

2x2 Achievement Goals in Learning and Coping among High School Students

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This study examines the 2 x 2 achievement goal frame-work (Elliot & McGregor, 2001), in relation to learning and coping strategies among high school students. The 2 x 2 achievement goals refer to 4 kinds of achievement goals: mastery approach, mastery avoidance, performance approach, and performance avoidance. By comparing the variable and person-centred perspectives, this study examined the relation of the 4 goal orientations on learning and coping strategies, which in turn had an effect on academic achievement and psychological health, respectively. Path analyses indicated that results differed when goal variables, as opposed to goal cluster profiles were employed as predictors. When goal variables were employed as predictors, mastery approach goals emerged as the most adaptive goal orientation. However, when goal profiles were employed as predictors, the “mastery” goal profile, as well as the “all goals moderate” goal profile emerged as the most adaptive goal groups. Contrary to expectations, the “all goals high” profile did not turn out to be as adaptive as previously thought. In addressing the goal debate on adaptiveness of goal orientations and goal profiles, the importance of concurrently examining both learning and coping domains was discussed.

Literature Review

Achievement Motivation and the 2 x 2 Achievement Goal Framework

Early conceptualizations of achievement motivation may be traced back to McClelland and colleagues' (McClelland, Atkinson, Clark, & Lowell, 1953) attempt to develop a theory of motivation based on the affective arousal model. They proposed affective states as the basis for motives, whereby a particular situation producing a positive affect would result in an *approach* motive, and a particular situation producing a negative affect would result in an *avoidance* motive. They extended this model of motivation to achievement, and developed the measure on “need for achievement” in success and failure situations. This idea of the need for achievement further expanded in association with intrinsic and extrinsic motivation. Deci (1971, p. 105) defined intrinsic motivation as performing an activity for the sake of the activity itself, without receiving any other external rewards. Elliot and Harackiewicz (1996, p. 462) defined intrinsic motivation as “enjoyment of and interest in an activity for its own sake.” Subsequently, the achievement goal theory which was theorised to influence the level of intrinsic motivation in a student's learning, was introduced (Ames, 1984; Ames & Archer, 1988; Dweck & Elliot, 1983; Nicholls, 1984). Achievement goals refer to the “purposes or reasons an individual is pursuing an achievement task” (Pintrich, 2000a, p. 93). Dweck and Elliot (1983) distinguished between *learning*¹ goals and *performance*² goals. According to them, learning goals are aimed at increasing one's competence, whereas performance goals are aimed at obtaining a favourable judgment of competence (performance approach), and avoiding a negative judgment of competence (performance avoidance). Along the same lines, Nicholls (1984) proposed two kinds of achievement goals: one of which is to develop one's competence (*task* goals), whereas the other is to demonstrate one's competence (*ego* goals). Elliot and Harackiewicz (1996) further expanded on these two distinct goal orientations by drawing on the approach-avoidance components proposed earlier by McClelland et al. (1953), with reference to the trichotomous

¹ Learning goals had also been labelled as: 1) *mastery* goals, 2) *task* goals.

² Performance goals had also been labelled as: 1) *ego* goals, 2) *ability* goals.

goal framework: *mastery* (same as task or learning goals), *performance approach*, and *performance avoidance*.

Following the utility of the trichotomous goal framework, emerged the proposal for a 2x2 achievement goal framework consisting of four goal orientations, (Elliot, 1999; Elliot & McGregor, 2001; Pintrich, 2000a; Pintrich, 2000b), where the concept of mastery avoidance was introduced into the trichotomous goal framework. Elliot (1999, p. 181) defined mastery avoidance goals as “striving to avoid losing one’s skills and abilities, forgetting what one has learned, misunderstanding material, or leaving a task incomplete or unmastered”, and such a goal orientation is likely to result in some positive and some negative consequences. Pintrich (2000a, p. 100) defined mastery avoidance as “focused on avoiding misunderstanding, avoiding not learning or not mastering a task”. Elliot and McGregor (2001) set out to test the proposed 2x2 goal framework and found support for the four-factor goal structure with the undergraduate sample. Other later studies also confirmed the four-factor structure and proceeded to further explore the utility of this framework (Adie, Duda & Ntoumanis, 2008; Bong, 2009; Coutinho & Neuman, 2008; Nien & Duda, 2008; Njouku, 2007; Sideridis, 2008).

The 2x2 Goal Framework and Academic Learning

A thorough investigation of the antecedents and consequences of the 2x2 goal framework was conducted in three studies by Elliot and McGregor (2001). Across the three studies, it was found that there were more adaptive antecedents and consequences for the two approach goal orientations, relative to the other two avoidance goal orientations. However, mastery approach³ proved to be the most adaptive of the four, while performance avoidance proved to be the most maladaptive. Specifically, in terms of positive antecedents such as overall need for achievement, work-mastery, self-determination⁴, competence valuation and class engagement, mastery approach was positively related to these variables. Performance approach was only positively related to an overall need for achievement and competence valuation. In addition to these antecedents, performance approach was also positively related to maladaptive antecedents, such as competitiveness, fear of failure and parents’ conditional approval. The only two adaptive antecedents related to mastery avoidance was competence valuation and class engagement. This goal orientation was more related to maladaptive antecedents such as fear of failure, lack of self-determination, entity theory⁵ (instead of incremental theory), and a focus on parental negative feedback. Along the same lines, performance avoidance was related to maladaptive antecedents such as fear of failure, lack of self-determination, entity theory, and focus on parental negative feedback. The only adaptive antecedent associated with this goal orientation was competence valuation.

In terms of consequences, the two approach goal orientations were once again the most adaptive, each with a different focus. Mastery approach predicted deep learning strategies, while performance approach predicted academic achievement. The other two avoidance goals were less adaptive in terms of consequences. Mastery avoidance predicted disorganization, state trait anxiety, worry and emotionality. Performance avoidance also

³ From this section onwards, when the 2x2 goals are referred, mastery approach goals will be termed as ‘mastery approach’, mastery avoidance goals as ‘mastery avoidance’, performance approach goals as ‘performance approach’, and performance avoidance goals as ‘performance avoidance’.

⁴ Self-determination refers to the inherent desire for autonomy and choice (Deci & Ryan, 1991).

⁵ Entity theory refers to the belief that one’s abilities are fixed while incremental theory is the belief that one’s abilities are changeable (Dweck & Leggett, 1988).

predicted these same negative emotions, and in addition, increased health centre visits and decreased academic performance.

The 2x2 Goal Framework and Psychological Health

Apart from its relation to academic learning, it is also important to consider how goal orientations might relate to students' psychological health. Dweck and Leggett (1988) provided an interpretation of how goal orientations might be linked to psychological health and emotion. They posited that especially in a setback or failure situation, individuals with a performance goal orientation will generate a low-ability self-judgement which poses a threat to self-esteem and eventually resulting in negative affect such as anxiety, depression and shame. Earlier studies on the dichotomous and trichotomous goals indicated that performance goals, especially performance avoidance, were related to test anxiety, fear of failure, lower academic self-concept, self-esteem and self-efficacy (Elliot & Church, 1997; McGregor & Elliot, 2002; Skaalvik, 1997). Later studies on the 2x2 goal framework found that in addition to performance avoidance, mastery avoidance also demonstrated a relation to negative affect, high physiological arousal, lower self-esteem, cognitive anxiety, fearfulness, and increased visits to health centres (Adie et al., 2008; Elliot & McGregor, 2001; Sideridis, 2008).

Exploring deeper into the link between goal orientations and psychological well-being, researchers started to investigate the role of coping in this aspect (Adie et al., 2008; Kaplan & Midgley, 1999; Ntoumanis, Bidle, & Haddock, 1999). According to Lazarus and Folkman (1984, p. 141), coping strategies refer to "cognitive and behavioural efforts to manage specific external and /or internal demands that are appraised as taxing or exceeding the resources of the person". Earlier studies on the dichotomous and trichotomous goals generally found that mastery goals were associated with adaptive coping while performance goals were associated with maladaptive coping (Kaplan & Midgley, 1999; Ntoumanis et al., 1999). Later studies adopting the 2x2 goal framework found a further delineation with respect to the approach-avoidance dimensions. Specifically in their mediational analyses (Adie et al., 2008), a distinction was drawn between mastery approach and mastery avoidance. The researchers found that for mastery approach, appraising a stress situation as a challenge mediated between this goal orientation and positive affect, while for mastery avoidance, it was threat appraisal which mediated between this goal orientation and negative affect.

Research Objectives and Questions

Previous reviewed studies had focused mainly on the dichotomous or trichotomous goal framework, although studies focusing on the 2x2 goal framework are recently emerging (Adie et al., 2008; Bong, 2009; Coutinho & Neuman, 2008; Nien & Duda, 2008; Sideridis, 2008). This present study adopts the 2x2 goal framework, together with work avoidance⁶ (for a more comprehensive comparison of goal orientations), with concurrent focus on academic learning and psychological health, aiming for a comprehensive and balanced perspective of the effects of the goal orientations on these two different aspects.

The challenge of maintaining a good balance between academic performance and coping with stress situations are common pertinent issues faced by school-aged adolescents (Byrne & Mazanov, 2002; Suldo, Riley, & Shaffer, 2006). Hence, with a sample of high

⁶ Work avoidance is defined as trying to complete or understand academic tasks with minimum effort, have easy assignments, no homework, or to do as little as possible (Archer, 1994; Jarvis & Seifert, 2002; Meece, Holt, & Blumenfeld, 1988; Nicholls, Cheung, Lauer, & Patashnick, 1989).

school students in Australia, this study investigates which kinds of goal profiles might be adaptive (or maladaptive) in the domains of learning and coping for school-aged adolescents.

Another objective of this study is to apply the 2x2 goal framework to address the long-standing debate in achievement goal theory research, which in the past was based mainly on the dichotomous or trichotomous goal frameworks, that: 1) mastery goals are adaptive, 2) performance avoidance goals are maladaptive, and 3) performance approach goals are inconsistent (adaptive, maladaptive or no relation) in their effect on outcomes (Harackiewicz et al., 2002; Midgley, Middleton, & Kaplan, 2001). In addition, this present study also attempts to address the inconsistent findings on multiple goal combinations, where in some cases mastery goals coupled with performance goals were adaptive (Bouffard, Boisvert, Vezeau, & Laroche, 1995; Pintrich, 2000b; Wentzel, 1993), but not so in other cases (Meece & Holt, 1993; Wolters, Yu, & Pintrich, 1996), and in other cases instead, a combination of high performance approach and low mastery goals resulted in positive academic outcomes (Elliot & Church, 1997; Elliot, McGregor, & Gable, 1999) and adaptive coping (Pensgaard & Roberts, 2003).

Research questions include the following:

1. What are the effects of goal orientations (and goal profiles) on learning strategies and academic performance?
2. What are the effects of goal orientations (and goal profiles) on coping strategies and psychological health?

Method

Participants

The participants were students from years 8-12 belonging to two high schools (one public and one private) located in Metropolitan Melbourne. The sample ($N = 341$) consisted 163 boys and 176 girls (two unspecified gender), with age ranging from 12 to 18 years of age ($M = 14.89$, $SD = 1.5$). The private school consisted 230 years 7-12 students, and the public school consisted 111 year 9 students. Majority of the students' (90%) main language at home is English, whereas the rest speak other languages apart from English. 84.8% were born in Australia, and 37.2 – 41.6% of the students' parents were professionals.

Procedure

The survey was conducted on different dates based on the schools' available timetable schedules. According to an instruction sheet, individual class teachers administered the questionnaires, supervised by the researcher. Students were informed that their participation was voluntary, and they could choose to withdraw anytime they wish.

Measures

Achievement Goal Questionnaire (Elliot & McGregor, 2001). The Achievement Goal Questionnaire (AGQ) is a 12-item scale designed to measure achievement goals in a general classroom setting. In this study, it was used to measure the students' goal orientations towards school work in general. The four subscales are: mastery approach, mastery avoidance, performance approach, and performance avoidance. Participants rated along a scale of 1 (*strongly disagree*) to 5 (*strongly agree*), indicating the extent of their agreement with a statement item. An example item for mastery approach is "I want to learn as much as possible". An example item for mastery avoidance is "I want to avoid learning less than it is possible to learn". An example item for performance approach is "I want to do well compared to other students". An example item for performance avoidance is "My goal is to avoid performing worse than other students". In this current study, the Cronbach's alphas for mastery approach = .75, mastery avoidance = .67, performance approach = .83, and performance avoidance = .81.

Work Avoidance (Harackiewicz, Barron, Tauer, Carter & Elliot, 2000). Participants responded to the three items along the same scale range of 1 (*strongly disagree*) to

5 (*strongly agree*) as the above AGQ. An example item was “I want to do as little work as possible in school”. In this study, it was .41⁷.

Learning Process Questionnaire (Kember, Biggs & Leung, 2004). Only the 11-item learning strategy components from the Learning Process Questionnaire (LPQ) were used in this study to assess the learning strategies adopted by the students. The elements consist of deep strategy (4 items) and surface strategy (7 items). Participants responded along a scale of 1 (*never or rarely*) to 5 (*always*). An example item for deep strategy is “I like constructing theories to fit odd things together”. An example item for surface strategy is “I learn some things by rote, going over and over them until I know them by heart”. In this current study, the Cronbach’s alphas for deep strategy = .66 and surface strategy = .65.

Effort. A single item was created to measure effort. The question was phrased “How much effort do you put in to achieve these goals?” and participants responded along a scale of 1 (*none*) to 4 (*a lot*).

Academic Grade. Participants were asked to write down, with reference to their core subjects, the best and weakest grades they achieved during their last examination or recent assignments. The grades were scored according to the universal common assessment and reporting standards legislation introduced by the Federal Government in 2005 (Wikipedia, 2008). Table 1 shows the universal common assessment system. The grades were scored along a scale of 1-6. For example, a student who obtained an ‘A’ grade or 90% points, would receive a score of 6.

Table 1
Academic Grading in Australia

Grade	Percentile	Band
A	90% and above (Excellence)	6
B	80-89% (Very Good)	5
C	70-79% (Good)	4
D	60-69% (Average)	3
E	50% - 59% (Unsatisfactory)	2
F	49% and under (Fail)	1

Source: Academic grading in Australia (Wikipedia, 2008).

Brief COPE Inventory (Carver, 1997). The Brief COPE Inventory comprised a total of 14 sub-scales. In this paper, the following six COPE variables would be reported: active coping (“I take action to try to make the situation better”), planning (“I think hard about what steps to take”), denial (“I say to myself this isn’t real”), venting (“I express my negative feelings”), behavioural disengagement (“I give up trying to deal with it”), and self-blame (“I criticise myself”). Participants responded to the question stem “What do you generally do and feel when you experience stressful events”, along a scale, ranging from 1 (*I usually don’t do this at all*) to 4 (*I usually do this a lot*). The question stem is aimed at measuring the participants’ dispositional coping preference. Cronbach’s alphas were as follows: active coping = .65, planning = .58, denial = .65, venting = .66, behavioural disengagement = .59, and self-blame = .73.

DASS-21 (Lovibond & Lovibond, 1995). There are three sub-scales each measuring depression, anxiety and stress, with seven items per scale. An example depression item is “I felt that life was meaningless”. An example anxiety item is “I felt I was close to panic”. An

⁷ Although Cronbach’s alpha = .41, work avoidance as a variable in this current study related to other variables in a way that concurred with past research evidence. Cronbach’s alpha was also relatively low for past studies (e.g. Harackiewicz et al., 2000), at .51.

example stress item is “I found it difficult to relax”. Participants were asked to rate the extent to which they experienced each of the statement symptoms *over the past week*. They responded along a scale of 0 (*did not apply to me at all*) to 3 (*applied to me most of the time*). The average of the three sub-scales produces a composite measure of negative emotional symptoms. In this study, the average total score of the three subscales was used to indicate the level of psychological health. Cronbach’s alphas for depression = .87, anxiety = .75, stress = .80, and the total scale = .86.

Results

Overview of the Statistical Analyses

Four path models were presented. Path Models 1-2 examined goal orientations in relation to academic performance. Path Models 3-4 examined goal orientations in relation to psychological health. The effects of goal variables as predictors were compared with that of cluster goal profiles as predictors.

Analyses of path models were done using statistical software AMOS version 17 and bootstrapping (Hayes, 2009; Preacher & Hayes, 2008). Based on theoretical framework and past research evidence, an initial proposed model would be tested first. Fit indices were examined to check the goodness-of-fit for the proposed model. With reference to the Modification Indices (MIs), Standardised Residuals Covariances (SRCs), and theoretical relevance, post-hoc parameter modifications were run in order to achieve a better-fitting and parsimonious final structural model. Only the final structural models were reported in this paper. The fit indices include: the Goodness Fit Index (GFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), Root-Mean-Square Error of Approximation (RMSEA), and Standardized Root-Mean-Square Residual (SRMR). The cut off criteria used for Maximum Likelihood method were according to Hu and Bentler (1999), whereby GFI , TLI, and CFI should be $\geq .95$, with RMSEA $\leq .06$, and SRMR $\leq .08$.

Descriptive Statistics

Table 2 presents the means and standard deviations of variables for Path Model 1. The inter-correlations between variables are seen from Table 3.

Table 2

Means and Standard Deviations of Variables for Path Model 1

Variable	Mean	SD	Scale range
Mastery approach	3.877	.827	1-5
Mastery avoidance	2.266	.733	1-5
Performance approach	3.505	1.013	1-5
Performance avoidance	3.487	1.014	1-5
Work avoidance	2.950	.851	1-5
Deep learning strategy	3.179	.812	1-5
Surface learning strategy	2.695	.654	1-5
Effort	3.19	.605	1-4
Best grade	5.80	.425	1-6
Weakest grade	3.86	1.156	1-6

Table 3
Inter-Correlations of Variables for Path Model 1

Variables	1	2	3	4	5	6	7	8	9	10
1 Mastery approach	--									
2 Mastery avoidance	.45**	--								
3 Performance approach	.47**	.31**	--							
4 Performance avoidance	.36**	.40**	.66**	--						
5 Work avoidance	-.22**	-.10	.07	.12*	--					
6 Deep processing	.32**	.21**	.19**	.12*	-.19**	--				
7 Surface processing	-.22**	-.07	.04	.09	.41**	-.03	--			
8 Effort	.36**	.19**	.12*	.08	-.27**	.32**	-.20**	--		
9 Best grade	.17**	.04	.10	.04	-.05	.04	-.06	.19**	--	
10 Weakest grade	.28**	.14*	.13*	.13*	-.18**	.23**	-.12*	.34*	.39**	--

* $p < .05$ ** $p < .01$

Path Model 1: Goal Orientations, Learning Strategies, Effort and Grade

Path Model 1 was based on a tested conceptual framework on learning (Coutinho & Neuman, 2008; Dupeyrat & Marine, 2005; Dweck & Leggett, 1988; Phan, 2008) which posited the relation between goal orientations, learning strategies, effort, and academic performance. The predictor variables for Path Model 1 were goal orientations (2x2 goals and work avoidance), mediator variables were learning strategies (deep versus surface), and effort. Outcome variables were best grade and weakest grade. Figure 1 presents the proposed path model.

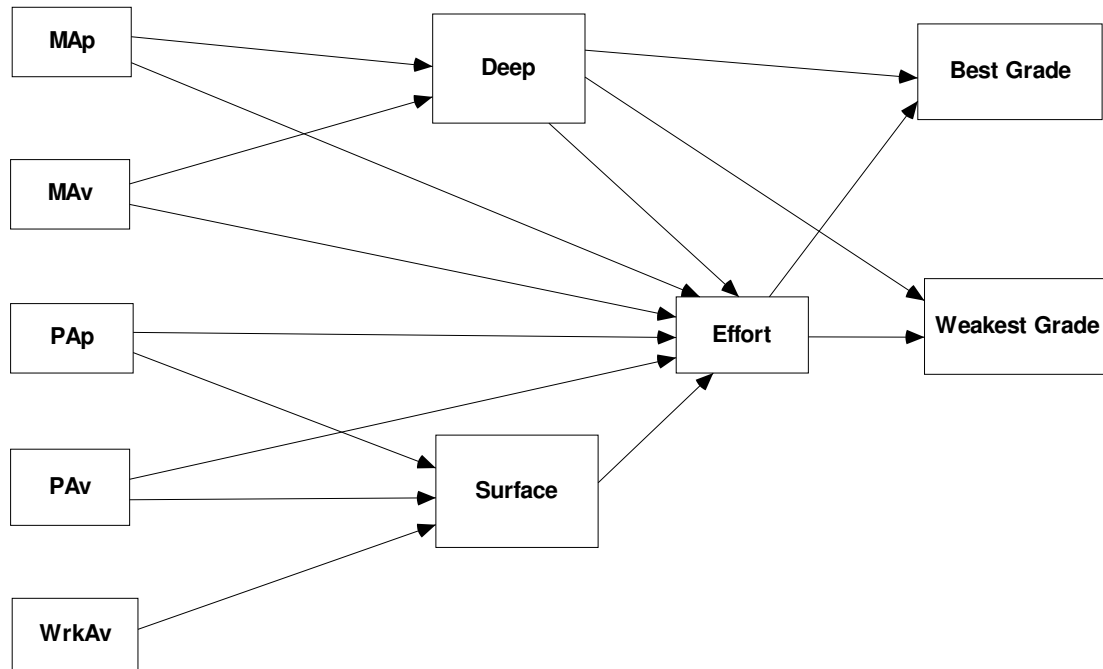


Figure 1. Proposed Path Model 1: Goal orientations, learning strategies, effort, and grades. MAp = mastery approach, MAv = mastery avoidance, PAp = performance approach, PAv = performance avoidance, WrkAv = work avoidance, Deep = deep learning strategy, Surface = surface learning strategy.

This proposed path model hypothesised that mastery goals would predict deep strategy and effort, while performance and work avoidance goals would predict surface strategy. Although the proposed model showed acceptable fit, with $\chi^2(20) = 90.482$, $p < .001$, and fit indices GFI = .950, TLI = .982, CFI = .901, RMSEA = .102, and SRMR = .066, several of the specified paths were non-significant, and therefore omitted for a more parsimonious model, as presented below.

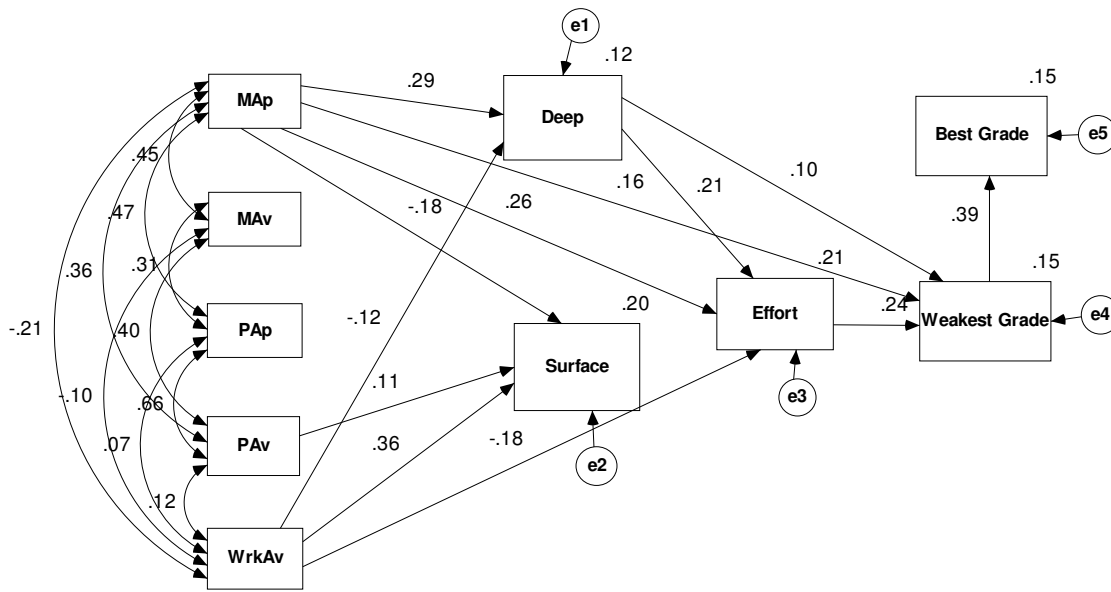


Figure 2. Final Re-specified Path Model 1: Goal orientations, learning strategies, effort and grades.

This final re-specified model fitted the data well, with $\chi^2(23) = 21.593$, $p = .545$, and fit indices $GFI = .987$, $TLI = 1.004$, $CFI = 1.000$, $RMSEA = .000$, and $SRMR = .027$. The model explained 15% of the variance in weakest grade, and 15% of the variance in best grade. This percentage of explained variance would be termed a medium effect size, according to Cohen (1992). All standardised regression paths were statistically significant at $p < .05$, except for the path from deep strategy to grade ($p = .06$).

This final Path Model 1 indicated that of all the goal orientations, only mastery approach was directly and positively related to grade (.16). It was also the only goal orientation to positively predict deep strategy (.29) and effort (.26). In contrast, both performance avoidance (.11) and work avoidance (.36) predicted surface strategy. In addition, work avoidance was negatively related to effort (-.18). Mastery approach had a significant indirect effect on grade, via deep strategy and effort.

Path Model 2: Goal Profiles, Learning Strategies, Effort and Grade

The results from Path Model 1 provided further support that a relation existed amongst the goal orientations, learning strategies, effort, and academic achievement. In order to further explore this web of relations, an attempt was made to cluster the 2x2 goal variables and to use these cluster groups as predictors. By doing so, Path Model 2 provides an alternative perspective to how the goal variables work in combination, as opposed to being single variable predictors. To identify possible sub-groups within the sample, hierarchical cluster analysis was run using Ward's Method and Squared Euclidean Distances to cluster the 2x2 goal variables⁸. The above method was selected because it was a tested effective method in creating groups that are relatively homogenous on the variables of interest and had been proven to be distinctive and consistent with past studies (Hodge & Petlichkoff, 2000; Levy-Tossman, Kaplan & Assor, 2007; Meece & Holt, 1993; Wang, Biddle & Elliot, 2007).

⁸ The means and Z scores of the 2x2 goal variables were used for clustering, and a five-cluster solution was identified.

A five-cluster solution was identified from the analysis. The five groups⁹ were as follows: “mastery” group ($N = 57$), “performance” group ($N = 81$), “all goals moderate” group ($N = 107$), “all goals high” group ($N = 81$), and “all goals low” group ($N = 15$). Path Model 2 was analysed based on these five goal profiles. Four predictor groups were included in Path Model 2, except the “performance” group, which was used as a reference control group¹⁰, due to its relatively low scores on grades, deep strategy, and effort¹¹. With reference to the MIs, SRCs, and significant regression coefficients, the final re-specified structural model with cluster goal groups as predictors is presented below.

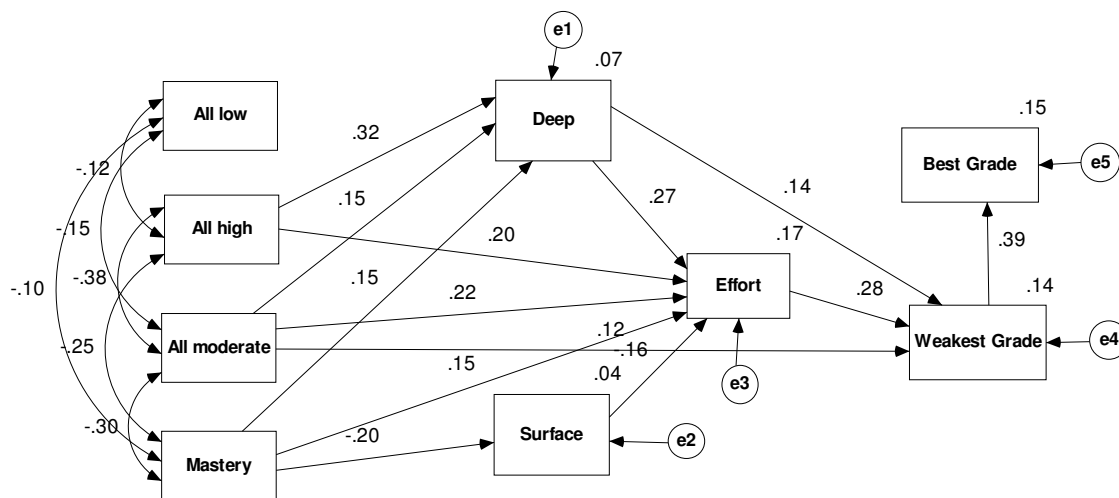


Figure 3. Final re-specified Path Model 2: Goal profiles, learning strategies, effort, and grades (with “performance” group as reference control group).

This final re-specified model fitted the data well, with $\chi^2(16) = 25.791$, $p = .057$, and fit indices $GFI = .984$, $TLI = .944$, $CFI = .975$, $RMSEA = .042$, and $SRMR = .041$. On the whole, this model explained 14% of the variance in weakest grade and 15% of the variance in best grade. All standardised regression paths were significant ($p < .05$).

This final structural path model indicated that out of all the groups, the “all moderate” group was the only group with a significant direct effect on grade. Except for the “all low” group, the rest of the other three groups similarly positively predicted deep strategy and effort. At the same time, these same three groups also predicted surface strategy, but in a negative direction. Path Model 2 indicated a similarity between the “all low” group and the “performance” group, in terms of learning patterns, that is, both groups did not advocate deep strategy and effort as much as the other three groups. All the other three groups had a significant indirect effect on weakest grade, via deep strategy and effort.

Path Model 3: Goal orientations, Non-adaptive Coping and Psychological Health

⁹ The “mastery” group refers to those who endorsed mastery over performance goals; “performance” group refers to those who endorsed performance over mastery goals; “all moderate” group refers to those who endorsed all four goals on moderate levels; “all high” to those who endorsed all four goals on high levels, and “all low” to those who endorsed all four goals on low levels.

¹⁰ A reference control group was selected based on its extreme score on the outcome measure and (or) mediating variables, serving as a bench-mark against which all other groups were compared.

¹¹ The scores on the variables for each group can be referred from Appendices A and B.

As past research (Adie et al., 2008; Elliot & McGregor, 2001; Sideridis, 2008) had indicated, achievement goal orientations could be linked to “patterns of psychological characteristics and outcome” (Wang et al., 2007, p. 147), this current study attempts to explore the mediational links of coping in relation to goal orientations and psychological health. Path Model 3 examined how specific non-adaptive coping strategies might relate to goal orientations and psychological health. This set of variables for Path Model 3 were the 2x2 goals and work avoidance as predictors, non-adaptive COPE variables as proposed mediators, and psychological health (the total average of DASS score) as outcome.

Descriptive Statistics

Table 4 presents the means and standard deviations of variables for Path Model 3. The inter-correlations between variables are seen from Table 5.

Table 4
Means and Standard Deviations of Variables for Path Model 3

Variable	Mean	SD	Scale range
Mastery approach	3.877	.827	1-5
Mastery avoidance	2.266	.733	1-5
Performance approach	3.505	1.013	1-5
Performance avoidance	3.487	1.014	1-5
Self-blame	2.282	.912	1-4
Denial	1.581	.711	1-4
Venting	2.499	.865	1-4
Behavioural disengagement	1.748	.712	1-4
DASS	2.241	1.676	0-3

Table 5
Inter-Correlations of Variables for Path Model 3

Variables	1	2	3	4	5	6	7	8	9
1 Mastery approach	--								
2 Mastery avoidance	.45**	--							
3 Performance approach	.47**	.31**	--						
4 Performance avoidance	.36**	.40**	.66**	--					
5 Work avoidance	-.22**	-.10	.07	.12*	--				
6 Self-blame	-.04	.070	.15**	.16**	.15**	--			
7 Behavioural disengagement	-.21**	-.10	-.01	-.01	.24**	.38**	--		
8 Denial	-.17**	-.10	-.02	.03	.19**	.29**	.33**	--	
9 DASS	-.04	-.05	.08	.04	.08	.41**	.34*	.31**	--

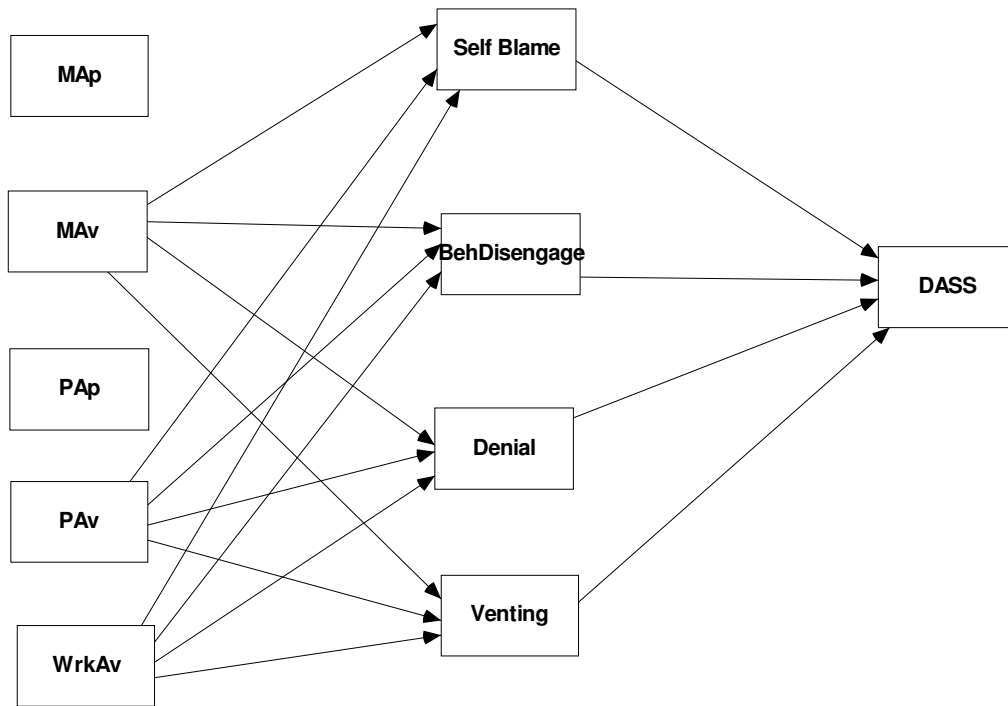


Figure 3. Proposed Path Model 3: Goal orientations, non-adaptive COPE, and DASS.
 BehDisengage = behavioural disengagement.

Figure 3 shows the proposed Path Model 3, which hypothesised that the three avoidance goals (mastery avoidance, performance avoidance, work avoidance) would predict non-adaptive COPE variables, which each in turn, has an effect on DASS. This proposed model did not fit the data well, with $\chi^2(19) = 155.859, p < .000$, and fit indices GFI = .899, TLI = .534, CFI = .803, RMSEA = .146, and SRMR = .101. Therefore, based on the MIs and SRCs, as well as reference to significant regression coefficients, the model was re-specified and presented in Figure 4.

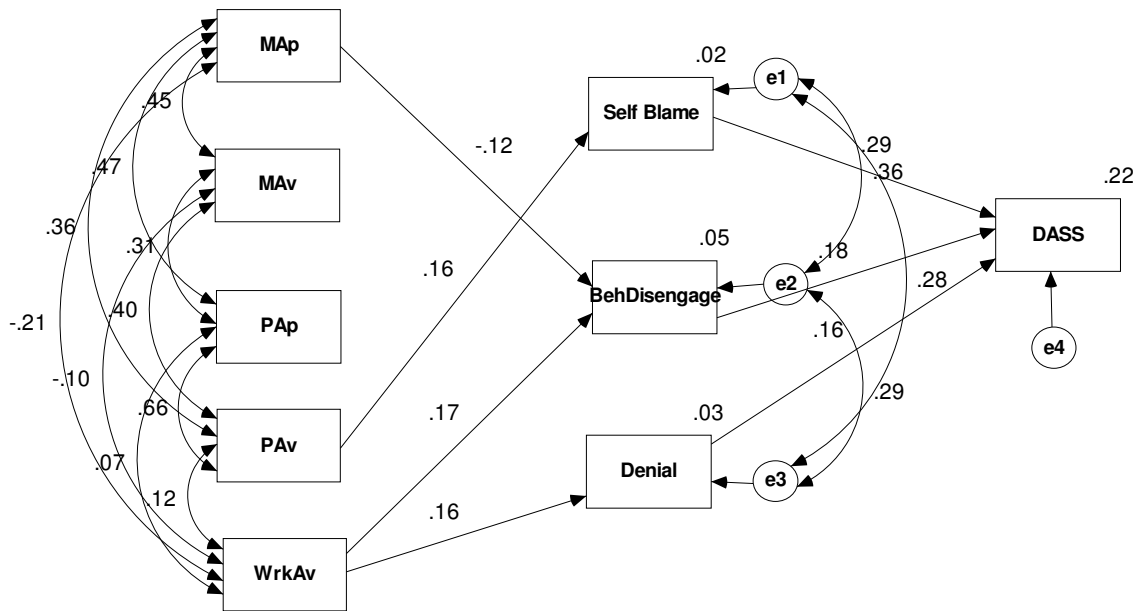


Figure 4. Final re-specified Path Model 3: Goal orientations, non-adaptive COPE, and DASS.

This final re-specified model fitted the data well, with $\chi^2(15) = 20.102$, $p = .168$, and fit indices GFI = .987, TLI = .981, CFI = .992, RMSEA = .032, and SRMR = .039. In this instance, as the COPE variables were inter-related, and belonged to the same non-adaptive COPE factor, the residuals associated with the mediators were permitted to covary, as recommended by Preacher and Hayes (2008, p. 882-883). According to them, “freeing residual covariances accounts for any unmodeled sources of covariation among mediators.” This model explained 23% of the variance in DASS, which was of medium effect size. All standardised regression paths were statistically significant ($p < .05$).

This final structural path model indicated that of all the goal predictors, only mastery approach, performance avoidance, and work avoidance had significant effects on the non-adaptive coping strategies. Their relations to the non-adaptive COPE variables indicated a distinction between mastery approach and the other two avoidance goals. Specifically, mastery approach negatively predicted behavioural disengagement (-.12). On the other hand, performance avoidance positively predicted self-blame (.16), and work avoidance positively predicted behavioural disengagement (.17) and denial (.16). In turn, all three non-adaptive COPE variables each had a significant positive direct effect on DASS (self-blame = .36, behavioural disengagement = .18, denial = .16), with self-blame having the largest effect.

Path Model 4: Goal Profiles, Non-Adaptive COPE, and Psychological Health

Results from Path Model 3 provided a basis for further exploration of how goal profiles might cope differently in face of general stress situations. Path Model 4 employed goal profiles as predictors with the same mediating variables and outcome. Four predictor groups were included in Path Model 4, except the “mastery” group, which was used as a reference control group. This group emerged as the most psychologically adaptive in terms of scores on DASS and the non-adaptive COPE. With reference to MIs, SRCs and significant regression coefficients, the final re-specified model with cluster goal groups as predictors is presented below.

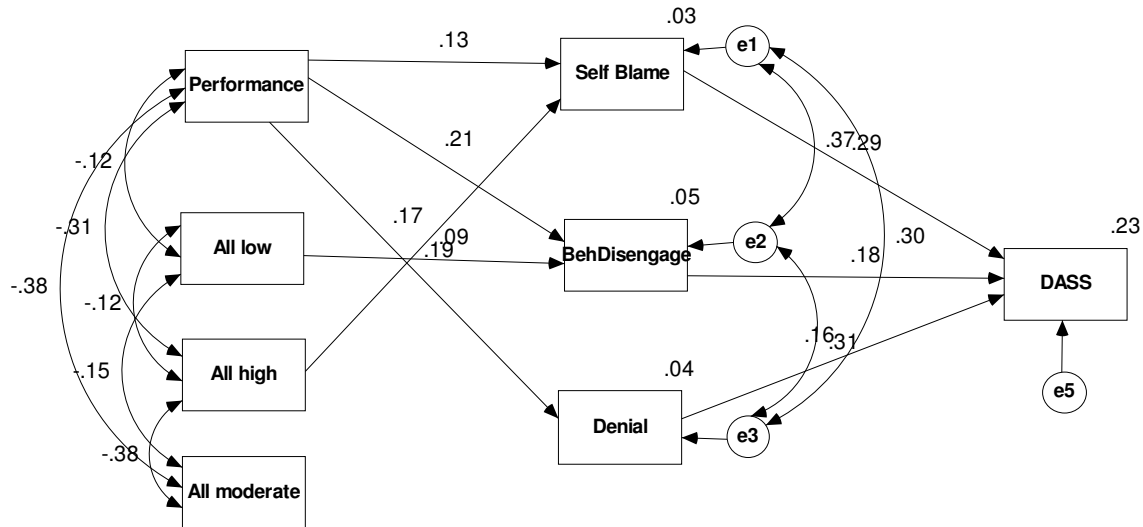


Figure 5. Final re-specified Path Model 4: Goal profiles, non-adaptive COPE, and DASS (with “mastery” group as reference control group).

This model fitted the data well, with $\chi^2(10) = 6.489$, $p = .773$, and fit indices GFI = .995, TLI = 1.020, CFI = 1.000, RMSEA = .000, and SRMR = .020. On the whole, this model explained 23% of the variance in DASS. All standardised regression paths were significant ($p < .05$). This final structural model indicated that the “performance” group was the only group with significant positive paths towards all three non-adaptive coping strategies. The “all low” group had a positive path towards behavioural disengagement, whereas the “all high” group had a positive path towards self-blame. This model indicated that the “performance” group had an indirect effect on DASS via self-blame, behavioural disengagement, and denial. The “all low” group had an indirect effect on DASS via behavioural disengagement. In this model, the “all moderate” group was not statistically different from the “mastery” group.

Discussion

Goal Orientations and Academic Learning

This study showed a distinction between mastery approach and avoidance goals. Specifically, mastery approach predicted deep strategy and effort on one hand, while on the other hand, performance avoidance and work avoidance predicted surface strategy, in addition to work avoidance relating to effort in a negative direction. These results confirmed findings from previous research on the distinctive effects of goal orientations on learning strategies and effort (Coutinho & Neuman, 2008; Dupeyrat & Marine, 2005; Dweck & Leggett, 1988; Elliot & McGregor, 1999; Elliot & McGregor, 2001; Phan, 2008).

However, in terms of academic achievement, results from this study are contrary to the common stand that performance approach, and not mastery goals, were related to academic achievement (Barron & Harackiewicz, 2000; see Harackiewicz et al., 2002 for a review of studies), but adds on to recent growing research literature that mastery goals could be related to academic performance after all (Bong, 2009; Dupeyrat & Marine, 2005; Lau & Nie, 2008; Njouku, 2007; Phan, 2008). Some reasons attributed to this association were high motivation, task-oriented or problem-focused coping, and adaptive learning strategies associated with mastery goals (Bong, 2009; Coutinho & Neuman, 2008; Nien & Duda, 2008).

This study found that out of the five goal profiles, three goal profiles (“all moderate”, “all high”, and “mastery” groups) similarly had positive paths towards deep strategy and

effort, but negative paths towards surface strategy. Academic grade scores among these three groups were not significantly different. This finding concurred with past studies (Poulin, Duchesne, & Ratelle, 2010; Wang et al., 2007) on the 2x2 multiple goal profiles, which also found the “mixed”, “high achievement”, and “mastery” groups to be most adaptive in terms of academic learning. These researchers concluded that a profile espousing all four goal orientations (either mixed or high levels) would be adaptive. The difference between this present finding and previous research, was that in this study, a more specific delineation between goal profiles was proposed, such that the profile with all four goals at *moderate* levels might be most adaptive, even more adaptive than the profile with all four goals at *high* levels.

In contrast, the “performance” and “all low” groups displayed similar non-adaptive learning patterns, with low endorsement of deep strategy and effort, and scoring lowest in academic achievement. Valle, Cabanach, Nunez, Gonzalez-Pienda, Rodriguez, and Pineiro (2003) also had analogous finding, whereby their “performance goal” group scored the lowest in academic grade, when compared to the “multiple goal” and “learning goal” groups. Similarly, Meece and Holt (1993) found that the group lowest in both mastery and ego goals were least adaptive in learning.

In addressing the goal theory debate, results from this present study give support to both propositions. When single goal variables were employed as predictors, mastery approach was indicated as most adaptive in terms of learning strategies, effort, and academic achievement, hence lending support to Midgley et al.’s (2001) proposition for a mastery approach orientation. However, on the other hand, when multiple goal profiles were employed as predictors, results suggest that a mixed goal profile was also adaptive, hence demonstrating the plausibility of Harackiewicz et al.’s (2002) proposition that a combination of mastery-performance goals were optimal.

Goal Orientations and Psychological Health

This study found that mastery approach was negatively related to DASS, whereas performance avoidance and work avoidance were positively related to DASS. These results demonstrated the adaptiveness of approach goals over avoidance goals, as shown in Elliot and Sheldon’s (1997) finding where avoidance goals related negatively to subjective well-being. Secondly, among the 2x2 goals, performance avoidance served as a significant contrast to mastery approach, emerging as the least adaptive. Results showed that while mastery approach negatively predicted non-adaptive coping, a reversal pattern was observed for performance avoidance, which positively predicted non-adaptive coping. The relevance of coping strategies helps to account for the earlier unanticipated but theoretically logical finding from Elliot and McGregor (2001), where mastery approach was a negative predictor of health centre visits, while performance avoidance was a positive predictor. Thirdly, the finding of work avoidance predicting non-adaptive coping strategies might help to explain for past findings where work avoidance related to hostility, helplessness, and boredom (Jarvis & Seifert, 2002).

The analysis of goal profiles as predictors provided another perspective to the relation between goal orientations and coping. Results showed that both the “all moderate” and “mastery” groups were most adaptive, by scoring the lowest on DASS, and endorsing the least of non-adaptive coping strategies. The finding on the adaptiveness of the “mastery” group lends support to past research (Kristiansen, Roberts, & Abrahamsen, 2008; Levy-Tossman et al., 2007; Pennsgard & Roberts, 2003) that high mastery/low performance goal profiles endorsed adaptive coping more than low mastery/high performance goal profiles. In addition, this present study proposed an additional adaptive goal profile, that is, the “all

moderate” group, which was generally similar to the “mastery” group, in terms of coping and psychological health.

An interesting finding emerged with the “all high” group predicting self-blame. This result suggests that this group might adopt a mixture of adaptive and non-adaptive coping strategies. A mixture of coping strategies in this type of goal profile was also found in Pennsgard and Roberts (2003) study among young athletes, where the high task/high ego profile scored higher on active coping, but lower on social emotional coping.

The “performance” group had the largest total effect on DASS, thus indicating this group to be poorest in psychological health compared to the other goal profiles. Path analyses indicated that coping strategies might account for such an observation, whereby this group had positively predicted all the three non-adaptive coping strategies (self-blame, behavioural disengagement, denial). Another characteristic of this group was a low adoption of mastery goals. This observation lent support to earlier finding (Elliot & McGregor, 2001) that in the absence of a mastery approach goal orientation, the positive relationship between performance avoidance and health centre visits was the strongest. Another explanation for this observation may also be found in Lindsay and Scott’s (2005) research which showed that a validation-seeking goal orientation (performance strivings to prove self-worth) predicted vulnerability to depression and loss of self-esteem. In this present study, the “performance” was not significantly different from the “all low” group, and the maladaptiveness of an all-goals-low profile had been verified by past studies (Pensgaard & Roberts, 2003; Poulin et al., 2010).

In addressing the goal theory debate, this present study’s analysis of coping and psychological health, once again evidenced support for both propositions. When analysing goal variables as predictors, results pointed to mastery approach as most adaptive, in terms of DASS and coping strategies, hence providing support to Midgley et al.’s (2001) proposition for a mastery approach orientation. On the other hand, however, when goal profiles were employed as predictors, results demonstrated that the “all moderate” and “mastery” groups were not statistically different from each other, thus lending support to both Harackiewicz et al.’s (2002) and Midgeley et al.’s (2001) propositions, for a mixed, and mastery goal profile, respectively.

For a succinct visual presentation of the adaptiveness (or maladaptiveness) of the goal profiles, Figure 6 is a simplified diagram of how the goal profiles might be positioned along the adaptiveness- maladaptiveness continuum, when learning and coping processes and outcomes were taken into consideration concurrently. The diagram indicates that the “all moderate” and “mastery” groups could be classified together at the adaptive end of the continuum, because both groups did not differ in terms of outcomes and mediational links. At the other end of the maladaptive continuum, the “performance” and “all low” groups were classified together. Finally, the “all high” group was positioned in the middle, because it differed in coping and psychological health, when compared to each of the two group categories placed on both ends of the continuum. In summary, the goal profiles analysis gave support to the proposition that “profiles that include a dominant mastery goals orientation or a combination of mastery and performance approach goals are associated with more adaptive outcomes than profiles that do not include mastery goals” (Levy-Tossman et al., 2007, p. 233; Midgley et al., 2001; Valle et al., 2003).

Adaptive
Maladaptive

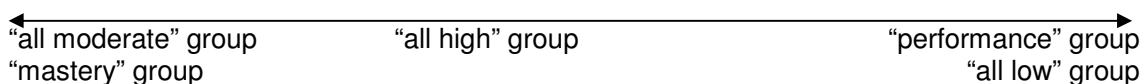


Figure 6. Simplified diagram of goal profile continuum.

Implications and Suggestions for Future Research

This current study illustrated that although a goal profile could be adaptive in one aspect, it might not essentially be adaptive in another. For example, the “all high” group was adaptive in the academic learning domain, but not as adaptive in the psychological health domain. This result demonstrated the importance of considering the goal orientations or goal profiles under different contexts.

Secondly, the finding on significant relations between goal orientations and general stress coping behaviour has implications for school counselling. The results suggest the possibility of a spill-over effect from coping in an achievement domain to general everyday life. Results suggest that certain goal orientations (and goal profiles) associated with non-adaptive coping behaviour in an academic setting, are also likely to be associated with non-adaptive coping with regard to general everyday life stress. Such a connection might be worth noting by school teachers and counsellors when helping students who are facing difficulties with school work, because there could be other underlying psychological stress issues. Moreover, since goal orientations are consciously accessible, the counsellor might use that as one of the starting points for the counselling process to work towards deeper issues. Also, consciously accessible attitudes (such as goal orientations) are more amenable (versus deeply entrenched personality traits) to improvement modifications. Apart from the students’ own goal orientations, that of parents, teachers, and the classroom environment should also be taken into consideration as a whole when helping the students.

Limitations and Conclusion

One limitation to adopting the 2x2 goal framework with high school students is the applicability of the mastery avoidance concept. One proposed reason to the null finding of this construct could be due to the younger adolescent sample used in this study. As Elliot (1999, p. 183) has pointed out specifically about mastery avoidance, this goal is “past-referential”, whereby the individual’s standard of evaluation is based on his/her own personal performance history. An example of mastery avoidance behaviour will be when “elderly persons focus on not performing worse than before, not stagnating, or not losing their skills, abilities, or memory” (Elliot & McGregor, 2001, p. 502). Bong (2009) also found low endorsement of mastery avoidance in her sample of elementary and middle school students. In developing the 2x2 goal youth sports questionnaire with a sample of 1,675 athlete students aged 9-14 years old, Cumming, Smith, Smoll, Standage and Grossbard (2008) reported that they were not successful in distinctively validating the two goal avoidance scales, and concluded that young students of this age range do not cognitively differentiate between the mastery avoidance and performance avoidance goal orientations. Therefore, it would seem that a past-referent goal like mastery avoidance, might be more relevant to older participants who have vast past performance history with which to make a comparison with, rather than younger adolescents, who were the participants in this study. Future research could consider examining the concept of mastery avoidance with samples of older students, for example postgraduates, or in the context of adult learning and higher education.

As the nature of data in this current study is correlational and cross-sectional, it would be difficult to ascertain the causal effects of each goal orientation in different achievement and situational-stress settings. It had been pointed out by researchers that goal orientations or goal profiles manifest differently during success/failure situations, or when competence beliefs are high/low (Dweck & Leggett, 1988; Midgely et al., 2001; Putwain & Daniels, 2010). Future research could address such issues through longitudinal and cross-contexts analyses.

In conclusion, this study's findings on multiple goals effects proposed for a finer delineation between goal profiles, in terms of the *extent* each goal is adopted and combined. In addressing the achievement goal theory debate, apart from providing a clear indication on the adaptiveness of mastery approach goals (Midgley et al., 2001), this study also highlighted the importance of examining the approach and avoidance components separately (Harackiewicz et al., 2002). It also lent support to a multiple goals perspective, whereby the advantages of adopting both mastery and performance goals are seen as steps towards gratifying the universal human quest for knowledge (mastery goals), and a sense of self-worth (performance goals). The crux of the issue lies in a) the differential effects of each goal orientation, b) the *way* these goals are combined, and lastly, c) the *extent* to which they are being combined.

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