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Influences of Mastery Goal and Perceived Competence on Educational Outcomes[1]

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ABSTRACT

Motivation research has shown significant relations of students' mastery goal orientation and perceived competence to educational outcomes, but has not simultaneously scrutinized their relative influences on various educational outcomes. In the present investigation, a sample of Australian students from 6 secondary schools in Western Sydney (N = 1519) responded to survey items that measured mastery goal orientation and sense of competence. They were also asked to rate their status in class and self-efficacy in life. Their achievement scores were obtained by conducting both a reading and a numeracy test. Structural equation modeling (SEM) was applied to relate the motivational constructs (mastery and competence) to the outcomes (achievement, status, and self-efficacy). Results showed that students' sense of competence was a stronger predictor of all three outcomes - achievement, status, and self-efficacy whereas mastery was a strong predictor of status and self-efficacy. Given that a sense of competence was found to be a strong predictor of achievement, it seems that educators should pay more attention to enhancing secondary students' sense of competence if the purpose is solely to improve achievement. However, if the goal is to enhance long-term and whole-person outcomes, then both a mastery goal orientation and a positive sense of competence should be nurtured in secondary education.

Keywords: Motivation; self-concept; secondary education; structural equation modeling

INTRODUCTION

The present study examined the unique contribution of each of two motivational constructs (mastery goal and sense of competence) in predicting three educational outcomes. The outcomes considered in this investigation included perceived status in class and general self-efficacy as an individual (i.e., a long-term educational outcome for an individual's lifelong wellbeing) and achievement (which is often the major concern for educators and researchers). The sample was secondary school students from six schools in Western Sydney, Australia.

Academic Motivation Constructs

Students' academic behavior and achievement are known to be closely linked with their academic motivation (e.g., McInerney & Ali, 2006; Smith, Duda, Allen, & Hall, 2002). Of the various motivational constructs examined in recent research, self-beliefs have been found to have significant

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impacts on a variety of outcomes. For example, research has demonstrated that students' self-beliefs tend to have significant influence on essential academic outcomes (e.g., McInerney, Yeung, & McInerney, 2001; Smith et al., 2002). In goal theory, mastery goal orientation has been shown to have significant influence on performance and other educational outcomes (Martin, 2007; Midgley, Maehr, Hruda, Anderman, & Freeman, 2000). In self-concept theory, evidence seems to point to the significant effects of self-concept on a range of educational outcomes (Craven & Yeung, 2008). However, although the existent literature has provided us with knowledge about the significant roles the various motivational constructs may play, there has been no vigorous test of the relative influences of these constructs on various short-term and long-term educational outcomes. Our purpose in this investigation is to consider two well documented factors (mastery goal and perceived competence) and scrutinize the positive impacts of each factor on short-term and long-term outcomes.

Mastery goal orientation.

Mastery goals focus on the purpose of learning for acquiring new learning with a focus on improving and mastering skills. With a mastery goal, importance is attached to developing new skills and knowledge. With this focus, the process of learning itself is valued, and the attainment of mastery is seen as partly dependent on effort (Ames & Archer ,1988). Several experimental studies have also suggested that students are likely to be more willing to pursue challenging tasks, have positive feelings toward learning situations, and exhibit an adaptive attributional pattern when they adopt a mastery goal orientation (Ames et al., 1977; Dweck, 1986, 1988; Elliott & Dweck, 1988; Nicholls, Patashnick, & Nolen, 1985). Mastery oriented children are more active and invest greater effort into the learning process, which may translate into better performance. For example, in a study with adults, Ford, Smith, Weissbein, Gully, and Salas (1998) investigated the roles of individual differences in achievement goals, learning strategies, and training outcomes in participants' transfer of learning to a more complex decision-making task. They found that mastery goals were positively correlated with metacognitive activities of the learner, which were then related to performance on the transfer task. In a more recent study on learning of negotiation strategies, teams that were primed with mastery goals were found to perform better on a transfer task than teams that were primed with performance goals (Bereby-Meyer, Moran, & Unger-Aviram, 2004). This finding suggests that mastery goals lead to transfer of knowledge and skills, which may then enhance performance.

Compared to course grades, mastery goals are found to positively predict subsequent interest in coursework (Harzckiewicz, Barron, Tauer, & Elliot, 2002). Moreover, mastery goals are advantageous to studying in more advanced courses which require deep processing, thoughtful integration of course contents, and sustained effort and involvement in the learning process. Some researchers also suggest that mastery goals might also have indirect effects on later grades by fostering interest in a particular discipline, which may facilitate learning and hence subsequent performance (Alexander, Kulikowich, & Jetton, 1994; Hidi, 1990; Maehr, 1976; Sansone & Harackiewicz, 1996).

However, studies to date do not seem to have shown a clearly direct link of mastery goals to actual achievement in the classroom. That is, students who vigorously pursue a mastery goal do not always perform better in class than students who do not pursue a mastery goal (e.g., Elliot & Church, 1997; Harackiewicz et al., 2000; Senko & Harackiewicz, 2005b; Skaalvik, 1997; Stipek & Gralinski,1996; Wolters, 1999; Zusho, Pintrich, & Cortina, 2005). Thus, we may speculate that mastery goals are stronger in influencing long-term outcomes than short-term outcomes. When learning processes instead of outcomes are concerned, a number of studies have found that mastery goals are associated with active cognitive engagement (Meece, Blumenfeld, & Hoyle, 1988), and the valuing and using of adaptive cognitive strategies such as planning, organizing, elaborating, and integrating (Kaplan & Midgley, 1997; Nolen, 1988; Nolen & Haladyna, 1990; Pintrich & Garcia, 1991). Similar relations were found between mastery goals and reports of meta-cognitive strategies such as awareness, monitoring, and regulation (Meece et al., 1988; Miller, Behrens, Greene, & Newman, 1993; Pintrich & Garcia, 1991). In an earlier study, Farrell and Dweck (1985; Dweck, 1986) found that mastery-oriented children achieved higher transfer of learning compared to those of performance-oriented children. The consistent findings showing the positive relations between

mastery goals and high-quality engagement, together with those showing enhanced transfer of learning, imply that a mastery goal orientation is undoubtedly influential in long-term outcomes.

Competence.

Perceived competence is conceptualized as the cognitive component of self-concept (i.e., how good a student feels in learning; see Marsh, Craven, & Debus, 1999). Marsh and colleagues have demonstrated the causal relationship between a sense of competence and achievement outcomes (e.g., Marsh & Craven, 2006). Perceived competence in academic work is known as a good predictor of academic performance and it is often found to be even stronger than students' actual ability in the specific task (Pajares & Schunk, 2002). Hence researchers have emphasized the enhancement of students' sense of competence as a vital goal in many education settings (Craven, Marsh, & Burnett, 2003; Marsh & Craven, 2006). It has also been demonstrated that a high self-perception of competence promotes goals, expectancies, coping mechanisms, and behaviors that facilitate productive achievement and work experiences in the long-term (e.g., Sommer & Baumeister, 2002).

Educational Outcomes

Outcomes of motivation may be short-term or long-term. This study focused on one short-term academic outcome (achievement) and two long-term social outcomes (status in class and self-efficacy).

Self-efficacy.

Self-efficacy here refers to a general sense of the self. It may be defined as ''people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 71). Self-efficacy makes a difference in how people feel, think, and act (see Bandura, 1997; Luszczynska & Schwarzer, 2005). In contrast to domain-specific efficacy beliefs (e.g., math self-efficacy, writing efficacy) or domain-specific competence beliefs (e.g., math self-concept, physical self-concept), general self-efficacy in the current study refers to one's confidence to solve problems and cope with life changes (Schwarzer, 1992; Schwarzer & Born, 1997).

It is for the general, global nature that self-efficacy was chosen as a valuable outcome of education, which is clearly different from specific academic efficacy which is often used as a predictor in educational and psychological research. Because general self-efficacy assesses coping skills and skills in managing transitions and other difficult situations, it is a long-term educational outcome that is important for the lifelong wellbeing of an individual. Because a strong sense of self-efficacy facilitates cognitive processes and performance in a variety of settings, including quality of decision-making and academic achievement (Schwarzer, BaBler, Kwiatek, Schroder, & Zhang, 1997), it is a significant lifelong outcome that education should aim to achieve. Whereas self-concept is a more complex construct that incorporates both cognitive and affective responses about the self and is influenced by the context in which comparisons to others exist, self-efficacy, in contrast, is primarily a general cognitive judgment of the self based on relevant mastery criteria (Bong & Clark, 1999). Although domain-specific efficacy in academic areas is known to be related to competence and motivation in such areas (see Bandura & Schunk, 1981; Lau, Liem, & Nie, 2008; Lau & Roeser, 2002; Schunk, Pintrich, & Meece, 2008), the relations of a general self-efficacy construct with the two predictors (mastery goal and perceived competence) considered here have not been systematically explored. We may speculate that a strong sense of competence and mastery of knowledge would probably lead to stronger general self-efficacy, but the present literature is not so clear.

*Status in Class***.**

The purpose of schooling is more than the transmission of knowledge or the development of learning skills. Instead, the central aim of education is, as expressed by Bryk et al. (1993), "the formation of each student as a person-in-community" (p. 289). Apart from academic work, students learn in school the sociallyacceptable language and behaviour, the etiquette in relating to peers and adults, social norms, taboos, rules, and regulations. Further, in the process of relating to others, students build up their status and ascertain for themselves the form of school and community life that

is most fulfilling. Hence this specific construct has direct bearing on students' sense of self-worth and importance at school.

The main motivating element of social integration is the development of self-awareness in a class, in school, and in relation to the larger society. Acquisition of social responsibility is dependent upon the student's status and prestige in the group (Williams & Batten, 1981). At a less global level students consider their well-being in terms of the extent to which the school provides them with the chance to develop notions of their own status vis a vis that of their peers and teachers; provides the structures that facilitate social integration and the status that grows from this experience; provides for harmonious and equitable interactions between students and teachers; and provides the means by which student learning can be certified and in this way be seen by others as a recognizable investment. In a study by Linnakyla (2006), students were found to experience their social status quite positively. In Finland, students found school to be more influential on the growth of their social identity and status than in the other Nordic countries. As many as 83% of the students said that other people had confidence in them, and 69% reported that others asked for their help. Among the students, 54% felt important, 50% appreciated, and 47% respected.

Achievement.

Researchers have suggested that student achievement is related to their motivation and self-concept (Craven et al., 2003; Marsh & Craven, 2006; McInerney & Ali, 2006). Studies have demonstrated that students' motivation and self-concept could have significant influence on essential academic outcomes including achievement scores (e.g., Craven et al., 2003; McInerney et al., 2001). Academic self-concept has been demonstrated not only to be a predictor of academic achievement (Marsh, 1990; Marsh & Shavelson, 1985), but it also has mutual cause and effect relationships with academic achievement (Marsh & Craven, 2006). That is, an increase in academic self-concept leads to an increase in academic achievement and vice versa. Furthermore, academic self-concept has a mediating effect on other educational outcomes. Therefore, it is important to enhance both academic self-concept and academic achievement to obtain long-lasting desirable outcomes as both are mutually reinforcing (Marsh & Martin, 2011). Considering self-concept in terms of a cognitive-affective combination, children's competence beliefs (i.e., the cognitive component) seem to have particularly strong influences on different aspects of performance (WigField, 1994), and are a particularly strong predictor of achievement (Pajares & Schunk, 2002). Hence we may predict that students' sense of competence would strongly predict academic achievement.

The Present Investigation

In the present study, we surveyed a diverse sample of secondary school students in the state of New South Wales, Australia and examined self-competence beliefs and mastery goal, and their influences on learning outcomes. The secondary schools student population in Western Sydney where there are diverse languages and cultural backgrounds provided an interesting context for the study of these constructs.

METHOD

Participants

Australian students from six primary schools in Western Sydney (N = 1519) participated in this study. Students came from grades 7, 8, 9, and 10 (357 boys, 377 girls). Typical of students in public schools of the Western Sydney Region, they were multicultural and were mostly from families of relatively lower socio-economic status compared to other regions in Sydney. Over 100 different languages spoken at home were reported.

Materials

In a survey, the students were asked to rate themselves on four factors (Mastery, Competence, Status in class, and Self-efficacy). Background variables included age, gender, ethnicity, and language background. For the four factors, there were a total of 23 items with four to six items in each factor (see Appendix). They were:

Mastery goal. The scale had six items adapted from Marsh, Craven, Hinkley, and Debus's (2003) mastery goal scale. An example is: "I feel most successful in school when I reach personal goals".

Competence. This is the cognitive component of self-concept (see Arens et al., 2011) adapted from Marsh (1993) Academic Self-Description Questionnaire II (SDQII). An example is: "I am good at all school subjects".

Status in Class. This was adapted from Linnakyla (2006) Quality of School Life Scale. An example is: "I feel important".

*Self-efficacy***.** Schwarzer and Jerusalem's (1995) General Self-Efficacy Scale was adapted. An example is: "I can always manage to solve difficult problems if I try hard enough".

In addition to these four constructs, we also collected achievement data from the students. These included a test on reading and a test on numeracy.

Achievement scores. Reading and numeracy test materials were provided by the Department of Education and Community (DEC), New South Wales, Australia. The materials were designed for mid primary and upper primary students. The students were asked to answer 28 multiple-choice questions for reading and numeracy respectively for middle primary, and 32 respectively for upper primary students. Each correct answer was scored as one, incorrect as zero. A total achievement score was computed by adding up all the correct answers on the reading and the numeracy tests. The analysis used achievement scores in percentages.

Procedure

The schools were randomly selected and the principals of the schools were invited to participate. Data collection was conducted in the second half of the school year. Due to the large sample size, the whole data collection process took about 2 months. Procedures of the research followed university guidelines to ensure confidentiality and approval was obtained from the university's ethics committee. Informed consent was obtained from the school and the parents of the students before data collection. The survey was piloted at the beginning of the year and the scales and items were refined after preliminary analysis. The survey was administered in groups by a research assistant, and in some schools the class teacher also assisted to ensure students who needed help would be supported. The students responded to the survey items in a random order on a 5-point scale (1 = false to 5 = true).

Statistical Analysis

The students' responses to the survey items were coded such that higher scores reflected more favorable responses. In preliminary analysis, we examined the Cronbach's alpha estimate of internal consistency of each *a priori* scale. Then we conducted confirmatory factor analysis (CFA) with the statistical package of Mplus, Version 6.0 (Muthén & Muthén, 1998-2010). Although the amount of missing data was very small (about 1%), we used the full information maximum likelihood (FIML) estimator for imputation of missing values.

The procedures for conducting CFA have been described elsewhere (e.g., Byrne, 1998; Jöreskog & Sörbom, 2005; Pedhazur & Schmelkin, 1991) and are not further detailed here. The goodness of fit of the CFA models was evaluated based on suggestions of Marsh, Balla, and McDonald (1988) and Marsh, Balla, and Hau (1996), with an emphasis on the Tucker-Lewis index (TLI, also known as the non-normed fit index) as the primary goodness-of-fit index. However, the chi-square test statistic and root mean square error of approximation (RMSEA) and the comparative fit index (CFI), are also reported. In general, for an acceptable model fit, the values of TLI and CFI should be equal to or greater than .90 for an acceptable fit and .95 for an excellent fit to the data. For RMSEA, according to Browne and Cudeck (1993), a value of .05 indicates a close fit, values near .08 indicate a fair fit, and values above .10 indicate a poor fit.

Specifically, based on commonly accepted criteria (Browne & Cudeck, 1993; Jöreskog & Sörbom, 2005; Marsh, Balla, & Hau, 1996; Marsh, Balla, & McDonald, 1988), support for an acceptable model requires (a) acceptable reliability for each scale (i.e., alpha = .70 or above), (b) an acceptable model fit (i.e., TLI and RNI = .90 or above and RMSEA < .08), (c) acceptable factor

loadings for the items loading on the respective factors (> .30), and (d) acceptable correlations among the latent factors such that they would be distinguishable from each other ($r < .90$).

We started by testing a measurement model (Model 1) with two motivation factors (Mastery and Competence). Then, another CFA model (Model 2) was tested with these two motivation factors together with three outcomes (Achievement, Status and Efficacy). Based on the established measurement of Model 2, a structural equation model (SEM) tested the relative predictive strength of each of the two predictors on each of three outcomes (Model 3).

RESULTS

CFA

The alpha reliability of each scale was acceptable ($\alpha > .70$), providing preliminary support for the a priori scales. The lowest alpha value was .74 for Competence and the highest alpha was .91 for the Mastery construct (Appendix). All CFA models resulted in a proper solution (Table 1). Model 1 (TLI = .96, CFI = .97, RMSEA = .053), and Model 2 (TLI = .93, CFI = .94, RMSEA = .046) provided a good fit to the data. Table 2 presents the standardized solution of Model 2. The factor loadings were acceptable. The factor correlations ranged from .10 to .76. The highest correlation was between the two outcome variables—Efficacy and Status in class. Although the correlation was high ($r = .76$), they were clearly distinguishable from each other. In sum, Model 2 provided reasonable support for the measurement, which formed the basis for a subsequent examination of paths from predictors to outcomes.

An inspection of the factor correlations (Table 2) found that Achievement was positively correlated with both motivation factors (rs = .22, and .46, respectively for Mastery and Competence) whereas self-efficacy was even more strongly correlated with these factors (rs = .60 and .69, respectively with Mastery and Competence). Although status in class was strongly related with competence ($r = .61$) it was not so strongly related with Mastery($r = .21$). The correlation between Achievement and Status in class and Self-efficacy was not so high ($rs = .10$ and .24 respectively), indicating a clear distinction between the short-term and long-term outcomes.

SEM

Model 3 tested the paths from two motivation predictors to three learning outcomes (Figure 1). The results showed that all the paths were statistically significant ($p < .05$). Firstly, the path to Status in Class was stronger for Competence ($\beta = .41$) than mastery ($\beta = .31$). Similarly the path to Self-efficacy was stronger for competence ($\beta = .51$) than for mastery ($\beta = .28$). Interestingly, the path to Achievement was negative ($\beta = -.12$) for Mastery and it was statistically significant, although the correlation between Achievement and Mastery was positive ($r = .22$). In contrast, the path for competence was strongly positive ($\beta = .54$). In sum, both motivation factors had positive influences on status in class and self-efficacy but perceived competence was a strong predictor of achievement whereas mastery goal orientation was not.

Table 1: Goodness-of-fit Summary for Models

Model	Items	χ^2	*df*	TLI	CFI	RMSEA
1. 2 predictors	10	177.820	34	.96	.97	.053
2 2 predictors + 3 Outcomes	23	915.853	220	.93	.94	.046
2. path model	23	915.853	220	.93	.94	.046

Note: $N = 1519$. CFI= Comparative Fit index. TLI= Tucker-Lewis index. RMSEA = Root mean square error of approximation.

Table 2: Solution of CFA (Model 2)

	Mastery	Compet	Achievement	Status	Efficacy	Uniqueness
Factor loadings:						
mastery1	.71*	--	--	--	--	.49
mastery2	.78*	--	--	--	--	.39
mastery3	.83*	--	--	--	--	.32
mastery4	.82*	--	--	--	--	.33
mastery5	.78*	--	--	--	--	.39
mastery6	.83*	--	--	--	--	.31
compet1	--	.70*	--	--	--	.51
compet2	--	.55*	--	--	--	.70
compet3	--	.57*	--	--	--	.68
compet4	--	.83*	--	--	--	.31
readpc	--	--	.82*	--	--	.33
numpc	--	--	.86*	--	--	.26
status1	--	--	--	.66*	--	.57
status2	--	--	--	.64*	--	.59
status3	--	--	--	.55*	--	.70
status4	--	--	--	.67*	--	.55
status5	--	--	--	.71*	--	.49
efficacy1	--	--	--	--	.67*	.55
efficacy2	--	--	--	--	.70*	.51
efficacy3	--	--	--	--	.77*	.41
efficacy4	--	--	--	--	.77*	.41
efficacy5	--	--	--	--	.60*	.63
efficacy6	--	--	--	--	.68*	.54
Factor correlations:						
Mastery	--					
Compet	.63*	--				
Achieve	.22*	.46*	--			
Status	.21*	.61*	.10*	--		
Efficacy	.60*	.69*	.24*	.76*	--	

Note: N = 1519. Parameters estimates are completely standardized. * $p < .05$. Compet = Competence. Readpc = reading score in percentages. Numpc = numeracy score in percentages. Achieve = Achievement.

DISCUSSION

In the present study, we examined what motivation constructs predicted short- and long-term outcomes of education. Before tested paths from motivation factors to outcome variables, we attempted to establish the validity of the measurement. In this regard, the structure of the model was supported. That is, the CFA model with two motivation factors and three outcomes provided a reasonable fit to the data.

Relations between Motivation and Outcomes

Although both motivational constructs were found to be positively associated with achievement (as can be seen in the positive correlations), interestingly, mastery (r = .22 with achievement) was found to display a negative path to achievement (β = -.12) when considered together with competence as predictors (Figure 1). By applying a structural equation modeling approach to examining the paths from each motivation factor to each of three outcome constructs, we were able to delineate the relative strength of each predictor on each outcome. Hence the negative path indicates that mastery, although positively associated with achievement, status in class and self-efficacy, was not as strong a predictor

as was perceived competence, which was so strong that the relative effect of mastery became even negative. Other than this negative path, all the other paths were positive and significant (Figure 1).

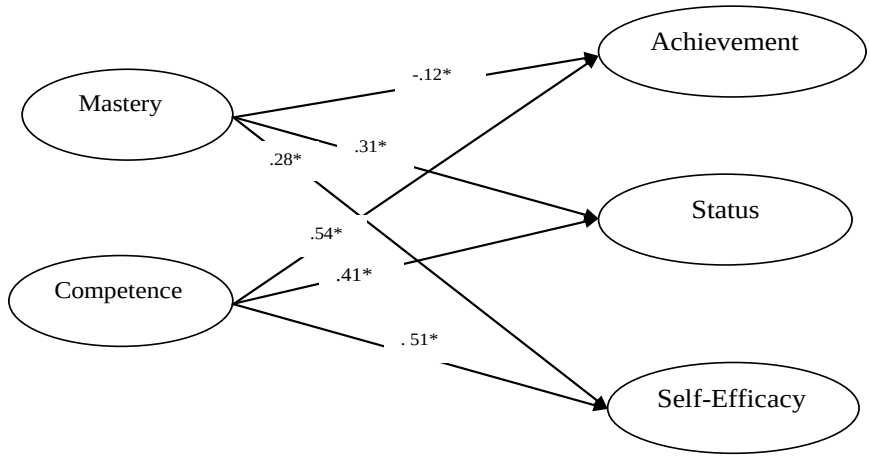

Figure 1: SEM: Paths from 2 motivation variables to 3 outcomes.

Note: * $p < .05$.

For Status as an outcome, the path from mastery was significantly positive ($\beta = .31$). That is, after accounting for the strong effects of the other predictor (competence), mastery to learning positively influences the development of students' status in class. In other words, mastery goal may not have strong influences on more direct and immediate outcomes such as achievement, but it does have strong positive influences on more long-term outcomes such as status in class. For example, studies have shown that mastery goal can facilitate transfer of learned problem solving strategies to new tasks (Meece et al., 1988; Miller, Behrens, Greene, & Newman, 1993; Pintrich & Garcia, 1991). Hence mastery goal has its value but should not be treated as a variable that gives prompt effects.

For self-efficacy as an outcome, the path from competence was significantly positive ($\beta = .51$). That is, after accounting for the strong effects of the other predictor (mastery), competence positively influences students' self-efficacy. Again, although mastery may not have as strong influences on more direct and immediate outcomes such as achievement, it does have positive influences on more long-term outcomes such as status in class and self-efficacy. This is consistent with previous findings showing that mastery goals are associated with active cognitive engagement and adaptive cognitive strategies such as planning, organizing, elaborating, integrating and creating awareness, monitoring, and regulation (Kaplan & Midgley, 1997; Meece, Blumenfeld, & Hoyle, 1988; Nolen, 1988; Nolen & Haladyna, 1990; Pintrich & Garcia, 1991). These enhanced cognitive processes would enhance problem-solving skills and transfer of knowledge and skills from one learning area to another (Bereby-Meyer, Moran, & Unger-Aviram, 2004; Ford, Smith, Weissbein, Gully, & Salas, 1998). However, as shown in our results, despite the strong link of mastery goals to long-term outcomes such as status and general self-efficacy, mastery goals did not seem to have direct bearing with academic achievement (Elliot & Church, 1997; Harackiewicz et al., 2000; Senko & Harackiewicz, 2005b; Skaalvik, 1997; Stipek & Gralinski,1996; Wolters, 1999; Zusho, Pintrich, & Cortina, 2005).

In contrast, competence had a relatively stronger influence on achievement ($\beta = .54$), This indicates that an increase in students' sense of competence would probably lead to better achievement results (Figure 1). This is consistent with previous research that demonstrated the causal relationship between the cognitive component of academic self-concept (i.e., sense of competence in academic work) and achievement outcomes (e.g., Marsh & Craven, 2006; Marsh et al., 1999) and the salience

of a sense of competence in academic work in predicting academic performance (Pajares & Schunk, 2002). Further to these findings, our data also show that students' sense of competence had a relatively stronger influence on status in class (β = .41) and self-efficacy (β = .51). This shows that the effects of students' sense of competence are not limited to short-term and immediate outcomes such as achievement scores. It may also foster the development of self efficacy and status in class which are more long-term outcomes. This has important implications as good status development and self-efficacy is an important dimension for successful living in schools and the workplace. Nevertheless, this pattern needs to be investigated further as the association between self-concept and status in class and self-efficacy development as a long-term outcome has not been thoroughly explored and should warrant further research.

It is important to note that the results showed significant correlations between both of the two motivation factors and the three outcome factors (all *r*s were positive and statistically significant), demonstrating that both school motivation constructs were positively related to both the short-term and long-term outcomes when considered separately. It is therefore important to note that the purpose of the path model (Figure 1) was to provide a more stringent explication of the relative strength of each predictor in predicting each outcome variable. The advantage of using this structural equation modeling approach is to be able to answer the research question of which predictor best predicts which outcome when there are multiple predictors and multiple outcomes to be tested simultaneously.

The consistently positive correlations of status in class with the two motivation factors (*r*s = .21, and .61 respectively with mastery and competence) and positive paths from these motivation variables (β = .31and .41 respectively) indicate that both of these motivation constructs are important for students' development of status in class. As such, they may also be important predictors of other distal goals of education. This gives support to the suggestion that students conceive education for their distal wellbeing as well as their proximal goal of doing well academically (Miller & Brickman, 2004). The consistently positive correlations of self-efficacy with the two motivation factors (*r*s = .60, and .69 respectively with mastery and competence) and positive paths from these motivation variables (β = .28 and .51 respectively) indicate that both of these motivation constructs are important for students' development of self-efficacy. As such, they may also be important predictors of other distal goals of education. Nevertheless, future research should also attempt to investigate how these motivation constructs may be related to other long-term goals such as identity, optimism, and psychological wellbeing.

Our findings have important implications for theory and practice. It is important that researchers examine how students' orientations for learning may influence learning in secondary schools. Whether students become more or less competent or whether they are more and less mastery oriented may have significant and quite different influences on educational outcomes. Researchers should bear in mind the dynamic influences of these motivation constructs on various outcomes as students progress in secondary schools.

This study has some limitations which can be addressed by future researchers. Firstly, students sampled in this study were not fully representative of all school students. There is a need to study the influence of motivation among educational outcomes among a range of student samples. Primary school students may see the influence of the two motivational constructs on achievement quite differently. Secondly, future studies may consider a longitudinal design, placing special emphasis on developmental changes on motivation and educational outcomes. Thirdly, future research may also examine gender and cultural differences in motivation and their influences on short-term and long-term outcomes. Fourthly, we have examined only the mastery constructs in the achievement goal theory literature primarily because of its relatively strong influences on student outcomes suggested by numerous researchers (e.g., Dweck, 1988; Elliot, & Church, 1997; Elliot & McGregor, 2001; McInerney et al., 2001). Further research would benefit from considering also other constructs based on a 2 x 2 achievement goal framework (Elliot & McGregor, 2001) differentiating approach and avoidance aspects of mastery and performance goal orientations, or a multidimensional model that includes mastery, performance, social, and extrinsic orientations (McInerney et al., 2001). As Elliot and McGregor (2001) have suggested, each construct may have a different pattern of relations with student outcomes. Finally, as there is a dearth of studies showing how culture and its influences

combine with gender to develop students' status and learning, further research may consider examining the combined effects of multiple background variables while investigating the causal relations between motivational factors and outcomes.

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APPENDIX

Variables Used in the Study

Factor Sample Items	Alphas Total
Mastery (6 items) I feel most successful in school when I really improve I feel most successful when I reach a goal or target	.91
Competence (4 items) Work in most school subjects is easy for me. I am good at most school subjects.	.74
Achievement Reading test score (%) Numeracy test score (%)	.82
Status (5 items) I feel important People come to me for help	.78
Self-Efficacy (6 items) I can always manage to solve difficult problems if I try hard enough I am confident that I could deal well with things I didn't expect	.85