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ABSTRACT

This study sought to determine whether the motivational patterns of first-year university students differed between courses of varying difficulty levels, and the nature of the interactions between self-efficacy, attributional style, and academic achievement. A total of 509 students majoring in history, physical education, mathematics, and private law at an independent, rural South African university were surveyed. A two-part subject-specific questionnaire was developed for each of the four courses of study to assess how students in the specific majors rated their self-efficacy, goal-orientation, attributional choice, and attributional style. The results indicated a relationship between motivational pattern and course difficulty, but not between motivational variables and academic achievement. Based on the results, it would seem that students need to have an adaptive motivational pattern before they would accept the challenge of a difficult course of study such as mathematics or private law. (Contains 28 references.) (MDM)

THE RELATIONSHIP BETWEEN MOTIVATIONAL PATTERN, CONCEPTUAL LEVEL OF THE COURSE AND ACADEMIC ACHIEVEMENT

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Abstract

This study tested two hypotheses, namely: (i) the motivational patterns of first-year university students differ in accordance with the conceptual level of the course, and (ii) there is a relationship between motivational variables and academic achievement. The results supported the first hypothesis, but not the second. The results of the empirical study are discussed in the context of previous research relating to the expectancy-value framework of achievement motivation.

In the humanities, and especially in an African context, Educational Psychology, with its focus on learning and development, is one the more relevant disciplines for research, since the students of the nineties, are to become the productive adults of the twenty-first century. Only well educated and intrinsically motivated adults will be able to meet the challenges of the next century.

Research dealing with these aspects thus ought to have a high priority in Africa, as it has in America and in other countries. According to the list of the eight most researched fronts in the Educational field in America, compiled by the *Social Sciences Citation Index* (quoted by Walberg and Haertel, 1992:14; see table 1) research on attributional styles, motivation and emotional concerns, is second only to research dealing with reading comprehension.

Table 1 Research fronts in the core Educational Psychology Journals

Research front no.	Research front content
1	Text recall, memory for stories, knowledge in discourse, comprehension and summarizing strategies.
2	Attributional style, family caregivers, and emotional response.
3	Active instruction for students, high school science, classroom lessons, learning time, regular education initiative, and alternate perspectives on learning.
4	Historical perspectives on educational research, mathematics education, organizational performance, and inexact sciences.
5	Regular education initiative, adaptive learning environments, and group instruction.
6	Reading performance, comprehension instruction, poor readers, learning disabled students, and metacognitive strategies.
7	Teacher expectations, ability groups, and pupils' performance.
8	Cognitive technologies for writing, young children's composition, and syntax of "if" clauses.

The value-expectancy framework, which is widely used for motivational research, postulates that achievement motivation is affected by *how students evaluate* their expectancy for success and the value of the learning task (Berndt & Miller, 1990:319; Feather, 1988:381; Pintrich, 1988:75). Expectancy beliefs are influenced by affective reactions resulting from *how* students interpret the locus, stability and control over causes to which they attribute their learning performances (i.e. their attributional styles; Weiner, 1985 and 1988), and their level of self-efficacy (Schunk, 1990:2). Values, mediated by attributions and self-efficacy, are related to goal orientations, differentiating between a mastery or learning orientation and an achievement or ego orientation (Feather, 1988:381; Pintrich, 1988a:75). Attributions, self-efficacy and goal orientation, interactionally, initiate and direct learning behaviour, and influence persistence (Schunk, 1990:3), task choice (Dweck, 1986:1041; Elliott & Dweck, 1988), course type (Feather, 1988; Falchikov and Boud, 1989) and achievement at all academic levels (Berndt & Miller, 1990;

Gigliotti & Buchtel, 1990; Wood, Schau & Fiedler, 1990; Marsh, 1990 and 1986; Wentzel, 1989; Chapman, 1987).

Students thus need to determine why they learn, who is in control of their learning, and what their competence level is. This they do by evaluating and interpreting their learning performances and achievements in terms of their original goals and the type and difficulty level of the course.

Motivational patterns incorporate a continuum from high self-efficacy (i.e. an adaptive pattern) to learned helplessness (i.e. a maladaptive pattern; Wood, Schau and Fiedler, 1990:3). Students with adaptive motivational patterns are mastery-oriented, have high levels of self-efficacy, show perseverance in the face of difficulties and attribute performances and results to causes that are mostly internal, stable for success and unstable for failure, but controllable. They attach much value to tasks from which they can gain new skills and competencies and have positive expectancies of success.

Students with maladaptive motivational patterns are performance-oriented, manifest high self-efficacy when successful, but low perseverance and self-efficacy when confronted by difficulties or failure. They attribute success to internal and stable causes, but failure to internal or external causes which are perceived to be stable and uncontrollable. Value and expectancy of success are determined by whether they are certain they will succeed and thus gain social approval (Schunk, 1990:7; Dweck, 1986:1040).

The aim of this study was to determine whether the motivational patterns of first-year university students differ between courses of varying difficulty levels, and what the nature of the interactions between self-efficacy, attributional style and academic achievement is.

METHOD

Subjects

All first-year students enrolled in History (N=62), Physical Education (N=65), Mathematics (N=130) and Private Law (N=252) at an independent, rural university in the Republic of South Africa were the participants in this study.

Instrumentation

A two-part subject-specific questionnaire was developed for each of the four courses to assess how students rated their self-efficacy, goal-orientation, attributional choice and attributional style for a specific course. The courses were classified on difficulty level to concur with Jacob's (1982) differentiation between types of content domains and type of information-processing (see Pintrich, 1988a:66 and 1988b:72, and Entwistle, 1988:26), as some content domains *lend* themselves more readily to surface processing than others.

Section A of the questionnaire measured domain-specific self-efficacy magnitude and strength (internal consistency reliability coefficient 0,74). The following is an example of one of the items:

Example 1 Self-efficacy sub-scale with 3 options

Discrimination: For which proportion of the time that the instructor explains the work, or that you are studying, can you discriminate between more and less important facts, concepts and relationships?

	Yes	Confidence
1. I can discriminate between more and less important work for 40% or less of the time.	1	5 4 3 2 1
2. I can discriminate between more and less important work for about 60% of the time.	2	5 4 3 2 1
3. I can discriminate between more and less important work for 80% or more of the time.	3	5 4 3 2 1

Goal expectancy (internal consistency reliability coefficient 0,89) was determined by means of the following four questions:

Example 2 Goal expectancy

a. What percentage do you hope to attain in the semester test?
b. What is the minimum percentage you will be satisfied with?
c. What percentage do you expect for the test?
d. For what percentage did you aim?

This section of the questionnaire was constructed according to a self-efficacy scale developed by Wood and Locke (1987). Goal orientation was identified by asking: Do you learn in order to understand the work without thinking of a specific grade? (yes or no).

Section B of the questionnaire measured attributional choice (B-1) and attributional style (B-2). Attributional choice was based on a modification of the Mathematics Attribution Scale (Fennema, Wolleat & Pedro, 1979). Students had to read eight suppositions and score each of the four options given as a possible cause for success or failure, on a 5-point Likert-type scale. The following is an example of one of the suppositions.

Example 3 Attributional choice sub-scale

Supposition 1: You have gained the marks you have aimed for in the class tests written so far.

You gained the marks because:

a.	The class tests were easy.	5..4..3..2..1
b.	You spent much time preparing for the tests.	5..4..3..2..1
c.	The lecturer explained the work very well.	5 4 3 2 1
d.	You have a special aptitude for this subject.	5 4 3 2 1

Attributional style was measured in accordance with research done by Van Overwalle (1989). Students chose the most salient attribution for each of the 8 subscales, and rated the locus, stability and control on a 5-point Likert-scale, with 5 as most internal, stable and controllable and 1 most external, unstable and uncontrollable (internal reliability coefficient 0,60).

Procedure

Students completed the questionnaire after the April-recess. To prevent them from basing their self-evaluation beliefs on the results of the term test only, their test marks were divulged only after they had filled out the questionnaires. To make certain that the opinions expressed by students were their own, they were not allowed to discuss questions or answers with each other, but the first item of each section was completed under the guidance of the researcher.

RESULTS

The first hypothesis addressed the question whether motivational pattern differs in accordance with the difficulty level of the course. In order to determine motivational pattern, defined as adaptive versus maladaptive, a factor analysis (PROC FACTOR with Varimax rotation method, SAS-Institute, Inc., 1988) was performed on all the experimental variables and the variable with the highest

factor loading (indicated by * in table 2) in each of the factors was summarised to define motivational pattern.

Table 2 Motivational Factors identified by Factor Analysis

Factor name	Variance explained by each factor	Variables in each factor	Factor loading	Commu-nality
Attributional style/success	2,42	S/orientation	0,74*	0,66
		S/effort	0,73	0,70
		S/locus	0,72	0,57
		S/control	0,70	0,59
Self-efficacy	2,02	SEM	0,72*	0,61
		Goal expectancy	0,68	0,52
		S/task diffic.	0,58	0,61
		SES	0,54	0,45
Attributions for failure	1,91	F/effort	0,79*	0,71
		F/environment	0,65	0,60
		F/ability	0,64	0,57
Attributional style/failure	1,62	F/locus	0,78*	0,67
		F/control	0,73	0,60
Attributional orientation to failure	1,60	F/task diffic.	0,75*	0,65
		S/environment	0,59	0,64
		F/orientation	-0,61	0,74
Stability S and F	1,51	S/stability	0,81*	0,74
		F/stability	0,73	0,66
Goal direction	1,22	Goal direction	0,68*	0,55
		S/ability	0,43	0,48
Total % of variance explained: 52,10				

Students were then divided into three groups according to the level of their motivational patterns. The top third of students from each course with high scores (N = 151), was classified as having adaptive motivational patterns, while the bottom third of students with low scores (N = 154), was classified as having maladaptive motivational patterns. Students with average scores were not used in the analysis. A frequency analysis (PROC FREQ, SAS Institute Inc., 1985) was done on motivational pattern and course group to determine the percentage of students in each course group with adaptive motivational patterns (table 3). The educational significance of the difference between motivational pattern and course was determined by computing the contingency coefficient (C = .248) and effect size.

Table 3 **Students per course with adaptive and maladaptive motivational patterns**

Difficulty level of course	Course	N	Motivational pattern % Adaptive	% Maladaptive
Average	History	41	24	76
	Phys. Ed.	45	33	67
	Total	**86**	**29**	**71**
Difficult	Mathematics	74	55	45
	Private Law	145	59	41
	Total	**219**	**58**	**42**
Contingency coef. for motivational pattern X course:			0.248	
Effect size:			0.4	

A much higher percentage of students taking the more difficult courses (i.e. Mathematics and Private Law) had adaptive (58%) rather than maladaptive (42%) motivational pattterns, whereas 71% of the students taking the courses of an average difficulty level had maladaptive patterns contrasted to 29% with adaptive patterns. An effect size of .4 indicates that the interaction between motivational pattern and course was of a medium to high effect and can be accepted as educationally significant (Cohen, 1977:223-227).

To test the second hypothesis dealing with the interaction between motivational variables and achievement, a series of two-way analyses of variance were done, differentiating between high and low self-efficacy and adaptive versus maladaptive attributional style. No significant interactions were found. Since Weiner (1985:555) states that attributional style predicts expectancy rather than actual achievement, another series of ANOVAS with expectancy of success as the independent variable were performed. Only the interaction beteen self-efficacy and expectancy for Private Law students was significant.

TABLE 4 Private law: Two-way analysis of variance with factors attributional style and self-efficacy on expectancy

Source	DF	Type 111 SS	F Value	PR · F	Effect size
Attributional style	1	2.202	0.83	0.3630	
Self-efficacy	1	43.564	16.43	0.0001	0.60
Style x SE	1	0.694	0.26	0.6090	

DISCUSSION

The research results denoted a relationship between motivational pattern and course difficulty, but not between motivational variables and academic achievement. It would seem that a student needs to have an adaptive motivational pattern before he would accept the challenge of a difficult course such as Mathematics or Private Law. These results are supported by a number of studies. Dweck (1986:1047) states that students with adaptive motivational patterns choose challenging tasks, irrespective of intelligence level, while students with maladaptive motivational patterns choose tasks of an average-to-easy difficulty level. Meece, Wigfield and Eccles (1990) reported that students' performance expectancies predicted mathematics grades, while their value perceptions predicted course enrollment intentions. According to Fyans and Maehr (1979) students who generally attributed achievement to ability, were likely to prefer tasks in which competence was requisite to outcome, while students who attributed successful performance to luck, were likely to avoid tasks in which ability played a major role.

Feather (1988) and Falchikov and Boud (1989) also affirm that self-evaluation differs between courses. Feather (1988:381) found that course enrollment was related to self-concepts of ability in Mathematics and English and to the subjective value assigned to the two courses, while Falchikov and Boud (1989:424) found that students taking natural sciences evaluated themselves more accurately than students taking social sciences. As expectancies and values are domain-specific (Maple & Stage, 1991:39; Gottfried, 1985:631), one can infer that the students' expectancies and values differed because the subjects differed, probably in content domain and difficulty level.

Within the South African context these research results, especially as pertaining to course type, are important. Changing motivational patterns of students at secondary school level could lead to more students choosing mathematics and science courses at university, which could be in favour of the growing demand for students qualified in these course areas. Further research must, however, also be done to determine how motivational pattern and difference in difficulty level of courses, influence the academic achievement of students.

The research results thus supported the first hypothesis, but not the second, and when interpreted within the context of social cognitive literature, led to the following conclusions: (i) as motivational pattern concurred with course type, motivational measures must be domain-specific; and (ii) as more students taking

the difficult courses had adaptive motivational patterns, motivational pattern can be used in guiding students in course choice.

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