Maximising Potential: The Psychological Effects of the Youth Development Programme Project K

Kirsty Furness[1], Matt N. Williams[2], Jaimie F. Veale[3], Dianne H. Gardner[2]
[1]Waitematā District Health Board, New Zealand, [2]Massey University, New Zealand, [3]Waikato University, New Zealand

Project K is a positive youth development programme targeting 13-15 year old students with low self-efficacy. It involves three components: wilderness adventure, community challenge and individual mentoring. This longitudinal study aimed to investigate changes in self-efficacy, resilience, connectedness and wellbeing in students participating in Project K. Eighty students (59% male) were recruited from five secondary schools across the North Island of New Zealand for a quasi-experimental study. Participants displaying delinquent behaviour, self-harm, suicidal ideation, or an eating disorder were excluded. Over 14 months, six waves of measurement were completed by Project K participants (*n* = 49), while four waves of measurement were completed by a control group (*n* = 31). Analyses using multilevel models showed that completion of Project K had substantial positive effects on self-efficacy, resilience, and wellbeing, although the effect on connectedness was not significant. We conclude that Project K appears to be an effective positive youth development programme for adolescents with low self-efficacy.

Keywords: Adolescence; adventure education; wellbeing; connectedness; resilience; self-efficacy.

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. Adolescents can engage in risky and damaging behaviours for a variety of biological, social, and developmental reasons (Jessor, 1991; Leather, 2009). Programmes designed to reduce the incidence of risky behaviours such as substance abuse, smoking, dangerous driving and unprotected sex in adolescents can have value. However, focusing solely on remedying deficits or reducing engagement in risky behaviours is not the only possible strategy for improving the outcomes for at-risk adolescents. Another strategy is to work on enhancing protective factors, with the goal of enhancing thriving and helping adolescents to acquire personal and psychosocial assets that can help protect them from negative outcomes. These are the goals of *positive youth development programmes.*[1]

Positive youth development is a strengths-based approach that can be conceptualised as a process of preparing youth to face the challenges of adulthood. These programmes aim to help youth meet their essential needs of building caring relationships, connections to community and basic safety, while at the same time building personal assets which include social, personal, academic, and vocational skills (Eccles & Gootman, 2002).

Project K

Project K, the focus of this study, was created in 1996 as a positive youth development programme by Graeme Dingle, a well-known New Zealand mountaineer, and Jo-anne Wilkinson, a lawyer. The programme has focused on improving outcomes for New Zealand youth, with a particular focus on improving self-efficacy (an individual's perception of their own ability to exert control over behaviour to successfully achieve tasks and goals; Bandura, 1997).

Project K has developed to become a national multi-site youth development programme delivered through local licensees across New Zealand. 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, and a 12-month mentoring partnership (Moore, 2005); these components are described in more detail below. Project K aims to improve social, psychological, and physical wellbeing in 13–15 year old students identified as having low self-efficacy, but who do not demonstrate high risk behaviours such as significant mental health or behavioural problems.

Project K Components

Wilderness adventure

In the wilderness adventure, participants engage in outdoor activities over the course of two to three weeks, such as abseiling, kayaking, hiking/tramping, mountain biking, and camping. This component of the programme is residential and participants have limited contact with parents and others not on the wilderness adventure. Using experiential learning, participants develop skills such as goal setting, teamwork, problem solving, and leadership. The wilderness adventure component of Project K falls within the broader domain of *adventure education*. There is good evidence that adventure education has positive effects on youth. Neill and Richard's (1998) meta-analysis of adventure education included over 12,000 participants from 96 studies and revealed small to medium positive impacts on self-confidence, self-concept, and locus of control. Similarly, a more recent meta-analysis of the effect of adventure therapy found evidence of moderate positive effects on psychological, behaviour, emotional and interpersonal variables (Bowen &

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1 Of course, positive youth development programmes and risk-prevention pro-grammes can often have overlapping goals and make use of overlapping strategies; see Guerra and Bradshaw (2008) for an edited book discussing these related literatures.

Neill, 2013).

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 part of the programme is non-residential, with each student meeting with the rest of their Project K group to work on the challenge approximately ten times. Project K participants are encouraged to connect with and meet key members of their communities, and to visit local organisations. The community challenge can be considered a form of *service learning*, a common component of positive youth development programmes that combines other forms of teaching and learning with meaningful community service (Billig, 2000). There is evidence that this type of intervention has small to moderate positive effects on social, personal, citizenship and academic outcomes for students (see the meta-analysis by Conway, Amel, & Gerwien, 2009).

Mentoring

In the mentoring component of Project K, each participant is paired with a mentor who meets with the participant at least once monthly over the course of 12 months. Support from a caring adult outside the family can assist adolescents in a number of ways. For example, mentors can help set academic goals, act as role models, provide emotional support, and provide advice and guidance on topics adolescents may be unwilling to discuss with their parents. Mentoring programmes have demonstrated positive effects on school outcomes (Teasley, 2004), reductions in risky behaviours (Vreeman & Carroll, 2007), and improved wellbeing and connections to others. This is especially true of mentoring relationships of longer duration, such as those developed in this study (Jekielek, Moore, Hair, & Scarupa, 2002).

Outcome Variables and Hypotheses

Project K "focusses on building confidence, teaching life skills, promoting good health and encouraging a positive attitude" (Graeme Dingle Foundation, n.d.). Four specific criterion variables were selected based on these goals to assess the psychological effects of participation in Project K.

Self-efficacy

Self-efficacy is the psychological variable most directly targeted by Project K; indeed, participants are selected largely on the basis of having low 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 can positively influence adolescents' achievement (Moore, 2005), motivation, regulation of thought and behaviour, coping with adversity, and reduce vulnerability to stress and depression (Bandura, 1997). Project K incorporates a number of features that seem likely to increase self-efficacy. For example, the wilderness adventure component provides an opportunity for participants to experience competence and mastery when faced with challenging tasks such as abseiling and team leadership, while the mentoring partnership involves mentors assisting participants with setting and achieving a range of goals.

Given Project K's central focus on self-efficacy, prior research has evaluated the effects of Project K on self-efficacy, with positive results. A randomised control study conducted with 1177 students found that 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 a one-year follow up (Deane, Harré, Moore, & Courtney, 2016). Although there thus exists evidence suggesting that Project K has a positive effect on self-efficacy, it is nevertheless important to investigate independent evidence to confirm these findings, particularly given the increasing drive for replication of findings in psychology (see Pashler & Wagenmakers, 2012), and the crucial status of this particular claim to the evidence basis for Project K. In addition, the current study attempts to extend the current evidence basis for Project K by investigating the effects of Project K on three other variables: resilience, connectedness, and wellbeing.

Resilience

Resilience is the ability to overcome obstacles or bounce back from challenges. 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 resilience is related to 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 (Ahern, Kiehl, Sole, & Byers, 2006). The three Project K components focus on goal setting, effective problem solving, effective communication and social skills, all of which are important for building resilience (see Masten, Best, & Garmezy, 1990; Werner, 1982). Involvement in Project K also widens social support networks by introducing participants to others in the school and wider community. We therefore hypothesised that Project K would lead to increased resilience in adolescents.

Connectedness

Adolescent connectedness refers to adolescents' emotional connections to the communities that they live in. Adolescents who report strong connectedness report lower levels of risk-taking behaviour and higher levels of prosocial behaviours (Whitlock, 2007). In Project K, connections between students and the wider community are facilitated in multiple ways. Firstly, teachers at the students' schools connect with students to help them access Project K and attend the project components. Secondly, staff running the wilderness adventure connect with students as primary caregivers during their time spent away from home. Thirdly, performing the community challenge provides students with an opportunity to connect with volunteer services and other organisations in the community. Finally, the mentoring component of the project allows students to connect with experienced mentors. We therefore hypothesised that Project K would lead to increases in feelings of connectedness.

Wellbeing

There were two broad reasons to expect that participation in Project K might result in higher levels of subjective wellbeing. Indeed, given our previous hypotheses (of positive effects on self-efficacy, resilience, and connectedness), we would expect a positive effect of Project K on wellbeing as wellbeing is positively correlated with all three of these variables (Caprara, Steca, Gerbino, Paciello, & Vecchio, 2006; Jose, Ryan, & Pryor, 2012; Mak, Ng, & Wong, 2011). Secondly, there is some existing evidence that experiences with nature (Maller & Townsend, 2006), civic engagement (Albanesi, Cicognani, & Zani, 2007), and mentoring (Jekielek, Moore, & Hair, 2002) can improve wellbeing. Project K's inclusion of wilderness adventure, community challenge and mentoring components therefore provide a basis to hypothesise that completion of Project K would be associated with improvements in general wellbeing.

Method

Participants and Procedure

Project K (intervention) group

Participants in the Project K group were recruited between July and September 2010 from four schools: 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. In order to identify students with low self-efficacy, a self-report self-efficacy questionnaire was administered to all Year 10 students in these schools. Two teachers also completed a screening report for each student. Students whose self-efficacy scores were the lowest (when combined across student and teacher ratings) were allocated highest priority for Project K participation. However, if a student met one or more of the four exclusion criteria (presence of delinquent behaviour, suicidal ideation, self-harm, or an eating disorder), as agreed by at least two Project K team members, the student would be excluded, as Project K does not target very high-risk youth.

The final sample size for the Project K group was $n = 49$. This was made up of 47 students who were approached at the start of the study (including the two who later withdrew), and the two replacement students who were selected into the programme one month after it began. Of the Project K students 63% ($n = 31$) were male. Students were 13 or 14 years old at the start of the study and 15 or 16 years old at the completion of the study. Participants identified with a range of ethnicities, with the most common identifications being European or Pākehā (78%), NZ Māori (24%), and Samoan (12%)[2]

Control group

This study used a quasi-experimental non-equivalent control group design, in which a group similar to the Project K group served as a control group. The control 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. Participants in the control group were recruited from a co-educational state decile 4 high school located in the North Island of New Zealand. 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 (thus slightly younger than the intervention group). 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 for the control group. The final sample for the control group ($n = 31$) consisted of 52% ($n = 16$) male and 48% ($n = 15$) female participants. The control group had a similar ethnic composition to the intervention group, with the most common identifications being European or Pākehā (74%), NZ Māori (26%), and Cook Island Māori (10%).

Procedure

Project K (intervention) group

Once 10-12 students from each school had been selected using the approach described above, students and their families were invited to a Project K introduction meeting, at which students who wanted to participate in Project K as well as their parents provided written consent. The first measurement point (i.e., survey completion) for

2 These percentages do not sum to 100% due to the fact that some participants identified with multiple ethnicities.

each participant also took place at this meeting.

Control group

Control group students were invited to participate through a teacher at their secondary school. To participate in the study, written consent was required from students and parents. Those who provided written consent then completed surveys during school time on a total of four occasions.

The programme and data collection started at slightly different times for each of the five participating schools, but with similar spacing between data collection points for all groups (see Table 1). Specifically, Time 1 took place in July 2010 for Project K school 1, in September 2010 for Project K schools 2-4, and December 2010 for the control group. The slightly delayed start for the control group occurred due to this control strategy only being decided on and implemented relatively late in the design process.

Data collection was timed so that most collection points coincided with important transitions in the Project K programme, such as the start and finish of the programme as a whole and transitions from one phase of the programme to another. The exceptions to this rule were at Times 4 and 5, at which data were collected during the ongoing mentorship phase rather than at a phase transition. This occurred because the mentoring phase was longer (12 months) in comparison to the other components and we wished to ensure that the data collection procedure facilitated adequate sensitivity to change over this long period. Data were collected from the control group only four times (rather than six) over the programme. Not asking the control group to provide data for two of the time points allowed us to minimise the time burden on the control participants who were contributing to the research project without receiving any material intervention. There was also some variance in data collection time points across schools due to the process of data collection being controlled to some degree by teachers at the schools.

Given the variation in the timing of data collection points, the individual waves of measurement were not treated in the analysis as occurring at the same

point for all participants. Rather, the timing of each measurement point for each individual was coded according to the length of time (in days) between the date of that measurement point and the first measurement point for that participant (i.e., when he or she entered the study). This allowed us to more accurately estimate the "effect of time"—i.e., the rate of change on each dependent variable.

Table 1

Data Collection Dates[1]

| Time | Project phase[2] | Project K schools | | | | Control |
		School 1	School 2	School 3	School 4	School
1	Baseline	27/07/2010	17/09/2010	16/09/2010	08/09/2010	06/12/2010
2	Near start of community challenge	12/10/2010	25/11/2010	27/10/2010	19/10/2010	01/04/2011
3	Near start of mentoring	02/12/2010	30/11/2010	09/11/2010	01/11/2010	10/06/2011
4	Near mentoring 6-month mark	14/06/2011	05/05/2011	19/05/2011	10/05/2011	
5	Near mentoring 9-month mark	06/09/2011	10/09/2011	22/08/2011	01/09/2011	
6	End of programme	25/10/2011	27/09/2011	26/11/2011	06/10/2011	01/11/2011

Notes. Data collection dates are modal (some individual students returned surveys on slightly different dates to the remainder of the students within their school). [2]These phases apply only to the Project K schools.

Measures

Self-efficacy

Self-efficacy was measured by the revised Project K Self-efficacy Questionnaire (PKSEQ), a 20-item self-report scale specifically designed for Project K (Moore, 2005). The questionnaire has three subscales, based on a factor analysis by Moore: *academic* (e.g., "How well can you study for a test?"; 8 items), *social* (e.g., "How well can you become friends with other people?"; 8 items), and *help-seeking* (e.g., "How well can you get adults to help you with a problem?"; 4 items). This said, a subsequent study by Deane et al. (2016) failed to find evidence for a 3-factor solution and focused their analysis only on the academic and social subscales. Given the ambiguity regarding the scales' factor structure and the fact that our study had a number of other distinct criterion variables, for parsimony's sake we focused our analysis on total scores on the PKSEQ rather than domain scores.

Resilience

Resilience was measured by the 25-item Resilience Scale (Wagnild & Young, 1993). All of the questions were positively worded, with example items including "I usually manage one way or another" and "When I am in a difficult situation I usually find my way out of it". The scale uses a 7-point Likert response scale from 1 = *strongly disagree* to 7 = *strongly agree*. Previous research has provided evidence for the reliability and concurrent validity of this scale (Wagnild, 2009, 2011). In this study, the Cronbach's alpha ranged across time phases from .90 to .96.

Connectedness

Connectedness was measured by the Hemingway Adolescent Connectedness Scale (HACS), a 57-item self-report scale (Karcher & Lee, 2002; Karcher & Sass, 2010). Example items include, "I get along with the kids in my neighbourhood" and response options range from *not at all true* (1) to *very true* (5). The scale also

However, an analysis of the estimated effects of Project K on each subscale is also briefly reported. PKSEQ items are scored on a 6-point scale from 1 = *not well at all* to 6 = *quite well*. Across time points, Cronbach's alpha ranged from .86 to .90 for the academic subscale, .81 to .90 for the social subscale, .71 to .84 for the help-seeking subscale, and .87 to .94 for the total scale.

has a *not clear* option for respondents who were unsure how to answer a particular item; such responses were treated as missing data. The HACS has ten subscales (Karcher & Sass, 2010); for the sake of parsimony we analysed only the total scale score in this study. Cronbach's alpha for the HACS ranged across time phases from 0.87 to 0.92.

Wellbeing

Overall psychological wellbeing was measured by the Affectometer 2 (Kammann & Flett, 1983), a 20 item scale with a 5-option rating scale format with endpoints of *not at all* and a*ll of the time*. The Affectometer 2 includes both positively worded items (e.g., "My life is on the right track") and negatively worded items (e.g., "I feel like a failure"). Possible scores range from 20 to 100. In this study, the Cronbach's alpha for the Affectometer 2 was .82 at time 1 and 0.87 at time 6. As the Affectometer 2 was considered a supplementary measure for this project, it was administered only twice (at the first and last data collection points for each person).

Data Analysis

Data were analysed in R version 3.2.4 (R Core Team, 2016), using the *nlme* package version 3.1-125 (Pinheiro et al., 2016) for multilevel models. Missing individual item responses were imputed using (single) expectation-maximisation in the *mice* (multivariate imputation by chained equations) package version 2.22 (Buuren & Groothuis-Oudshoorn, 2011). Just 3.3% of the possible responses to the items used in this study were missing (for returned surveys). Where an entire survey was completely missing for a participant for a given time point, the data point was excluded from analysis (surveys were missing for 12% of the total of 418 measurement points across times and students). Multilevel models can provide maximum likelihood estimates based on all the data that is available without completely excluding participants that had some missing time points.

Results

Self-efficacy

At the beginning of the programme, Project K participants had a mean score of 73 on the self-efficacy scale (*SD* = 15), improving to a mean of 87 (*SD* = 12) at

the end of the programme (a difference of Cohen's $d = 0.93$)[3]. In contrast, control participants started with a higher self-efficacy levels ($M = 84$, $SD = 13$), but showed a slight fall in self-efficacy levels over the course of the programme (time 6 $M = 82$, $SD = 18$, d for change = -0.20). Changes in self-efficacy scores over the course of the programme are displayed in the top left panel of Figure 1. At the end of the programme Project K participants' mean self-efficacy level was above that of the control group.

Figure 1. Time series for each of the dependent variables over the course of the programme. Each data point represents the mean for a particular group and time phase. Only 2 time phases (pre and post) were completed for the wellbeing measure (bottom right panel).

The graphed results in Figure 1 provide a simple description of how students in the Project K and control groups changed over the course of the intervention. However, in order to draw statistical inferences about the effect of Project K on self-efficacy, a multilevel model was utilised. Multilevel models allow for the estimation of effects that vary across participants, and help deal with issues with statistical dependence that can arise when data is "nested" (e.g., multiple time points nested within an individual). Good introductions can be found in Singer and Willett (2003) or Gelman and Hill (2007).

In the multilevel model, a key independent variable was *time*, operationalised as the time period elapsed between the participant entering the
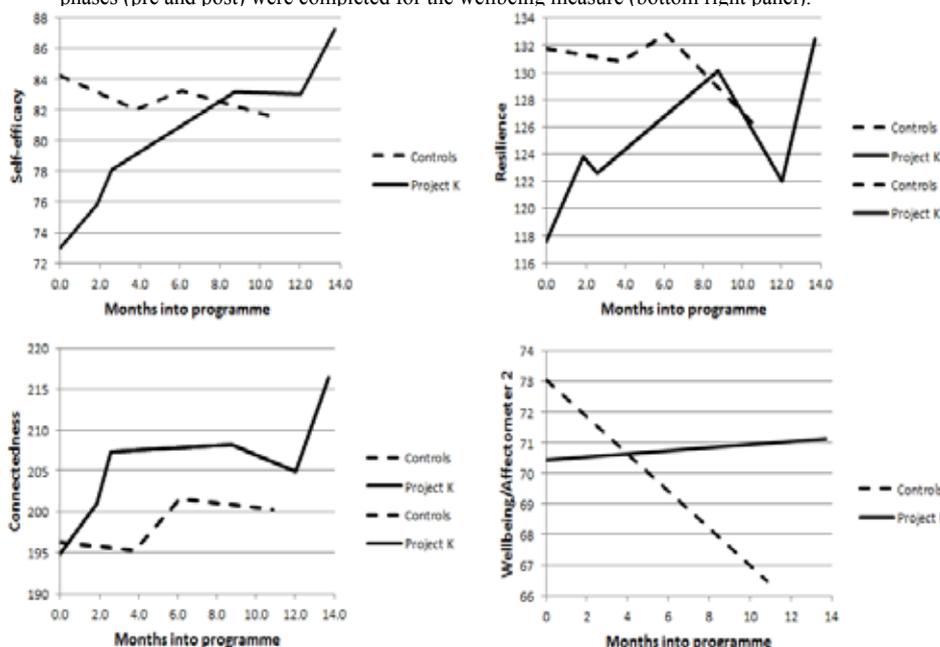
programme, and the data collection point. The goal was to determine if the rate of change over the course of the programme was different for Project K participants than for control participants. This was assessed by specifying an interaction between group and rate of change. The rate of change and the intercept (i.e., the self-efficacy level at the start of the programme) were permitted to vary randomly across participants. In addition, these two parameters were allowed to covary, such that the rate of change could differ across different starting levels of self-efficacy. As Project K participants started with lower levels of self-efficacy, regression to the mean presented a potential threat to internal validity, which was addressed by allowing the rate and intercept to covary. The coefficients for this model are displayed in Table 2.

In Table 2, the estimate of -9.11 for Project K means that the Project K group started with self-efficacy scores approximately 9 points lower than those in the control group. The rate of change of -0.31 means that control participants showed very slight reductions in self-efficacy over the course of the programme, with self-efficacy scores falling by approximately 0.3 points per month. The Group*Rate of change interaction of 1.21 means that the Project K group showed increases of approximately -0.31 + 1.21 = 0.90 points per month in self-efficacy scores (measured on a scale from 20 to 120) during the programme. The fact that the 95% confidence interval for the interaction term excludes zero indicates that there is sufficient evidence to reject a null hypothesis of no difference in rate of change between the groups. The correlation of -.36 between the intercept and rate of change also suggests that participants who started with lower self-efficacy tended to improve more over time, but the inclusion of this parameter (as in the model shown in Table 2) did not remove the effect of Project K on rate of change—suggesting that the positive effect of the programme was unlikely to be due solely to a selection-regression interaction. The multilevel findings thus reinforce the impression visible in the top-left panel of Figure 1: Self-efficacy levels improved in the Project K group, but not the control group.

When we estimated the effects of Project K on the three subscales of the PKSEQ scale in a supplementary analysis, the crucial Group*Rate of change coefficient was positive and statistically significant in each case: $\hat{\beta} = 0.52$, 95% CI [0.24, 0.80] for academic self-efficacy, $\hat{\beta} = 0.38$, 95% CI [0.13,

Table 2

Multilevel Model for Self-Efficacy

	95% CI lower	Estimate	95% CI upper	Standardised estimate
Fixed effects				
Intercept	79.10	83.81	88.53	-
Group (Project K)	-15.11	-9.11	-3.12	-0.09
Rate of change (per month, controls)	-0.76	-0.31	0.15	-0.03
Group*Rate of change	0.66	1.21	1.75	0.09
Random effects (SDs)				
Intercept | Participant	9.52	11.59	14.12	0.14
Rate of change | Participant	0.55	0.79	1.13	0.07
Correlation (intercept, rate of change)	-.62	-.36	-.03	-.36

Note. $N = 369$ observations across 80 participants. Possible scale range of dependent variable: 20–120.

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3 Cohen's *d* scaled in terms of the time 1 standard deviation; see Cumming (2013).

0.62] for social self-efficacy, and $\hat{\beta} =$ 0.30, 95% CI [0.16, 0.44] for help-seeking self-efficacy.

Resilience

At the beginning of the programme, Project K participants had a mean score of 118 on the resilience scale (SD = 21), improving to a mean of 132 (SD = 19) at the end of the programme (a difference of d = 0.70). Control group participants started the programme with higher levels of resilience than those in the Project K group (M = 132, SD = 17), but their mean scores declined over the course of the programme (time 6 M = 126, SD = 26, d for change = -0.36). Change in resilience scores over the course of the programme are displayed in the top right panel of Figure 1. As is visible in the figure, despite starting with lower levels of resilience, the Project K participants ended the programme with higher average levels of resilience than those in the control group. The effect of Project K on resilience was again investigated using a multilevel model. The coefficients for this model are displayed in Table 3.

In Table 3, the rate of change of -0.63 means that control participants showed slight reductions in resilience over time, reinforcing the pattern visible in the graphed results. The Group*Rate of change interaction of 1.32 means that the Project K group showed increases of -0.63 + 1.32 = 0.69 points in resilience scores per month in the programme (with resilience scores measured on a scale from 25 to 175). The fact that the 95% confidence interval for the interaction term excludes zero again indicates that there is sufficient evidence to reject a

null hypothesis of no difference in rate of change between the groups.

Connectedness

At the beginning of the programme, Project K participants had a mean score of 195 on the connectedness scale (SD = 28), improving to a mean of 217 (SD = 21) at the end of the programme (a difference of d = 0.77). Control group participants' scores at the start of the programme were similar to those in the Project K group (M = 196, SD = 24) and also increased over time (time 6 M = 200, SD = 26, d for change = 0.17). Changes in connectedness scores over the course of the programme are displayed in the bottom left panel of Figure 1. The coefficients for a multilevel model of connectedness are displayed in Table 4.

Table 4

Multilevel Model for Connectedness

	95% CI lower	Estimate	95% CI upper	Standardised estimate
Fixed effects				
Intercept	187.09	195.92	204.74	-
Group (Project K)	-8.26	2.97	14.19	0.01
Rate of change (per month, controls)	-0.44	0.33	1.09	0.01
Group*Rate of change	-0.20	0.69	1.58	0.02
Random effects (SDs)				
Intercept | Participant	17.93	21.77	26.44	0.11
Rate of change | Participant	0.69	1.06	1.62	0.04
Correlation (intercept, rate of change)	-0.68	-0.39	-0.00	-0.39

Notes. N = 369 observations across 80 participants. Possible scale range of dependent variable: 57–285.

In Table 4, the rate of change of 0.33 means that control participants showed slight improvements in connectedness over time. The positive Group*Rate of change interaction term suggests that Project K participants' connectedness

scores improved more than did those of control participants within the sample, but the confidence interval for the interaction term spans zero meaning that this effect was not statistically significant.

Wellbeing

At the beginning of the programme, Project K participants had a mean score of 70 on the Affectometer 2 (SD = 10), improving very slightly to a mean of 71 (SD = 12) at the end of the programme (a difference of d = 0.07). The control group's mean wellbeing scores were higher at the start of the programme (M = 73, SD = 9), but had declined quite substantially by the end of the programme (time 6 M = 67, SD = 12, d for change = -0.74). Changes in

wellbeing scores over the course of the programme are displayed in the bottom right panel of Figure 1. The coefficients for a multilevel model of connectedness are displayed in Table 5.

In Table 5, the rate of change of -0.62 means that control participants showed reductions in wellbeing over time, as indeed is visible in the bottom left panel of Figure 4. The Group*Rate of change interaction term of 0.67 suggests that in this sample, Project K participants showed virtually no change (-0.62 + 0.67 = 0.05) in wellbeing scores over time (with wellbeing measured on a scale ranging from 20 to 100). However, the confidence interval for the interaction term excludes zero, meaning that there was some evidence of a difference in rate of change between the two groups (with the control group declining in wellbeing, and the Project K group remaining relatively stable).

Table 3

Multilevel Model for Resilience

	95% CI lower	Estimate	95% CI upper	Standardised estimate
Fixed effects				
Intercept	126.34	132.78	139.23	-
Group (Project K)	-20.02	-11.94	-3.87	-0.08
Rate of change (per month, controls)	-1.33	-0.63	0.08	-0.04
Group*Rate of change	0.51	1.32	2.13	0.07
Random effects (SDs)				
Intercept | Participant	10.82	13.62	17.13	0.11
Rate of change | Participant	0.33	0.71	1.52	0.04
Correlation (intercept, rate of change)	-0.41	-0.02	0.37	-0.02

Notes. N = 369 observations across 80 participants. Possible scale range of dependent variable: 25–175.

Table 5
Multilevel Model for Wellbeing (Affectometer 2)

	95% CI lower	Estimate	95% CI upper	Standardised estimate
Fixed effects				
Intercept	69.50	73.03	76.56	-
Group (Project K)	-7.05	-2.53	1.99	-0.03
Rate of change (per month, controls)	-1.03	-0.62	-0.21	-0.08
Group*Rate of change	0.18	0.67	1.16	0.06
Random effects (SDs)				
Intercept	Participant	2.28	5.80	14.73	0.07
Rate of change	Participant	0.05	0.42	3.75	0.04
Correlation (intercept, rate of change)	-0.99	0.31	1.00	0.78

Notes. N = 152 observations across 80 participants. Possible scale range of dependent variable: 20–100.

Supplementary Analysis: Controlling for School Term of Observation

A peer reviewer raised the concern that the control and intervention groups experienced data collection points at different times, meaning the effect of Project K could be confounded by the effect of time of school year (e.g., students perhaps being happier near the end of the school year, and less so in the middle of it, perhaps producing spurious trajectories of change). To deal with this potential confound, we conducted supplementary analyses controlling for the school term of each observation (1, 2, 3, 4 or holidays) as a nominal variable. This control strategy resulted in no change to the direction or statistical significance of the key interaction between condition (Project K vs. control) and time, with the size of the effect on each of the four main dependent variables remaining very similar. Further details are available upon request.

Discussion

This study provided evidence suggesting positive effects of Project K on the self-efficacy, resilience, and wellbeing of adolescents. The magnitude of these effects was relatively large for self-efficacy and resilience, with an improvement over the course of the programme of Cohen's $d = 0.93$ for self-efficacy, and $d = 0.70$ for resilience. It was less clear whether the programme had a positive effect on adolescent connectedness; this effect was not statistically significant.

These findings replicate the finding of Deane et al. (2016) that Project K has a positive effect on self-efficacy. Indeed, although Project K participants started with substantially lower mean self-efficacy levels than control group participants in the current study, their mean self-efficacy levels had overtaken those of the control group by the end of the programme. A strength of this study is the use of multilevel modelling to demonstrate that this change was not simply due to regression to the mean. The current study also extends Deane et al.'s findings by showing positive effects of Project K on resilience and wellbeing.

The findings of this study fit well with previous research showing positive effects of the components that form part of the Project K package. For example, adventure education programmes have demonstrated their ability to build resilience (Neill & Dias, 2001), while mentoring programmes have been shown to be effective positive youth development tools (Jekielek, Moore, Hair, et al., 2002), and engagement in service activities (like those in the community challenge) is associated with positive academic, behavioural and civic outcomes (Schmidt, Shumow, & Kackar, 2007).

With respect to wellbeing, an interesting finding was that control participants displayed *decreases* in wellbeing over time, while Project K participants displayed essentially stable wellbeing over time. It is possible that the stresses of adolescence result in a temporary reduction in wellbeing over this developmental stage, as

reflected in the control group's decline in wellbeing scores. Indeed, a survey of 9,107 secondary school students in New Zealand found that older students tended to report lower levels of wellbeing (Adolescent Health Group, 2008). It could be the case that Project K provides a protective effect against a decline in wellbeing during adolescence. This would make sense given Project K's primary focus on self-efficacy, as self-efficacy is a good predictor of overall life satisfaction (Vecchio, Gerbino, Pastorelli, Del Bove, & Caprara, 2007). However, it is also possible that the apparent decline in wellbeing in the control group was due to a time-of-year effect (given the fact that the first and last data collection points took place at slightly different times of the school year), or even simply due to chance variation in scores. Given the limited number of time points for the wellbeing data (just two), the evidence of a protective effect on Project K on this variable should be considered tentative.

The effects seen in this study appear to be large enough to have practical significance: For example, the Project K participants started with much lower mean levels of self-efficacy and resilience, yet by the end of the programme had *higher* mean scores on these two variables than did the control group.

Mechanism of action

The results presented here provide evidence of a positive effect of Project K on self-efficacy and resilience (and, more tentatively, wellbeing). There is a number of ways in which Project K might improve self-efficacy and resilience. For example, the wilderness adventure provides students with an opportunity to experience competence and mastery when faced with challenging tasks such as abseiling and team leadership, and such experiences of mastery are considered essential to developing self-efficacy (Bandura, 1977; Pajares, 2002). Similarly, Project K emphasises several skills that are important to developing resilience, such as goal setting, effective problem solving, effective communication and social skills which could explain its apparent positive effect on resilience. Nevertheless, our study was not designed to determine the mechanism of action of Project K and this question could be addressed in future research.

Limitations

While a control group was used, the present study used a quasi-experimental design with non-random allocation of participants to conditions. The use of a control group helps rule out single-group threats to internal validity such as maturation, history, or testing, but the lack of random assignment means that more complex threats to internal validity are possible. Of these, perhaps the most troublesome is the possibility of a selection-regression threat: Project K participants were selected in large part on the basis of having low self-efficacy scores, and started the programme with lower levels of self-efficacy than did the control group. The Project K group's levels of self-efficacy might therefore have improved at a faster rate than the control participants due simply to a faster rate of regression to the mean. However, our multilevel models provided an indirect control for this threat to internal validity. The models specifically included a correlation term modelling the relationship between initial status and rate of change, statistically controlling for a selection-regression threat. For example, for self-efficacy, there was a correlation of -.36 between initial status and rate of change. Participants with lower levels of self-efficacy at the start of the programme tended to improve more, and this was explicitly controlled for in the statistical analysis.

A limitation with respect to the breadth of applicability of our findings is that we were unable to specifically study the efficacy of Project K for Māori adolescents. It could have been useful to study whether the efficacy of Project K differed for Māori versus non-Māori, but the moderate overall sample size meant that there simply were not enough Māori participants to produce a robust and valid comparison (12 Māori participants in the Project K group, and just 8 in the control group). This said, a qualitative study with a group of Māori Project K participants found that these participants generally found Project K to be a supporting and challenging environment to which they attributed positive changes in their lives (Hollis, Deane, Moore, & Harré, 2011). Furthermore, the effect of Project K on self-efficacy amongst Māori adolescents has been studied in the past: Deane (2012) had 264 Māori participants in her randomised controlled trial (when including Māori participants identifying with multiple ethnicities). She found no significant difference in the efficacy of Project K in Māori versus non-Māori for academic or social efficacy when outcomes were measured just after the programme, albeit that a one year follow-up did suggest that the effect of the programme on social (but not academic) self-efficacy was smaller for Māori. Future studies with larger samples than ours could further research the efficacy of Project K amongst Māori, and attempt to determine whether the program does indeed have a smaller effect on social self-efficacy for Māori youth.

Other limitations of the study included the fact that the control group started their waves of measurement slightly later in time than the Project K group, raising the possibility of a selection-history threat. The Project K group could have been exposed to slightly different historical or calendar events over the course of the study period than the control group, thus resulting in a different change trajectory unrelated to the actual effects of Project K. This seems a relatively unlikely explanation for the differences in rates of change across Project K and control participants given that controlling for the school term of each observation resulted in no substantial change to our primary findings.

Implications for Practice and Future Directions

Project K targets youth who are moderately at risk. DuBois et al. (2011) noted that 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, its targeting of 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 results of this study, along with the randomised controlled trial by Deane et al. (2016), provide some justification for organisations who undertake programmes like Project K to advocate for and obtain increased funding to invest in this important area. This said, we have not evaluated the cost-effectiveness of Project K in comparison to competing alternatives for youth development.

On a broader scale, this study demonstrates the importance of building strengths in young people. Not every adolescent can attend Project K, but activities similar to some of the individual components of Project K (adventure education, service learning, and mentoring) could be available more broadly. For example, young people can attend outdoor adventure education courses via programmes such as Outward Bound, engage in local community projects, or make use of one of the several mentoring programmes in New Zealand; see Farruggia et al. (2011) and Dunphy et al. (2008) for reviews.

Conclusion

Positive youth development programmes such as 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. This study provides evidence that Project K meets these goals by producing a positive effect on self-efficacy, resilience, and wellbeing in moderately at-risk young people.

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Corresponding Author
Matt N. Williams
School of Psychology
Massey University
Private Bag 102904
North Shore
Auckland 0745
New Zealand
Email: m.n.williams@massey.ac.nz
DD: +64 9 213 6117