Domain-Specific School Motivation

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Abstract

The purpose of the current research was to evaluate the psychometric properties of two motivational measures in domain-general and domain-specific contexts. A total of 476 secondary students completed self-report motivational measures. Reliability and confirmatory factor analyses demonstrated support for the domain specificity of motivational goals and demonstrated that both motivational measures were psychometrically sound for assessing academic motivation across different subject areas and toward school in general. It was concluded that in order to capture the true complexity of how student goals operate in specific subjects, it may be more appropriate to use domain-specific motivational measures. Theoretical and practical implications, potential limitations, and directions for future research are also discussed.

Conventional models of school motivation make a distinction between intrinsic and extrinsic motivation (Deci & Ryan, 1985; Dweck, 1986; Spaulding, 1992) but recent research has emphasized students' goal orientations, which may direct students' behaviour, cognition, and affect in their academic work (Ames, 1992; McInerney, 1995; Pintrich, Marx, & Boyle, 1993; Wentzel, 1991). Additionally, it is assumed that motivation tends to be consistent across school subjects and that global measures of a motivational construct would be sufficient to account for students' motivational states across various areas and settings (Bandura, 1997; Bong, 2001; Wentzel, 1996; Wolters, 2004). The present investigation tests this assumption in the motivation literature. Specifically, on the basis of a validated measure of motivation, we developed a set of domain-specific motivation instrumentation that examined the mastery, performance, and social goal orientations of students in English and maths. If each respective domain-specific construct (e.g., mastery goal) in two distinctly different curriculum areas (e.g., English and maths) is clearly distinguishable from each other, then the assumption of a global motivational construct that explains students' achievement behaviours will be challenged. If the association between respective constructs (e.g., performance goals in English and in maths) is so high that they cannot be separated from each other, then there will be support for the application of global constructs to measure student motivation across different subject areas (e.g., a single performance goal construct for both English and maths). The findings will have important implications for the measurement of student motivation in a range of curriculum areas.

Students' Goal Orientations

Achievement goal theory proposes that students' motivation and achievement behaviours can be best understood by considering their purposes or intentions for academic engagement based on their subjective learning experiences (Ames, 1992; Grant & Dwek, 2003; McInerney & Ali, 2006; Middleton & Midgley, 1997; Wigfield, 1997). Similar to the intrinsic/extrinsic distinction, goal theory distinguishes between two different types of motivational goal orientations: (a) "mastery goal orientation", where the focus is on *developing* one's competence for personal satisfaction, and (b) "performance goal orientation", where the emphasis is on *demonstrating* one's competence in an effort to impress (Linnenbrink, 2005).

Within the model utilised within this investigation, *social goals* are also posited as additional goal orientation for schooling success. Social goals can be defined as the social purposes for wanting to achieve in academic tasks or situations (Barker, 2006; Dowson & McInerney, 2003; Dowson, McInerney, & Nelson, 2006). Examples may involve wanting to please one's parents or gain approval from friends. Numerous theorists have suggested that like achievement goals, social goals may also influence students' affect, cognitions, and behaviours in academic settings (Blumenfield, 1992; Dowson, McInerney, & Nelson, 2006; Urdan & Maehr, 1995). Efforts to be socially responsible and responsive tend to lead to active task engagement simply because the value of the task is endorsed by the social group (Wentzel, 1996).

Need for Testing the Domain Specificity of Achievement Goals

Theoretical and methodological issues regarding the domain specificity of motivational goal constructs has remained largely unexplored. In general, it has been assumed that student motivation is consistent across school subjects, and that global measures of motivational constructs are sufficient to explain the complexities of students' motivational states and their relations with academic outcomes (Bandura, 1997; Bong, 2001; Wentzel, 1996; Wolters, 2004). Despite the growing consensus among motivational researchers that student behaviour follows domain-specific patterns, goal orientation research has continued to rely almost exclusively on unidimensional or global measures of students' goals (Trautwein, Ludtke, Schnyder, & Niggli, 2006). This global approach may not be adequate in real school settings as students may exhibit quite different behaviours and attitudes toward different school subjects (Trautwein et al., 2006). However, to date, the significant issue of whether students' goal orientations are distinctive or stable across various subjects has not been systematically explored (Wigfield, 1997). It is becoming increasingly clear that in order to gain a full understanding of what drives students to achieve, future research need to examine domain-specific models of motivation.

Duda and Nicholls (1992) conducted one of the few studies examining the between-domain associations of goal orientation. They investigated high school students' goal orientations and self-perceived ability across both classroom and sporting activities. Their results indicated that students reported similar goal orientations across the two contexts and they concluded that goal orientations tend to generalise across different educational areas rather than being domain-specific. However, while it is likely that some goals are applicable across both academic and non-academic domains, the effects of these goals on various educational outcomes can be very different. For example, performance orientation may be operating in both sport and English; however, it may have a facilitative effect on performance in sport, whereas in English it may impede performance.

Bong (2001) examined the domain specificity of goal orientations in middle and high school students across four different academic subjects. The results demonstrated strong subject specificity of students' goal orientation in all four subjects, although the strength of

the associations differed depending on the type of goal. Performance goals were found to be more generalized across subject areas whereas mastery goals showed strong domain specificity. Based on these results, Bong concluded that it would be highly inappropriate to assess students' achievement goals in relation to school in general without referring to a specific school subject. Despite this important finding that suggests the need for emphasizing domain specificity, there is little research examining the domain specificity of student motivation. One exception can be found in the work of Green, 2004. Green (2004) examined student motivation across three subject areas. Basing her findings on within and between-subject factors correlations, Green found that a mastery orientation was positively associated with outcomes across all subjects, however, the strongest associations were found in domain-specific relations. In contrast to the findings regarding mastery goals, there appeared to be no clear evidence for the domain-specificity of the failure-avoidance dimension in Green's (2004) study. This may be due to the rather narrow definition of performance goals used in the study. Alternatively, it is possible that some goals are domain-specific (e.g. mastery) whilst others such as performance goals are not. Before any sound conclusions can be drawn concerning the domain-specificity of performance goals, they need to be examined and compared in both general and domain-specific contexts using different motivational instruments.

The Present Investigation

This investigation aims to test the domain specificity of mastery and performance goal orientations. Capitalizing on recent advances in goal theory, research, and measurement, we first developed a new domain-specific instrument comprising items parallel to a previously validated instrument. We then tested the psychometric properties (reliability and latent factor structure) of both the established motivation instrument and the newly developed domain-specific measures. The established measure used here is the Inventory of School Motivation (ISM), which has been previously validated in numerous cross-cultural settings (McInerney et al., 1997, 1998, 2003). We hypothesized that for the same sample of students, the structure of the mastery and performance orientations would demonstrate sound psychometric properties for both the established ISM that taps into student motivation in global terms and the newly established domain-specific school motivation (DSSM) scales. Similar to Green's (2004) study, we observed the factor correlations. However, we used more sophisticated analytical techniques that would provide more accurate estimates and account for measurement errors. Support for domain specificity would require (a) the factor structure of the domain-specific (DSSM) model to be as strong as the general (ISM) model, and (b) the correlations between domains (i.e., English and maths) within the same factor (e.g., mastery) to be sufficiently low for them to be distinguishable (e.g., $r < .8$).

Method

Participants

The sample consisted of Australian secondary students (N = 476) in Years 7-11 from two secondary schools within the Sydney metropolitan area. Participants included 241 male students and 235 female students, aged between 11 and 17 years, with a mean age of 13.84 years (SD = 1.23). Two hundred and one of the participants within this sample described their culture as Australian, 106 reported being from a culture other than Australian, and the remainder (n = 169) considered their cultural background to be a combination of Australian and another culture (e.g., Australian-Greek, Australian-Lebanese). Only those students who volunteered to participate and whose parents consented to their child's participation were selected to participate in the study.

Measures

Inventory of School Motivation. The ISM has been used cross-culturally by a number of researchers (McInerney et al., 1997, 1998, 2003) and has consistently demonstrated acceptable reliability and validity across diverse cultural groups. The ISM consists of 34 positively worded items randomly assigned throughout the questionnaire. All items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Thus, higher scores reflect a stronger endorsement of the particular goal orientation being examined. The ISM delineates eight first-order factor scales and three higher order factors labelled Mastery, Performance, and Social goal orientations (McInerney, 1997). The Mastery factor is defined by two first-order factors: Task (4 items) and Effort (5 items). The Performance factor is represented by four first-order factors: Competition (4 items), Social Power (4 items), Praise (5 items), and Token (4 items). The Social factor is characterised by two first-order factors: Social Concern (5 items) and Affiliation (3 items).

Domain-specific School Motivation. In order to measure students' goal orientations in a domain-specific context, items of the ISM were modified to create new English and maths domain-specific school motivation (DSSM) scales. For example, the ISM item: "I try hard at school because I am interested in my work" was adapted to "I try hard in mathematics because I am interested in my work" from the DSSM.

Procedure

After obtaining ethics approval from the university, permission was obtained from the school organization to conduct the survey. Students with parental consent were informed verbally and in writing of the purpose of the study, that their participation was voluntary and anonymous, and that they could withdraw from the study at any time without penalty. The survey was group administered to participants in either a classroom or school hall. To emulate previous research techniques (Barker, McInerney, & Dowson, 2002), the questionnaire was read aloud by the researcher to ensure efficient, effective, and consistent administration.

Statistical Analyses

Preliminary analysis. All data were initially entered and screened in SPSS v.14. Preliminary data screening involved checking for assumptions of normality, linearity, and homoscedasticity, identifying missing values and univariate and multivariate outliers. In addition, reliability analyses, using Cronbach's alpha, were performed for each of the subscales of the ISM and the DSSM.

Confirmatory factor analysis (CFA). CFA was used to assess the extent to which the observed indicators (items) reflect the structure of the underlying latent constructs (Byrne, 2001). Following recent recommendations (Hoyle & Panter, 1995; Holmes-Smith, 2000; Hu & Bentler, 1995; Marsh, Wen, & Hau, 2004), the Tucker Lewis Index (TLI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA) were used in the current study to assess model fit. A CFI and TLI of .95 or above are indicative of an excellent fitting model, although values of .90 or above are considered acceptable (Byrne, 2001; Hu & Bentler, 1999; Marsh et al., 2004). RMSEA values at or below .05 are considered to represent a "close fit" to the data, values of .08 indicate an "acceptable fit", and values of .1 or above indicate a "poor fit" (Browne & Cudeck, 1993; Marsh, Balla, & Hau, 1996). In order to validate the factor structure of the ISM and the DSSM scales, both first-order and higher order CFAs were performed with PRELIS and LISREL 8.72 (Jorskog & Sorbom, 2004), using maximum likelihood estimation to estimate the models' parameters.

CFAs were conducted separately for the ISM domain-general instrument and the newly developed DSSM in order to assess the hypothesized factor structure. Due to the parallel wording of the indicators (mathematics and English items), it is possible that the matching items across the subjects would be correlated, resulting in biased parameter estimates and

consequently posing statistical problems to the structure of measurement errors. Thus, following recommendations by Joreskog (1979) and Marsh, Roche, Pajares, and Miller (1997), the uniquenesses between parallel items were correlated in the hypothesized domain-specific model in order to obtain more accurate estimates and avoid inflating the correlation between English and maths corresponding factors.

Results

Reliabilities. Cronbach's alpha estimates for the ISM, with the exception of the Task factor (.60) were deemed acceptable and ranged from .72 to .87. The lower reliability of the Task subscale may reflect the small number of items (4) within the scale. There was substantial improvement when the Task scale was combined into the higher-order Mastery factor, resulting in a reliability estimate of .80.

First-order CFA for the ISM. In order to examine the structure of the eight motivational factors posited to underlie responses to the ISM, a first-order CFA was conducted whereby each of the 34 items were assigned to load only onto their designated factor. The final model (see Figure 1) consisted of 34 items measuring 7 first-order factors (Mastery, Competition, Social Power, Praise, Token, Affiliation, and Social Concern) and one higher-order Performance factor. Whilst this model is not identical to the McInerney et al. (1997) model, it is still theoretically valid as all first-order factor items have been retained and the three academic goal orientations under investigation (mastery, performance, social) are well represented.

Results testing the revised first-order model demonstrated a good fit, with a RMSEA of .050, a CFI of .95, and a TLI of .95. Factor loadings indicated that all 7 factors were clearly defined and all factor loadings were positive and statistically significant. Correlations among the 7 first-order factors were all positive, and although they varied from low (.01) to high (.69) in size, they still indicated distinct factors. The inter-correlations among the four performance factors were moderate to high (.34 to .63) thereby supporting the formation of a higher order Performance factor.

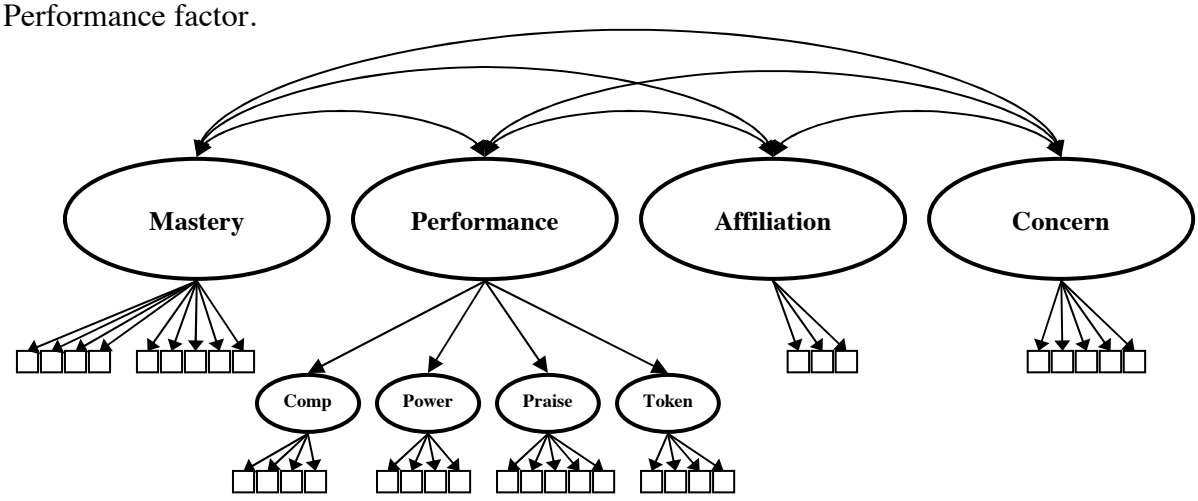

Figure 1. Final model reflecting the factor structure of the ISM
Note. Mastery = mastery goals; Comp = competition goals; Power = social power goals; Praise = praise goals; Token = token goals; Affiliation = affiliation goals; Concern = social concern goals. Performance is a higher order factor derived from four first-order factors.

Higher Order CFA for the ISM

The higher order model provided a slightly better fit to the data than the first order model (CFI= .96, TLI = .96, RMSEA= .049). All factor loadings for the higher order Performance factor were statistically significant (ranging from .47 to .86) and well over the minimum level

of acceptability of .30 (Hills, 2005), thereby supporting the higher order model. Correlations among latent factors (first- and second-order) ranged from .00 to .70, again indicating a set of distinct factors.

Reliability analyses for DSSM scales. Next, separate reliability analyses were carried out for each first-order DSSM factor and each higher order factor. With the exception of Maths-Task (α = .62) and English-task (α = .65,), the reliability estimates for all scales were acceptable for both males and females, ranging from .70 to .90. The fact that Task also showed the lowest reliability as in the ISM suggests that this DSSM scale may benefit from refinement.

First-order CFA for DSSM Scales. As with the general ISM instrument, the structural nature of the DSSM instrument was assessed using a first-order CFA in order to validate the structure of the DSSM factors. The CFA was conducted on the 14-first-order DSSM subscales for each of two domains together with also English and maths achievement scores in the model. Each of the 70 items was constrained to load only onto their designed factor. The goodness-of-fit indices show that the proposed first-order model provides an excellent fit to the data with a RMSEA of .049, a TLI of .97, and a CFI of .97. All scale item loadings were acceptable (ranging from .36 to .90) and loaded significantly onto their designated factor (Table 1).

Correlations between factors (see Table 2) showed similar patterns to the ISM first-order model as both mathematics and English Social Concern correlated more highly with the Mastery factor than with the Affiliation factor. The correlations among the four Math Performance and English Performance first order factors were sufficiently high to warrant the formation of the higher order factor (.44 to .84). Correlations among factors also provide support for the domain specificity of motivational goal orientation, although some of the factors appear more domain-specific than others. Mathematics and English achievement were correlated at .50 and in the majority of cases were more highly correlated with the factors in the same subject domain (i.e., English achievement was more highly correlated with the English factors whereas mathematics achievement showed higher correlations with the mathematics factors than with the English factors), thereby providing support for the domain specificity of the relation between goal orientation and achievement.

Higher order CFA for DSSM scales. The higher order CFA examined the structure of the 14 first-order and the 2 higher order DSSM factors along with two outcome variables (maths and English achievement). The results of the CFA indicated that the model provided a good fit to the data with an RMSEA of .056, a CFI of .96, and a TLI of .95.

Results demonstrate that the two higher order factors (Maths-Performance and English-Performance) were well defined as all first-order factors loaded onto their designated factor at .61 or above. English Competition, Social Power, Praise, and Token loaded onto English-Performance with values of .77, .61, .89, and .83 respectively. Similarly, Mathematics Competition, Social Power, Praise, and Token loaded onto Maths-Performance with values of .77, .63, .92, and .88 respectively.

Results show substantial variations in the size of the correlations among latent factors (see Table 3) with correlations ranging from -.14 (English Affiliation and Mastery) to .96 for the two Performance factors. Such a high correlation between the two Performance factors suggests that, at least for the present sample, performance goals did not appear to be domain-specific. The correlations between Mathematics and English Social Concern were also relatively high (.81) although not so high that the two factors were measuring the same construct. Other between-domain and within-domain factor correlations did not exceed .69, suggesting that although these factors shared variance across subjects, there was sufficient support for the multidimensional and domain-specific view of academic goal orientations.

Also in support of domain specificity, correlations between latent factors and outcome measures were stronger for within-domain factors than between-domain factors with the exception of Maths-Affiliation correlating slightly higher with English achievement than maths achievement; however, both of these correlations were close to zero.

Table 1
First-Order Factor Loadings for the DSSM Subscales

English Scale	Item	Loading	Math Scale	Item	Loading
E Mastery			M Mastery		
	1	.60		1	.52
	2	.36		2	.48
	3	.68		3	.72
	4	.72		4	.72
	5	.73		5	.70
	6	.71		6	.70
	7	.72		7	.72
	8	.76		8	.73
	9	.63		9	.74
E Competition			M Competition		
	1	.78		1	.79
	2	.79		2	.72
	3	.85		3	.75
	4	.72		4	.72
E Social Power			M Social Power		
	1	.81		1	.67
	2	.85		2	.83
	3	.84		3	.84
	4	.65		4	.90
E Praise			M Praise		
	1	.80		1	.85
	2	.74		2	.70
	3	.80		3	.58
	4	.83		4	.77
	5	.56		5	.73
E Token			M Token		
	1	.71		1	.78
	2	.78		2	.82
	3	.81		3	.80
	4	.58		4	.69
E Affiliation			M Affiliation		
	1	.65		1	.80
	2	.65		2	.81
	3	.86		3	.79
E Social Concern			M Social Concern		
	1	.52		1	.60
	2	.84		2	.73
	3	.70		3	.61
	4	.76		4	.71
	5	.40		5	.42
E Achievement		1	M Achievement		1

Note. E=English and M=Mathematics

Table 2
Correlations between First-Order Subscales of the DSSM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Emastery	1															
2. Ecompition	.53	1														
3. Epower	.33	.64	1													
4. Epraise	.57	.65	.48	1												
5. Etoken	.32	.52	.49	.74	1											
6. Eaffiliation	-.13	-.12	.02	.06	.24	1										
7. ESocialConcern	.59	.15	.21	.33	.18	.17	1									
8. Mmastery	.62	.34	.12	.46	.28	.07	.35	1								
9. Mcompetition	.27	.77	.42	.53	.50	.08	.05	.53	1							
10. Mpower	.18	.56	.82	.39	.46	.11	.11	.34	.63	1						
11. Mpraise	.42	.56	.31	.89	.71	.15	.20	.64	.69	.44	1					
12. Mtoken	.26	.51	.42	.78	.89	.15	.14	.41	.60	.53	.84	1				
13. Maffiliation	.11	.00	.11	.20	.28	.68	.36	.20	.08	.13	.25	.22	1			
14.MsocialConcern	.40	.06	.48	.32	.26	.35	.80	.61	.22	.15	.39	.29	.45	1		
15. Eachievement	.27	.13	.04	.17	-.02	-.08	.16	.16	.00	.01	.15	.02	.04	.09	1	
16. Machievement	.18	.08	-.07	.08	-.07	-.01	.06	.30	.10	.03	.12	.05	.04	.16	.50	1

Note. M = Mathematics, E = English

Table 3
Correlations Between the DSSM Latent Factors

	EMast	EPerf	EConc	EAffil	MMast	Mperf	MConc	MAffil	EAch	MAch
Emast	1									
EPerf	.57	1								
EConc	.59	.30	1							
Eaffil	-.14	.05	.16	1						
MMast	.62	.41	.36	.06	1					
Mperf	.36	.96	.18	.14	.60	1				
MConc	.39	.24	.81	.31	.60	.34	1			
MAffil	.11	.19	.37	.69	.19	.22	.44	1		
EAch	.27	.12	.16	-.08	.16	.08	.09	.04	1	
MAch	.18	.08	.06	-.01	.30	.10	.16	.03	.50	1

Note. EMast =English Mastery, EPerf = English Performance, EConc = English Social Concern, EAffil = English Affiliation, MMast = Math Mastery, MPerf = Math Performance, MConc = Math Social Concern, MAffil = Math Affiliation, EAch = English Achievement, MAch = Math Achievement, FL = factor loadings.

Discussion

The present findings support predictions that the ISM measure is psychometrically sound and demonstrates comparable factor structure for both males and females. In relation to the research question regarding whether there is psychometric support for the domain specificity of goals, the present research has provided empirical confirmation relating to the domain specificity of motivational goals, although some goal types appear more subject-specific than others. Results indicate that mastery and social goal orientations, although correlated, are sufficiently distinct in mathematics and English, whereas performance goals appeared to be more generalised across subjects.

These findings are consistent with previous research conducted by Bong (2001), who found that performance goals displayed the strongest generalisations across domains, whereas mastery goals were far more subject specific. Although Bong did not examine social goals, the current study has extended Bong's findings by showing support for the domain specificity of social goals. These findings also support results reported by Green (2004), who found strong empirical support for the domain specificity of mastery goals across three academic subjects. In contrast to the present findings, failure-avoidance goals (similar to performance goals), were also found to be domain-specific in Green's study. This inconsistency may be a reflection of the different theoretical constructs or measures used, or alternatively, may be due to the higher order factor structure of performance goals used in the current study. It is possible that much of the variance in the Performance factor was explained by the first-order factors and in order to clarify this discrepancy, future research could examine the domain specificity of performance goals at the first-order level.

The present research contradicts conclusions drawn by Duda and Nichols (1992), who claimed that goal orientations were global constructs generalising across different domains. This incongruity might be best explained by the different methodology employed in the two studies. Rather than assessing the domain specificity of goals in different academic areas, the Duda and Nichols' (1992) study examined goal orientations in sport and motivation toward school in general, thereby obscuring motivational differences between academic subjects.

Also consistent with previous research (Green, 2004), further support for the domain specificity of motivational goals was found in the correlations between subject-specific goals and achievement. In almost all cases, the relation between goals and achievement was strongest within domains than between domains. These findings suggest for example, that being mastery orientated in mathematics does not necessarily facilitate performance in English. To date, most research investigating students' motivational goals use global or general measures under the assumption that student motivation is consistent across all subject areas. It is concluded here that in order to capture the true complexity of how student goals operate in specific subjects, global measures are insufficient. It is recommended that domain-specific measures such as the one utilised in the present study be used in future research investigating students' motivational goals.

The preliminary findings of this study may offer a partial explanation for the mixed and inconsistent findings arising from global approaches to goal theory research studies which has generated much debate between motivational researchers. It is important that future research continues to examine students' goals in domain-specific areas in order to ascertain whether doing so can produce more consistent findings between goals and desirable educational outcomes. Additionally, although research has shown students' goal orientations influence students' achievement outcomes in a variety of ways, it is important to recognise the numerous other factors that influence student learning and achievement. As self-concept research has shown strong support for domain-specificity, it would be interesting for future research to determine which other important predictors follow subject-specific patterns and assess these psychological variables in conjunction with motivational goals and achievement outcomes.

It is important to note a number of limitations of this research. Firstly, this study was cross-sectional in nature, which did not allow the causal ordering among variables to be determined (Bong, 1996). Future research could employ the use of longitudinal causal modelling to track changes in students' motivational goals over time in specific subject domains. Secondly, the motivational data presented was reliant on student self-report. The use of self-report measures is based on the assumption that respondents have an objective and direct awareness of the constructs under study, however, this is can create potential problems with response bias (Murphy & Alexander, 2000; Pintrich, 2000). Finally, due to practical constraints the scope of this study was confined to measuring students' goals in math and English only. Future research could examine students' goals in a variety of other school subjects such as art, science, language and music and determine whether or not goal orientations differ between these additional subject areas.

In conclusion, in order to maximise student performance in a particular subject area, educational curriculum and teaching practice may benefit from facilitating adaptive goal adoption within specific subject domains. Taken together, the current findings suggest that the examination of students' general motivation towards school using solely global measures may no longer be appropriate and that the salience of a domain-specific model of motivation warrants further investigation.

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