The present paper presents findings from two distinct intervention programs designed to enhance students’ motivation and engagement. The first intervention revolved around a self-complete workbook program among a sample of 53 Australian high school boys. Using a pre/post, treatment/control group design, it was found that the self-complete workbook intervention brought about significant shifts in motivation and engagement. Relative to the control group, the workbook group made positive motivation shifts on key dimensions including study management, persistence, anxiety, failure avoidance, and uncertain control. Against a large weighted external comparison group, the workbook group also made positive shifts on valuing of school, mastery orientation, planning, study management, persistence, failure avoidance, uncertain control, and self-handicapping. The second intervention involved a different sample of 53 high school boys and girls who participated in a workshop program revolving around motivation and engagement and strategies aimed at enhancing these dimensions. Using a pre/post/follow-up design, data showed that there were gains on key facets of students’ motivation and engagement by the end of the program (post-test) – gains that were sustained 6-8 weeks later (follow-up test). When compared to a large weighted external comparison sample, by post-testing and then at follow-up testing, significant declines in motivation had been reversed and any pre-existing advantages or parallel strengths of the workshop sample over the weighted sample were maintained. Key contributing factors underpinning each intervention are discussed as well as the implications the findings have for educational practice.

Motivational research is diverse and to varying degrees, is or can appear, fragmented (Murphy & Alexander, 2000; Pintrich, 2003). Moreover, it has been suggested that educational research can oftentimes yield limited practical and useful implications and applications and that there is a need to combine research that advances scientific understanding but which also has applied utility. Hence, it has recently been recommended that greater attention be given to “use-inspired basic research” (Stokes, 1997; see also Greeno, 1998; Pintrich, 2000, 2003). In response to recent calls for a more ‘use-inspired’ approach to the study of motivation and engagement (see Bong, 1996; Murphy & Alexander, 2000; Pintrich, 2003), the present investigation employs two intervention programs that are shaped by a multidimensional motivation and engagement conceptual framework and then assesses the efficacy of these targeted interventions using a multidimensional instrument that directly reflects an integrative conceptual framework.

The Motivation and Engagement Framework Underpinning the Interventions

Martin (2001, 2002b, 2003) developed the Student Motivation and Engagement Wheel to represent an integrative framework for representing seminal motivation and engagement theory. The development of the Student Motivation and Engagement Wheel emerged through an attempt to bridge a gap between diverse dimensions of educational theorising on the one hand and on the other hand, practitioners’ (e.g., teachers, counsellors, psychologists) need to draw on the strengths of these dimensions within a parsimonious and intuitively appealing framework that they could clearly communicate to students. There are two levels at which the Wheel has been conceptualised: (a) the integrative higher order level comprising adaptive cognitive and behavioural dimensions, impeding cognitive dimensions, and maladaptive behavioural dimensions and (b) the operationalised lower
order level comprising eleven first-order factors subsumed under the four higher order factors. These first order factors are self-efficacy, valuing school, mastery orientation, planning, study management, persistence, anxiety, failure avoidance, uncertain control, self-handicapping, and disengagement.

The intervention programs for this study were developed around these eleven first order factors and assessed using the Student Motivation and Engagement Scale (Martin 2001, 2002b), a multidimensional measure of high school students’ motivation and engagement. Taken together, these programs were aimed at developing a targeted and multidimensional framework within which high school students’ motivation and engagement can be enhanced and sustained. The purpose of this report is to describe two intervention studies and the effects of these interventions on high school students’ motivation and engagement. The first intervention centrally comprised a self-complete workbook. The second intervention comprised a series of workshops targeting students’ motivation and engagement.

**Intervention 1: The Workbook Program**

Intervention 1 comprised a self-complete workbook program of activities targeting students’ motivation and engagement. In total, 13 modules comprised the workbook intervention. The first eleven modules address each of eleven key facets of the Wheel (see Method) and comprised five exercises in each module. The first three exercises were self-complete activities specifically targeting the relevant motivation and engagement facet, and the final two exercises comprised a stocktake and sign-off for reflection. For example, when working on the self-efficacy module, the five exercises involved: (1) identifying and challenging negative thinking, (2) identifying ways to build more success into one’s schoolwork, (3) identifying one’s academic strengths and talents, (4) conducting a stocktake by identifying important messages, how to apply them, and rating one’s confidence in applying the messages, and (5) signing off from the self-efficacy component by revisiting important strategies and having work signed off by oneself and one’s parent/teacher.

The final two modules involved a top-up and a strength-consolidation module. The former (top-up) required the student to identify a previous module in which his or her confidence in applying its important messages was rated low, and then revisit this module with some focused forward-thinking activity. The latter (strength-consolidation) module required the student to identify a previous module in which his or her confidence in applying its important messages was rated highly, and then revisit this module with some focused forward-thinking activity.

Students completed the modules in small tutorial groups (separate from regular class), which were led by teachers. They were free to ask questions as they worked through the modules. Teachers were asked to conduct discussion revolving around the modules that focused on practical ways the lessons learnt could be applied in students’ academic lives. At the same time as treatment tutorial groups were conducted, students in the control group carried on with regular classwork—along with the bulk of their year group. Students in the control group were administered pre and post motivation surveys (Student Motivation and Engagement Scale) at the same time as the treatment group completed their pre and post surveys.

**Aims of Intervention 1**

The central aim of Intervention 1 was to assess the extent to which a targeted and multidimensional workbook program could bring about gains in high school students’ motivation and engagement. It was hypothesized that relative to the control group, students participating in the intervention (treatment group) would evince significant gains on multidimensional motivation and engagement. It was also hypothesized that relative to an external weighted comparison sample, the treatment group would demonstrate significant motivation and engagement gains.

**Target Sample and Procedure**

For Intervention 1, the treatment and control group participants were 53 Australian high school students from a large urban independent boys’ school. Twenty-six were assigned to the treatment group and 27 were assigned to the control group. Participants were in Years 10 (n = 36) and 11 (n = 17). The mean age of participants was 15 years (SD = .66 years), represented by 14- (n = 12), 15- (n =
33), 16- \((n = 7)\), and 17-year olds \((n = 1)\). Teachers administered the Student Motivation and Engagement Scale (Martin, 2001, 2003, 2005) to all participants prior to the treatment group commencing the intervention program. The Scale was again administered to all students when the intervention had concluded.

**The weighted external comparison sample**

In addition to the control group involved in Intervention 1, mean-level group comparisons were drawn with a larger Australian external sample (the comparison group) who had previously been administered the Student Motivation and Engagement Scale. This larger sample comprised 12,237 male and female high school students. From this sample, all 14-, 15-, 16-, and 17-year old boys were selected. In total, this represented 3,381 students. The data for this comparison sample of students were then weighted to reflect the number of 14- \((22.6\%)\), 15- \((62.3\%)\), 16- \((13.2\%)\), and 17-year olds \((1.9\%)\) in the target sample. The weighted data for this group then served as the weighted external comparison group for the study. Importantly, this comparison sample is not a control group. It is simply another means by which the present data can be contextualized, understood, and interpreted.

**Materials**

The Student Motivation and Engagement Scale (Martin, 2001, 2003) is an instrument that measures high school students’ motivation and engagement. It is hypothesised to assess motivation through three adaptive cognitive dimensions, three adaptive behavioural dimensions, three impeding cognitive dimensions, and two maladaptive behavioural dimensions of motivation and engagement. Each of the eleven factors comprises four items—hence, it is a 44-item instrument. For each item, students rate themselves on a scale of 1 (‘Strongly Disagree’) to 7 (‘Strongly Agree’). Reliabilities in this study ranged between .62 and .87 with only one of the eleven factors evincing reliability lower than .70. Previously, Martin (2001, 2003, 2005) has shown that the Student Motivation and Engagement Scale is a valid and reliable measure of academic motivation and engagement, as reflected in the Wheel.

**Adaptive dimensions of motivation and engagement.** Each adaptive dimension falls into one of two groups: cognitions and behaviours. Adaptive cognitions include self-efficacy, mastery orientation, and valuing of school. Adaptive behaviours include persistence, planning, and study management.

- **Self-efficacy** (e.g., “If I try hard, I believe I can do my schoolwork well”): Adapted in part from Midgley et al.’s (1997) Patterns of Adaptive Learning Survey, self-efficacy is a measure of students’ belief and confidence in their ability to understand or to do well in their schoolwork, to meet challenges they face, and to perform to the best of their ability.

- **Valuing of school** (e.g., “Learning at school is important to me”): Adapted in part from Pintrich, Smith, Garcia and McKeachie (1991). Motivated Strategies for Learning Questionnaire, valuing of school measures how much students believe what they learn at school is useful, important, and relevant to them or to the world in general.

- **Mastery orientation** (e.g., “I feel very pleased with myself when I really understand what I’m taught at school”): A measure adapted in part from Nicholls (1989), mastery orientation is being focused on learning, solving problems, and developing skills.

- **Planning** (e.g., “Before I start an assignment I plan out how I am going to do it”): Adapted in part from Miller et al. (1996), planning measures how much students plan their schoolwork, assignments, and study and how much they keep track of their progress as they are doing them.

- **Study management** (e.g., “When I study, I usually study in places where I can concentrate”): Adapted in part from Pintrich et al. (1991), study management refers to the way students use their study time, organize their study timetable, and choose and arrange where they study.

- **Persistence** (e.g., “If I can’t understand my schoolwork at first, I keep going over it until I understand it”): Adapted in part from Miller et al. (1996), persistence measures how much students keep trying to work out an answer or to understand a problem even when that problem is difficult or is challenging.
Impeding cognitive dimensions. The impeding cognitive dimensions measured were anxiety, failure avoidance, and uncertain control.

Anxiety (e.g., “When exams and assignments are coming up, I worry a lot”): Adapted in part from Pintrich and DeGroot (1990), anxiety has two parts: feeling nervous, and worrying. Feeling nervous is the uneasy or sick feeling students get when they think about their schoolwork, assignments, or exams. Worrying is their fear about not doing very well in their schoolwork, assignments, or exams.

Failure avoidance (e.g., “Often the main reason I work at school is because I don’t want to disappoint my parents”): Adapted from an orientation outlined by Harter, Whitesell, and Kowalski (1992), students have an avoidance focus when the main reason they do their schoolwork is to avoid doing poorly or to avoid being seen to do poorly.

Uncertain control (e.g., “I'm often unsure how I can avoid doing poorly at school”): Adapted in part from Connell’s (1985) Unknown cognitive dimension of the Multidimensional Measure of Children’s Perceptions of Control (1985), this subscale assesses students’ uncertainty about how to do well or how to avoid doing poorly.

Maladaptive behavioural dimensions. The maladaptive behavioural dimensions measured are self-handicapping and disengagement.

Self-handicapping (e.g., “I sometimes don’t study very hard before exams so I have an excuse if I don’t do as well as I hoped”): this measure is adapted from the Academic Self-Handicapping Scale (Midgley, Arunkumar, & Urdan, 1996) and the Shortened Self-handicapping Scale (Strube, 1986). Students self-handicap when they do things that reduce their chances of success at school. Examples are putting off doing an assignment or wasting time while they are meant to be doing their schoolwork or studying for an exam.

Disengagement (e.g., “I often feel like giving up at school”): Students are disengaged or at risk of disengagement when they feel like giving up in particular school subjects or school generally. Students high in disengagement tend to accept failure and behave in ways that reflect helplessness.

Intervention 1 Results
Pre- and Post-Test Differences
Pre- and post-test data were analysed using a series of 2 (treatment/control) x 2 (Pre/Post) ANOVAs with repeated measures on the second factor. Table 1 presents findings. There were significant main within-subjects effects on pre- and post-test scores on planning, study management, anxiety, failure avoidance, and uncertain control—however, all but planning were qualified by a significant interaction effect. In terms of planning, for all participants, post-test scores were higher than pre-test scores with a large effect size. As Table 1 shows, there were statistically significant repeated measures of interaction effects on valuing of school, study management, persistence, anxiety, failure avoidance, and uncertain control. Each of these is plotted in Figures 1a to 1f, along with associated effect sizes.

Valuing of school scores for the treatment group increased (medium effect size) between pre- and post-testing while scores for the control group decreased (medium effect size). Planning scores for the treatment group increased markedly (medium effect size) between pre- and post-testing while scores for the control group increased slightly (negligible effect size). Persistence scores for the treatment group increased (medium effect size) between pre- and post-testing while scores for the control group decreased (small effect size). Anxiety scores for the treatment group decreased (medium effect size) between pre- and post-testing while scores for the control group remained the same (zero effect size). Failure avoidance scores for the treatment group decreased modestly (medium effect size) between pre- and post-testing while scores for the control group decreased slightly (negligible effect size). Uncertain control scores for the treatment group decreased markedly (large effect size) between pre- and post-testing while scores for the control group decrease slightly (negligible effect size).
Table 1

Tests for Repeated Measures Effects and Differences between Treatment Group and a Weighted External Comparison Sample

<table>
<thead>
<tr>
<th></th>
<th>Pre Test–Post Test Main Repeated Measures Effect</th>
<th>Pre Test–Post Test Repeated Measures x Group Effect</th>
<th>Treatment Group Pre Test–Weighted Comparison Difference¹</th>
<th>Treatment Group Post Test–Weighted Comparison Difference¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F (df) (Effect Size)</td>
<td>F (df) (Effect Size)</td>
<td>t (df) (Effect Size)</td>
<td>t (df) (Effect Size)</td>
</tr>
<tr>
<td>ADAPTIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>1.91 (1,51) ns</td>
<td>.20 (1,51) ns</td>
<td>.22 (25) ns</td>
<td>1.22 (25) ns</td>
</tr>
<tr>
<td>Valuing of school</td>
<td>.06 (1,51) ns</td>
<td>7.34 (1,51)**</td>
<td>.97 (25) ns</td>
<td>2.80 (25)** Treat&gt; Compar (.43)</td>
</tr>
<tr>
<td>Mastery orientation</td>
<td>3.82 (1,51) ns</td>
<td>1.59 (1,51) ns</td>
<td>.55 (25) ns</td>
<td>2.03 (25)* Treat&gt; Compar (.39)</td>
</tr>
<tr>
<td>Planning</td>
<td>16.68 (1,51)***                                Pre &lt; Post (.69)</td>
<td>2.36 (1,51) ns</td>
<td>.07 (25) ns</td>
<td>4.11 (25)*** Treat&gt; Compar (.64)</td>
</tr>
<tr>
<td>Study management</td>
<td>7.16 (1,51)* Qualified by interaction</td>
<td>3.10 (1,51)†</td>
<td>.92 (25) ns</td>
<td>3.83 (25)*** Treat&gt; Compar (.60)</td>
</tr>
<tr>
<td>Persistence</td>
<td>.63 (1,51) ns</td>
<td>5.59 (1,51)**</td>
<td>.10 (25) ns</td>
<td>2.30 (25)* Treat&gt; Compar (.38)</td>
</tr>
<tr>
<td>IMPEDING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>7.97 (1,51)** Qualified by interaction</td>
<td>9.29 (1,51)**                                   See Figure 1d</td>
<td>1.00 (25) ns</td>
<td>-1.43 (25) ns</td>
</tr>
<tr>
<td>Failure avoidance</td>
<td>4.95 (1,51)* Qualified by interaction</td>
<td>2.77 (1,51)†                                     See Figure 1e</td>
<td>-.30 (25) ns</td>
<td>-1.70 (25)† Treat&lt; Compar (.36)</td>
</tr>
<tr>
<td>Uncertain control</td>
<td>9.39 (1,51)** Qualified by interaction</td>
<td>5.14 (1,51)*                                   See Figure 1f</td>
<td>.93 (25) ns</td>
<td>-1.86 (25)† Treat&lt; Compar (.31)</td>
</tr>
<tr>
<td>MALADAPTIVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-handicapping</td>
<td>.48 (1,51) ns</td>
<td>2.08 (1,51) ns</td>
<td>-1.98 (25)† Treat&lt; Compar (.36)</td>
<td>-4.35 (25)*** Treat&lt; Compar (.59)</td>
</tr>
<tr>
<td>Disengagement</td>
<td>1.75 (1,51) ns</td>
<td>.43 (1,51) ns</td>
<td>-.37 (25) ns</td>
<td>-1.19 (25) ns</td>
</tr>
</tbody>
</table>

* p < 0.05 ** p < 0.01 *** p < 0.001 † p < 0.1 ns = not statistically significant
Note that for repeated measures analyses, Bonferroni correction would render p < 0.005 as the revised significance level
Note that for the one-sample t-tests, Bonferroni correction would render p < 0.002 as the revised significance level
1. Weighted external Comparison is weighted sample of n = 3,381 Australian high school boys
Figure 1a. Pre/Post x Treat/Cont interaction on **VALUING OF SCHOOL**
Treatment Pre/Post Effect Size = .32
Control Pre/Post Effect Size = .35

Figure 1b. Pre/Post x Treat/Cont interaction on **STUDY MANAGEMENT**
Treatment Pre/Post Effect Size = .44
Control Pre/Post Effect Size = .08

Figure 1c. Pre/Post x Treat/Cont interaction on **PERSISTENCE**
Treatment Pre/Post Effect Size = .43
Control Pre/Post Effect Size = .25

Figure 1d. Pre/Post x Treat/Cont interaction on **ANXIETY**
Treatment Pre/Post Effect Size = .44
Control Pre/Post Effect Size = NA

Figure 1e. Pre/Post x Treat/Cont interaction on **FAILURE AVOIDANCE**
Treatment Pre/Post Effect Size = .31
Control Pre/Post Effect Size = .07

Figure 1f. Pre/Post x Treat/Cont interaction on **UNCERTAIN CONTROL**
Treatment Pre/Post Effect Size = .52
Control Pre/Post Effect Size = .06
Tests Using a Larger Weighted External Comparison Sample

One limitation of previous analyses is that it is unclear how the mean levels of motivation compare to a larger and more representative sample beyond the school in which the study took place. To redress this, a weighted external comparison sample (described above) was incorporated into analyses. To test for differences between this comparison sample and pre- and post-testing for the treatment group, a series of one-sample $t$-tests were carried out. Findings of the one-sample $t$-tests and associated effect sizes are presented in Table 1.

Table 1 shows that at pre-testing, on all but the self-handicapping measure the treatment group was not significantly different from the weighted comparison sample. In terms of self-handicapping, the difference is at the $p < 0.1$ level, with the comparison sample scoring higher than the treatment group. Taken together, these findings show that at the outset of the intervention, the treatment group was not significantly different from the weighted comparison sample.

By post-testing, however, significant differences in motivation and engagement had emerged such that the treatment group was more motivated than the comparison sample. Specifically, by the end of the intervention, the treatment group scores significantly higher than the weighted comparison archive sample on valuing of school, mastery orientation, planning, study management, and persistence. Moreover, by the end of the intervention, the treatment group scored significantly lower than the weighted comparison group on failure avoidance and uncertain control. In terms of self-handicapping, the gap between the treatment group and the archive sample had widened, with the treatment markedly lower in self-handicapping scores. Effect sizes ranged from medium to large, with a number of effect sizes in the large range (planning, study management, and self-handicapping). Taken together, these findings also attest to the positive effects of the intervention on students’ academic motivation and engagement.

Intervention 2: The Workshop Program

In the second intervention, workshops were conducted with high school students. Motivation and engagement workshops were conducted within a Rotary youth enrichment weekend program. The program is the Rotary Youth Program of Enrichment (RYPEN), a program for 14-16 year old school students. Invitations to participate in the program are sent to schools in a given district. Young people are selected on the basis of age, availability to participate in the full program, and a readiness to make some changes in their lives. Selection is carried out by a school’s Principal or Year Advisor who identifies appropriate students and then nominates them to Rotary. The program does not target ‘at risk’ students per se but includes students experiencing some difficulties such as decreased motivation, low self-esteem, vocational confusion, or bouts of school failure. The program, then, is aimed at the middle range of students who are not performing to their potential yet who have demonstrated a capacity to make changes in their lives. Nominated students are informed that they have been identified on the basis that they show potential to benefit from the program.

The RYPEN program typically invites a guest speaker enabling a focus on a complementary but non-overlapping dimension of development. Motivation was identified by program administrators as an area that was consistent with the goals of the program and which could be meaningfully embedded in the weekend’s activities. In the RYPEN program reported on here, two motivation workshops were conducted with participants. Participants were divided into two equally-sized groups, each receiving the two motivation sessions. The first workshop introduced and defined the concept of motivation, presented and explained the Student Motivation and Engagement Wheel to students, presented case studies of students who represented different motivation patterns, and explained to participants potential barriers to change and how to overcome these barriers. The second workshop focused on specific facets of the Student Motivation and Engagement Wheel and detailed strategies students could use to address each one in their academic life. Support materials were also provided to participants which included all slides from both workshops, activity sheets, and reading lists for participants and their parents.
Aims of Intervention 2

The central question in Intervention 2 is the impact the program had on participants’ academic motivation over the course of the weekend and then over the following 6-8 weeks. It was also of interest to determine if gender effects emerged in relation to these differences across time. Given the widespread interest in gender effects in academic engagement, motivation, and achievement (House of Representatives, 2002; Lingard, Martino, Mills, & Bahr, 2002; Martin, 2002a), it was considered important to determine the (potentially) differential nature in which boys and girls responded to the youth enrichment activities. Age was not included as a factor for formal analysis because only 10 and 7 students were 14 and 16 years respectively (68% of students being 15 years) representing cell sizes deemed too small to yield generalisable findings as a function of age.

Intervention 2 Method

Sample and Procedure

Intervention 2 participants were 53 high school students from urban high schools (government, systemic catholic, and independent schools) located in predominantly middle-class suburbs of Sydney, Australia. For the most part, schools were represented by only one student. In total, 53% of students were males and 47% females with a mean age of 15 years (SD=.57 years). One student was in Year 9, 46 were in Year 10, and six were in Year 11.

Leaders administered the Student Motivation and Engagement Scale (Martin, 2001, 2003) to participants in the early part of the weekend. The Scale was again administered to students towards the end of the weekend. Approximately five weeks later, the Scale was posted to participants in a self-addressed reply-paid envelope. Along with the Scale was a one-page letter to parents reiterating the central ideas underpinning the motivation workshops and a similar one-page letter to students. Twenty-three surveys were completed and returned following this initial mail-out. A reminder survey was posted two weeks later and a further thirteen surveys were completed and returned. In total, the response rate for the follow-up survey was 68% (36 follow-up surveys). Follow-up data pertain to the 6-8 week period following the RYPEN weekend.

The weighted comparison sample

Because no control group was involved in this study, mean-level group comparisons were drawn with a larger Australian sample who had previously been administered the Student Motivation and Engagement Scale. This larger sample comprised 5,203 high school students. From this sample, all Year 9, 10, and 11 students were selected. In total, this represented 2,769 students. The data for this comparison sample of Year 9, 10, and 11 students were then weighted to reflect the number of Year 9 (2%), Year 10 (87%) and Year 11 (11%) students in the RYPEN sample. The weighted data for this group then served as the comparison group for the study. As with Intervention 1, this comparison sample is not a control group. It is simply another means by which the present data can be contextualised, understood, and interpreted.

Materials

The Student Motivation and Engagement Scale (see Intervention 1 Method) was administered to participants. Reliabilities in Intervention 2 ranged between .60 and .94 with only two of the eleven factors evincing reliability lower than .70. Previously, Martin (2001, 2003, 2005) has shown that the Student Motivation and Engagement Scale is a valid and reliable measure of academic motivation and engagement, as reflected in the Wheel.
(towards the end of the weekend) data because it was at these two time points that the entire sample’s data were available. Secondly, this entailed comparing (a) Time 1 and Time 3 (6-8 weeks following the weekend) data and (b) Time 2 and Time 3 data for the sub-sample that completed and returned the follow-up surveys.

Time 1 and Time 2 data were analysed using a series of 2 (boys, girls) x 2 (Time 1, Time 2) ANOVAs with repeated measures on the second factor. Table 2 presents findings. Because there were no statistically significant gender effects on any measure (indicating that the immediate effects of the RYPEN program do not differ markedly for boys and girls), the findings in Table 2 relate to repeated measures main effects only. As Table 2 shows, there were a number of statistically significant repeated measures main effects with effect sizes ranging from small to moderate. Specifically, students were significantly higher at Time 2 than Time 1 on self-efficacy, mastery orientation, and persistence and were significantly lower at Time 2 than Time 1 on anxiety, failure avoidance, and uncertain control. These results show that by the end of the RYPEN program, students were significantly improved on key facets of academic motivation and engagement.

The critical question, however, is whether there gains were sustained 6-8 weeks later. This question was explored through a series of 2 (boys, girls) x 2 (Time 1, Time 3) ANOVAs with repeated measures on the second factor. Results (see Table 2) showed that there were statistically significant differences in motivation at the outset of the program compared with 6-8 weeks later with effect sizes ranging from moderate to large. Specifically, at Time 3 (6-8 weeks later), students were significantly higher than they were at Time 1 (the start of the program) in self-efficacy, valuing of school (p<0.1), planning, study management, and persistence. At Time 3 they were significantly lower than Time 1 in anxiety, uncertain control, and self-handicapping. Moreover, only one gender-related effect emerged: girls’ persistence was more likely to have improved between Time 1 and Time 3, F(1,33)=7.89, p<0.01. Taken together, these findings provide support for the medium-term benefits from the program for both boys and girls.

Further analysis was undertaken to examine the nature of effects between Time 2 and Time 3 – that is, between the end of the program and 6-8 weeks later. This was explored through a series of 2 (boys, girls) x 2 (Time 2, Time 3) ANOVAs with repeated measures on the second factor. Results (see Table 2) showed that there were statistically significant differences between Time 2 and 3 on some dimensions with small effect sizes. Specifically, students were significantly higher on mastery orientation, planning, and study management and significantly lower in uncertain control and self-handicapping – all reflecting adaptive shifts in motivation. One interaction effect was found: girls’ persistence was more likely to have improved between Time 2 and Time 3, F(1,31)=11.51, p<0.01

Comparisons with a Larger Weighted Sample

One limitation of the previous analyses is that no control data were available and so it is unclear how the mean levels of motivation compare to a sample that did not undertake the RYPEN weekend. To redress this, a weighted comparison sample (described above) was incorporated into analyses. To test for differences between this weighted sample and each time point in the RYPEN sample, a series of one-sample t-tests was carried out. Findings are presented in Table 2.

Table 2 shows that at the outset of the weekend, students were significantly lower in mastery orientation, planning, and study management and not significantly different in self-efficacy, valuing of school, persistence, anxiety, failure avoidance, or self-handicapping. Taken together, these findings show that at the outset of the program, they are either no different from the weighted sample or significantly less motivated on key dimensions.

By Time 2 and also by Time 3, however, significant declines in motivation had been reversed such that they were no longer markedly less motivated than the weighted sample or such that they were now significantly more motivated than the weighted sample. Moreover, any pre-existing advantages or parallel strengths of the RYPEN sample over the weighted sample were maintained across time. Effect sizes ranged from small to large with most effect sizes in the moderate to large range. Taken together, these findings also attest to the positive effects of the program on students’ academic motivation in the short term and also some 6-8 weeks later.
Table 2
Tests for main effects across time and differences between each time and a comparative weighted sample

<table>
<thead>
<tr>
<th></th>
<th>Time 1 - Time 2</th>
<th>Time 1 - Time 3</th>
<th>Time 2 - Time 3</th>
<th>Time 1 - Comparison²</th>
<th>Time 2 - Comparison²</th>
<th>Time 3 - Comparison²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effect (Effect Size)</td>
<td>Effect (Effect Size)</td>
<td>Effect (Effect Size)</td>
<td>Effect (Effect Size)</td>
<td>Effect (Effect Size)</td>
<td>Effect (Effect Size)</td>
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<tr>
<td></td>
<td>F (df)</td>
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<td>F (df)</td>
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<tr>
<td>ADAPT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>6.93 (1,46)**</td>
<td>4.83 (1,32)*</td>
<td>.51 (1,31)</td>
<td>-0.49 (50) ns</td>
<td>2.27 (49)*</td>
<td>1.75 (35)†</td>
</tr>
<tr>
<td>Value school</td>
<td>.54 (1,47)</td>
<td>3.40 (1,33)†</td>
<td>3.71 (1,31)</td>
<td>1.28 (51) ns</td>
<td>1.60 (49) ns</td>
<td>1.96 (35)*</td>
</tr>
<tr>
<td>Master orient</td>
<td>3.93 (1,46)*</td>
<td>1.79 (1,33)**</td>
<td>7.05 (1,31)*</td>
<td>-2.52 (51)*</td>
<td>-1.06 (49) ns</td>
<td>.26 (35) ns</td>
</tr>
<tr>
<td>Planning</td>
<td>3.23 (1,46)</td>
<td>12.78 (1,33)**</td>
<td>8.16 (1,31)**</td>
<td>-1.76 (50)†</td>
<td>-2.59 (49) ns</td>
<td>1.18 (35) ns</td>
</tr>
<tr>
<td>Study manag</td>
<td>.24 (1,46)</td>
<td>5.25 (1,32)*</td>
<td>4.34 (1,31)*</td>
<td>-1.94 (50)†</td>
<td>-1.77 (49)†</td>
<td>-3.5 (35) ns</td>
</tr>
<tr>
<td>Persistence</td>
<td>11.63 (1,47)**</td>
<td>4.95 (1,33)*</td>
<td>.02 (1,31)</td>
<td>-0.63 (51) ns</td>
<td>1.20 (49) ns</td>
<td>2.04 (35)*</td>
</tr>
<tr>
<td>IMP &amp; MAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>20.07 (1,45)**</td>
<td>4.62 (1,32)*</td>
<td>2.6 (1,31)</td>
<td>-0.53 (49) ns</td>
<td>-2.73 (49)**</td>
<td>-1.61 (35) ns</td>
</tr>
<tr>
<td>Failure avoid</td>
<td>14.26 (1,47)**</td>
<td>.55 (1,33)</td>
<td>1.42 (1,31)</td>
<td>-1.56 (51) ns</td>
<td>-4.12 (49)**</td>
<td>-1.53 (35) ns</td>
</tr>
<tr>
<td>Uncert contrl</td>
<td>7.47 (1,47)**</td>
<td>13.03 (1,33)**</td>
<td>5.52 (1,31)*</td>
<td>-1.78 (51)†</td>
<td>-3.41 (49)†</td>
<td>-5.26 (35)****</td>
</tr>
<tr>
<td>Self-handicap</td>
<td>1.49 (1,45)</td>
<td>13.3 (1,32)**</td>
<td>6.84 (1,31)*</td>
<td>.16 (49) ns</td>
<td>-1.15 (49) ns</td>
<td>-3.92 (35)***</td>
</tr>
</tbody>
</table>

* p<0.05  ** p<0.01  *** p<0.001  † p<0.1  ns=not statistically significant

Note that for repeated measures analyses (comprising 30 tests), Bonferroni correction would render p<0.001 as the revised significance level.

Note that for the one-sample t-tests (comprising 30 tests), Bonferroni correction would render p<0.001 as the revised significance level.

1. Only main effects reported as only two time x gender effects statistically significant.
2. Comparison is weighted sample of N=2,769 Australian high school students.
Discussion

The present paper presents findings from two distinct intervention programs designed to enhance students' motivation and engagement. The first intervention revolved around a self-complete workbook program. Using a pre/post, treatment/control group design, it was found that the self-complete workbook intervention brought about significant shifts in motivation and engagement. Relative to the control group, the workbook group made positive motivation shifts on key dimensions including study management, persistence, anxiety, failure avoidance, and uncertain control. Against a large weighted external comparison group, the workbook group also made positive shifts on valuing of school, mastery orientation, planning, study management, persistence, failure avoidance, uncertain control, and self-handicapping.

The second intervention involved a different sample who participated in a workshop program revolving around motivation and engagement and strategies aimed at enhancing these dimensions. Using a pre/post/follow-up design, data showed that there were gains on key facets of students’ motivation and engagement by the end of the program (post-test) – gains that were sustained 6-8 weeks later (follow-up test). When compared to a large weighted external comparison sample, by post-testing and then at follow-up testing, significant declines in motivation had been reversed and any pre-existing advantages or parallel strengths of the workshop sample over the weighted sample were maintained.

Significance of Findings

The findings are significant for a number of reasons. Firstly, they show that targeted intervention yields effects consistent with the underlying theoretical rationale of the program. Previous research shows that targeted intervention is more effective than intervention that does not focus on specific target behaviours (Weisz, Weiss, Han, Granger, & Morton, 1995) and so it is proposed that educational programs seeking to build specific academic skills and competencies need to provide targeted support that can do this. Indeed, as the present data show, multidimensional interventions are an effective means of achieving this.

Second, the findings reflect and confirm research into the elements of programs that work. For example, the intervention involved the following elements that research has found to underpin effective intervention and strategy: theoretically-derived targets of motivation and engagement, empirically-derived intervention methodology, multidimensional educational cognition, affect, and behaviour, research-based risk (impeding and maladaptive dimensions of the Wheel) and protective factors (adaptive dimensions), established practices that nurture optimal youth development, use of interpersonally-skilled staff (e.g., teachers well known to the students), and incorporation of evidence-based programming (see Dryfoos, 1990; Lerner & Galambos, 2002; Nation et al., 2003, Weissberg et al., 2003). All these elements were central to both interventions and underpin the importance of quality intervention that meets widely endorsed quality standards.

A third reason the findings are significant is because they provide support for a multidimensional conceptualisation and application of motivation and engagement, show how multidimensional intervention can address a diversity of motivation and engagement factors, and demonstrate what particular dimensions of these are most influenced by intervention work.

Limitations and Future Directions

The present study provides a number of important insights into two forms of educational intervention that are multidimensionally targeted, and also the impact such interventions can have on motivation and engagement outcomes. Notwithstanding this, there are some aspects of the interventions that require qualification and which provide direction for future research.

It may be that a Hawthorne Effect can account for part of the gains observed. That is, simply being part of any new program and participating in the motivation interventions prompted students to operate in more motivated ways and perhaps to inflate their self-reports of motivation and engagement. It might also be possible that these gains were a function of participants’ expectations, practice effects, or their propensity to be “test savvy”. They were aware of the purpose of the intervention and may have been motivated to give the “right” answers. Future research is needed to assess the extent to which these factors are relevant to such intervention programs.
All data in both interventions were self-report in nature. A more powerful test of the effectiveness of the interventions would be to assess the link between these results and later academic achievement. Unfortunately, no achievement data were available in the two interventions and future research would do well to extend the data collection to incorporate “objective” measures of performance such as achievement scores.

Finally, it is recognised that the samples for the two interventions were not large, and so the extent to which they are representative of the larger student population is unclear. It must be noted, however, that intervention research typically does not involve large numbers, and so these samples are not unusually small in this context. Furthermore, inclusion of large weighted external comparison samples provided an important and valid context in which to explore the motivational gains observed.

**Conclusion**

The present study sought to explore the effects on students’ academic motivation and engagement of two distinct multidimensional educational interventions. Relative to control and large weighted comparison samples, the data demonstrated gains for treatment groups on key facets of motivation over the course of the interventions. Taken together, these findings hold practical implications for program developers seeking to enhance key facets of students’ academic motivation and engagement, as well as implications for researchers seeking to assess the impact of programmatic interventions on academic outcomes.

**About the Author**

Dr Andrew Martin is Post Doctoral Research Fellow at the SELF Research Centre, University of Western Sydney. He is a Registered Psychologist and his research interests are student motivation, parenting, and research methodology. In 2002, his PhD was judged the Most Outstanding Doctoral Dissertation in Educational Psychology by the American Psychological Association and before that was judged the Most Outstanding PhD in Education in Australia by the Australian Association for Research in Education. Andrew was also listed in *The Bulletin’s* SMART 100 Australians and in the Top 10 in the field of Education. He has published over 35 refereed articles and chapters and presented 18 invited/keynote addresses in the past two years. Andrew also regularly conducts staff development in schools focused on enhancing student motivation in the classroom, and is author of the recently published book by Bantam, “*How to Motivate Your Child For School and Beyond*”.

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References


