEVEN:
RESULTS

Preliminary information for model building

Correlations of predictors

Correlations were calculated on raw scores at Time 1. Table 9 presents the correlations for the Project K group. As expected, there was a positive relationship between self-efficacy, resilience, and connectedness to school for the Project K group. Table 9 shows that the comparison group followed a similar trend to the Project K group with a positive and significant relationship between self-efficacy and resilience, and connectedness to school. Unsurprisingly, Table 10 shows that post-programme, the Project K group showed a positive and significant relationship between self-efficacy and resilience. The comparison group demonstrated a similar pattern.

Table 9 *Correlations of raw scores pre-programme between self-efficacy, resilience, and connectedness to school. Project K group (top right) and comparison group (bottom left in italics and bold)*

	Self-efficacy	**Resilience**	**School connectedness**
Self-efficacy	-	.70**	.71**
Resilience	***.70*** **	-	.42**
School connectedness	***.55*** **	***.49*** **	-

Note: * Correlation is significant at the .05 level (2-tailed).** Correlation is significant at the .01 level (2-tailed).

Table 10 *Correlations of raw scores post-programme between self-efficacy, resilience, and connectedness to school. Project K group (top right) and comparison group (bottom left in italics and bold)*

	Self-efficacy	**Resilience**	**School connectedness**
Self-efficacy	-	.68**	.45**
Resilience	***.82***	-	.48**
School connectedness	***.56***	***.40****	-

Note: * Correlation is significant at the .05 level (2-tailed).** Correlation is significant at the .01 level (2-tailed).

T-tests

There was a significant difference in self-efficacy scores for males (*M* = 73.57, *SD* = 15.45) and females (*M* = 83.93, *SD* = 14.37; *t* = (72.02), *p* = .003 two-tailed). The magnitude of the difference in the means (mean difference = -10.36, 95% *CI*: - 17.07 to -3.65) was large (eta squared = .11). There was no significant difference in resilience scores for males (*M* = 120.70, *SD* = 21.05) and females (*M* = 127.85, *SD* = 20.31; *t* = (78), *p* = .13 two-tailed). The magnitude of the difference in the means (mean difference = - 7.15, 95% *CI:* - 16.54 to 2.23) was small (eta squared = .03). There was no significant difference in connectedness scores for males (*M* = 16.77, *SD* = 4.30) and females (*M* = 17.19, *SD* = 3.41; *t* = (78), *p* = .52 two-tailed). The magnitude of the difference in the means (mean difference = - .42, 95% *CI:* - 2.21 to 1.37) was very small (eta squared = .003).

Self-efficacy: empirical growth plots (Hypothesis 1)

Each individual's data was graphed over time. Figure 4 presents descriptive graphs in the form of empirical growth plots, with the OLS regression line fitted over the top for each individual's self-efficacy scores in the Project K group, while Figure 5 provides this information for the comparison group. Inspection of the OLS regression lines for the Project K group shows the majority of the individuals increased their self-efficacy scores over time, with 36 out of 49 producing an increase (73%) (Start of programme *n* = 49, *M* = 73.81, *SD* = 15.93; End of programme *n* = 49, *M* = 87.63, *SD* = 11.19). The comparison groups self-efficacy scores suggested a less consistent pattern over time with 15 of 31 (48%) producing an increase in self-

efficacy scores over time (Start of programme n = 31, M = 84.23, SD = 13.43; End of programme n = 31, M = 81.62, SD = 17.48). Graphs showing the smoothed OSL trajectories for the self-efficacy scores demonstrated a clear difference in the average change trajectories between the two groups (Appendix N).

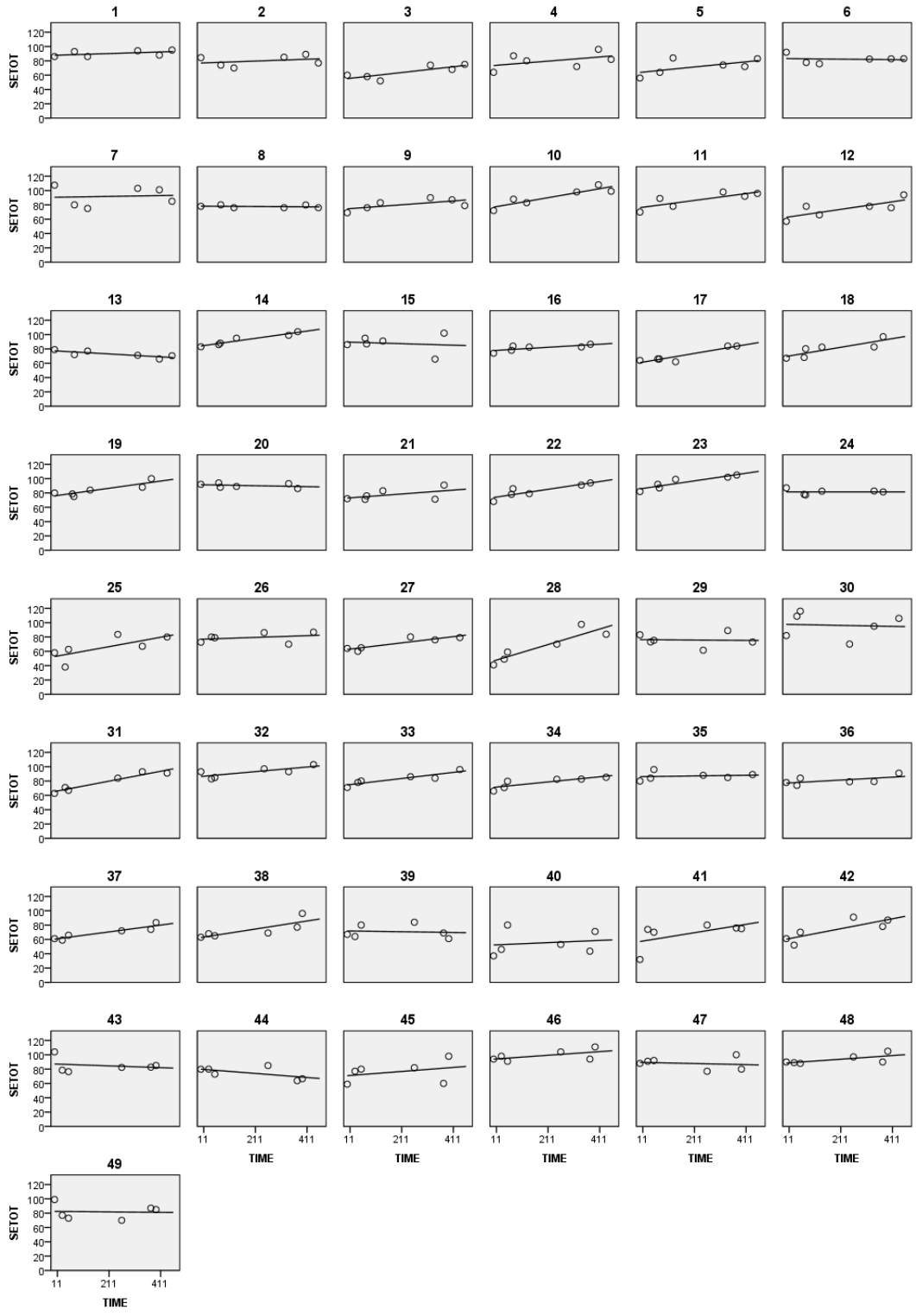

Figure 4. OLS trajectories of each individuals self-efficacy scores (SETOT) over Time for the Project K group.

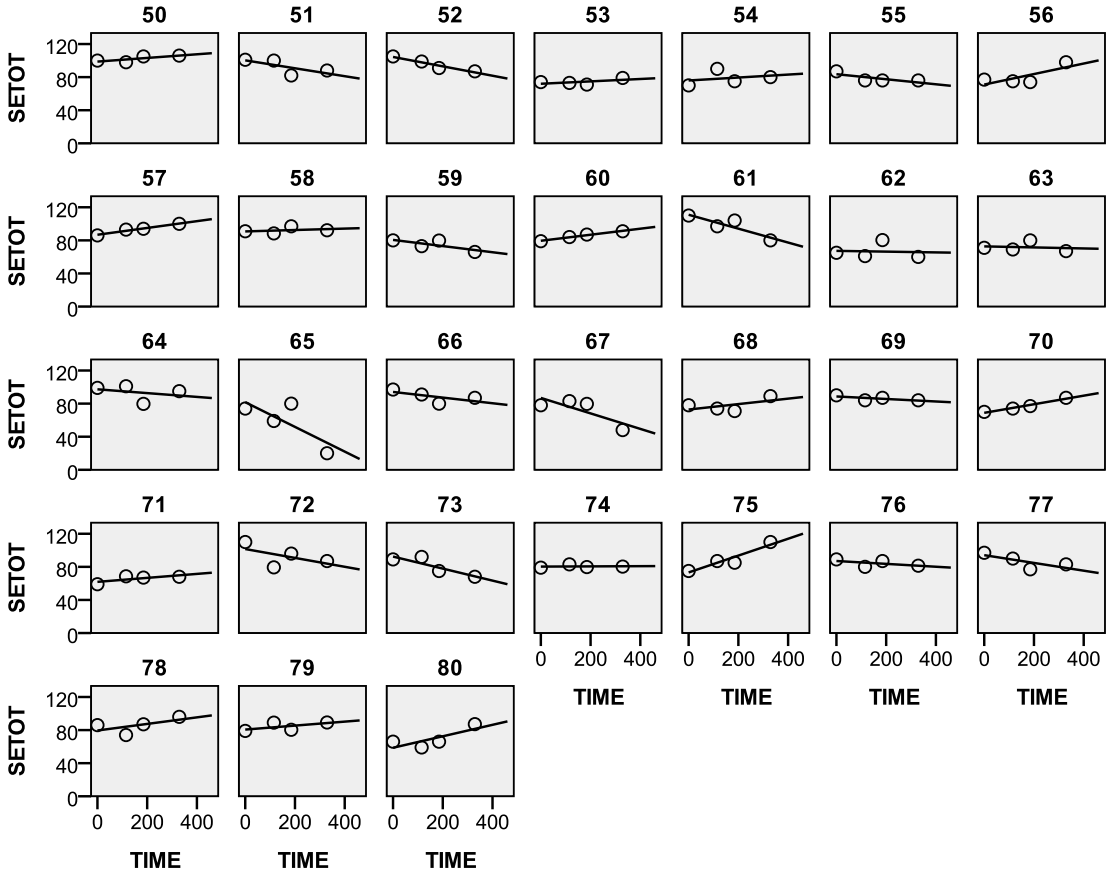

Figure 5. OLS trajectories of each individuals self-efficacy scores (SETOT) over Time for the comparison group.

Figure 6 shows the average change trajectories over time for each group.

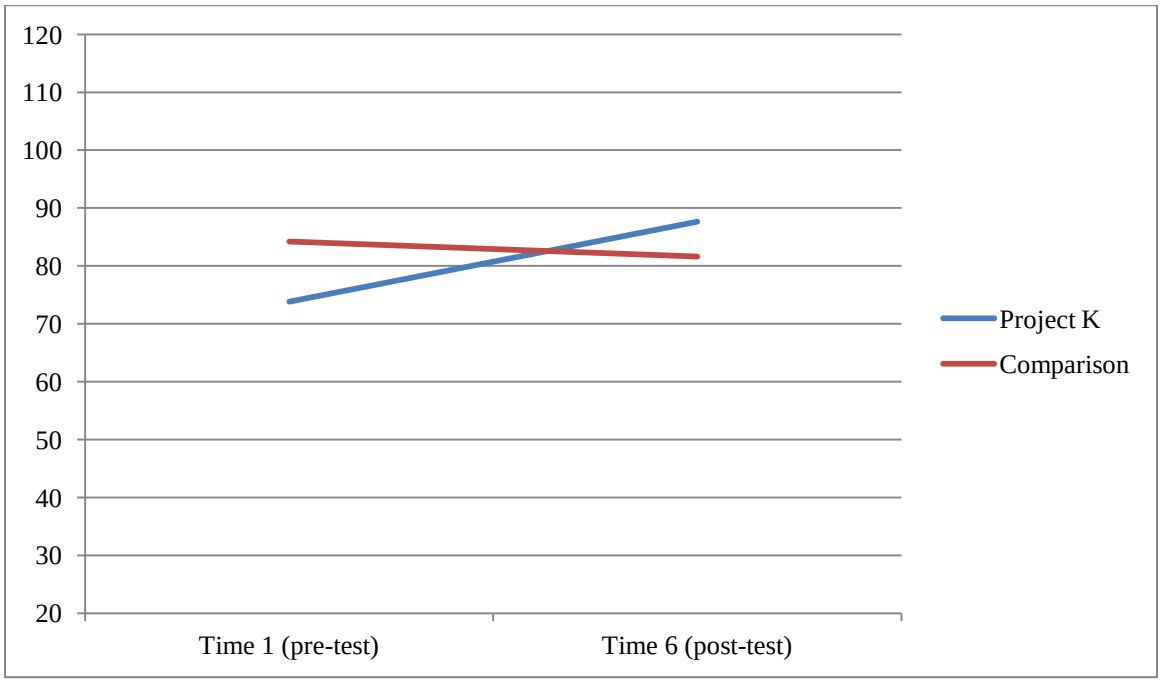

Figure 6. Self-efficacy means by group at time 1 and 6. PKSEQ scores range from 20 to 120.

Resilience: empirical growth plots (Hypothesis 3)

Figure 7 displays the OLS regression lines for resilience. In the Project K group, 40 of 49 participants (82%) increased resilience scores over time (Start of programme n = 49, M = 118.50, SD = 21.84; End of programme n = 49, M = 133.48, SD = 18.28). Twelve out of 31 (39%) in the comparison group had increased resilience scores over time (Start of programme n = 31, M = 131.79, SD = 16.52; End of programme n = 31, M = 126.42, SD = 25.34). Although the direction of the relationship is less clear in the comparison group when compared to the Project K group, there is still significant variability. Taken together, the resilience scores appear to vary for each individual across the length of the programme and between participants in terms of their initial status and change trajectories. Smoothed OSL trajectories comparing the groups demonstrated a clear difference in the average change trajectories between the two groups (Appendix N).

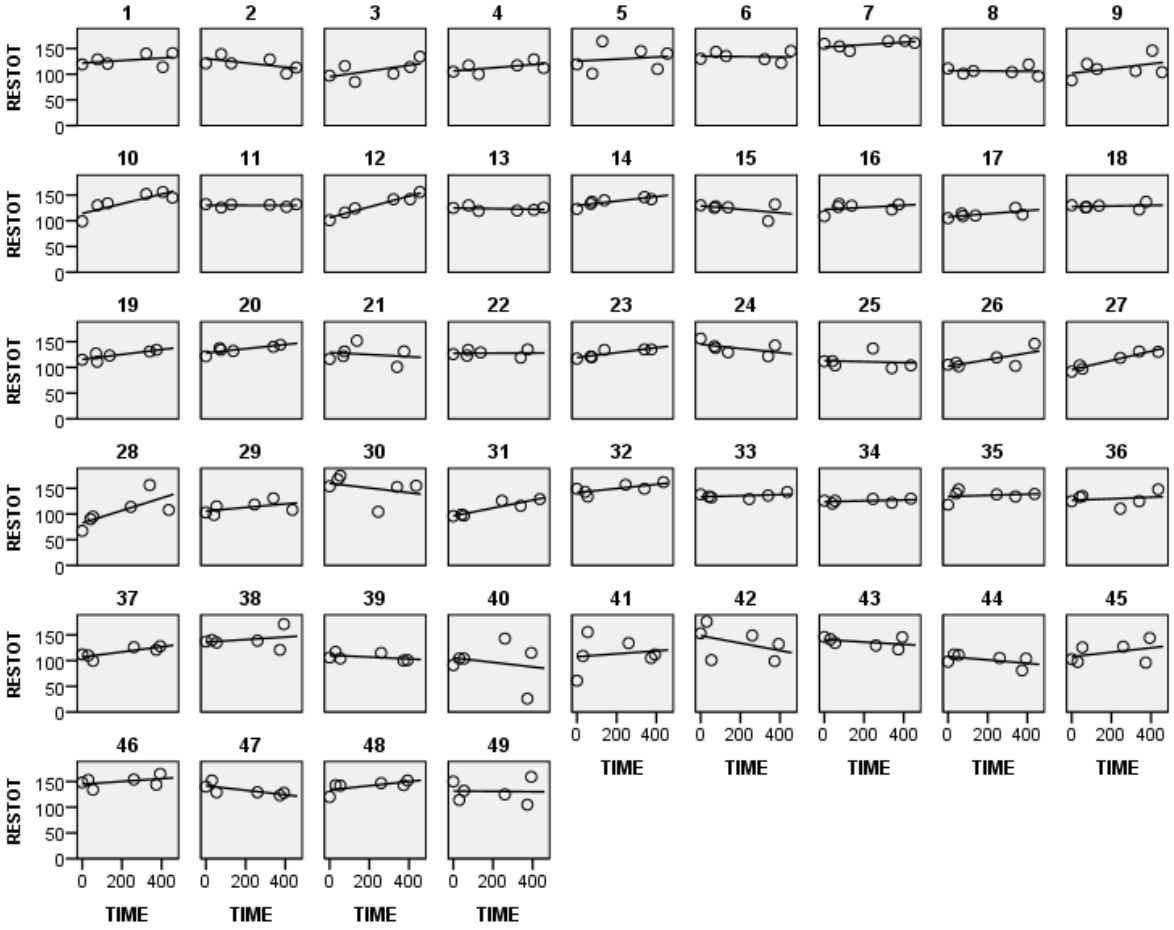

Figure 7. OLS trajectories of resilience scores (RESTOT) for each individual over Time for the Project K group.

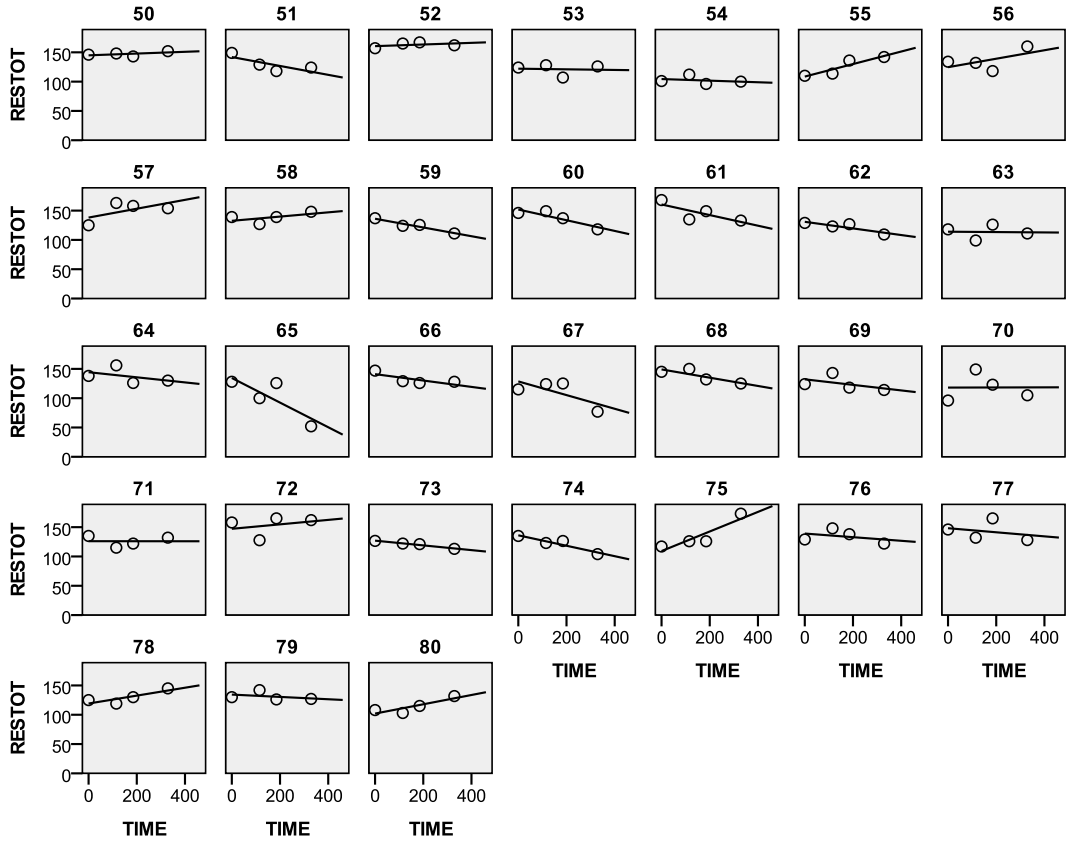

Figure 8. OLS trajectories of resilience scores (RESTOT) for each individual over Time for the comparison group.

Figure 9 shows the average change trajectories over time for each group.

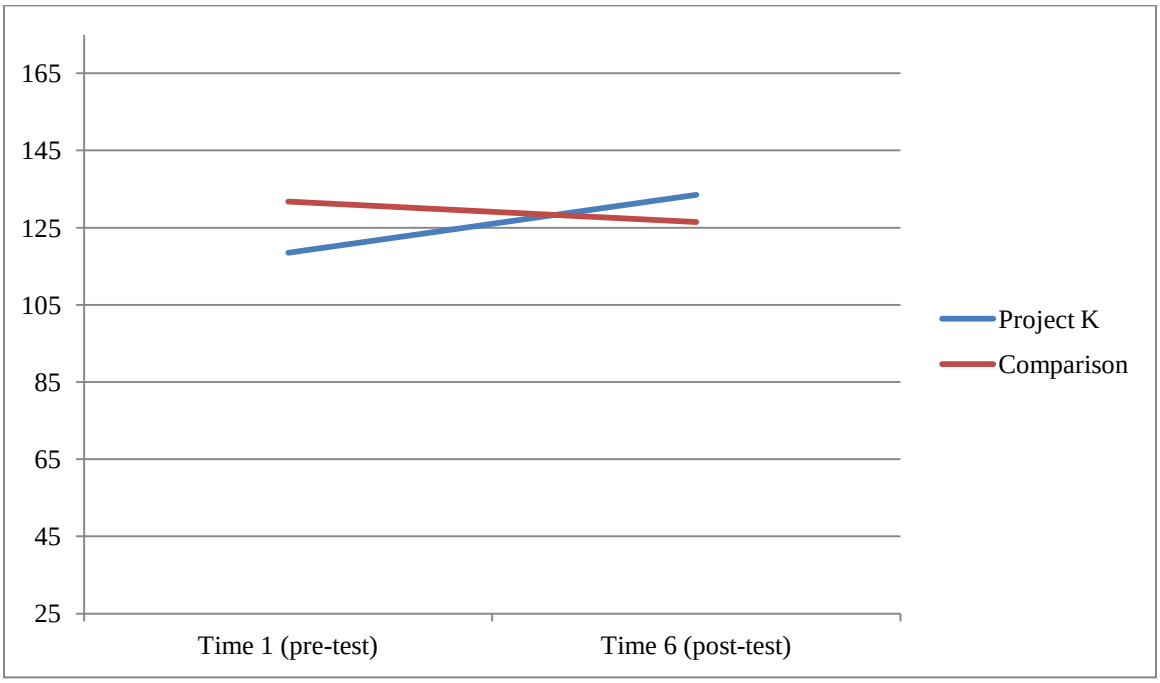

Figure 9. Resilience means by group at time 1 and 6. RS scores range from 25 to 175.

Connectedness to school: empirical growth plots (Hypothesis 5)

Figure 10 shows each individual's connectedness to school scores in the Project K group, while Figure 11 shows each individual's connectedness to school scores in the comparison group. Thirty-six out of 49 participants (73%) in the Project K group increased their connectedness to school scores over time (Start of programme n = 49, M = 16.35, SD = 4.44; End of programme n = 49, M = 20.17, SD = 2.78), while 16 out of 31 (52%) participants in the comparison group had increased connectedness to school scores over time (Start of programme n = 31, M = 17.88, SD = 2.79; End of programme n = 31 M = 18.72, SD = 3.98). Overall, participants showed a slight increase in connectedness to school.

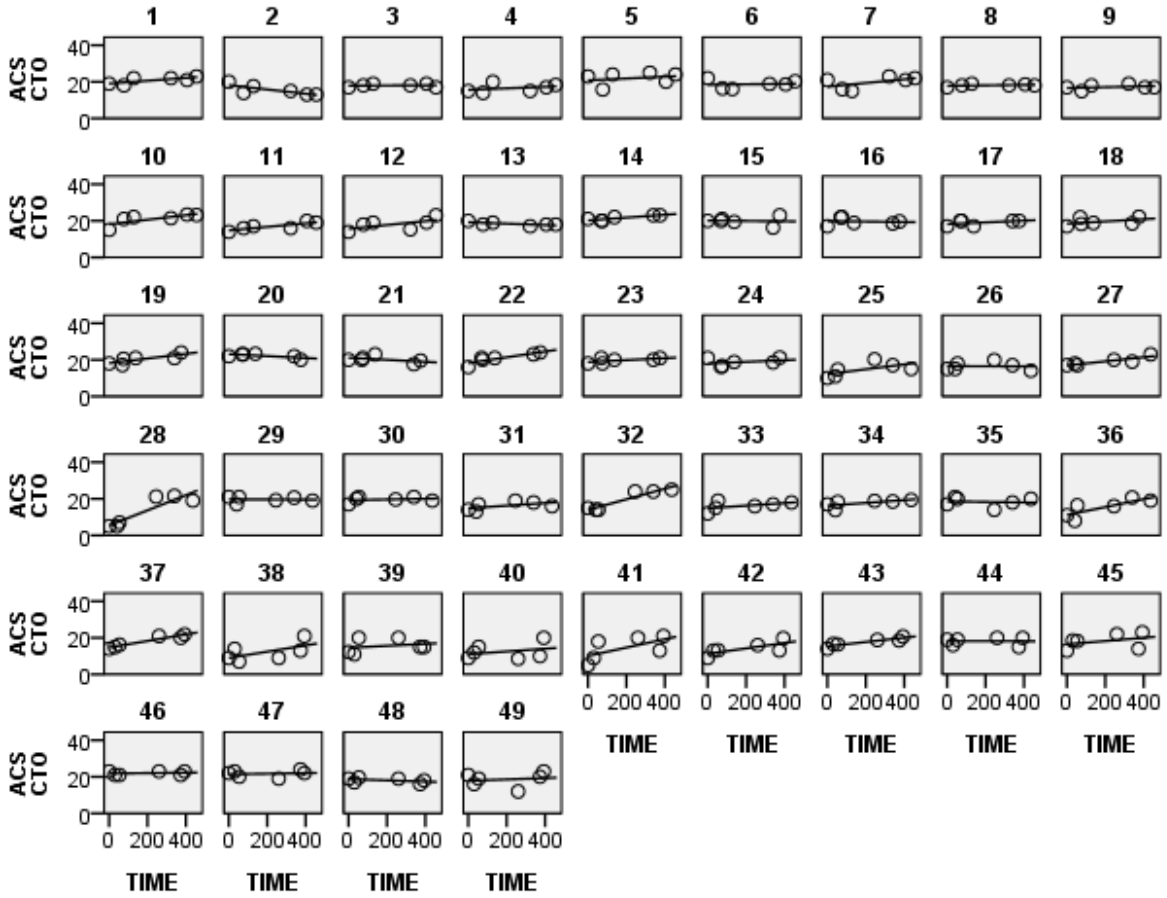

Figure 10. OLS trajectories of connectedness to school scores (ACSCTO) for each individual over Time for the Project K group.

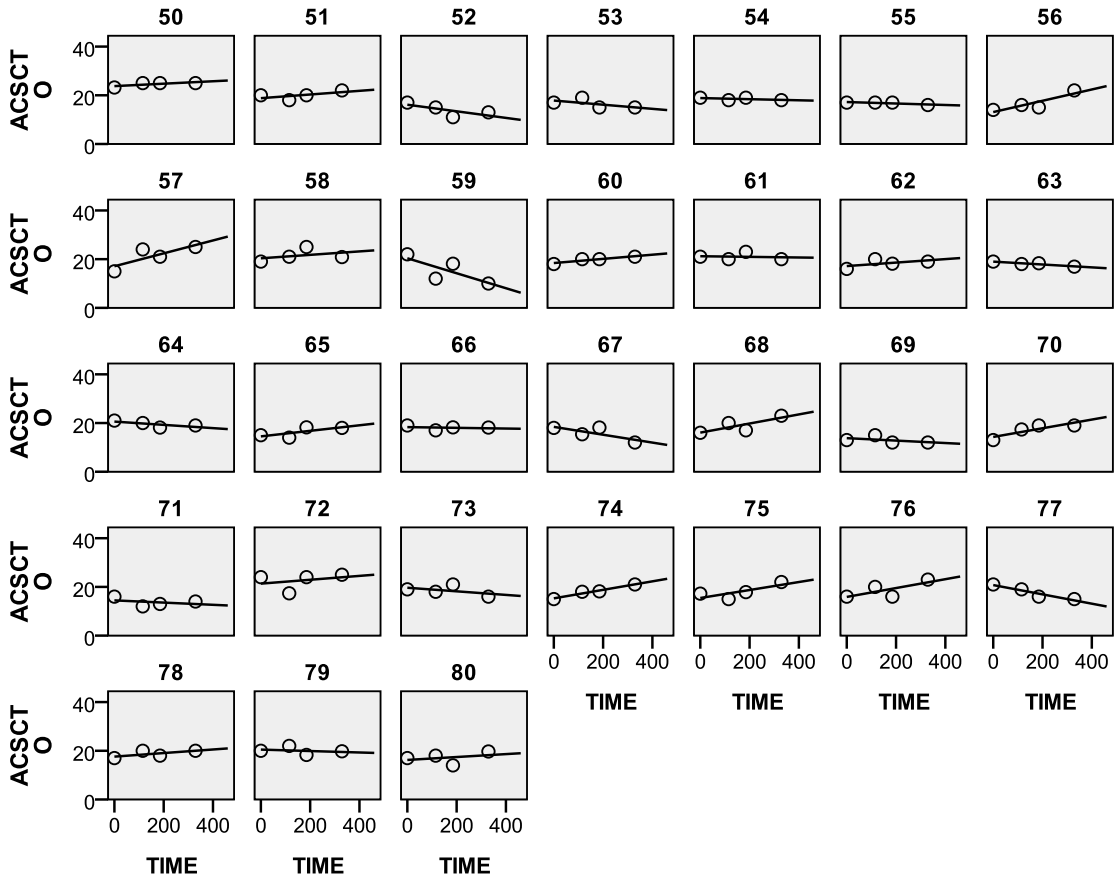

Figure 11. OLS trajectories of connectedness to school scores (ACSCTO) for each individual over Time for the comparison group.

Figure 12 shows the average change trajectories over time for each group.

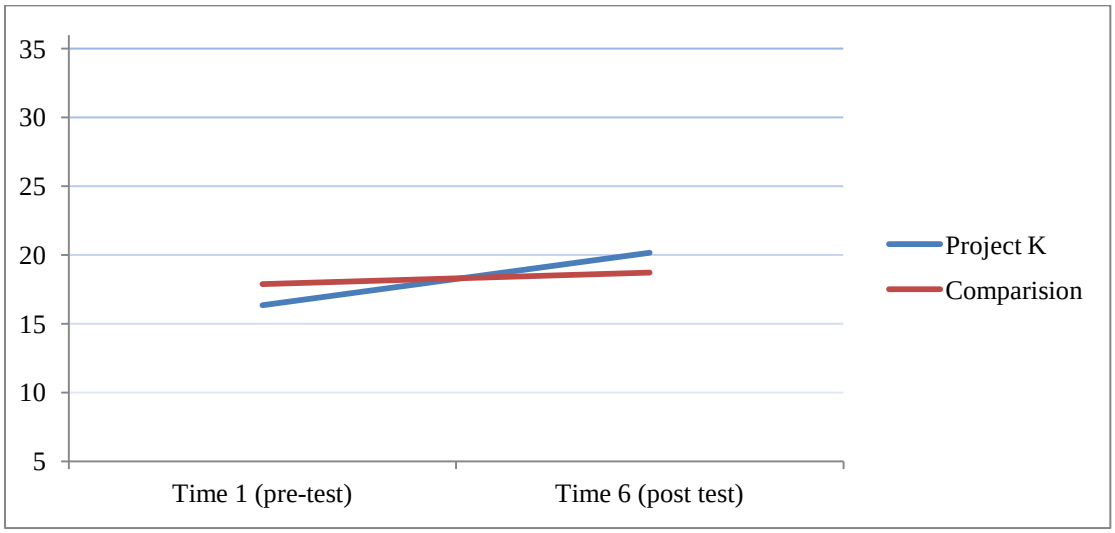

Figure 12. Connectedness to school means by group, at time 1 and 6. Connectedness to school subscale scores range from 6 to 36.

Overall, participants in the Project K group showed an increase in their level of self-efficacy, resilience, and connectedness to school. Visual inspection of the graphs shows that there was variability in participants' initial status and their rate of change, and differences in change trajectories between the Project K and comparison group. This provided support for progressing to multilevel analysis.

Multilevel Analysis

Self-efficacy: Hypothesis 1 and 2.

Null Model

Table 11 displays the results for the Null Model, which provided the baseline Pseudo R^2 and goodness-of-fit statistics, and for Model A, which adds self-efficacy and Model B, which adds time.

Table 11 *Estimates of fixed and random effects from a series of individual growth models in which time predicts changes in self-efficacy*

		Parameter	Null Model	Model A	Model B
Fixed effects					
Initial status π_{0i}	Intercept	γ_{00}	80.85*** (.65)	81.02*** (1.07)	77.76*** (1.41)
Rate of changeπ_{1i}	Intercept	γ_{10}			.02*** (.00)
Variance components					
Level 1	Within-person	σ_ε^2	178.46*** (12.34)	106.87*** (8.22)	77.08*** (7.00)
Level 2	Initial status	σ_0^2		72.18*** (14.85)	123.00*** (25.61)
	Rate of change	σ_1^2			.00** (.07)
	Covariance	σ_{01}			-.18** (.07)
Pseudo R^2 and goodness-of-fit					
		R_ε^2			0.11
		R_0^2			
		R_1^2			
		Deviance	3353.30	3353.30	3258.92
		AIC		3357.30	3264.92
		BIC		3365.37	3277.03

Note: *** p < .001;**p < .01. The Null model a baseline model. Model A is an unconditional means model. Model B is an unconditional growth model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Self-efficacy: Models A and B

An important purpose of the unconditional means model (*Model A)* was to estimate the portion of total variation between persons. This was done by calculation of the intra-class coefficient (ICC), which was calculated as .40, indicating that an estimated 40% of the variation in self-efficacy was attributable to differences between individuals. This suggests that there is unexplained variation that might be explained by adding in time, which is explored in the unconditional growth model (*Model B).*

There is one fixed effect (γ_{00}) associated with *Model A*, which is shown in Table 11, and this indicates the average self-efficacy scores across all occasions and participants. For *Model B* the fixed effect is 77.76, indicating the average self-efficacy score, taking time into account. The important point is that this score is positive and significant ($p < .001$). This confirms that there is enough variance in the self-efficacy data to build additional models. For *Model B* the rate of change (slope) (γ_{10}) is positive and significant ($p < .001$). The important point is that for *Model A* and *B* the fixed effects numbers were positive and highly significant, which means that self-efficacy increased over the period of this study.

Next, the variance component (random effects) part of *Model A* was examined. According to Singer and Willett (2003), the variance components are of most interest. At Level 1 the variance within-persons decreased from *Model A* to *Model B.* This indicates that adding the variable *time coded in days* explains more variation within persons. The Level 2 between-persons variance component in *Model B* increased, meaning the addition of time explains less between-person variance than within-person variance. The positive and significant scores at Level 1 and 2 ($p < .001$) confirmed the earlier correlations, indicating that there is variance to explain both within and between persons. Calculation of the residual variance, or Pseudo R^2, enables the conclusion that 11% of the variance within-persons is explained by time. From this, we can conclude that the average participant's self-efficacy scores vary over time and that participants differ from each other in self-efficacy scores. This means that adding predictors will be useful in explaining differences between-persons (Singer & Willett, 2003).

The *deviance* statistic shows that there has been an improvement in model fit from the *Null Model* (3353.30) to *Model A* (3258.92) to *Model B* (3202.46). The difference in fit between *Model A* and *B* is 56.46. Compared to a chi-squared distribution with three degrees of freedom (*df*), (calculated by subtracting the number of parameters in *Model A* (3) from *Model B* (6)) this difference is less than the $p < .001$ critical value, indicating a significant difference in deviance and an improvement in model fit between *Model A* and *B.* Finally, to assess model selection, the *AIC* and *BIC* statistics were examined and compared to the *Null Model:* the reduction indicated that *Model B* was an improved model. From this it can be concluded that time explains variation in self-efficacy scores.

Self-efficacy: Model C – Controlling for group

This model introduced the group a participant was in, as a predictor variable. Table 12 presents the four fixed effects of *Model C*, which can be interpreted as follows. The intercept parameter (γ_{00}) for the average participant is 83.68 and highly significant ($p < .001$). The estimated difference in self-efficacy initial status (γ_{01}) between participants in the Project K group when compared to the comparison group is -8.76 ($p < .01$). This means that on average Project K participants scored lower than the comparison group by 8.76 at the start of the programme (scores can range from 20 to 120). The estimated rate of change in self-efficacy scores for all participants was -.01 (*ns*). Finally, the estimated differential in the rate of change in self-efficacy between participants in the Project K group and the comparison group was .03 ($p < .001$). From these parameters, Project K participants' self-efficacy increased more quickly over time than the comparison group. The highly significant score indicated that the null hypothesis for Hypothesis 1, that there is no difference between the rate of change in the Project K group when compared to the comparison group, can be rejected.

The variance components of the model are examined next. The Level 1 within-person variance between *Model B* and *Model C* increased, and explained 28% of within-person variance. Looking at the Level 2 between-persons variance components, σ_0^2, there was a statistically significant ($p < .001$) decline from *Model B* (123.00) to *Model C* (108.47), meaning the group a person was in explained more between-person variance. The Pseudo R^2 statistics for Level 2 in *Model C* assessed the variation that could be explained by adding participant group as a predictor. From the results, the group an individual was in explained .33 or 33% of between-person differences and only .28 or 28% of the within-person variability. The negative and significant covariance statistic indicated that those who had a higher initial self-efficacy continued to experience a slower rate of change over time. The *deviance, AIC,* and *BIC* all show a reduction from *Model B* indicating that adding participant group provided a better model fit.

Table 12 *Estimates of fixed and random effects from a series of individual growth models where group and gender predict changes in self-efficacy*

		Parameter	Model A	Model B	Model C	Model D
Fixed effects						
Initial status π_{0i}	Intercept	γ_{00}	81.02*** (1.07)	77.76*** (1.41)	82.68*** (4.07)	87.77*** (2.56)
	Group	γ_{01}			-8.76** (2.76)	-7.84* (2.71)
	Gender=0	γ_{02}				-7.92* (2.62)
Rate of change π_{1i}	Intercept	γ_{10}		.02*** (.00)	-.01 (.01)	-.02 (.01)
	Group*Time	γ_{11}			.034*** (.01)	.03*** (.01)
	Gender*Time	γ_{12}				-.02 (.01)
Variance components						
Level 1	Within-person	σ_ε^2	106.87*** (8.22)	77.08*** (7.00)	76.53*** (6.84)	76.32*** (6.81)
Level 2	In initial status	σ_0^2	72.18*** (14.85)	123.00*** (25.61)	108.47*** (23.06)	93.74*** (20.72)
	In rate of change	σ_1^2		.00** (.07)	.00* (.00)	.00* (.00)
	Covariance	σ_{01}		-.18** (.07)	-.13* (.05)	-.10 (.05)
Pseudo R^2 and goodness-of-fit						
		R_ε^2		0.11	.28	.29
		R_0^2			.12	.38
		R_1^2			.33	.33
	Deviance		3258.92	3202.46	3187.72	3179.00
	AIC		3264.92	3214.46	3203.72	3199.00
	BIC		3277.03	3238.67	3236.01	3239.36

Note: *** $p < .001$;** $p < .01$; * $p < .05$. Time = time coded in days. Model A is an unconditional means model. Model B is an unconditional growth model. Model C adds group participants in to the model. Model D adds gender to the model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Self-efficacy: Model D controlling for gender (Hypothesis 4)

Model D (Table 12) included gender to determine whether gender influenced the relationship between self-efficacy and group.

After introducing gender, the initial status, γ_{00} describing the estimated self-efficacy score at the start of the programme for the average participant was 87.77 and remained significant ($p < .001$). The initial status parameters ($\gamma_{01} = \text{group}$; $\gamma_{02} = \text{gender}$) showing the estimated differential between self-efficacy at the start of Project K and males were both negative (-7.84; -7.92) and significant at the $p < .05$ level, indicating that on average Project K participants and males had lower self-efficacy at Time 1. The estimated differential in the rate of change in self-efficacy between participants in the Project K group and the comparison group was .03 ($p < .001$). This meant that after controlling for gender there was almost no change in the γ_{11} parameter between *Model C* and *D* suggesting that gender did not influence the rate of change of self-efficacy. Because the γ_{12} parameter is negative and non-significant, the null hypothesis for Hypothesis 4, that there is no difference in the rate of change in self-efficacy between males and females, cannot be rejected.

The variance components of the model were examined next. The Level 1 within-person variance between *Model C* and *Model D* were almost identical, and explained 29% of within-person variance. Looking at the Level 2 residual variance component, σ_0^2, there was a statistically significant ($p < .001$) reduction from *Model C* (108.47) to *Model D* (93.74) with the introduction of gender. Taken together, the Level 2 variance calculated by the Pseudo R^2 statistics explained 71% of between-person variance. The remaining Level 2 variance was still statistically significant, indicating that it may be beneficial to add further predictors into the model to explain the between-person variance.

Almost no reductions were observed from *Model C* to *D* in the *deviance* and *AIC* statistics, and a slight increase was observed in the *BIC* statistic. This means that *Model D*, which controlled for the effects of gender on self-efficacy, was unlikely to provide a better fit than *Model C.*

Resilience: Hypothesis 3 and 4.

The null model

Table 13 displays the results for the *Null Model*, which represents the baseline value of the *deviance, AIC and BIC* statistics for resilience from which subsequent models can be compared.

Resilience: Model A and B

The fixed effects associated with *Model A* and *Model B* are as followed. *Model A* (γ_{00}) indicated the grand mean of the *resilience* data across all occasions and participants. The fixed effect for rate of change in *Model B,* γ_{10}, estimated the average rate of change over the length of the programme. This score is positive, which means that participants' scores increased over time and were significant ($p < .01$), indicating change in resilience scores over time.

Model B assessed how much variance can be explained by adding in the predictor *time coded in days*. Table 13 showed a decrease in Level 1 within-person variance (σ_ε^2) and an increase in Level 2 between-person (σ_0^2) variance from *Model A* to *B.* Both parameters are statistically significant and positive, suggesting there is variance in resilience to be explained within-persons and between-persons. Calculation of the Pseudo R^2 (R_ε^2) enabled the conclusion that a minority, 9%, of the within-person variation in resilience can be explained by time. The only way to further reduce the within-person variance is additional Level 1 time-varying predictors, if these were available. The covariance statistic, in *Model B* quantifies the population covariance between true initial status and rate of change. The non-significant score (-.13) suggests that there is no significant relationship between participants' initial status and rate of change over time.

Model A serves an additional purpose in that it enabled the calculation of the relative magnitude of the within-persons and between-persons variance component by calculating the ICC (ρ). The resilience intra-class correlation was .38. This indicated that a reasonable amount, 38%, of the variance in resilience in *Model A* can be attributed to between-person variance at Level 2, however there is still additional variance to be explained.

Finally, the *deviance* statistics associated with *Model B* were examined. To compare the models, the difference between *Model A* and *Model B* was calculated as (3590.44 - 3581.99) =

8.45. To calculate the degrees of freedom, the number of parameters in *Model A* (3) are subtracted from the number of parameters in *Model B* (6). Compared to a chi-squared distribution with three degrees of freedom, this difference exceeds the $p < .05$ critical value, indicating a significant difference in deviance. This improvement in the deviance statistic indicates that *Model B* provides a better model fit when compared to *Model A*. Reductions were also observed in the *AIC* and *BIC* statistics, which means that Model B should be selected ahead of Model A as it better explains the data.

Table 13 *Estimates of fixed and random effects from a series of individual growth models in which time predicts changes in resilience*

		Parameter	Null Model	Model A	Model B
Fixed effects					
Initial status π_{0i}	Intercept	γ_{00}	126.72*** (.97)	127.03*** (1.55)	125.14*** (1.88)
Rate of change π_{1i}	Intercept	γ_{10}			.010* (.01)
Variance components					
Level 1	Within-person	σ_ε^2	386.77*** (26.75)	239.50*** (18.41)	217.89*** (19.11)
Level 2	In initial status	σ_0^2		147.20*** (30.89)	180.79*** (45.18)
	In rate of change	σ_1^2			.00 (.00)
	Covariance	σ_{01}^2			-.13 (.11)
Pseudo R^2 and goodness-of-fit					
		R_ε^2			.09
		R_0^2			
		R_1^2			
	Deviance		3676.61	3590.44	3581.99
	AIC		3680.61	3596.44	3593.99
	BIC		3688.68	3608.54	3618.20

Note: *** $p < .001$. The Null Model is the baseline model. Model A is an unconditional means model. Model B is an unconditional growth model. Model C adds group participants into the model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Resilience: Model C – Controlling for group

Model C (Table 13) introduced *participant group* as a control variable. As outlined earlier, participants in the Project K group were expected to show an improvement in resilience scores over time when compared to the comparison group.

Table 14 presents the results for *Model C*. After introducing group as a control variable, the initial status, (γ_{00}) indicating the average resilience scores across all occasions and participants in the Project K group was significant ($p < .001$). The estimated differential in the initial status (γ_{01}) between participants in the Project K and the comparison group was 10.71 ($p < .05$) (scores range from 25 to 175). The estimated rate of change in resilience scores in the Project K group was .018 ($p < .05$). Finally, the estimated differential in the rate of change in resilience between participants in the Project K group and the comparison group was -.034 ($p < .05$). This means that Project K participants initially start with lower resilience and improve faster when compared to the comparison group. Because the rate of change score is negative and significant, the null hypothesis, which is that there is no difference in the rate of change in resilience between the two groups, can be rejected.

The variance components of the model were examined next. The Level 1 within-person variance in *Model B* and *Model C* are almost identical. The Level 2 residual variance component, σ_0^2, showed a reduction from *Model B* (180.79) to *Model C* (161.83), meaning there is a difference between the initial status between groups. More importantly, coefficients for between-persons Level 2 rate of change in *Model C* were statistically significant. From the results in Table 14, Pseudo R^2 indicated that 17% of the variation in resilience between-persons can be explained by Project K. The proportion of the total variance that is explained by Pseudo R^2 between-persons variance is 10% and 17%. The remaining Level 2 variance is still statistically significant, indicating that it may be beneficial to add further predictors in the model to explain the between-person variance.

Table 14 *Estimates of fixed and random effects from a series of individual growth models in which time and group predict changes in resilience*

		Parameter	Model A	Model B	Model C
Fixed effects					
Initial status π_{0i}	Intercept	γ_{00}	127.03*** (1.55)	125.14*** (1.88)	121.78*** (2.25)
	Group	γ_{01}			-10.71** (2.83)
Rate of change π_{1i}	Intercept	γ_{10}		.010* (.01)	.018** (.006)
	Group*Time	γ_{11}			-.034** (.013)
Variance components					
Level 1	Within-person	σ_{ε}^2	239.50*** (18.41)	217.89*** (19.11)	216.18*** (18.81)
Level 2	In initial status	σ_0^2	147.20*** (30.89)	180.79*** (45.18)	161.82*** (41.66)
	In rate of change	σ_1^2		.00 (.00)	.00 (.00)
	Covariance	σ_{01}^2		-.13 (.11)	-.08 (.10)
Pseudo R^2 and goodness-of-fit					
		R_{ε}^2		.09	.09
		R_0^2			.10
		R_1^2			.17
	Deviance		3590.44	3581.99	3573.19
	AIC		3596.44	3593.99	3589.19
	BIC		3608.55	3618.20	3621.47

Note: *** $p < .001$;** $p < .01$; * $p < .05$. Time = time coded in days. Model A is an unconditional means model. Model B is an unconditional growth model. Model C adds group participants into the model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Resilience: Model D – Controlling for gender (Hypothesis 4)

Estimates of the fixed and random effects from an individual growth model that included gender as a predictor of changes in resilience over time showed that gender had no effect on

initial status or rate of change. The null hypothesis, that there is no relationship between the rate of change in resilience between males and females, cannot be rejected. The results are presented in Appendix O.

Connectedness to school: Hypothesis 5 and 6.

Connectedness to school: Null Model

Table 15 displays the results for the *Null Model*, which represents the baseline value of 2258.14 for connectedness to school.

Connectedness to school: Model A and B

There is one fixed effect (γ_{00}) associated with *Model A*, which is shown in Table 15, indicating the average connectedness to school scores across all occasions and participants. For *Model B,* the fixed effect was 17.12, which is positive and significant ($p < .001$). This confirmed that the average intercept is non-zero. For *Model B,* the rate of change (slope) (γ_{10}) was positive and significant ($p < .001$). The important point is that for *Model A* and *B* the fixed effects value was positive and significant, which meant that among all participants, connectedness to school increased over the period of this study.

The variance components were examined next. Estimated within-person variance (σ_ε^2) at Level 1 was 8.53 and the between-person variance (σ_0^2) was 4.43. The positive and significant scores on both parameters ($p < .001$) confirmed there is variance to be explained both within and between-persons. As expected, the variance within-persons decreased from *Model A* to *Model B* indicating that adding the variable *time coded in days* explains some of the variation between-persons. From this we can conclude that the average participant's connectedness to school score will vary over time and that participants differ from each other in connectedness to school scores.

The residual variance or Pseudo R^2 (R_ε^2) can be calculated from *Model B.* This assesses the within-person variation that can be explained by adding 'time'. Table 15 illustrates that, a significant amount, 29%, of the within-person variation in connectedness to school scores can be explained by time. The only way to further reduce this variance component is to include additional within-person time-variant predictors. The negative and significant covariance statistic indicates that those who have higher initial connectedness to school experience a slower rate of change over time.

The ICC was calculated as .52. This indicates that 52% of the variance in connectedness to school in *Model A* can be attributed to between participant variance at Level 2.

Finally, the *deviance* statistic shows that there has been an improvement in model fit from *Model A* (2186.60) to *Model B* (2121.63). The difference in fit between *Model A* and *B* is 64.97. Compared to a chi-squared distribution with three degrees of freedom, (calculated by subtracting the number of parameters in *Model A* (3) from *Model B* (6)) this difference exceeds the $p < .001$ critical value indicating a significant difference in *deviance* and an improvement in model fit between *Model A* and *B.* Finally, the *AIC* and *BIC* statistics were examined and compared from the baseline *Null Model* to subsequent models. The reduction indicated that *Model B* had improved fit.

Connectedness to school: Model C

Model C introduced *participant group* as a predictor of a participant's initial status and change.

The fixed effects of *Model C* are interpreted as follows. The intercept parameter of initial status (γ_{00}) for the average participant is 17.82 and highly significant ($p < .001$). The remaining fixed parameters are not significant. This means that on average there is no significant difference in connectedness to school scores between the Project K and comparison group in participants' initial status and rate of change.

The variance components of the model are examined next. The Level 1 within-person variance between *Model B* and *Model C* was almost identical, and calculation of the Pseudo R^2 showed that this model explained a large amount, 53%, of within-person variance. Looking at the Level 2 initial status between-persons variance component, σ_0^2, there is a statistically significant ($p < .001$) decline of 2% from *Model B* (7.92) to *Model C* (7.74). The between-persons rate of change coefficients indicate a small but significant difference between persons in Project K compared to the comparison group. Calculation of the *Pseudo* R^2 statistics for Level 2 rate of change in *Model C* assessed the variation that can be explained by adding participant group as a predictor. From the results, the group a person is in explains 6% of the variation in rate of change between-persons. This suggested there is a small difference in participants' rate of change between the groups. The negative and significant covariance statistic indicated that those who have a higher initial connectedness to school score continue to experience a slower rate of

change over time. This means that the null hypothesis, that there is no difference between the rate of change in connectedness to school between the groups, cannot be rejected.

The *deviance, AIC,* and *BIC* showed almost no change from *Model B* to *C*. Looking at the deviance statistic this indicates that *Model C* does not provides a better model fit when compared to *Model B*. No reductions were observed in the AIC and BIC statistics, which indicates that *Model B* should be selected ahead of *Model C,* as it better explains the data.

Table 15 *Estimates of fixed and random effects from a series of individual growth models in which time and group predict changes in connectedness to school*

		Parameter	Null Model	Model A	Model B	Model C
Fixed effects						
Initial status π_{0i}	Intercept	γ_{00}	18.15*** (.18)	18.15*** (.28)	17.12*** (.37)	17.82*** (.62)
	Group	γ_{01}				-1.01 (.77)
Rate of change π_{1i}	Intercept	γ_{10}			.01*** (.00)	.00 (.00)
	Group*Time	γ_{11}				.00 (.00)
Variance components						
Level 1	Within-person	σ_{ε}^2	12.99*** (.90)	8.53*** (.66)	6.07*** (.53)	6.05*** (.53)
Level 2	In initial status	σ_0^2		4.43*** (.97)	7.92*** (1.68)	7.74*** (1.65)
	In rate of change	σ_1^2			4.89** (1.67)	4.62* (1.61)
	Covariance	σ_{01}^2			-.01** (.00)	-.01* (.00)
Pseudo R^2 and goodness-of-fit						
		R_{ε}^2			.29	.53
		R_0^2				.02
		R_1^2				.06
	Deviance		2258.14	2186.60	2121.63	2118.69
	AIC		2262.14	2192.60	2133.63	2134.69
	BIC		2270.21	2204.71	2157.84	2166.98

Note: *** $p < .001$;** $p < .01$; * $p < .05$. Time = time coded in days. The Null Model is the baseline model. Model A is an unconditional means model. Model B is an unconditional growth model. Model C adds the group participants into the model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Connectedness to school: Model D – Controlling for gender (Hypothesis 4)

Estimates of the fixed and random effects from an individual growth model that included gender as a predictor of changes in connectedness to school, demonstrated that gender had no

effect on initial status or rate of change. This means that the null hypothesis (hypothesis 4). that there is no relationship between the rate of change in connectedness to school between males and females, cannot be rejected. The results are presented in Appendix O.

Summary of results

Table 16 presents a summary of key findings.

Table 16 *Summary of key findings by group for self-efficacy, resilience and connectedness to school*

Variables	Findings
Self-efficacy: Hypothesis 1 and 2.	▪ Of the Project K group, 73% (36 out of 49) of participants finished the programme with a higher self-efficacy than when they started. On average, scores out of 120 went up from 73.81 at the start of the programme to 87.63 at the end of the programme. This was an increase of 19 %. ▪ Of the comparison group, 48% (15 out of 31) of students had higher self-efficacy at the end of the research than when they started, and some students showed lower, rather than higher, self-efficacy over this time. On average, in the comparison group the score changed from 84.23 out of 120 at the start of the study, to 81.62 at the end of the study. This was a decrease of 3 %. ▪ Of the Project K group, participants who started with lower self-efficacy increased at a *faster rate* and by *more* over time when compared to participants who started with higher self-efficacy. Participants in the Project K group, increased at a *faster rate* over time when compared to participants in the comparison group (hypothesis 1). ▪ In this study, we found that females had higher scores on self-efficacy than males before starting the programme (hypothesis 2).
Resilience: Hypothesis 3 and 4.	▪ Of the Project K group, 82% (40 of 49) of participants finished the programme with higher resilience scores than when they started. On average, scores out of 160 went up from 118.50 at the start of the programme to 133.48 at the end of the programme. This was an increase of 13 %.

	▪ Of the comparison group, 39% (12 out of 31) of participants finished the study with higher resilience scores than when they started. On average, in the comparison group scores changed from a score of 131.79 out of 160 at the start of the study to 126.42 at the end of the study. This was a decrease of 4 %. ▪ In this study, we found that participants who had higher self-efficacy scores at the end of the study also had higher resilience scores at the end. ▪ Participants in the Project K group, increased at a *faster rate* over time when compared to participants in the comparison group (hypothesis 3). ▪ In this study, we found no interaction between gender and initial status and rate of change (hypothesis 4).
Connectedness to school: Hypothesis 5 and 6.	▪ Of the Project K group, 73% (36 out of 49) of participants finished the programme with higher connectedness to school scores. On average, scores out of 25 went up from 16.35 at the start of the programme to 20.17 at the end of the programme. This was an increase of 23 %. ▪ Of the comparison group, 52% (16 out of 31) of participants finished the study with higher connectedness to school scores than when they started. On average, in the comparison group scores out of 25 changed from 17.88 at the start of the study to 18.72 at the end of the study. This was an increase of 5 %. ▪ In this study, we found we found that participants who had higher self-efficacy scores at the end of the study also had higher connectedness to school scores. ▪ In this study, we found no interaction between gender and initial status and rate of change (hypothesis 6).

CHAPTER EIGHT:
DISCUSSION

The following chapter reviews the major findings and discusses these with reference to current literature. The strengths and contributions to existing knowledge are examined followed by limitations of the study, implications for practice of the current findings, and directions for future research.

Before proceeding, it is important to place a caveat on the conclusions from the current study. RCTs are considered the "gold standard" used to test the efficacy or effectiveness of an intervention (Domanski & McKinlay, 2009). In the current study participants were not randomly assigned and therefore true cause and effect as demonstrated in RCTs could not be determined. This created a number of threats to validity limiting conclusions drawn; these are explored in the limitations section.

The primary objective of Project K is to maximise youth potential. It targets youth with low self-efficacy, identifying students who are mostly likely to benefit from a program to build enhanced beliefs in their ability. During adolescence, competence and mastery are important building blocks for successful negotiation of challenges (Eccles & Gootman, 2002). Adolescents face many changes, with increased pressure on school achievement and social relationships, and therefore need efficacy and resilience to negotiate and overcome these challenges. The Project K logic model (Deane, 2012) identified connectedness, resilience, and self-efficacy as key programme outcomes, and highlighted competence and mastery as essential contributors towards these outcomes. The logic model also identified connectedness as a key outcome for Project K. Increases in connectedness to school are known to impact on two important Project K goals: a reduction in risky behaviours, and increased academic achievement (Anderman, 2002). Catalano and Hawkins (2002), in a large scale evaluation of positive youth development programmes, concluded that self-efficacy, resilience and prosocial involvement were essential outcomes for youth development interventions to target. Clearly, Project K aligns well with these aims.

Adventure education, service learning, and mentoring

Positive youth development programmes that include adventure education, service learning, and mentoring (the three core components of Project K) appear suitable for increasing

self-efficacy, resilience, and connectedness to school. Adventure education has demonstrated its ability to increase self-efficacy through providing participants with experiences of competence and mastery in challenging and unfamiliar but supportive social and physical environments. These environments, combined with instructors' feedback and review (Goldenberg et al., 2005), and opportunities to attempt challenges while managing anxiety, create an ideal environment for enhancing self-efficacy. In one of the largest meta-analytic reviews, Hattie et al. (1997) confirmed that outdoor adventure programmes positively influence self-efficacy.

Adventure education programmes have also demonstrated their ability to build resilience, the ability to bounce back when faced with challenges (Ahern, 2006; Fraser & Galinsky, 2004; Greenberg, 2006). An essential aspect of adventure education is exposure to challenges. Neill and Dias (2001) demonstrated that participation in a New Zealand outdoor education programme resulted in significant gains in resilience, suggesting that environments that provide opportunity to develop positive coping in the face of adversity (Catalano et al., 2004; Resnick et al., 1997) are promising avenues for building resilience.

Service learning programmes challenge participants to take on leadership roles in order to complete community projects. Service learning programmes share common links with adventure education programmes through providing experiential learning. By applying knowledge and skills to meaningful projects, participants' beliefs about their ability are enhanced (self-efficacy), and a sense of connectedness to the community can be strengthened (Waldstein & Reiher, 2001). Morgan and Streb (2001) found strong support for the positive effects of service learning on efficacy and personal competence when youth were given a voice in projects. However, in New Zealand, the term "service learning" is not common and there appears to be very few service learning programmes, so although showing promise, further exploration of service learning programmes is necessary before claims can be made regarding its impact on building assets.

Mentoring programmes are also effective for improving self-efficacy, resilience, and connectedness (Jekielek et al., 2002) through the development of a trusting relationship with a mentor who then works alongside a young person to encourage them to set and achieve challenging goals. As goals are achieved a sense of competence and mastery develops, encouraging youth to attempt more challenges. This, coupled with verbal feedback and encouragement from mentors, influences a young person's belief in their ability. Exposure to challenges with support from mentors provides youth with one-on-one opportunities, where

effective mentors provide role models and teach positive coping strategies and skills for reframing negative experiences into positive ones (Day, 2006). K.A. King et al. (2002) demonstrated positive effects of mentoring on self-esteem and positive connections to school, peers, and family. Resilience research has consistently identified the presence of a supportive and caring non-parental adult in the lives of youth who succeed despite adversity (Masten & Garmezy, 1985; Werner & Smith, 1992).

Project K outcomes

The present research examined changes in participants' self-efficacy, resilience, and connectedness to school over time. Results from the multilevel analysis confirmed that, although Project K participants started with lower self-efficacy levels than control group participants, as they progressed through the programme Project K participants' levels of self-efficacy overtook those of the comparison group. Although this study cannot prove that Project K caused this increase (due to limitations introduced by the non-equivalent design), these findings suggest that those participating in Project K were more likely to develop higher levels of self-efficacy compared to those not participating in the programme. Deane's (2012) robust evaluation of Project K students using RCT data clearly demonstrated positive programme effects on self-efficacy. Project K closely aligns with characteristics of effective youth development programmes through its core components of adventure education, service learning and mentoring, along with the use of evidence based outcome frameworks. Additionally, Project K's three core components incorporate the four identified sources of self-efficacy beliefs: past performance (mastery), vicarious experiences, verbal feedback, and physiological cues (Bandura, 1977a; Pajares, 1996; Pajares & Urdan, 2006). The present study provides further support for Project K's role in developing self-efficacy.

Over the course of the programme, participants in Project K experienced faster increases in resilience than those in the comparison group. This means that although Project K participants started with lower resilience levels, as they progressed through the programme their levels of resilience overtook those of their counterparts in the comparison group. The comparison group's resilience scores did not show a clear change over time. A ceiling effect for resilience is unlikely to explain the lack of change in the comparison group, as mean scores fell in the low to moderate range.

No prior research exists on the effectiveness of Project K on fostering resilience. However, numerous outdoor adventure courses, such as Outward Bound, have been well researched and shown to build resilience (Neill & Dias, 2001). As Project K incorporates an adventure education component similar to Outward Bound, this finding is not surprising. Furthermore, Project K's three core components tap into a number of processes that build resilience. In particular, the three-week Wilderness Adventure aims to foster resilience through providing challenges in the form of a unique environment combined with physically and interpersonally challenging activities. Participants are expected to set goals, solve problems, communicate effectively, and lead peers while being supported by trained instructors who provide optimum conditions through encouragement, support, feedback, and reflection. This enables participants to experience a sense of mastery and achievement in a positive and supportive environment (Rutter, 1987, 2000; Small & Memmo, 2004).

Unexpectedly, at the start of the programme the Project K group had higher connectedness to school scores and did not improve at a faster rate when compared to the comparison group. A number of factors may have contributed to this finding. Connectedness is enhanced through creating caring environments with quality relationships between staff and students and through providing access to opportunities outside of school (Blum, 2005; Bond et al., 2007). At the first data collection time point, Project K participants were aware that their school was offering the Project K programme and that they had been selected to participate. This knowledge may have increased feelings of connectedness to school prior to the completion of the first measurement, as participants may have felt that their school was engaged with and committed to supporting and offering opportunities for activities outside of the curriculum. Additionally, Project K participants may have already been aware that their teachers were providing additional academic support and time to ensure that participants did not miss important academic work. This requires further investigation.

Gender and Project K

Gender may impact on self-efficacy outcomes but the research findings to date have been at best inconclusive on the relationship between gender, and resilience, and connectedness to school. The current study indicated gender differences existed in self-efficacy, as females reported overall higher initial self-efficacy than males. To date, the only New Zealand research specifically investigating the relationship between gender and self-efficacy in a positive youth

development programme comes from the RCT evaluation completed by Deane (2012). These findings demonstrated that gender differences in self-efficacy consistently favoured females. Looking at the overseas literature, gender differences and self-efficacy have been extensively researched (Britner & Pajares, 2006; Carroll et al., 2009; Pajares, 1996; Vecchio et al., 2007). The literature indicates that during adolescence, self-efficacy generally declines at similar rates for males and females due to the increased academic and social demands associated with this developmental stage (Caprara, Steca, Gerbino, Paciello, & Vecchio, 2006; Vecchio et al., 2007), but females consistently report higher social self-efficacy during this stage of development (Bandura et al., 2001; Moore, 2005; Vecchio et al., 2007). Consequently, as the current study measured overall self-efficacy, it may be that females' social self-efficacy raised their overall levels, providing some explanation for the findings. Other forms of self-efficacy and their changes over time will need to be examined to explore this issue further. Although participants with higher initial levels of self-efficacy, both males and females, showed less increase over time than those with initially lower levels, they still showed improvements during participation in Project K, so this programme appears to have benefits for both males and females.

There were no significant differences between gender and levels of resilience at the start of the programme or in the rates of change over the 14 months. There is a paucity of New Zealand research into resilience and gender, while internationally the literature reports a steady decline in resilience during adolescence for females (Turner et al., 1995). Given this, it was expected that females may have demonstrated a larger decline in resilience over the course of the programme. However, this was not the case. A possible explanation comes from the relationship between resilience and self-efficacy. As females had higher levels of self-efficacy this may have boosted their levels of resilience to keep them at similar levels to boys, at a time when a decline would be expected. This would provide some explanation and understanding for the lack of gender differences. However, further exploration of this relationship is necessary before any definitive conclusions can be drawn.

Gender did not moderate the relationship between connectedness to school at the start of the programme and rate of change over the 14 months. Previous research on the relationship between connectedness and gender has been contradictory, with no clear pattern emerging (McGraw et al., 2008). A review of local literature could find no prior research in New Zealand

on the relationship between resilience and gender during adolescence and this relationship needs further investigation using longitudinal designs.

The sample size did not allow for an investigation of other moderating variables such as ethnicity, school decile and socioeconomic status. The New Zealand population is increasingly diverse, with an increase in those identifying as Asian, from 9.2% in 2006 to 11.8% of the population in 2013, and those identifying as Pasifika increasing from 6.9% in 2006 to 7.4% in 2013 (Statistics New Zealand, 2013). Research on the effects of positive youth development programmes with participants who are Māori and of other ethnicities is almost non-existent. A larger data set with equal numbers of participants in the groups and meaningful numbers of different ethnicities is required to draw relevant conclusions. This is important, as with different social and cultural contexts, research focusing on the effectiveness of Project K with participants with a range of demographics would significantly increase the evidence base.

While much research is still needed, the positive effects of Project K on self-efficacy and resilience suggest that positive youth development programmes can be an important intervention for building competence and positive beliefs, and fostering the ability to bounce back when faced with challenges. These assets are important contributors to adolescent well-being. The New Zealand Government recognises the importance of investing in youth well-being. In 2002 a reported was commissioned to identify issues impacting on the well-being of young New Zealanders and reviewed evidence from both New Zealand and elsewhere on the effectiveness of early interventions (Jacobsen et al., 2002). More recently, the *Youth'07: National survey of the health and well-being of New Zealand secondary school students* report identified youth well-being as a key area of focus for government (Denny et al., 2011). Building on this earlier work, Jansen et al. (2011) on behalf of the Youth Advisory Group identified two key outcomes from the Positive Youth Development Aotearoa framework to ensure that the focus remained on promoting well-being. First, the priority for 'developing the whole person' incorporates providing connections, prosocial relationships, self-efficacy, a sense of belonging, and spiritual identity. Second, 'developing connected communities' takes an ecological view of youth development, which recognises that youth need to be connected to family, community, and schools and to have opportunities to use their strengths, assets and resources. Not only do these reports highlight the importance the government places on improving adolescent well-being, they provide impetus for further research to build on the current findings on the effectiveness of

interventions such as Project K, which aim to promote these key outcomes as an avenue for improving youth well-being.

Research strengths and contributions to existing evidence base

The current study has a number of strengths. Adolescence is a time of change in many domains and it was important to select a comparison group that was closely matched on age. Participants in both groups were 13 – 14 years old at the start of the study, which ameliorated some potentially confounding variables associated with age. Use of an age-matched comparison group reduced the likelihood that changes could be attributed to other explanations, such as maturity.

A further strength was the longitudinal design, which gives grounds for arguing that Project K had a role in improving self-efficacy and resilience. The design measured scores at multiple time points, so that participants' initial status as well as rates of change could be accounted for. The use of multilevel analysis meant that missing data and unbalanced data sets presented no difficulties. When conducting research in real world settings, participants are often missing from at least one of the data collection points. The current study was no different and a number of participants were absent for at least one wave of measurement. The flexible approach to analysis meant that all data (six waves for the Project K group; four waves for the comparison group) could be included in the final sample.

This appears to be the first New Zealand-based investigation of a youth development programme in relation to resilience, self-efficacy, and connectedness to school. Prior research has shown that self-efficacy is one of the best predictors of psychological well-being (Vecchio et al., 2007). This would imply that a programme which improves self-efficacy is likely to have positive effects on other areas of functioning (Fraser & Galinsky, 2004). In addition, this research is one of only two studies (see Deane, 2012) to investigate a New Zealand positive youth development programme made up of multiple components. Empirical research in New Zealand on positive youth development programmes has largely focused around adventure education in the form of Outward Bound (Carter et al., 2007; Ewert & Yoshino, 2007; Neill & Dias, 2001). As highlighted by Farruggia et al. (2010) in a large scale review of New Zealand mentoring programmes, few quality reviews exist. There do not appear to be any New Zealand evaluations of programmes that include a community component, or the three components of outdoor adventure education, community connectedness, and mentoring (Catalano et al., 2004).

This research makes a solid contribution towards this goal, although there remains a significant lack of longitudinal research on positive youth development programmes in New Zealand.

Limitations and directions for future research

Threats to validity prevent drawing the conclusion that Project K *caused* the changes in the study variables, and the two groups were not directly comparable in initial self-efficacy. Project K participants were selected partly based on their low initial self-efficacy scores, while this criterion was not applied to participants who volunteered to be part of the comparison group. Although attempts were made to match the comparison group as closely as possible on age, matching on other variables, such as gender and school decile as well as self-efficacy, would have enabled more control. Non-equivalent groups can create threats to internal validity as it is possible that pre-existing differences may account for group differences at the end of the study. In particular, as Project K participants had lower initial self-efficacy on average, and as those with low scores showed the greatest rate of change, it is possible that the improvements in self-efficacy for the Project K group in comparison to the control group may be over-stated. Although the current study aimed to minimise threats to internal validity, future research will need to address this issue by aiming for more comparability between groups, perhaps by use of a wait-list control. Ways to minimise threats to internal validity need to be considered in future studies and these are discussed in the section on considerations for future research.

Applied research in real world settings brings with it a number of practical limitations. The programmes in the current study were all run by different programme directors and staff and this could affect the focus and exposure given to different components of the programme. Motivation amongst participants may also vary, with some being more engaged and motivated than others. To boost motivation, the researcher met with parents and potential participants at the introduction meetings to highlight the importance of research for FYD to access funding for future programmes. Programme motivation and engagement would be worthwhile variables to include in future studies.

The programme directors for the four Project K cohorts and the comparison group ran their programmes on different data collection schedules, and data collection approaches could vary across sites. This may have introduced bias in the form of history effects, in which different groups may have been affected by significant events. In an attempt to address some of these

issues the researcher met with each of the programme directors to explain the study and the data collection procedures but exposure to different experiences cannot be ruled out.

Further practical constraints included time and funding. In the current study an external timeframe was imposed on data collection to meet the requirements of the programme of study. Data collection had to be completed within a two year timeframe. This constraint is important to note as Project K runs for 14 months, which gave a very small period of time to set up the study, and did not allow for examination of longer term outcomes or for a randomised control trial. These considerations also gave rise to the relatively modest sample size. Future research with larger samples is called for. A larger sample would also allow for multivariate analyses to explore interactions between the dependent variables. This would enable the investigation of inter-relationships between resilience, self-efficacy, connectedness to school, and school performance.

The self-efficacy measure was specifically designed for a New Zealand population and to date has been subject to very few validation studies. Additional validation studies would provide more evidence for the reliability, factor structure, and validity of the PKSEQ. In addition, although the HACS measure is based on solid theory and validation studies report strong psychometric properties (Karcher, 2001, 2006, 2009; Karcher & Lee, 2002; Karcher & Sass, 2008, 2010), more research is required on its validity for New Zealand adolescents.

A further avenue for investigation is long-term follow-up to determine whether changes were maintained post programme and whether they were related to other outcomes. For example, participants who demonstrated a positive change trajectory over time in resilience and self-efficacy may engage in an increased number of positive behaviours at follow-up, but this has not been examined.

Implications for practice and future directions

Project K targets youth who are moderately ‘at risk’. DuBois et al. (2011) note that mentored youth who are moderately at risk tend to experience increased benefits from mentoring programmes when compared to youth in the low and high risk ranges. As Project K includes a significant mentoring component, targeting moderate risk youth appears to be filling an important gap in order to meet the needs of youth who are most likely to benefit from this type of intervention.

The study has provided information that may assist The Foundation for Youth Development and similar organisations to advocate for and obtain increased funding to invest in this important area. Youth at moderate risk are often omitted from research and may lack access to the support they need. Much research and many intervention programmes have tended to focus on 'high risk' youth, with good reason, but leaving a gap in service provision. Given that improving youth outcomes has positive implications for longer-term outcomes in adulthood, additional funding will mean a solid investment in robust, preventive, and proactive programmes for all young New Zealanders. This research provides evidence-based support for intervention programmes that support the international shift towards strengths-based preventative approaches to working with youth.

On a broader scale, this study demonstrates the importance of building strengths in young people. Many young people may not have access to positive youth development programmes but there are a number of implications for those concerned about the well-being of young people. To maintain self-efficacy, resilience, and connectedness, youth who are not taking part in Project K can learn goal-setting skills and apply these skills to achieve meaningful activities in their lives. Young people can attend outdoor adventure education courses to help build confidence and take part in formal and informal mentoring partnerships to increase their connectedness to others (Brendtro & Strother, 2007; Ewert & Yoshino, 2007; Paxton & McAvoy, 1998). Although each component of Project K was not assessed individually, there is now a significant body of literature on interventions that include adventure education, service learning, and mentoring, and the relationship of these interventions to the development of resilience, protective factors, and developmental assets. Mentoring programmes are widely available in New Zealand. Many of these programmes match an adolescent with an adult outside their family who can assist in setting and achieving goals. Having a trusted adult outside of the family has been shown to be beneficial to academic performance, relationships with parents, self-efficacy, and connectedness to peers and parents (DuBois et al., 2002; Jekielek et al., 2002). There are numerous, easy to access mentoring programmes in New Zealand. For more details and a review of mentoring programmes in New Zealand see Farruggia et al. (2010) and Dunphy et al. (2008). For more information on adventure education courses in New Zealand, see the resource section at www.fyd.org.nz.

Conclusion

Programmes like Project K aim to help young people reach their full potential through building self-confidence, teaching essential life skills, such as goal setting and team work, and promoting good health and a positive attitude. The current study has made a significant contribution to the positive youth development literature. This study is one of the first of its kind in New Zealand and has provided evidence that positive youth development programmes combining adventure education, community connectedness, and mentoring components may be related to improvements in self-efficacy, resilience, and connectedness in young people. This lays a foundation for future research on positive youth development programmes in New Zealand. These findings highlight the important role of research in furthering our understanding of effective positive youth development programmes and may inspire other researchers to continue building a strong evidence base that can inform programme development.

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Appendix A

FOUNDATION FOR YOUTH DEVELOPMENT

24 May 2010

To whom it may concern

Research Project: Resilience, self-efficacy, and connectedness: Changes in protective factors with Project K students

Most New Zealand youth make the transition from childhood successfully; however a large number experience some degree of difficulty. For example, New Zealand youth have high rates of unplanned pregnancy, and more deaths and injury from motor vehicle accidents than any other age group. Research has shown that negative outcomes can be avoided if there is an intervention point before patterns of behaviour become engrained.

Project K is a Foundation for Youth Development programme that aims to be a catalyst for positive change in the lives of New Zealand youth. Project K helps young people develop the skills, values, attitudes, and knowledge necessary to succeed in life. The programme has three components; the selected students attend a 3-week residential wilderness adventure, a non-residential 10-day Community Challenge, and are then paired for 12 months with a mentor. Previous research has shown Project K to be effective in improving self-efficacy, an individual's personal judgement of his or her own ability to succeed in reaching specific goals. The self-efficacy beliefs of Project K participants have been found to increase from pre to post-programme more so than those of a similar group of control students, an increase that was sustained one year post programme.

In 2010, Kirsty Furness will be carrying out a research project investigating the protective factors of self-efficacy, resilience, and connectedness in a group of Year 10 Project K students. Kirsty Furness is carrying out the study for her Doctor of Clinical Psychology thesis. The project will add to the current knowledge on Project K by examining the affect of the programme on resilience and protective factors in adolescence. Participants will be recruited from Project K programmes starting at the end of 2010. They will be asked to complete a quantitative survey pre programmme, post-programme and after completing core components of the programme.

One of the strategic goals of the Foundation for Youth Development is to be at the cutting edge of research and evaluation. FYD fully supports this research project, which will add to the existing body of knowledge on intervention programmes targeted at enhancing protective factors and resilience in adolescence. This research project will also provide support for the international move towards the strengths based preventative approach to working with youth.

Yours sincerely

JMoore

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Research and Evaluation Manager

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FOUNDATION FOR YOUTH DEVELOPMENT

11th March 2011

To whom it may concern,

Research Project: Resilience, self-efficacy, and connectedness: Changes in protective factors with Project K students
Researcher: Kirsty Furness

Following recent discussions between FYD, Kirsty, and her supervisors the following amendments to her research project were proposed. These proposed amendments are strongly supported by FYD.

1. Include programme evaluation data currently held by FYD on students' experiences and outcomes. This includes information on participant engagement, facilitator support, and the quality of the mentoring relationship.

FYD feels that the current information and consent process covers the inclusion of these variables in Kirsty's research project. In collaboration with the University of Auckland, FYD have developed ethical guidelines, participant information sheets, and consent forms in line with University wide models for the ethical review of research involving human participants. Data on participant experiences and outcomes such as engagement, facilitator support, and the quality of the mentoring relationship are collected by FYD as part of current process and outcome evaluation, for which informed consent was obtained at the start of the programme. Code numbers are used to protect students' privacy and it will not be possible to identify an individual student in any evaluation reports.

2. Include an additional two data collection time points, to increase the power of the research and provide FYD with additional information on programme outcomes.

Kirsty and FYD's National Support Office staff have worked closely with our community partners to arrange the proposed additional data collection points during two existing meeting times, which will ensure the least amount of inconvenience and disruption to Project K students and staff.

Examining the link between resilience, self-efficacy, connectedness and factors that may influence individual outcomes, will add to our understanding of how and why Project K works to enhance protective factors in our students. Ultimately, the findings will enable us to improve Project K content and outcomes for our students.

We are pleased to continue to work with Kirsty who has worked inclusively with the Foundation for Youth Development (FYD) during her research project and we look forward to continuing our collaboration with Kirsty and Massey University.

Yours sincerely,

Julie Moore
Research and Evaluation Manager

Foundation for Youth Development – National Support Office
PO Box 305 474, Triton Plaza, North Shore 0632
P 09 477 6237 F 09 478 3105 E office@fyd.org.nz W fyd.org.nz

Appendix B

OFFICE OF THE REGIONAL CHIEF EXECUTIVE
Māori Strategic & Development Unit
Building 18, Ōtehā Rōhe Campus
Wharerata Pl, Gate 5, Albany Highway
Private Bag 102 904, NSMC
Auckland 0745
T 09 443 9561
F 09 443 9781
msdu@massey.ac.nz
www.massey.ac.nz

Tuesday 11 May 2010

Kirsty Turness
Doctoral Student
School of Psychology
Level 3 North Shore Library Building
Massey University Albany
229 State Highway 17
Albany Village

Tēnā koe Kirsty

I have read through your ethics application regarding your intentions to undertake research emerging from the apparent need within the strengths-based paradigm to enhance protective factors of adolescent students through intervention programmes. Enhancing protective factors in adolescents is linked to "positive adaption" in times of stress. Research has shown that when protective factors such as resilience are low this correlates with low self-efficacy, low self-esteem, increased risk of mental illness, lower levels of connectedness (social support/relatedness), lower levels of persistence, poorer adaption and, less effective coping.

I note that you have advised that there is a strong likelihood that engagement with Maori may be likely and that you have acknowledged all participants will be fully informed and their individual consent obtained prior to participating in your research. I have provided some advice in how to gain the confidence of Maori students and hope this will enable to facilitate your engagement process with Maori students.

Should you encounter any specific cultural concerns during your research; I would encourage and welcome you to contact me in the first instance for help and advice or Dr Lily George – L.George@massey.ac.nz

It would be advantageous if you would consider forwarding a copy of your findings to the Foundation for Youth Development and Te Puni Kokiri.

I wish you well in your research and hope your journey is enjoyable and rewarding, I know this research will be very beneficial to Māori and Pasifika peoples.

Nāku noa, nā

Donald Ripia
Kaiwhakahaere
Senior Manager for Maori (Albany)

Email: d.ripia@massey.ac.nz
Work DDI: 09 443 9789
Mobile Ph: 027 475 5295

Massey University

OFFICE OF THE REGIONAL CHIEF EXECUTIVE
Māori Strategic & Development Unit
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Thursday 6 August 2010

Kirsty Furness
Doctoral Student
School of Psychology
Level 3 North Shore Library Building
Massey University Albany
229 State Highway 17
Albany Village

Tēnā koe Kirsty

I have read through your ethics application regarding your intentions to undertake research emerging from the apparent need within the strengths-based paradigm to enhance protective factors of adolescent students through intervention programmes. Enhancing protective factors in adolescents is linked to "positive adaption" in times of stress. Research has shown that when protective factors such as resilience are low this correlates with low self-efficacy, low self-esteem, increased risk of mental illness, lower levels of connectedness (social support/relatedness), lower levels of persistence, poorer adaption and, less effective coping.

I also note that you have to make another ethics application regarding interviews with another school that isn't participating in Project K. Although in this instance, you have advised me that engagement with Māori may be minimal it is advised once again that all participants will be fully informed and their individual consent obtained prior to participating in your research. I have already provided some advice in how to gain the confidence of Maori students and hope this will enable you to facilitate your engagement process with Maori students.

Should you encounter any specific cultural concerns during your research; I would encourage and welcome you to contact Dr Lily George – L.George@massey.ac.nz in the first instance as she will be taking on this role.It would be advantageous if you would consider forwarding a copy of your findings to the Foundation for Youth Development, Ministry of Social and Youth Development as well as Te Puni Kokiri. I wish you well in your research and hope your journey is enjoyable and rewarding, I know this research will be very beneficial to Māori and Pasifika peoples.

Nāku noa, nā

Donald Ripia
Kaiwhakahaere
Senior Manager for Māori (Albany)

Email: d.ripia@massey.ac.nz
Work DDI: 09 443 9789
Mobile Ph: 027 475 5295

Appendix C

MASSEY UNIVERSITY
ALBANY

25 June 2010

Kirsty Furness
c/- Dr D Gardner
College of Humanities and Social Sciences
Massey University
Albany

Dear Kirsty

HUMAN ETHICS APPROVAL APPLICATION – MUHECN 10/045
"Resilience, Self-efficacy, and Connectedness: Changes in protective factors with Project K students"

Thank you for your application. It has been fully considered, and approved by the Massey University Human Ethics Committee: Northern.

Approval is for three years. If this project has not been completed within three years from the date of this letter, a reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Dr Ralph Bathurst
Chair
Human Ethics Committee: Northern

cc: Dr D Gardner
College of Humanities and Social Sciences

Te Kunenga ki Pūrehuroa
Office of the Assistant to the Vice-Chancellor (Research Ethics)
Private Bag 102 904, North Shore City 0745, Auckland, New Zealand Telephone +64 9 414 0800 ex 9539
humanethicsnorth@massey.ac.nz

MASSEY UNIVERSITY
ALBANY

6 September 2010

Kirsty Furness
c/- Dr D Gardner
College of Humanities and Social Sciences
Massey University
Albany

Dear Kirsty

HUMAN ETHICS APPROVAL APPLICATION – MUHECN 10/064

"Resilience, Self-efficacy, and Connectedness: Changes in protective factors with Project K students: Control Group"

Thank you for your application. It has been fully considered, and approved by the Massey University Human Ethics Committee: Northern.

Approval is for three years. If this project has not been completed within three years from the date of this letter, a reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Dr Ralph Bathurst
Chair
Human Ethics Committee: Northern

cc: Dr D Gardner
College of Humanities and Social Sciences

Te Kunenga ki Pūrehuroa
Office of the Assistant to the Vice-Chancellor (Research Ethics)
Private Bag 102 904, North Shore City 0745, Auckland, New Zealand Telephone +64 9 414 0800 ex 9539
humanethicsnorth@massey.ac.nz

Appendix D

Memorandum of Understanding

Between The Foundation for Youth Development and Massey University.

This understanding covers the research to be conducted by Kirsty Furness for her Doctor of Clinical Psychology thesis, through the School of Psychology, under the supervision of Dianne Gardner and Paul Merrick. Her research aims to investigate protective factors of self-efficacy, resilience, and connectedness of Year 10 students taking part in Project K, using two quantitative surveys.

Participants will complete a survey relating to self-efficacy, resilience, and connectedness at four time points during the 14 month programme. The survey will be completed prior to starting the first core component and then after completion of each of the three core components. Participants will also complete another survey on subjective wellbeing at two time points. The survey will be completed prior to staring the first core component and on completion of the final core component.

The Foundation for Youth Development (FYD) and Massey University agree that:

1. The research will be conducted as outlined in the ethics application titled Resilience, Self-efficacy, and Connectedness: Changes in protective factors with Project K students (Ref # **MUHECN 10/045B**) attached. This application was approved by the Massey University Human Ethics Committee on 10th June 2010.

2. FYD agrees to notify and facilitate Kirsty Furness' attendance at Project K meetings to allow access to students who are taking part in Project K.

3. Kirsty Furness will not copy any FYD materials or use them for any other purpose than to design, conduct and write up the research.

4. Kirsty Furness has the full rights to use the data and results of the analysis to publish any findings for her doctoral thesis, scholarly papers, and conference presentation. The role of FYD will be fully acknowledged.

5. Kirsty Furness undertakes to write a summary report specifically for FYD on the findings of her research on the completion of the data analysis.

6. The researchers have the right to publish any findings from the data analysis in another outlet or talk about the results at a conference, with the media or in any other public forum after obtaining consensus from FYD regarding the way the research is presented. An appropriate

person from FYD will be invited to take an authorship role if this allowed by the outlet concerned. In order to an author on any studies, the person from FYD will need to be involved in the writing process. However, this will need to be done in a timely fashion so as not to impede the dissemination of the report. Where FYD is not involved as an author the presentation will acknowledge the source and contribution of FYD.

7. FYD have the right to use any findings resulting from the research for marketing and fundraising purposes upon reaching consensus with Kirsty Furness, Dianne Gardner, and Paul Merrick regarding the way the research is to be presented. Any roles that Massey University has had in the research process will be fully acknowledged in these communications.

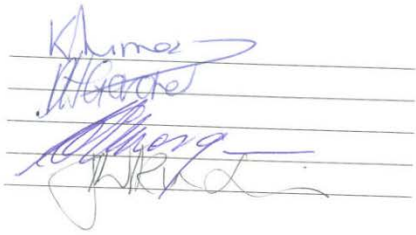
8. Regardless of input from any party, oral and written reports of findings will be open, direct and honest in their disclosure, including limitations, in order to maintain the integrity of the research.

9. The summary of findings will be produced by Kirsty Furness as a representative of Massey University and given to FYD/Project K who will own it thereafter.

10. Kirsty Furness undertakes to communicate with FYD Research and Evaluation Manager (Julie Moore) and/or the Executive trustee (Jo-anne Wilkinson) to ensure FYD are kept fully informed about her research.

11. Regardless of any personnel changes within FYD or those involved from Massey University during the time of the study, the research will continue according to the guidelines outlined in this document.

Signed by:



Doctoral student

Supervisor

Supervisor

Massey University Head of School of Psychology

FYD Representative

Appendix E

MASSEY UNIVERSITY
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www.massey.ac.nz

1 September 2010

Name
Address line 1
Address line 2
Suburb
City

Re: Resilience, Self-efficacy, and Connectedness study - Initial Information for Schools

Dear Name,

Thank you for considering having (School name) students participate in the Resilience, Self-efficacy, and Connectedness research project. I have included some information about the project below, and attached versions of the information sheets and consent forms we could use to inform the children and parents at the school about the project – and allow them to refuse consent if they choose to.

Nature of research proposed

This study is looking at the strengths of resilience (bouncing back), self-efficacy (self-belief), and connectedness (social support) in Year 10 students; enhancing strengths can help protect adolescents. This is an important issue for New Zealand: research indicates developing strengths like resilience, self-efficacy and connectedness in youth is linked to "positive adaption" thereby avoiding some of the possible negative outcomes youth experience in New Zealand.

This study is part of a larger research study with Project K. Project K is a program which aims to be a catalyst for positive change in student's lives, through helping them develop skills, values, attitudes, and knowledge necessary to succeed in life. Although you may never have heard of it we need students from schools who are not part of Project K to help us.

The data from this study will be compared with data of students who are taking part in a Project K program to determine if there are any differences in the scores between the two groups.

What it involves

Ideally, the survey would be administered in the classroom in pen and paper form. Administration of the questionnaire should only take about 15 minutes and would be completed four times over 14 months, so disruption to class schedules would be reasonably small. We do not anticipate that completing the survey will have any distressing effect on children, the survey looks at strengths and does not include any requests for sensitive information, and information will be kept confidential.

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Ethics approval status

This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 10/064. If you have any concerns about the conduct of this research, please contact Dr Ralph Bathurst, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 9570, email humanethicsnorth@massey.ac.nz.

Parental consent procedure

For students to participate in this study, their parent or caregiver will need to agree for the student to take part and to complete a Consent Form.

Benefits to the school and students

We will give each student who completes all the surveys a voucher for an outdoor adventure course, which is similar one of the parts of Project K, to say thank you. We will give the school a summary of the findings and some suggestions and recommendations on how to build strengths in students. Additionally, research such as this will allow programs like Project K to undertake continuous assessment to ensure the program's effectiveness to help make positive changes in New Zealand's youth.

Attachments

- Information sheet for children
- Information sheet for parents
- Parents' consent form
- Student consent form
- A copy of the survey

We would be very interested in any feedback or comments you have about the study. If you have any questions about our proposed study, please do not hesitate to contact either myself or Dr Dianne Gardner.

Kind regards,

Kirsty Furness

Doctoral Candidate, School of Psychology
Albany Campus, Massey University
Phone 021 482 458

Dr Dianne Gardner

Senior Lecturer, School of Psychology
Albany Campus, Massey University
09 414 0800 Ext. 41225

Appendix F

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INFORMATION SHEET for Parents

Resilience, self-efficacy, and connectedness with Project K

My name is Kirsty Furness and I am a psychology doctoral student at Massey University and a former Project K volunteer mentor. I would like to tell you about some research we are doing with Project K. This research is looking at changes to resilience (bouncing back), self-efficacy (self-belief), and connectedness (social support) of school students who are taking part in Project K. We would like to invite your child to take part in this voluntary study. If you accept this invitation your child will be asked to complete some paper and pencil surveys, as they complete the three different parts of the Project K programme.

This study is voluntary.

It is your choice whether you are willing for your child to take part in this study or not. If you agree, they can withdraw at any stage without having to give a reason and this will not affect their participation in Project K. Please feel free to talk with me or a friend or family member if you need help to make the decision. You can ask questions about the study at any time.

What does it involve?

If you are willing for your child to be part of this study, then you child will do some surveys at four time points during the 14 month period. There will be two surveys to complete before Project K starts, two surveys when they finish Project K, and one survey after the Community Challenge and Mentoring parts. The surveys ask about resilience, self-efficacy, connectedness and wellbeing. The surveys will only take about 15 minutes.

How were people selected for this study?

Your child has been invited to participate in this study because they are doing the Project K programme. For your child to participate in this study, as their parent or caregiver you will need to agree to this and to complete a Consent Form.

Are there any benefits or risks?

We will give you feedback on changes your child has made over the 14 months as well as some suggestions and tips for maintaining the strengths they have developed. Research such as this will allow Project K to undertake continuous assessment to ensure the programme's effectiveness.

What will happen to the information collected?

The surveys will be kept confidential and used for research purposes only. The surveys will be coded once they have been handed to the researcher and your child's name will be replaced with a number. We will keep information in a secure place, and only those who are part of the research team will be able to see it. The survey data will be used to measure change over time but will not identify any person by name. We will store the information for five years and after this time it will be securely destroyed.

What are your child's rights as a participant?

If you are willing for your child to be part of this study, it is you and your child's choice to accept this invitation. If you and your child decide to take part, you child will be able to:

- decide not to answer any particular question
- withdraw from the study at any time
- ask any questions about the study
- Confidentiality - your child's name will be replaced with a number
- be told about what we found out when the project is finished (if you would like us to send you what we find out please give Kirsty your details on the Consent Form)

If you would like more information about the study, please feel free to contact one of us:
Kirsty Furness: 021 482 458 or Dr Dianne Gardner: 09 414 0800 Ext. 41225

Thank you for reading this letter. We hope you and your child will help.

Kirsty Furness
Doctoral Candidate

Dianne Gardner, PhD
Senior Lecturer

Committee Approval Statement
This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 10/045. If you have any concerns about the conduct of this research, please contact Dr Ralph Bathurst, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 9570, email humanethicsnorth@massey.ac.nz.

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INFORMATION SHEET for Students
Resilience, self-efficacy, and connectedness with Project K

We would like to tell you about some research we are doing with Project K. We need students like you who are part of Project K to help us see if there are some changes before, during and after Project K.

This research is about looking at how programs like this can help make positive changes in your life. Looking at the students answers to the survey will help us decide which parts of Project K can help make changes. We are asking students in your Project K group to help us by filling out two surveys. You can see what the surveys will cover in the boxes below.

Survey One	Will have some questions about bouncing back from setbacks (resilience), your belief in yourself (self-efficacy), and social support (connectedness).
Survey Two	Will have some questions about quality of life.

Please have a talk with your parents, and think about whether you're ok with helping out. We will be visiting your Project K group just before you start the Wilderness Adventure so you have at least a week to decide!

We have talked to Project K about our study, and if you're happy to help, you can fill out the surveys during Project K meetings. You will be asked to fill in the surveys 4 times over the 14 months you are taking part in Project K. The surveys we give you will be paper and pencil and won't take long.

We would really like your help, but when we visit your Project K group it's okay to say no!
If you decide to fill out our surveys, you will have the right to:

- Decide not to answer any particular question
- Stop filling out the survey
- ask any questions about the study
- confidentiality - your name will be replaced with a number
- be told about what we found out when the project is finished (if you would like us to send you what we find out please give Kirsty your details on the Consent Form)

We will give Project K feedback that could help improve the program for other students like you. We will also give you feedback about what changes you have made over the 14 months and some suggestions and tips to help you keep the positive changes.

If you would like more information about the study, please feel free to contact one of us:
Kirsty Furness: 021 482 458 or Dr Dianne Gardner: 09 414 0800 Ext. 41225

Thank you for reading this letter. We hope you will help.

Kirsty Furness and Dr Dianne Gardner

Committee Approval Statement
This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 10/045. If you have any concerns about the conduct of this research, please contact Dr Ralph Bathurst, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 9570, email humanethicsnorth@massey.ac.nz.

Massey University
CENTRE FOR PSYCHOLOGY, ALBANY

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Student Consent Form

Resilience, Self-efficacy, and Connectedness with Project K

I have read and I understand the information sheet (dated June 2010) for taking part in the study about self-efficacy, resilience and connectedness with Project K students. I understand what is being asked of me, I have had time to talk with others about this study, and I am satisfied with the answers I have been given.

I understand that taking part is my choice and that I may withdraw from the study at any time and it will in no way affect me continuing to take part in Project K.

I know who to contact if I have any questions about the study.

I (potential participants full name)_____ consent (agree) to taking part in this study.

Signature (potential participant): _____

Please send me a summary of the findings Address or email:	YES/ NO

Massey University
CENTRE FOR PSYCHOLOGY, ALBANY

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Parent Consent Form

Resilience, Self-efficacy, and Connectedness with Project K

I have read and I understand the information sheet (dated June 2010) for participants taking part in the study about self-efficacy, resilience and connectedness with Project K students. I understand what is being asked of my child and I have had the opportunity to discuss this study with my child. I have had the opportunity to ask questions and I am satisfied with the answers I have been given.

I understand that participation is voluntary (our choice) and that my child may withdraw from the study at any time and that, should this occur, it will in no way affect my child's continuing participation in Project K. I understand that my child's agreement is necessary for their participation in the study.

I know who to contact if I have any questions about the study.

I (parents full name)_____ hereby consent to my child (full name) _____taking part in this study.

Signature (or proxy consent): _____

Please send me a summary of the findings Address or email:	YES/ NO

Appendix G

MASSEY UNIVERSITY
CENTRE FOR PSYCHOLOGY

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INFORMATION SHEET for Parents

Resilience, self-efficacy, and connectedness with Project K

My name is Kirsty Furness and I am a psychology doctoral student at Massey University. I would like to tell you about some research we are doing with Project K. This research is looking at changes to resilience (bouncing back), self-efficacy (self-belief), and connectedness (social support). Project K is a program which aims to be a catalyst for positive change in student's lives, through helping them develop skills, values, attitudes, and knowledge necessary to succeed in life. Although you may never have heard of Project K we need students like your child who is not part of Project K to help us to see if there are any changes between the groups. We would like to invite your child to take part in this voluntary study. If you accept this invitation your child will be asked to complete some paper and pencil surveys.

This study is voluntary.

It is your choice whether you are willing for your child to take part in this study or not. If you agree, they can withdraw at any stage without having to give a reason. Please feel free to talk with me or a friend or family member if you need help to make the decision. You can ask questions about the study at any time.

What does it involve?

If you are willing for your child to be part of this study, then you child will complete surveys at four time points during the 14 month period, which will take about 15 minutes.

Survey One	Will have some questions about bouncing back from setbacks (resilience), your belief in your-self (self-efficacy), and social support (connectedness).
Survey Two	Will have some questions about quality of life.

How were people selected for this study?

Your child has been invited to participate in this study because their school has agreed to be part of this research. For your child to participate in this study, as their parent or caregiver you will need to agree to this and to complete a Consent Form and return it to the school within two weeks.

Are there any benefits or risks?

If your child completes the research we will give them a voucher for an outdoor adventure course, which is similar one of the parts of Project K, to say thank you, and we will give you a summary of findings. Research such as this will allow programs like Project K to undertake continuous assessment to ensure the program's effectiveness to help make positive changes in New Zealand's youth.

What will happen to the information collected?

The surveys will be kept confidential and used for research purposes only. The surveys will be coded once they have been handed to the researcher and your child's name will be replaced with a number. We will keep information in a secure place, and only the researcher and her supervisors Dr. Dianne Gardner and Dr. Paul Merrick will be able to see it. The survey data will be used to measure change over time but will not identify any person by name. We will store the information for five years and after this time it will be securely destroyed.

What are your child's rights as a participant?

If you are willing for your child to be part of this study, it is you and your child's choice to accept this invitation. If you and your child decide to take part, you child will be able to:

- decide not to answer any particular question
- withdraw from the study at any time
- ask any questions about the study
- Confidentiality - your child's name will be replaced with a number
- be told about what we found out when the project is finished (if you would like us to send you what we find out please give Kirsty your details on the Consent Form)

If you would like more information about the study, please feel free to contact one of us. Thank you for reading this letter. We hope you and your child will help.

Kirsty Furness
Doctoral Candidate
021 482 458

Dianne Gardner, PhD
Senior Lecturer
09 414 0800 Ext. 41225

Committee Approval Statement
This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 10/064 If you have any concerns about the conduct of this research, please contact Dr Ralph Bathurst, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 9570, email humanethicsnorth@massey.ac.nz.

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INFORMATION SHEET for Students
Resilience, self-efficacy, and connectedness with Project K

We would like to tell you about some research we are doing with Project K. This research is looking at changes to resilience (bouncing back), self-efficacy (self-belief), and connectedness (social support). Project K is a program which aims to make positive change in student's lives, through helping them develop skills, values, attitudes, and knowledge to succeed in life. Although you may never have heard of Project K we need students like you to help us see if there is any change.

Looking at the student's answers to the survey will help us decide if programs like Project K can help make positive changes. We are asking students in your class to help us by filling out two surveys. You can see what the surveys will cover:

Survey One	Will have some questions about bouncing back from setbacks (resilience), your belief in your-self (self-efficacy), and social support (connectedness).
Survey Two	Will have some questions about quality of life.

Please have a talk with your parents, and think about whether you're ok with helping out. We will be visiting your school in two weeks to drop off the surveys so you have at least two weeks to decide.

We have talked to your school about our study, and if you're happy to help, you can fill out the surveys at school. You will be asked to fill in the surveys 4 times over the 14 months. The surveys we give you will be paper and pencil and won't take long.

We would really like your help, but it's okay to say no!
If you decide to fill out our surveys, you will have the right to:

- decide not to answer any particular question
- stop filling out the survey
- ask any questions about the study
- confidentiality - your name will be replaced with a number
- be told about what we found out when the project is finished (if you would like us to send you what we find out please give Kirsty your details on the Consent Form)

If you complete the research we will give you a voucher for an outdoor adventure course to say thank you. We will also give you a summary of the findings and some suggestions and tips to help you keep the positive changes.

If you would like more information about the study, please feel free to contact one of us:

Kirsty Furness: 021 482 458 or Dr Dianne Gardner: 09 414 0800 Ext. 41225

Thank you for reading this letter. We hope you will help.

Kirsty Furness and Dr Dianne Gardner

Committee Approval Statement
This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application 10/064. If you have any concerns about the conduct of this research, please contact Dr Ralph Bathurst, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800 x 9570, email humanethicsnorth@massey.ac.nz.

Massey University
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Student Consent Form

Resilience, Self-efficacy, and Connectedness with Project K

I have read and I understand the information sheet (dated June 2010) for taking part in the study about self-efficacy, resilience and connectedness with Project K students. I understand what is being asked of me, I have had time to talk with others about this study, and I am satisfied with the answers I have been given.

I understand that taking part is my choice and that I may withdraw from the study at any time and it will in no way affect me at school.

I know who to contact if I have any questions about the study.

I (potential participants full name)_____ consent (agree) to taking part in this study.

Signature (potential participant): _____

Please send me a summary of the findings Address or email:	YES/ NO

Massey University
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Parent Consent Form

Resilience, Self-efficacy, and Connectedness with Project K

I have read and I understand the information sheet (dated June 2010) for participants taking part in the study about self-efficacy, resilience and connectedness with Project K students. I understand what is being asked of my child and I have had the opportunity to discuss this study with my child. I have had the opportunity to ask questions and I am satisfied with the answers I have been given.

I understand that participation is voluntary (our choice) and that my child may withdraw from the study at any time and that, should this occur, it will in no way affect my child at school. I understand that my child's agreement is necessary for their participation in the study.

I know who to contact if I have any questions about the study.

I (parents full name)_____ hereby consent to my child (full name) _____taking part in this study.

Signature: _____

Please send me a summary of the findings Address or email:	YES/ NO

Appendix H

Date _____

Name _____

After you complete this survey your name will be removed and replaced with a code number which is used to protect your privacy. This is not a test and there are no right or wrong answers. Your opinions are important to us. Your answers will help guide the development of a programme which is designed to help young people.

It is very helpful if you please answer every question. You will be asked to check your survey to make sure it is complete before handing it in.

Project K Self-efficacy Questionnaire

Please rate how well you can do the things below by circling one number for each question, using a pencil or black pen. "1" means you cannot do it at all well and "6" means you can do it very well. We are interested in your honest response. There is no right or wrong answers.

	Not well at all			Quite well		Very well
How well can you study when there are other interesting things to do?	1	2	3	4	5	6
How well can you express your opinions when your classmates disagree with you?	1	2	3	4	5	6
How well can you study for a test?	1	2	3	4	5	6
How well can you become friends with other people?	1	2	3	4	5	6
How well can you get adults to help you with a problem?	1	2	3	4	5	6
How well can you succeed in finishing all your homework?	1	2	3	4	5	6
How well can you have a chat with an unfamiliar person of your age?	1	2	3	4	5	6
How well can you pay attention during class?	1	2	3	4	5	6
How well can you cooperate with your classmates?	1	2	3	4	5	6
How well can you get the information you need from adults?	1	2	3	4	5	6
How well can you remember information given in class?	1	2	3	4	5	6
How well can you take part in class discussions?	1	2	3	4	5	6
How well can you motivate yourself to do school work?	1	2	3	4	5	6
How well can you participate in class activities?	1	2	3	4	5	6
How well can you get teachers to help you when you get stuck on school work?	1	2	3	4	5	6
How well can you finish school assignments?	1	2	3	4	5	6
How well can you succeed in staying friends with other people?	1	2	3	4	5	6
How well can you succeed in satisfying your teachers with your school work?	1	2	3	4	5	6
How well can you work in a group?	1	2	3	4	5	6
How well can you get school staff to help you, when you have a problem at school?	1	2	3	4	5	6

The Resilience Scale™

Please read the following statements. To the right of each you will find seven numbers, ranging from "1" (Strongly Disagree) on the left to "7" (Strongly Agree) on the right. Circle the number which best indicates your feelings about that statement. For example, if you strongly disagree with a statement, circle "1". If you are neutral, circle "4", and if you strongly agree, circle "7", etc.

	Strongly Disagree						Strongly Agree
When I make plans, I follow through with them.	1	2	3	4	5	6	7
I usually manage one way or another.	1	2	3	4	5	6	7
I am able to depend on myself more than anyone else.	1	2	3	4	5	6	7
Keeping interested in things is important to me.	1	2	3	4	5	6	7
I can be on my own if I have to.	1	2	3	4	5	6	7
I feel proud that I have accomplished things in life.	1	2	3	4	5	6	7
I usually take things in my stride.	1	2	3	4	5	6	7
I am friends with myself.	1	2	3	4	5	6	7
I feel that I can handle many things at a time.	1	2	3	4	5	6	7
I am determined.	1	2	3	4	5	6	7
I seldom wonder what the point of it all is.	1	2	3	4	5	6	7
I take things one day at a time.	1	2	3	4	5	6	7
I can get through difficult times because I've experienced difficulty before.	1	2	3	4	5	6	7
I have self-discipline.	1	2	3	4	5	6	7
I keep interested in things.	1	2	3	4	5	6	7
I can usually find something to laugh about.	1	2	3	4	5	6	7
My belief in myself gets me through hard times.	1	2	3	4	5	6	7
In an emergency, I'm someone people can generally rely on.	1	2	3	4	5	6	7
I can usually look at a situation in a number of ways.	1	2	3	4	5	6	7
Sometimes I make myself do things whether I want to or not.	1	2	3	4	5	6	7
My life has meaning.	1	2	3	4	5	6	7
I do not dwell on things that I can't do anything about.	1	2	3	4	5	6	7
When I'm in a difficult situation, I can usually find my way out of it.	1	2	3	4	5	6	7
I have enough energy to do what I have to do.	1	2	3	4	5	6	7
It's okay if there are people who don't like me.	1	2	3	4	5	6	7
I am resilient.	1	2	3	4	5	6	7

The Hemingway Measure of Adolescent Connectedness©

Please use this survey to tell us about yourself. Read each statement. MARK the number that best describes how true that statement is for you or how much you agree with it. If a statement is unclear to you, ask for an explanation. If it is still unclear, mark the "?"

	Not at all true	Not really true	Sort of true	True	Very true	Not clear ?
I like hanging out around where I live (like in my neighbourhood).	1	2	3	4	5	6
Spending time with friends is not so important to me.	1	2	3	4	5	6
I can name 5 things that others like about me.	1	2	3	4	5	6
My family has fun together.	1	2	3	4	5	6
I have a lot of fun with my brother(s) or sister(s). (leave blank if you have none)	1	2	3	4	5	6
I work hard at school.	1	2	3	4	5	6
My classmates often bother me.	1	2	3	4	5	6
I care about what my teachers think of me.	1	2	3	4	5	6
I will have a good future.	1	2	3	4	5	6
I enjoy spending time by myself reading.	1	2	3	4	5	6
I spend a lot of time with kids around where I live.	1	2	3	4	5	6
I have friends I'm really close to and trust completely.	1	2	3	4	5	6
There is not much that is unique or special about me.	1	2	3	4	5	6
It is important that my parents trust me.	1	2	3	4	5	6
I feel close to my brother(s) or sister(s). (leave blank if you have none)	1	2	3	4	5	6
I enjoy being at school.	1	2	3	4	5	6
I like pretty much all of the other kids in my grade (year).	1	2	3	4	5	6
I do not get along with some of my teachers.	1	2	3	4	5	6
Doing well in school will help me in the future.	1	2	3	4	5	6
I like to read.	1	2	3	4	5	6
I get along with the kids in my neighbourhood.	1	2	3	4	5	6
Spending time with my friends is a big part of my life.	1	2	3	4	5	6
I can name 3 things that other kids like about me.	1	2	3	4	5	6
I enjoy spending time with my parents.	1	2	3	4	5	6
I enjoy spending time with my brother(s) or sister(s). (leave blank if you have none)	1	2	3	4	5	6
I get bored in school a lot.	1	2	3	4	5	6

	Not at all true	Not really true	Sort of true	True	Very true	Not clear ?
I like working with my classmates.	1	2	3	4	5	6
I want to be respected by my teachers.	1	2	3	4	5	6
I do things outside of school to prepare for my future.	1	2	3	4	5	6
I never read books in my free time.	1	2	3	4	5	6
I often spend time playing or doing things in my neighbourhood.	1	2	3	4	5	6
My friends and I talk openly with each other about personal things.	1	2	3	4	5	6
I really like who I am.	1	2	3	4	5	6
My parents and I disagree about many things.	1	2	3	4	5	6
I try to spend time with my brother(s)/sister(s) when I can. (leave blank if you have none)	1	2	3	4	5	6
I do well in school.	1	2	3	4	5	6
I get along with other students in my classes.	1	2	3	4	5	6
I try to get along with my teachers.	1	2	3	4	5	6
I do lots of things to prepare for my future.	1	2	3	4	5	6
I often read when I have free time.	1	2	3	4	5	6
I hang out a lot with kids in my neighbourhood.	1	2	3	4	5	6
I spend as much time as I can with my friends.	1	2	3	4	5	6
I have special hobbies, skills, or talents.	1	2	3	4	5	6
My parents and I get along well.	1	2	3	4	5	6
I try to avoid being around my brother(s)/sister(s). (leave blank if you have none)	1	2	3	4	5	6
I feel good about myself when I am at school.	1	2	3	4	5	6
I am liked by my classmates.	1	2	3	4	5	6
I always try hard to earn my teachers' trust.	1	2	3	4	5	6
I think about my future often.	1	2	3	4	5	6
I usually like my teachers.	1	2	3	4	5	6
My neighborhood is boring.	1	2	3	4	5	6
My friends and I spend a lot of time talking about things.	1	2	3	4	5	6
I have unique interests and skills that make me interesting.	1	2	3	4	5	6
I care about my parents very much.	1	2	3	4	5	6
What I do now will not affect my future.	1	2	3	4	5	6
Doing well in school is important to me.	1	2	3	4	5	6
I rarely fight or argue with other kids at school.	1	2	3	4	5	6

Additional Information

Please tick one circle

Male O Female O

Please tick the circle for the ethnic group(s) you belong to. You may tick more than one.

O	NZ Maori	O	NZ European/Pakeha
O	Tokelauan	O	Other European
O	Fijian	O	South-East Asian
O	Niuean	O	Indian
O	Tongan	O	Chinese
O	Cook Islands Maori	O	Other Asian (e.g. Japanese, Korean)
O	Samoan	O	Other (e.g. African, South American)
O	Other Pacific Islands		

PLEASE CHECK THAT YOU HAVE ANSWERED ALL THE QUESTIONS.

THANK YOU for taking the time to complete this survey☺

Appendix I

Table I1 *Revised Project K Self-efficacy Questionnaire factor loadings*

	1	**2**	**3**
1. **Academic self-efficacy**			
How well can you study when there are other interesting things to do?	.64		
How well can you study for a test?	.74		
How well can you succeed in finishing all your homework?	.79		
How well can you pay attention during class?	.72		
How well can you remember information given in class?	.63		
How well can you succeed in satisfying your teachers with your schoolwork?	.74		
How well can you motivate yourself to do schoolwork?	.71		
How well can you finish school assignments?	.68		
2. Social self-efficacy			
How well can you express your opinions when your classmates disagree with you?		.58	
How well can you become friends with other people?		.70	
How well can you have a chat with an unfamiliar person of your age?		.68	
How well can you cooperate with your classmates?		.67	
How well can you participate in class discussions?		.62	
How well can you participate in class activities?		.73	
How well can you succeed in staying friends with other people?		.65	
How well can you work in a group?		.75	
3. **Help seeking self-efficacy**			
How well can you get adults to help you with a problem?			.73
How well can you get the information you need from adults?			.67
How well can you get teachers to help you when you get stuck on schoolwork?			.72
How well can you get school staff to help you, when you have a problem at school?			.78

Note: Adapted from Self-efficacy and heath behaviours: A test of measures to assess the effectiveness of a youth development programme by J. Moore (2005), (Unpublished master thesis) The University of Auckland: Auckland.

Appendix J

Table J1 *Magnitude of missing data and the results from Little's MCAR test*

Time	**Measure**	**Magnitude of missing data**	**Little's MCAR test**
Time 1	PKSEQ	1.3 – 5 %	Non-significant
	Resilience Scale	1.3 – 2.5 %	Non-significant
	HACS	1.3 - 12.5 %	Non-significant
Time 2	PKSEQ	6.3 – 10 %	Significant ($p < .005$)
	Resilience Scale	6.3 – 8.8 %	Non-significant
	HACS	6.3 – 20 %	Non-significant
Time 3	PKSEQ	18.8 – 20 %	Non-significant
	Resilience Scale	20 – 23.8 %	Non-significant
	HACS	20 - 28.8 %	Non-significant
Time 4	PKSEQ	20.4 – 22.4 %	Non-significant
	Resilience Scale	20.4 – 26.5 %	Non-significant
	HACS	20.4 - 32.7 %	Non-significant
Time 5	PKSEQ	22.4 – 24.5 %	Non-Significant
	Resilience Scale	22.4 - 26.5 %	Non-significant
	HACS	22.4 - 34.7 %	Non-significant
Time 6	PKSEQ	11.3 – 16.3 %	Significant ($p < .02$)
	Resilience Scale	11.3 - 15 %	Non-significant
	HACS	10 - 22.5%	Non-significant

Appendix K

Comparison between Cronbach's Alpha with missing data and Cronbach's Alpha after imputation shows that there was very little difference in the Cronbach's Alpha before and after imputation, which provides increased confidence in the choice of this method of estimation.

Table K1 *Alpha of the PKSEQ, Resilience Scale, and HACS Connectedness to school with missing data and after data had been imputed using EM*

Time	**α with missing data**	**α with data imputed**
PKSEQ		
1	.92	.93
2	.91	.90
3	.86	.86
4	.87	.87
5	.92	.94
6	.94	.94
Resilience Scale		
1	.92	.92
2	.91	.91
3	.94	. 94
4	.91	.90
5	.96	.96
6	.95	.94
HSAC connectedness to school with item 26 deleted		
1	.84	.83
2	.82	.81
3	.86	.84
4	.78	.79
5	.80	.79
6	.82	.81

A final consideration relating to missing data was the unbalanced nature of the data set; the Project K group has six waves of data and the comparison group has four waves. The missing two waves (four and five) of data for the comparison group were correctly missing i.e. no data was meant to be collected as per the data collection schedule. EM was not used to impute data

for the missing data in the comparison group at waves four and five, one of the advantages of MLM is to handle unequal waves of data.

Appendix L

Table L1 *Results from fitting the within-individuals exploratory OLS regression model for self-efficacy data as a function of linear time*

	Initial status		Rate of change			
ID	*Estimate*	*Error*	*Estimate*	*Error*	*Residual variance*	R^2
1	87.706	2.709	.011	.009	15.635	.267
2	76.936	5.327	.013	.018	60.444	.108
3	55.135	4.081	.040	.014	35.472	.671
4	73.443	7.501	.029	.026	119.877	.237
5	63.835	6.516	.036	.023	90.463	.388
6	83.082	4.281	-.004	.015	39.034	.014
7	90.602	10.393	.006	.036	230.091	.006
8	78.176	1.439	-.002	.005	4.412	.051
9	74.440	4.404	.027	.015	41.320	.437
10	76.835	4.068	.063	.014	35.258	.831
11	76.124	4.821	.048	.017	49.519	.670
12	62.627	5.860	.053	.020	73.166	.627
13	77.314	2.093	-.020	.007	9.330	.665
14	84.078	1.583	.051	.007	6.315	.924
15	89.570	8.563	-.011	.039	184.784	.018
16	77.693	2.132	.022	.010	11.453	.549
17	60.850	2.626	.061	.012	17.384	.865
18	69.506	4.161	.061	.019	43.631	.716
19	75.908	3.037	.050	.014	23.238	.766
20	91.448	2.051	-.006	.009	10.601	.106
21	72.869	4.845	.027	.022	59.169	.270
22	73.658	3.252	.054	.015	26.658	.768
23	85.674	2.577	.053	.012	16.738	.835
24	81.476	2.505	.000	.011	15.820	.000
25	52.668	7.897	.066	.032	164.437	.516
26	76.848	4.423	.012	.018	51.581	.104
27	62.664	2.681	.043	.011	18.955	.801
28	46.624	6.088	.108	.025	97.740	.830
29	76.277	6.489	-.002	.026	111.044	.002
30	97.610	12.039	-.007	.048	382.196	.005
31	65.326	2.365	.069	.010	14.744	.929
32	86.342	3.207	.032	.013	27.121	.609

33	74.575	2.386	.043	.010	15.015	.831
34	71.157	2.806	.036	.011	20.756	.717
35	86.086	3.696	.005	.015	36.017	.027
36	77.115	3.192	.020	.013	26.869	.382
37	60.378	2.265	.048	.009	13.464	.871
38	62.622	4.946	.056	.020	64.203	.662
39	71.801	6.284	-.005	.025	103.616	.010
40	52.225	11.482	.015	.047	345.990	.027
41	57.024	9.991	.058	.041	261.950	.342
42	60.343	5.947	.069	.024	92.824	.673
43	87.164	6.645	-.012	.027	115.896	.051
44	79.936	4.581	-.028	.019	55.061	.367
45	70.817	9.543	.028	.039	239.013	.116
46	93.963	4.142	.025	.017	45.033	.364
47	89.416	5.730	-.008	.023	86.162	.026
48	88.460	3.317	.025	.013	28.870	.472
49	82.444	7.376	-.003	.030	142.773	.003
50	98.778	2.419	.022	.012	8.533	.619
51	100.277	6.641	-.048	.034	64.334	.503
52	104.385	1.974	-.057	.010	5.684	.941
53	71.985	2.806	.014	.014	11.486	.339
54	75.949	8.295	.018	.042	100.370	.082
55	83.540	3.612	-.030	.018	19.028	.581
56	71.008	7.422	.064	.038	80.369	.588
57	86.795	1.027	.041	.005	1.538	.969
58	90.816	3.450	.009	.017	17.359	.106
59	80.552	4.291	-.037	.022	26.860	.595
60	79.512	.630	.036	.003	.579	.985
61	110.959	5.973	-.084	.030	52.038	.794
62	67.316	9.531	-.005	.048	132.525	.005
63	72.723	5.742	-.006	.029	48.090	.022
64	97.286	9.253	-.023	.047	124.905	.107
65	81.710	17.732	-.149	.090	458.691	.580
66	94.097	5.491	-.034	.028	43.992	.429
67	86.895	10.037	-.094	.051	146.976	.629
68	72.831	6.549	.033	.033	62.574	.330
69	88.632	2.004	-.015	.010	5.858	.527
70	68.844	1.342	.052	.007	2.627	.967

71	61.863	3.058	.024	.015	13.640	.546
72	101.527	11.050	-.054	.056	178.137	.314
73	92.409	5.587	-.073	.028	45.537	.767
74	80.301	1.759	.001	.009	4.516	.011
75	73.238	4.828	.102	.024	34.009	.896
76	87.071	3.672	-.017	.019	19.668	.303
77	94.127	5.848	-.047	.030	49.893	.556
78	79.513	7.298	.040	.037	77.706	.365
79	80.607	4.408	.024	.022	28.350	.367
80	58.652	7.741	.069	.039	87.422	.609

Table L2 *Results from fitting the within-individuals exploratory OLS regression model for resilience data as a function of linear time*

	Initial status		Rate of change			
ID	*Estimate*	*Error*	*Estimate*	*Error*	*Residual variance*	R^2
1	121.656	7.978	.024	.028	135.585	.159
2	130.255	7.972	-.042	.028	135.378	.361
3	94.857	10.383	.056	.036	229.664	.377
4	106.122	6.405	.031	.022	87.390	.329
5	125.241	18.016	.020	.063	691.421	.025
6	135.026	6.833	-.004	.024	99.470	.006
7	152.600	4.579	.023	.016	44.669	.353
8	106.868	6.121	-.003	.021	79.826	.005
9	101.695	13.380	.046	.046	381.369	.197
10	114.212	8.235	.094	.029	144.475	.731
11	130.108	2.190	-.001	.008	10.219	.001
12	106.013	3.486	.105	.012	25.891	.949
13	124.964	3.021	-.007	.010	19.439	.088
14	129.578	3.119	.044	.014	24.517	.700
15	129.098	7.572	-.034	.035	144.509	.195
16	121.903	5.863	.020	.027	86.618	.126
17	107.540	3.652	.030	.017	33.614	.450
18	127.481	3.518	.006	.016	31.196	.034
19	115.564	3.646	.048	.017	33.502	.671
20	128.102	3.158	.041	.014	25.128	.665
21	129.070	11.824	-.021	.054	352.330	.035
22	127.440	4.384	.001	.020	48.444	.001
23	119.041	2.933	.048	.013	21.684	.760
24	144.802	7.046	-.040	.032	125.107	.280
25	113.042	9.303	-.009	.037	228.197	.016
26	101.934	8.386	.065	.034	185.447	.480
27	95.372	2.948	.090	.012	22.911	.935
28	82.461	14.115	.121	.057	525.322	.533
29	105.832	6.906	.034	.028	125.773	.275
30	159.735	15.890	-.046	.064	665.746	.113
31	96.176	4.042	.077	.016	43.079	.849
32	141.489	4.656	.040	.019	57.151	.537
33	133.410	3.046	.011	.012	24.463	.157

34	123.853	2.485	.009	.010	16.280	.156
35	134.173	6.761	.011	.027	120.536	.037
36	126.656	8.437	.015	.034	187.710	.046
37	106.818	4.242	.050	.017	47.234	.680
38	135.837	10.939	.025	.044	314.011	.074
39	110.569	4.417	-.018	.018	51.209	.209
40	105.453	26.342	-.045	.107	1820.984	.042
41	107.531	21.636	.028	.088	1228.444	.025
42	148.392	19.099	-.072	.077	957.282	.178
43	140.708	6.082	-.023	.025	97.081	.177
44	107.970	6.728	-.033	.027	118.786	.270
45	107.594	12.382	.043	.050	402.341	.155
46	144.692	6.399	.027	.026	107.472	.212
47	141.538	5.016	-.043	.020	66.038	.533
48	133.567	5.660	.041	.023	84.069	.442
49	131.442	14.295	-.003	.058	536.277	.001
50	144.873	3.175	.015	.016	14.703	.304
51	141.933	8.584	-.076	.044	107.498	.603
52	160.539	3.950	.014	.020	22.764	.198
53	122.084	9.738	-.005	.049	138.324	.006
54	104.397	6.679	-.014	.034	65.083	.075
55	108.628	6.289	.107	.032	57.698	.849
56	124.629	14.614	.072	.074	311.541	.323
57	138.116	13.726	.076	.070	274.862	.371
58	132.565	7.135	.036	.036	74.269	.333
59	136.121	2.891	-.075	.015	12.196	.928
60	151.861	6.180	-.091	.031	55.717	.810
61	160.497	10.418	-.091	.053	158.344	.595
62	130.883	4.369	-.056	.022	27.846	.765
63	113.999	11.629	-.003	.059	197.263	.001
64	144.326	12.065	-.043	.061	212.364	.202
65	134.487	20.587	-.210	.104	618.255	.670
66	141.023	6.377	-.054	.032	59.320	.586
67	128.623	16.177	-.117	.082	381.771	.503
68	149.097	6.284	-.071	.032	57.614	.710
69	132.191	11.225	-.047	.057	183.809	.257
70	118.096	23.699	.001	.120	819.348	.000
71	126.064	9.352	.000	.047	127.577	.000

72	147.190	16.637	.038	.084	403.793	.092
73	126.997	1.010	-.040	.005	1.488	.969
74	136.102	4.652	-.089	.024	31.564	.877
75	109.216	10.877	.167	.055	172.601	.821
76	139.111	10.578	-.031	.054	163.245	.143
77	148.213	16.248	-.035	.082	385.105	.082
78	119.151	6.217	.067	.032	56.389	.696
79	134.411	6.900	-.020	.035	69.458	.139
80	101.995	6.383	.079	.032	59.436	.750

Table L3 *Results from fitting the within-individuals exploratory OLS regression model for connectedness to school data as a function of linear time*

	Initial status		Rate of change			
ID	*Estimate*	*Error*	*Estimate*	*Error*	*Residual variance*	R^2
1	19.053	.991	.008	.003	2.091	.556
2	18.152	1.350	-.012	.005	3.882	.610
3	17.897	.682	.000	.002	.991	.009
4	15.596	1.663	.004	.006	5.893	.115
5	20.811	2.558	.005	.009	13.935	.074
6	18.392	1.742	.001	.006	6.467	.010
7	17.330	2.092	.010	.007	9.326	.327
8	17.795	.484	.001	.002	.498	.133
9	16.610	.999	.002	.003	2.126	.100
10	18.091	1.518	.013	.005	4.908	.586
11	14.737	.912	.010	.003	1.772	.705
12	15.603	1.890	.011	.007	7.610	.394
13	19.193	.583	-.004	.002	.723	.457
14	20.218	.484	.008	.002	.590	.751
15	20.083	1.551	-.001	.007	6.063	.003
16	19.867	1.374	-.001	.006	4.761	.011
17	18.202	.952	.005	.004	2.284	.223
18	18.457	1.338	.006	.006	4.510	.197
19	18.155	1.004	.013	.005	2.542	.660
20	23.102	.622	-.005	.003	.976	.463
21	21.132	1.088	-.006	.005	2.983	.238
22	18.218	.940	.016	.004	2.228	.770
23	18.799	.776	.005	.004	1.516	.350
24	17.979	1.401	.005	.006	4.945	.112
25	12.172	2.017	.013	.008	10.732	.403
26	16.541	1.537	.000	.006	6.229	.001
27	16.897	.702	.011	.003	1.299	.800
28	5.421	2.410	.041	.010	15.316	.820
29	19.731	1.080	.000	.004	3.075	.003
30	19.254	1.003	.002	.004	2.654	.052
31	14.841	1.327	.007	.005	4.641	.308
32	13.968	1.229	.029	.005	3.986	.895
33	14.856	1.469	.007	.006	5.687	.262

34	16.244	1.014	.008	.004	2.713	.466
35	18.618	1.768	-.002	.007	8.238	.011
36	11.189	1.975	.022	.008	10.289	.647
37	14.712	.721	.018	.003	1.363	.903
38	8.997	2.795	.017	.011	20.494	.364
39	14.566	2.530	.005	.010	16.799	.062
40	11.046	2.892	.007	.012	21.945	.092
41	10.122	3.445	.023	.014	31.153	.399
42	11.260	1.683	.015	.007	7.430	.541
43	15.342	.695	.012	.003	1.267	.815
44	18.171	1.475	.000	.006	5.708	.000
45	16.474	2.576	.009	.010	17.412	.152
46	21.773	.741	.001	.003	1.440	.040
47	21.368	1.269	.002	.005	4.229	.024
48	18.741	.860	-.003	.003	1.942	.194
49	17.816	2.679	.004	.011	18.830	.028
50	23.763	.592	.005	.003	.512	.581
51	18.815	1.279	.008	.006	2.387	.403
52	16.130	1.813	-.014	.009	4.793	.521
53	17.839	1.536	-.009	.008	3.441	.374
54	18.859	.491	-.002	.002	.352	.295
55	17.226	.281	-.003	.001	.115	.693
56	13.102	1.676	.023	.008	4.096	.789
57	17.085	2.678	.026	.014	10.463	.656
58	20.353	2.365	.007	.012	8.159	.148
59	20.366	3.604	-.031	.018	18.952	.586
60	18.403	.448	.009	.002	.293	.877
61	21.205	1.422	-.001	.007	2.952	.016
62	17.162	1.409	.007	.007	2.898	.333
63	18.984	.312	-.006	.002	.142	.874
64	20.589	.838	-.007	.004	1.024	.555
65	14.515	1.460	.011	.007	3.109	.543
66	18.323	.810	-.001	.004	.957	.060
67	18.421	1.867	-.016	.009	5.086	.592
68	16.062	1.867	.019	.009	5.087	.661
69	13.787	1.253	-.005	.006	2.290	.237
70	14.284	1.437	.018	.007	3.013	.750
71	14.464	1.612	-.005	.008	3.790	.134

72	21.340	3.386	.008	.017	16.726	.097
73	19.656	1.845	-.007	.009	4.965	.236
74	15.297	.489	.017	.002	.349	.961
75	15.445	1.884	.016	.010	5.176	.596
76	15.888	2.338	.018	.012	7.974	.541
77	20.754	.833	-.019	.004	1.013	.911
78	17.597	1.126	.007	.006	1.849	.452
79	20.486	1.488	-.003	.008	3.229	.072
80	16.236	2.282	.006	.012	7.595	.118

Appendix M

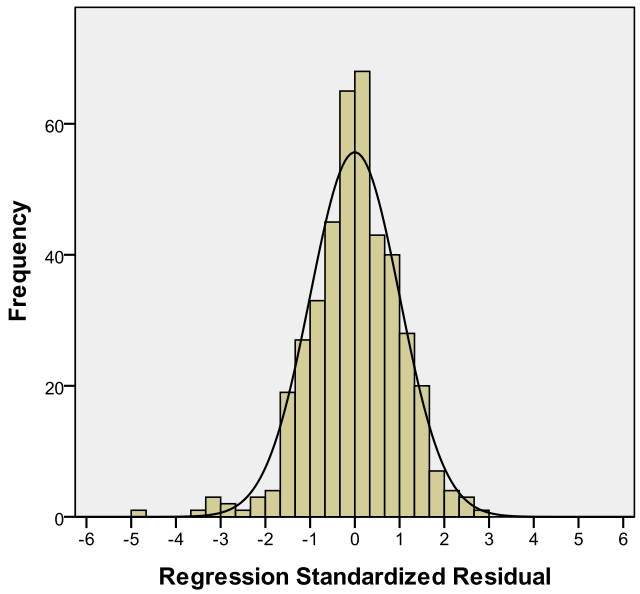

Figure M1. Histogram showing the distribution of the self-efficacy scores

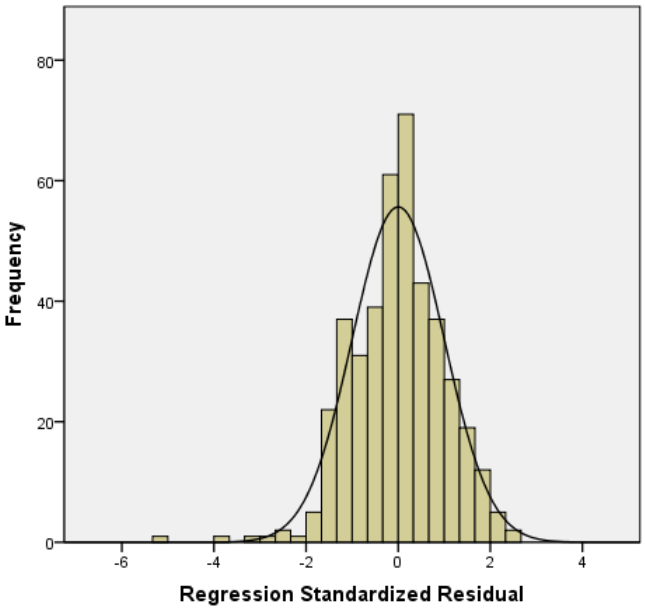

Figure M2. Histogram showing the distribution of the resilience scores

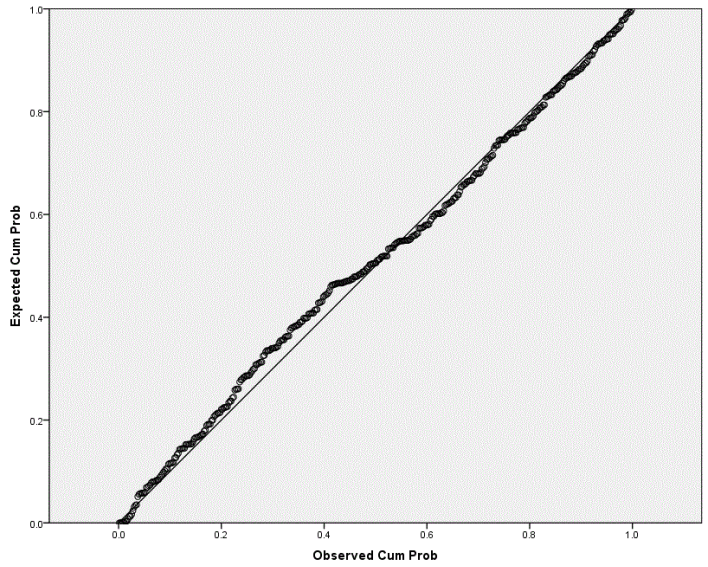

Figure M3. Normal P-P standardised residual plot for self-efficacy scores over time

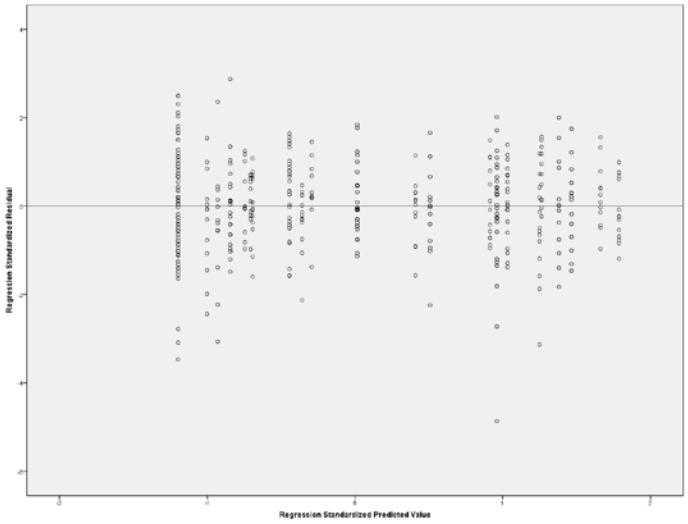

Figure M4. Standardised residual values for self-efficacy scores over time with a reference line fitted on the Y-axis at zero

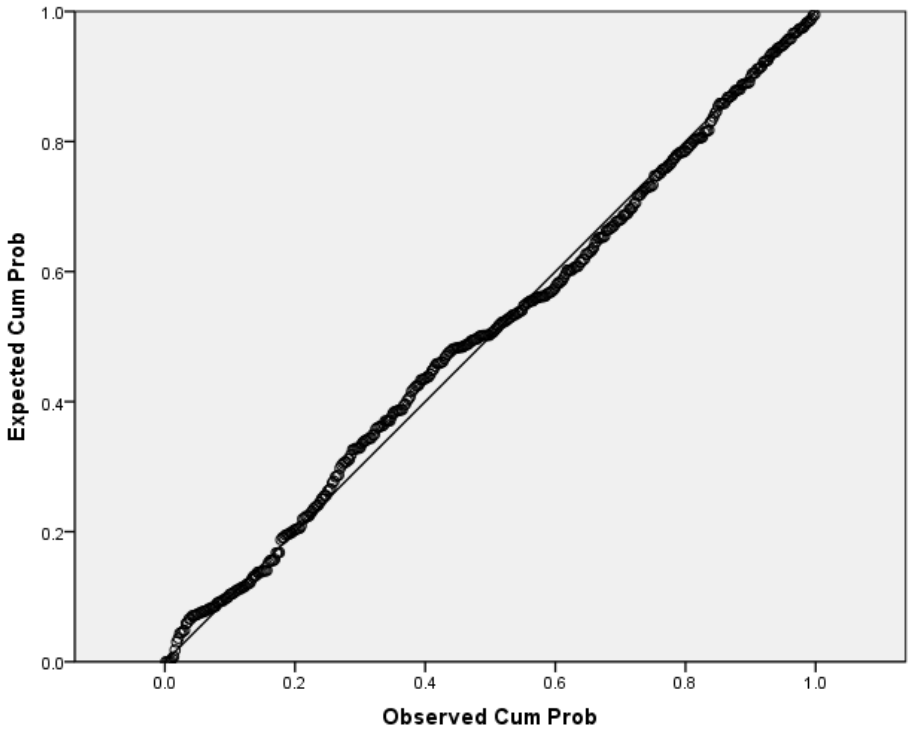

Figure M5. Normal P-P standardised residual plot for resilience scores over time

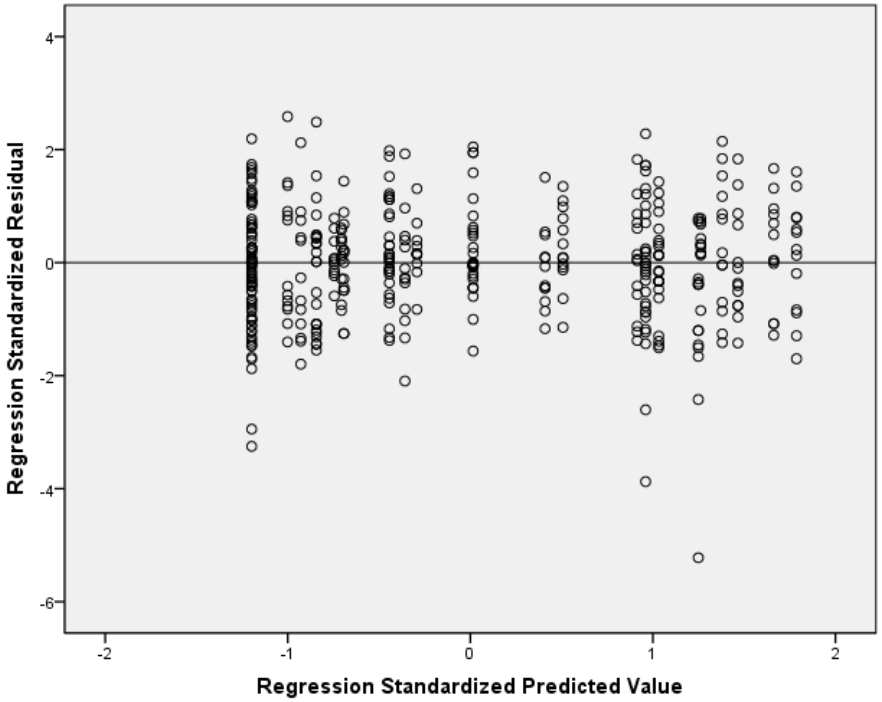

Figure M6. Standardised residual values for resilience scores over time with a reference line fitted on the Y-axis at zero

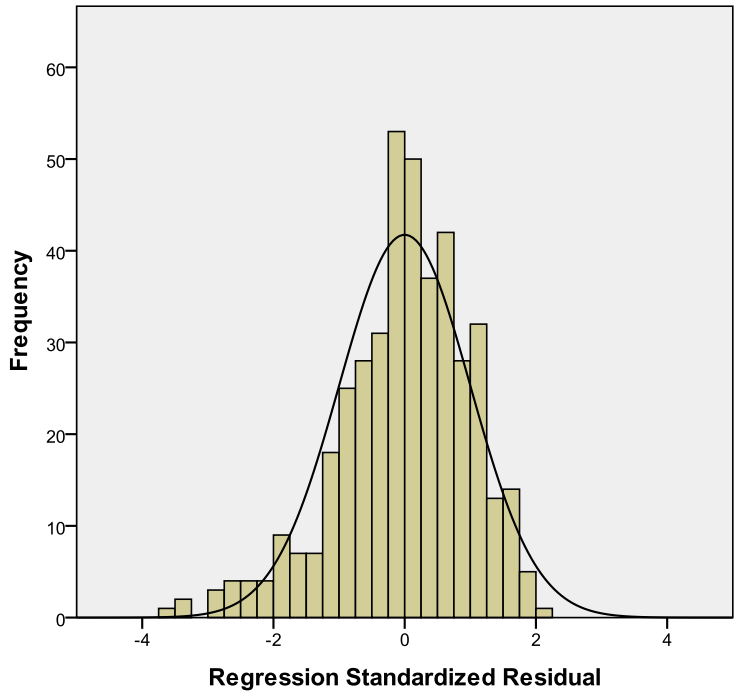

Figure M7. Histogram showing the distribution of the connectedness to school subscale scores

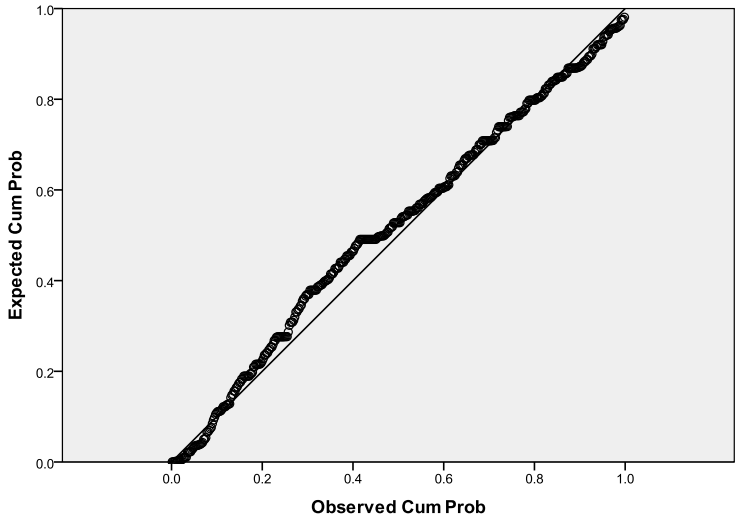

Figure M8. Normal P-P standardised residual plot for the connectedness to school subscale scores over time

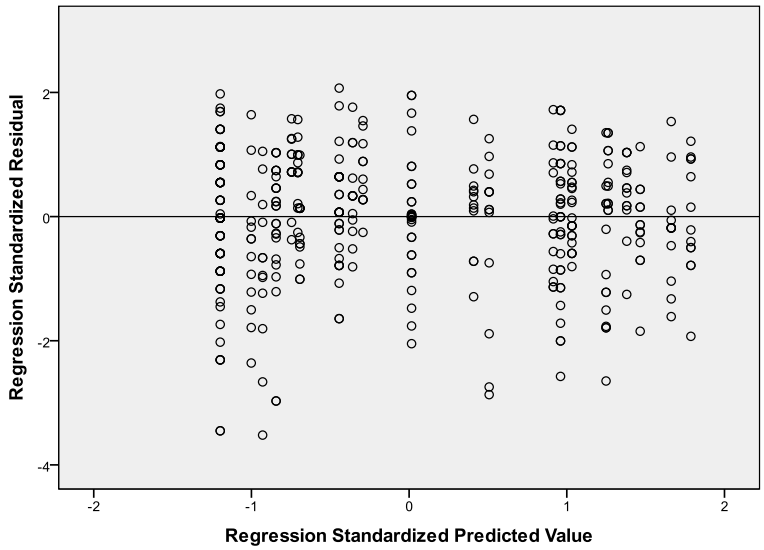

Figure M9. Standardised residual values for the connectedness to school subscale scores over time with a reference line fitted on the Y-axis at zero

Appendix N

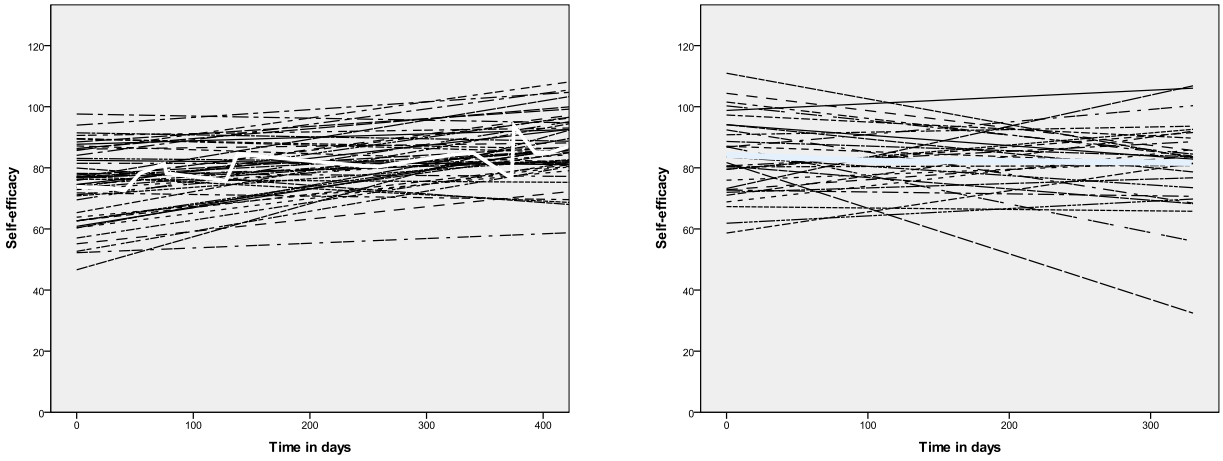

Figure N1. Smoothed OSL trajectories for the PKSEQ scores with the Project K group (left) and comparison group (right) with average change trajectories fitted

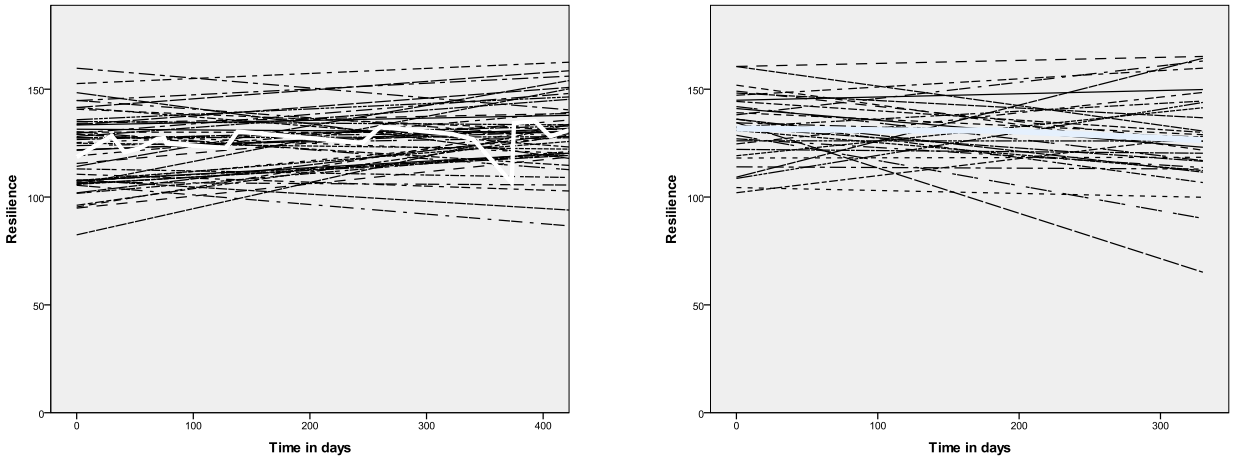

Figure N2. Smoothed OLS trajectories for the Resilience Scale scores with average change trajectories fitted with the Project K group (left graph) and the comparison group (right graph)

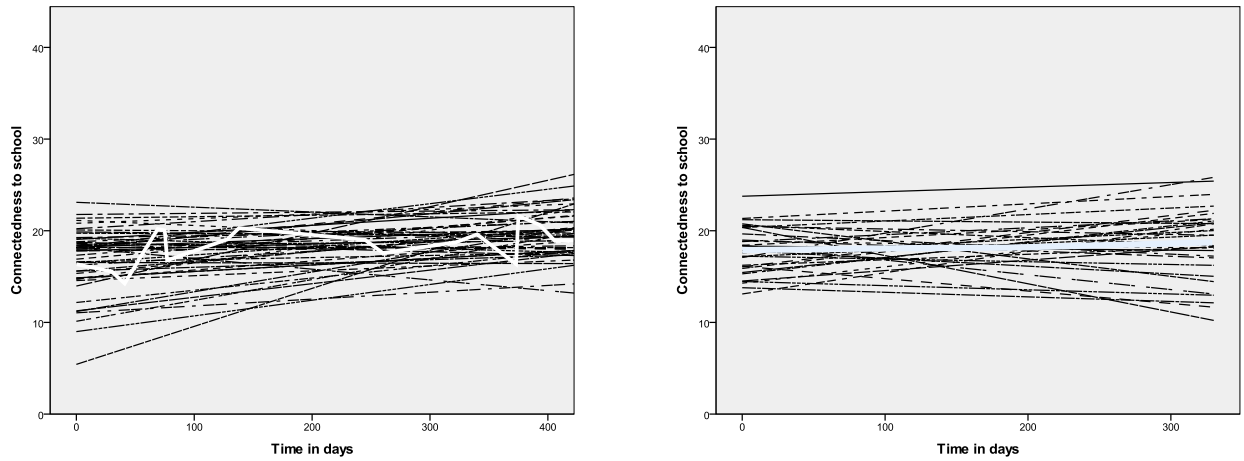

Figure N3. Smoothed OLS trajectories for the connectedness to school scores with average change trajectories fitted with the Project K group (left graph) and the comparison group (right graph).

Appendix O

Table O1 *Estimates of fixed and random effects from a series of individual growth models in which time, group, and gender predict changes in resilience*

		Parameter	Model A	Model B	Model C	Model D
Fixed effects						
Initial status π_{0i}	Intercept	γ_{00}	127.03*** (1.55)	125.14*** (1.88)	121.78*** (2.25)	134.20*** (3.70)
	Group	γ_{01}			-10.71** (2.83)	-10.30* (3.90)
	Gender	γ_{02}				-3.30 (3.71)
Rate of change π_{1i}	Intercept	γ_{10}		.010* (.01)	.018** (.006)	-.01 (.01)
	Group*Time	γ_{11}			-.034** (.013)	.04** (.01)
	Gender*Time	γ_{12}				-.01 (.01)
Variance components						
Level 1	Within-person	σ_ε^2	239.50*** (18.41)	217.89*** (19.11)	216.18*** (18.81)	216.00*** (18.80)
Level 2	In initial status	σ_0^2	147.20*** (30.89)	180.79*** (45.18)	161.82*** (41.66)	159.14*** (41.27)
	In rate of change	σ_1^2		.00 (.00)	.00 (.00)	.00 (.00)
	Covariance	σ_{01}^2		-.13 (.11)	-.08 (.10)	-.09 (.00)
Pseudo R^2 and goodness-of-fit						
		R_ε^2		.09	.09	.10
		R_0^2			.10	-.47
		R_1^2			.17	.33
	Deviance		3590.44	3581.99	3573.19	3569.20
	AIC		3596.44	3593.99	3589.19	3589.20
	BIC		3608.55	3618.20	3621.47	3640.04

Note: *** $p < .001$;** $p < .01$; * $p < .05$. Time = time coded in days. Model A is an unconditional means model. Model B is an unconditional growth model. Model C adds group participants are in to the model. Model D adds gender into the model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Table O2 *Estimates of fixed and random effects from a series of individual growth models in which time, group, and gender predict changes in connectedness to school*

		Parameter	Model A	Model B	Model C	Model D
Fixed effects						
Initial status π_{0i}	Intercept	γ_{00}	18.15*** (.28)	17.12*** (.37)	17.82*** (.62)	17.91*** (.73)
	Group	γ_{01}			-1.01 (.77)	-1.00 (.77)
	Gender					-.18 (.75)
Rate of change π_{1i}	Intercept	γ_{10}		.01*** (.00)	.00 (.00)	.00 (.00)
	Group*Time	γ_{11}			.00 (.00)	.00 (.00)
	Gender*Time					-.00 (.00)
Variance components						
Level 1	Within-person	σ_ε^2	8.53*** (.66)	6.07*** (.53)	6.05*** (.53)	6.10*** (.53)
Level 2	In initial status	σ_0^2	4.43*** (.97)	7.92*** (1.68)	7.74*** (1.65)	7.73*** (1.65)
	In rate of change	σ_1^2		4.89** (1.67)	4.62* (1.61)	4.63** (1.60)
	Covariance	σ_{01}^2		-.01** (.00)	-.01* (.00)	.01** (.00)
Pseudo R^2 and goodness-of-fit						
		R_ε^2		.29	.53	.28
		R_0^2			.02	-.38
		R_1^2			.06	.05
	Deviance		2186.60	2121.63	2118.69	2118.55
	AIC		2192.60	2133.63	2134.69	2138.55
	BIC		2204.71	2157.84	2166.98	2188.91

Note: *** $p < .001$;** $p < .01$; * $p < .05$. Time = time coded in days. The Null Model is the baseline model. Model A is an unconditional means model. Model B is an unconditional growth model. Model C adds the group participants into the model. Model D adds gender into the model. Coefficients are unstandardised with standard errors in brackets below each coefficient.

Appendix P

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16 December 2010

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Dear Kirsty

RESILIENCE - WHY BOTHER? Conference 2011: Share, swap and debate resilience research and practice knowledge 6th and 7th April 2011 – University of Brighton, England

Thank you very much for submitting your abstract titled "The power of potential". We are very pleased to tell you that your proposal has been accepted as a WORKSHOP session. Your presentation is scheduled as part of the Concurrent Workshop session on **Thursday 7 April 2011** to be held from **1.45-3pm**. The conference programme is now taking shape and thanks to the large number of submissions we've received, it looks like we're set for a really exciting international event.

As you will be aware, we want the conference to be a place where we can advance our thinking about resilience and consider the practice implications of new research. Delegates are attending from a broad range of both research and practice settings, so it's very important for presentations to aim to straddle both of these interests. To achieve this, facilitators will be assigned to the workshops to help ensure the practice points are highlighted, so be prepared to engage in a lively discussion! Most of the workshops have at least two, and possibly more, presenters each briefly presenting their work, followed by an open discussion in which themes can be explored in more depth with the audience. Your assigned facilitator will be there to support the discussion and, of course, to oversee timings! Please note, you will have a max of **20 minutes** to present important aspects of your work, allowing **15 minutes** of whole workshop discussion.

We will publish further details regarding the arrangements for the conference, and guidance for presenters, on the website as they become available http://www.boingboing.org.uk.

Please don't hesitate to get in touch if you need any further information at this stage. We are really looking forward to seeing you in Brighton in 2011!

Best wishes

Becky

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