Motivational orientations, strategic learning and achievement in English in Years 5, 7 and 9 students: Preliminary findings

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Abstract

This paper reports on preliminary findings of the first year study of a three-year longitudinal project, focusing on the relationship among motivation, strategic learning and achievement in English in Years 5, 7 and 9 students. Specifically, the paper aims to examine the changes in the pattern of relationships across years of schooling among students' attributional beliefs regarding the reasons for their school success and failure, their approaches to learning, their knowledge and usage of reading and writing strategies,

and achievement in English. Measures of students' attributional beliefs and approaches to learning in the specific subject domain of English were obtained using rating scales adapted from the global Causal Attribution Scale (Chan, 1994) and Learning Process Questionnaire (Biggs, 1987). Measures of knowledge and usage of reading and writing strategies were obtained using both an interview and a rating scale developed following the format of the global Self-Regulated Learning Strategies Scale (Youlden & Chan, 1994). Data were collected from 391 Year 5, 804 Year 7 and 664 Year 9 students. The results of the preliminary data analysis are reported and the findings are discussed.

Research in educational and developmental psychology has indicated that successful academic outcomes are often the result of strategic, independent and active learning and problem solving (eg, Baker & Brown, 1984; Billingsley & Wildman, 1990; Borkowski, Carr, Rellinger & Pressley, 1990; Chan, 1991; Zimmerman & Martinez-Pons, 1986). Students who have good metacognitive skills and actively use strategies such as checking, planning, evaluating, testing, summarising and revising, are taking executive control over their cognitive and learning processes in different learning situations (Billingsley & Wildman, 1990), leading to more efficient learning.

Language skills such as reading and writing have also been found to involve

metacognitive skills (Myers & Paris, 1978). A metacognitive reader knows the purpose for reading; modifies reading strategies according to different purposes for reading; identifies main ideas in the text; activates prior knowledge; monitors level of comprehension and takes remedial action if necessary (Baker & Brown, 1984). Likewise, metacognitive writing processes consist of planning, drafting, editing and self-evaluation (Harris & Graham, 1992). Nevertheless, recent research findings indicate that most students have superficial understanding of how their mind works and their usage of reading and writing strategies is relatively limited (Cole & Chan, 1994). Furthermore, knowledge of strategies alone is not sufficient to promote academic achievement. Students must also be motivated to use the strategies (Paris, Lipson & Wixson, 1983; Pintrich, Roeser & De Groot, 1992). In order to be effective in self-regulation, students need to be metacognitively, motivationally and behaviorally active participants in learning situations (Zimmerman & Martinez-Pons, 1986, 1988).

Most of the research on relationships between motivational orientations and strategic learning has been limited to general notions of learning rather than learning in specific subject domains. However, some studies have indicated that there are differences in motivational orientations and strategy usage in different subject areas (Marsh, Cairns, Relich, Barnes & Debus, 1984; Pintrich & De Groot, 1990; Young, Arbreton & Migdley, 1992). Therefore, one main emphasis of this longitudinal study is to investigate the possible developmental differences in motivational orientations and strategic learning in English and in academic learning in general.

In the subject domain of English, research findings indicate that good reading comprehension and high-quality writing products are directly related to students' active knowledge and usage of strategies (Haller, Child & Walberg, 1988; Harris & Graham,

1992). Effective reading is a strategic, meaning-getting procedure requiring awareness and control of complex reasoning processes, while a successful writing product results from well-structured, planful process writing (Baker & Brown, 1984; Brown, Armbruster & Baker, 1986). Research suggests that students with good reading and writing skills have cultivated and developed their metacognitive skills and strategies according to different demands of academic tasks. They know which reading strategies are most useful for a particular task; they are goal-orientated and aware of the desirable learning outcomes; and they are intrinsically motivated (Paris & Winograd, 1990). Although poor readers are aware of different cognitive and metacognitive strategies, they lack the ability to automatically apply strategies in different learning situations (Baker, 1984; Chan, 1991; Moore, 1983; Palincsar & Brown, 1984).

Research findings strongly suggest that metacognitive strategies have a positive impact on reading comprehension (eg, Chan, in press; Palincsar & Brown, 1984). Good readers monitor their comprehension constantly and take steps to correct situations when they fail to comprehend (Burns, Roe & Ross, 1990). Good readers are engaged in pre-reading activities such as predicting (Palincsar & Brown, 1984), skimming and activating prior knowledge (Wong, 1985). They look for key sentences (Baker & Brown, 1984), summarise (Palincsar & Brown, 1984), make use of logical structure (Gaskins et. al., 1988) and create storymaps (Beck & McKeown, 1981) to ensure high level of comprehension and recall of texts. They also use strategies such as self-questionning (Brown, Bransford, Ferrara & Campione, 1983) and self-evaluating (Bandura, 1982) to assess the level of comprehension.

Research also suggests that writing skills and metacognition are correlated (Tompkins, 1990). Less experienced writers have a smaller repertoire of writing strategies and they

are less actively involved in monitoring the writing process than do more experienced writers. Successful writers perceive writing tasks as problem-solving situations during which they need to apply different strategies to produce the best possible product (Tompkins, 1990). The most common writing strategies are planning, drafting, structuring information, editing and publishing (Englert & Raphael, 1988; Humes, 1983). Although writing strategies are usually individually labelled, research indicates that the writing process involves recurring cycles. A skilled writer varies the process flexibly using all the strategies in different stages of writing tasks (Tompkins, 1990).

To summarise, superior reading comprehension and high-quality writing products are directly related to students' knowledge and usage of effective general metacognitive and task-specific strategies (Haller, Child & Walberg, 1988; Harris & Graham, 1992). However, knowledge and usage of strategies by themselves are not sufficient to enhance students' academic performance. Students' motivational orientations are equally important (Paris, Lipson & Wixson, 1983; Pintrich, Roeser & De Groot, 1992)

In the theory of metacognitive development (Borkowski & Muthukrishna, 1992), attributional beliefs form an important component of metacognition. The construct of causal attributions refers to what students perceive as the cause of their successes and failures in school, such as ability, effort, task difficulty and luck (Weiner, 1984). Strategic learning requires effort, initiation, willingness to try as well as persistence. Borkowski, Chan & Muthukrishna (in press) maintain that before students are prepared to deploy effort in planning, evaluating and regulating strategy use, they must believe in the value of doing well on the given task, personal control over task outcomes, usefulness of using strategies in completing the task, and their own ability to use strategies effectively and successfully. In other words, "students who are committed to do well on a given task,

who have well-developed specific strategy knowledge, and who believe that their effortful use of strategies will lead to successful task performance are likely to be active in strategy selection, monitoring and regulation" (Borkowski, Chan & Muthukrishna, in press).

The other motivational construct of importance to this study is Bigg's (1987) approaches to learning. Of the three approaches to learning, students with deep approach are most likely to understand the beneficial nature of metacognitive strategies which leads to strategic learning. "A deep approach involves metacognition, in that the search for meaning involves one in monitoring and reshaping one's own thoughts, whereas a surface approach is simply reactive" (Biggs, 1988; p. 48). While deep and surface approaches are exclusive, an achieving approach is often linked to the deep or the surface approach. Surface-achieving students aim at good results but apply ineffective surface strategies, while deep-achieving students are organised, self-disciplined and actively use successful strategies to perform learning tasks. Research findings tend to show that the best students academically are very often deep-achievers (Biggs, 1987).

This paper reports on preliminary findings of the first year study of a three-year longitudinal project and focuses on the relationship among motivation, strategic learning and achievement in English in Years 5, 7 and 9 students. Specifically, the paper aims to examine the changes in the pattern of relationships across years of schooling among students' attributional beliefs regarding the reasons for their school success and failure, their approaches to learning, their knowledge and usage of reading and writing strategies, and achievement in English.

METHOD

Subjects

The subject sample included 391 Year Five (183 boys and 208 girls), 804

Year Seven (420 boys and 384 girls) and 664 Year Nine (316 boys and 348 girls) students from 12 metropolitan primary and 4 high schools in Newcastle, New South Wales, providing a total sample of 1859 students (919 boys and 940 girls). All participating schools are comprehensive and co-educational. Students attending these schools come from both lower and middle socio-economic backgrounds.

Assessment Instruments

The instruments used to assess motivational orientation and strategic learning are described below.

Self-Regulated Learning Strategies (English) Scale. The Self-regulated Learning Strategies (English) Scale was designed to assess students' awareness and reported use of reading and writing strategies. This scale followed the same format as the Self-regulated Learning Scale developed for previous research (Youlden, 1993; Youlden and Chan, 1994). It consists of 20 items, each describing a student using a particular strategy for reading and writing, such as, "As Brenda reads, she summarises the main ideas in her own words." The items describe four general learning strategies (seeking social assistance, environmental structuring, keeping records, and monitoring and self-evaluating), 12 reading comprehension strategies (predicting, use of prior knowledge, visualisation, selecting key sentences, summarising, making use of logical structure, skimming, storymapping, rereading and making inferences) and four writing strategies (planning, drafting, editing and structuring information). After each description, students are required to rate the strategy on two separate four-point scales in terms of how helpful they consider the strategy to be and how often they study that way. One-factor congeneric measurement models (Joreskog & Sorbom, 1989) were employed to obtain subscale scores for Knowledge of General Study Strategies (a combination of

general learning and writing strategies), Knowledge of Comprehension Strategies, Reported Use of General Study Strategies, and reported Use of Comprehension Strategies. Each subscale score represents a maximally weighted composite of the items for the subscale.

Causal Attributions (English) Scale. Students' attributional beliefs were assessed using the Causal Attribution Scale initially developed by Chan (1992, 1994) and revised for this study. The Causal Attribution (English) Scale is a ten-statement scale designed to assess students' tendency of attributing their school success and failure experiences in the study of English to the four likely reasons of effort, ability, strategy use and luck. Five statements describe success incidents and five describe failure incidents. For each statement, four different reasons were listed and students were required to rate each reason on a four-point scale to indicate how true they consider that particular reason to be for them. Hence the scale consists of eight subscales, (ability, effort, strategies and luck for success and failure), each with five items. One-factor congeneric measurement models (Joreskog & Sorbom, 1989) were employed to obtain subscale scores for the eight success and failure attributions. Each subscale score represents a maximally weighted composite of the five items for the subscale.

Learning Process Questionnaire (English). The Learning Process Questionnaire (LPQ)(Biggs, 1987), developed and normed for Australian secondary students, was "designed to assess the extent to which students endorse the more important approaches to learning and the motives and strategies comprising these approaches" (Biggs & Moore, 1993, p. 316). The original questionnaire had an equal number of items measuring motives and strategies but because strategy knowledge and usage were assessed with a different scale in this study the revised scale consists of 15 items: 5 items for each of the

deep, surface and achieving subscales. The items describe different motives toward learning English language skills, such as "I try to get high marks in English because I want to do better than others in my class". Students were required to rate each item on a 5-point scale to indicate how true they consider that statement is a description of them.
Again, one-factor congeneric measurement models (Joreskog & Sorbom, 1989) were employed to obtain subscale scores for the three approaches to learning. Each subscale score represents a maximally weighted composite of the items for the subscale.

English Achievement Measures. Achievement measure for English was based on students' end of the year result in English. For each grade, the scores were converted to z-scores (standardised across schools) for the statistical analyses.

Procedures

Data collection took place during the end of Term Three and the beginning of Term 4, 1994. The rating scales were administered at once to the entire grade level in each of the schools. Since this study is a part of a bigger research project investigating relationships between motivational orientations, strategic learning and achievement in different subject domains, the questionnaires were administered in four different occasions. On each visit, a set of three questionnaires was administered to each class - Learning Process Questionnaire, Causal Attributions Scale and Self-Regulated Learning Strategies Scale.
Due to the repetitive nature of the questionnaires, care was taken to avoid an order bias.
This was achieved by randomising the order of the items for the questionnaire in each subject-domain, randomising the order in which the subject domains were presented over the four visits; and randomising the order in which the three questionnaires were given on each visit. Procedures were standardised for administering the questionnaires. Students

were read the instructions and then completed the practice items for

the questionnaire.
The items were read to the students as they completed the questionnaires.

RESULTS AND DISCUSSION

Causal Attributions

Two separate 3 x 2 x 4 (Year x Gender x Attribution Type) repeated measures MANOVAs were run on the success and failure attribution measures. Significant Year x Attribution Type interactions were obtained for both the success and failure measures. For the success measures, there was also a significant Gender x Attribution Type interaction.

Of the four success attribution types, students in general were most likely to attribute success to effort, then to ability and strategy, and least likely to luck. The significant Year x Attribution Type interaction on the success attribution measures, $F(6,3248) = 5.16$, $p<.001$, indicates that grade level differences depend on the type of success attributions, As depicted in Figure 1, the Grade 5 students were more likely than older students to attribute success to ability, strategy and effort, but there were no grade differences on luck attribution and no differences between Grades 7 and 9 on all four success attributions. The significant Gender x Attribution Type interaction is depicted in Figure 2. Results indicate that gender differences were observed only for effort and strategy attributions. Girls were more likely than boys to attribute success to effort but were less likely than boys to attribute success to strategy.

The Year x Attribution Type interaction on the failure attribution measures, $F(6,3226)=23.33$, $p<.001$, is graphed in Figure 3. In the case of failures, students were most likely to attribute failures to insufficient effort than to the other reasons. Grade 9 students in particular were much more likely than the younger ones to attribute failures to insufficient effort. Again there were no grade differences on the luck

attribution and no difference between Grades 7 and 9 on ability attribution, while on the others, Grade 9 students made higher ratings than Grade 7 students, who in turn made higher ratings than the Grade 5 students.

Approaches to Learning

The means and standard deviations of the three approaches to learning measures for

Grades 5, 7 and 9 students are presented in Table 2. A 3 x 2 (Year x Gender) MANOVA was run on the three measures. The Gender x Year interaction was significant, multivariate $F(6, 3260)=3.92$, $p<.001$. Univariate results indicate that the interaction was significant only for the Surface approach, $F(2,1632)=3.35$, $p<.05$. The interaction is graphed in Figure 4. Results suggest that there were no gender differences in Grade 9, whereas in Grades 5 and 7, girls were found to be more surface than boys, and that the Grade 5 boys scored the lowest on Surface.

On the Deep and Achieving approaches, girls were also found to score higher than boys. Regarding grade differences, Grade 9 students were less deep than Grade 7 students, who were less deep than the Grade 5 students. Students in Grades 9 and 7 were more surface than the Grade 5 students, and students in Grade 7 were found to be less achieving than their older or younger peers.

Overall, results on approaches to learning suggest that the younger students were less surface and more deep than their older high school peers and the Grade 7 students were the least achieving. Across grades, girls were found to be more achieving and deep than boys, and apart from those in Grade 9, were also more surface than boys.

Knowledge and Usage of Strategies

The means and standard deviations of the four strategies measures are presented in Table

2. Data were analysed using two separate 3 x 2 (Year x Gender) MANOVAs to investigate possible differences in students' knowledge and usage of strategies. No significant interactions were obtained. Gender differences favouring girls, were found on knowledge of both types of strategies: general study strategies, $F(1,1601) = 26.30$, $p<.001$; and comprehension strategies, $F(1,1601) = 7.79$, $p<.01$. Grade level differences were observed only in students' knowledge of general study strategies, $F(2,1601) = 89.61$, $p<.001$, but not in knowledge of comprehension strategies. Further, the significant grade differences occured between Grade 5 and the older students in relation to knowledge of general study strategies.

The results on usage also indicated no significant interaction. There were significant gender differences in students' reported use of general study strategies only, $F(1,1590) = 46.08$, $p<.001$, suggesting that girls reported greater use of general study strategies than boys. Significant grade level differences were found only in reported use of comprehension strategies, $F(2,1590) = 320.36$, $p<.001$, but not in use of general study strategies. The significant grade level difference was observed only between Grades 5 and 7, $F(1,1590) = 637.50$, $p<.001$, but not between Grades 7 and 9.

Overall, regarding general study strategies, results indicate that the younger students reported greater knowledge of these strategies, but there were no grade differences in reported use of these strategies. Regardless of grade, girls reported greater knowledge and usage of these strategies than boys. As for comprehension strategies, there were no differences among grades in knowledge of comprehension strategies, but the older students (Grades 7 and 9) reported greater use of comprehension strategies than the younger ones. Across grades, girls reported greater knowledge of comprehension strategies than boys, but there were no gender difference in their reported use.

Patterns of motivational orientations

It has been argued by Borkowski, Chan & Muthukrishna (in press) that to make inferences as to the consequences of particular motivational orientations, it is not sufficient to know students' tendency of making any one attribution for success or failure. Instead we need to examine the relative pattern of a student's tendency to attribute success and failure to the various internal or external, consistent or inconsistent, controllable or uncontrollable causes. The patterns of students' motivational orientations across the three grade levels were examined using confirmatory factor analysis on the LISREL program (Joreskog & Sorbom, 1989). The analysis allows the attributional beliefs and approaches to learning measures to be grouped into two or three groups (factors). The three resultant models are presented in Figures 5 to 7.

It must be noted that the analysis is preliminary and exploratory in nature. Nevertheless, some interesting and meaningful patterns emerged. Common to all three grades is a construct that can be named "Belief in personal control" comprising tendency to attribute success to personal ability, effort and use of strategies, but not to attribute failure to lack of ability or luck (factors beyond one's personal control), and a desire to spend time and effort to achieve a better mark than other students. Such a pattern of beliefs reflects an adaptive motivational orientation.

For Grades 7 and 9, two further common constructs were revealed. One involved a

tendency to attribute failure to lack of ability, insufficient effort, and not using strategies, as well as a lack of desire to spend time and effort to achieve a better mark than other students, in other words, blaming oneself for failure. The second construct consists of a tendency to attribute success and failure to luck but not to personal effort, one that exemplifies an external locus in one's belief regarding the reasons for

school success and failure. For Grade 5, however, only one other construct was revealed. It involved all four failure attributions, with greater loading from the tendency to attribute failure to insufficient effort and not using strategies (both controllable) and less from the tendency to attribute failure to lack of ability and bad luck (both uncontrollable). All these three patterns, "Self-blame for failure" and "External locus" for Grades 7 and 9, as well as "Failure attributions" for Grade 5, reflect maladaptive motivational orientations. They are negatively correlated with "Belief in personal control" and are positively correlated among themselves.

Comparison of the three models across the three grades suggests that while the adaptive motivational orientation pattern showed little variation across grade levels, the maladaptive motivational orientation pattern changes from primary to high school. The primary students seemed not to have differentiated perceptions of the reasons for failure, the high school students, with more years through the school system, more failure experiences, and with greater exposure to different assessment methods, could have developed somewhat differentiated maladaptive motivational orientation patterns. They would differentiate between blaming their own personal inadequacies for their failure and blaming external factors for their failure.

Relationships among motivational orientations, strategic learning and achievement

Pearson correlation coefficients for the motivational orientations, strategic learning and achievement measures are presented in Table 2. Several trends can be observed:

1. English achievement was positively and moderately correlated with knowledge and reported use of general study strategies (for all three grades, with relatively smaller coefficients in Grade 5). The correlations of achievement with knowledge and use of comprehension strategies, however, were either very small (around 0.1)

or small and negative, again for all three grades.

2. English achievement was consistently positively and moderately correlated with adaptive motivational orientation and negatively correlated with the maladaptive motivational orientation measures.

3. The intercorrelations among the strategies measures were positive and moderate, and relatively higher in Grade 5.

4. The strategies measures were positively correlated with the adaptive motivational orientation measure but negatively correlated with the maladaptive measures. The correlations were relatively higher for the usage measures than for the knowledge measures, and higher for the general study strategies measures than for the comprehension strategies measures.

Path analyses were then run on the set of motivational orientations, strategic learning and achievement measures for the three grades. Initial results revealed the presence of suppressor variables. Hence the general study and comprehension strategies measures had to be analysed separately. The resultant path diagrams for the three grades are presented in Figures 8 to 10.

For Grade 9, an indirect path from belief in personal control to achievement mediated through knowledge and reported use of general study strategies was revealed, together with direct paths from belief in personal control to achievement and to reported use of study strategies. Further, there was a negative indirect path from self-blame for failure to achievement mediated through reported use of strategies. Results for Grade 7 revealed the same set of direct and indirect paths from belief in personal control to achievement and the same negative indirect path from self-blame for failure to achievement. In addition, two direct negative paths from self-blame for failure, and from external locus, to

achievement were revealed, which were absent from the Grade 9 model. In the Grade 5 model, no significant path from reported use of study strategies to achievement was observed, but the other direct and indirect paths from belief in personal control found in the models for the older students were again observed in this model for the younger students. There was also a negative indirect path from failure attributions to use of study strategies mediated through knowledge of study strategies. These results involving general study strategies support previous findings (Chan, 1994; Youlden & Chan, 1994) regarding the influence of motivation on strategic learning and subsequently, achievement. In particular, the link from strategy use to achievement appears to become stronger in the higher grades.

The results of the path analyses involving comprehension strategies differed from those involving the general study strategies in two critical aspects. The first is the negative path from comprehension strategies (reported use of comprehension strategies for Grade 7 and knowledge of comprehension strategies for Grade 5) to achievement. The second is the positive path from external locus to use of comprehension strategies in Grades 7 and 9. These results are contrary to theoretical propositions. One possible explanation relates to the exact nature of the achievement measure. The achievement scores used in this study were students' end of year results in English supplied by the school and converted to z-scores (standardised across schools within each grade) for the statistical analysis. If use of comprehension strategies assessed in the present study (predicting, use of prior knowledge, visualising, selecting key sentences, summarising, making use of logical structure, skimming, storymapping, rereading and making inferences) did not benefit students' end of year results in English, nonsignificant or even negative links could have been quite possible. There is clearly a need to check on the assessment task(s) used by

each school to obtain the end of year results in English, and to conduct multilevel analysis using programs such as the MLn (Rasbash & Woodhouse, 1995).

To conclude, it must be restated that the analyses reported in this paper are preliminary and exploratory in nature. No firm conclusions can be drawn from the analyses. Further, the data reported in this paper come from the first year data of a three-year longitudinal study. An intervention program providing strategy and motivational training was implemented in seven Grade 6 and seven Grade 8 classes in the second year. The longitudinal data and data from intervention classes will help to clarify many of the issues raised earlier in the discussion.

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Table 1. Means and standard deviations of Approaches to Learning and Strategies Measures

Table 2
Correlations among variables