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ABSTRACT

A study examined the relationships among early adolescents' motivational goal orientations (task and ability focus), cognitive processing strategies, self-efficacy, and expectancy-value for literacy activities. These factors appear to vary by gender, academic status (special education, at-risk, and not-at-risk), and grade level. Subjects, 678 middle-school students from a largely "blue collar" district near a major city in the midwest, completed a self-report questionnaire. For students who are learning-focused, findings support use of deep-level cognitive processing strategies such as monitoring of comprehension, paraphrasing, and summarizing; students who are ability-focused tend to use surface-level cognitive processing strategies such as memorization, copying, and rehearsal of information. The relationships between these variables and performance on several standardized measures of language and reading achievement were also measured. Results indicated that (1) self-efficacy was the most powerful predictor of success; and (2) those students who valued literacy activities and were learning-focused tended to do worse on some standardized tests than their peers. Findings suggest that educators should place greater emphasis on the relationships between motivational and affective factors with strategy usage, rather than referring to gender and academic classifications such as "at risk" or "special education" when considering the ways in which adolescents approach reading and writing activities. (Contains 12 references and five tables of data. An appendix presents a list of the constructs and items of the students' scales and four figures of data displaying the motivational, affective, cognitive, and achievement-related belief scales.) (RS)

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Motivation and Cognitive Strategy Use in Reading and Writing

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Abstract

The present study examines the relationships among early adolescents' motivational goal orientations (task and ability focus), cognitive processing strategies, self-efficacy, and expectancy-value for literacy activities. These factors appear to vary by gender, academic status (special education, at-risk, and not-at-risk), and grade level. Students who are learning focused tend to use deep-level cognitive processing strategies such as the monitoring of comprehension, paraphrasing, and summarizing; students who are ability focused tend to use surface-level cognitive processing strategies such as memorization, copying, and rehearsal of information. We also examined the relationships between these variables and performance on several standardized measures of language and reading achievement. While self-efficacy is the most powerful predictor of success on these tests, we also found that those students who value literacy activities and are learning-focused tend to do worse on some standardized measures than their peers. Implications for educators and policy-makers are discussed.

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Considerable research has confirmed that students' achievement goals are related to distinct patterns of motivation and cognitive strategy use. Two types of goals have been identified: "task" goals, which focus on task-mastery, problem solving, and the intrinsic value of learning; and "ability" goals, which focus on students' grades, relative ability, and performance compared to others. Students who adopt task focused goals tend to persist at academic tasks longer and take on challenges, while students who adopt ability focused goals tend to avoid challenging tasks and to give up when faced with difficult work (Ames & Archer, 1988; Elliot & Dweck, 1988; Dweck & Leggett, 1988; Nicholls, 1989; Maehr & Midgley, 1991).

Students' goals also are related to the types of cognitive processing strategies that they use in academic settings (Nolen, 1988; Golan & Graham, 1990; Meece, Blumenfeld & Hoyle, 1988). For example, students who adopt task-focused goals tend to use *deep cognitive processing strategies*, such as connecting new material with previously learned material, trying to understand their mistakes, and stopping to think about their work; in contrast, students who adopt ability focused goals often use *surface level cognitive processing strategies*, such as rushing through assignments, giving up, and writing down the first answer that comes to mind.

Studies only recently have begun to look at the relationship between motivational and cognitive variables within specific academic content areas (Pintrich & DeGroot, 1990; Young, Arbreton & Midgley, 1992; Stodolsky,

1988). This study examines the relationships between middle school students' motivational goals, achievement, and cognitive strategy use in reading and writing. Particular attention is paid to the differing motivational patterns and cognitive strategies used by normally achieving, special education, and "at risk" early adolescents. The following questions are addressed: (1)How do students' gender, academic status, and grade in school relate to motivation and strategy usage in reading and writing? (2) How do students' motivational orientation and achievement-related beliefs relate to the use of deep cognitive processing strategies and achievement in reading and writing?

Subjects

The sample includes 678 middle school students from a largely "blue collar" distinct near a major city in the midwest, and consists of 62 special education, 220 at risk, and 396 normally achieving students. The students represent two middle schools in the same district, each containing grades six through eight. The present sample includes all sixth and seventh grade students who were given permission to participate; over 75% of the students in each school received permission from their parents.

Measures

The students responded to a self-report questionnaire assessing motivation, cognitive strategy use, and attitudinal measures related to reading and writing. The measure was administered in April 1991 in the students' language arts classrooms. All items were scored on a five point Likert scale. The measures were piloted with middle school students and

refined as necessary. Data also were collected on students' achievement test scores, grades in school for reading and language arts, and behavioral grades.

Classroom teachers were asked to rate their students as "at risk" for academic failure or "not at risk." These categories were broadly defined for teachers -- at risk merely referred to any students whom the teacher felt might be "at risk" for academic problems. Students were categorized as "special education" if they took at least one special education course. This strategy of determining the academic status of students has been used in other studies with good results (Ames & Maehr, 1989; Maehr & Midgley, 1990).

Factor analysis was used to guide scale construction. Appendix I displays the motivational, affective, cognitive, and achievement-related belief scales. Reliability was assessed using Cronbach's alpha.

Results

Table 1 displays the results of an ANOVA used to assess differences in motivational and cognitive constructs related to reading and writing.

Insert Table 1 About Here

A number of gender differences emerged from the data. Girls use surface strategies less than boys ($F=15.25$, $p<.001$) and deep cognitive strategies more than boys ($F=10.12$, $p<.01$) . Girls also value literacy skills ($F=8.09$, $p<.01$) and expect to do well at literacy activities ($F=3.76$, $p<.05$) more than boys. The only significant relationship involving students' grade in school is that seventh graders feel more efficacious in reading and writing than do sixth graders ($F=4.27$, $p<.05$).

Academic status is related to cognitive strategy usage, goal orientation, and attitudes toward literacy. Since most of these constructs are significantly related to the academic status variable, we used Multiple Classification Analysis (MCA), a statistical technique that allows for regression-like analyses with multiple-level categorical predictor variables to examine the differences. Table 2 displays the results of this analysis.

Insert Table 2 About Here

All main effects that are statistically significant in the ANOVA (Table 1) are also significant in the MCA. The numbers in each category represent the deviation scores from the "grand mean" (on the five point Likert scale) for each group. The MCA allows for an examination of relationships among the constructs and the three-level academic status variable. Results show that special education students feel the least efficacious in literacy activities, have the lowest personal expectations for success at reading and writing, and use surface processing strategies more often than not at risk and at risk adolescents. But, the results also show that the "at risk" students stand out in certain respects: they have the lowest self-concept of ability in reading and writing, and use deep cognitive strategies less than not at risk *and* special education students. The at risk students feel less efficacious, have lower expectancies for success, and use more surface strategies than not at risk students.

Students who use deep-level cognitive processing strategies in reading and writing engage in such processes as the monitoring of comprehension, relating newly learned material to previously learned material, and attempting to understand abstract and complex relationships. Since the MCA

only explained 7.3% of the variance in deep cognitive strategy usage, , we used correlations and multiple regressions to examine the additional effects of personal, attitudinal, and motivational factors on the use of deep cognitive processing strategies.

Table 3 presents the zero-order correlations among motivational and cognitve constructs measured within the domain of English (Reading/Language).

Insert Table 3 About Here

Some correlations are particularly strong. For example, ability-focused students tend to use surface-level cognitive strategies (r=.453); students who value reading and writing tend to use deep-level cognitive strategies (r=.426); students who are learning-focused tend to value reading and writing (r=.396); students with high self-concepts of ability (r=.728) and high self-efficacy (r=.483) have high expectancies for success at language arts tasks; and not at risk students have exhibit higher levels of self-concept of ability, self efficacy, expectancies for success, and lower use of surface strategies, than academically at-risk students.

We did multiple regression analyses examining cognitive strategy usage, and, we used a dummy-variable coding system for students' academic classification, with the "not at risk" students used as the comparison group. Table 4 displays these results.

Insert Table 4 About Here

We decided to include a construct measuring students' beliefs about the nature of intelligence ("modifiability of intelligence"), since recent studies have suggested that such beliefs are strongly related to motivational and cognitive dimensions of achievement (Dweck & Leggett, 1988; Elliot & Dweck, 1988; Nicholls, 1989). . A high score on this construct means that students believe that intelligence is a modifiable entity; a low score represents a belief that intelligence is a fixed, stable trait.

The strongest predictor of using deep strategies in reading and writing is having a learning focused motivational orientation (beta=.486, $p<.001$). Other strong predictors include value (beta=.136, $p<.001$), and surface strategy use, which is negatively related to deep strategy use (beta=-.185, $p<.001$). The regression for deep strategy use explains 52% of the variance.

Another analysis looked at predictors of cognitive surface-level strategy usage. Some different variables are significant predictors in this analysis. For example, self-efficacy is negatively related to surface strategy use (beta=-.151, $p<.001$); females, special education and at-risk students all use surface strategies more than their peers; deep strategy use is negatively related (beta=-.217, $p<.001$). It is interesting that an ability-focused goal orientation is a strong predictor of surface strategy use (beta=.319, $p<.001$), while a learning-focused goal orientation is a positiive predictor of deep strategy use. This finding corroborates the work of others (e.g., Nolen, 1988).

Since progress in school is usually measured by performance on teacher generated and standardized tests, we examined the effect of motivational orientations and cognitive strategy usage on various measures of achievement. We also included a measure of behavioral conduct as an outcome, to see if students' orientations toward reading and writing are related to behavior. Since reading and writing skills are an integral part of all

academic domains for early adolescents, student conduct might in fact be related to motivational orientations toward English.

We again used multivariate regressions, and included the motivational and cognitive predictors, as well as gender and beliefs about intelligence. Table 5 displays the results of these analyses.

Insert Table 5 About Here

Significant amounts of variance were explained for all dependent variables except the MEAP test of Reading Information Selection (r^2=.04). For most reading and language related outcomes, self-efficacy is the strongest predictor of achievement. Numerous studies in fact have documented that power of this construct as a predictor of academic performance (Bandura, 1986; Schunk, 1989). Gender also is a very strong predictor -- girls on average tend to outperform boys on assessments of reading and writing, after controlling for motivational orientations.

One of the most intriguing results is that being ability focused is unrelated to achievement in all cases except for the MEAP story selection test (beta=.051, p<.05), while the measures of value and learning focus are negatively related to achievement in most of the analyses. Use of surface-level cognitive processing strategies is negatively related to most measures of achievement, while use of deep strategies is unrelated.

The CTBS total percentile is a measure of overall student performance in various academic domains. Since reading and writing are integral parts of all academic work for early adolescents, we examined the effects of motivation toward reading and writing on this overall measure of academic performacne. The results matched most of the other analyses. While gender

is no longer a signficant predictor, students who are highly self-efficacious at reading and writing (beta=.318, p<.001) and who tend not to use surface-level strategies when reading and writing (beta=-.208, p<.001) tend to get higher overall CTBS scores. However, students who are learning focused (beta=-.154, p<.01) and who value reading and writing (beta=-.151, p<.001) tend to have lower achievement.

The regression examining the relationship between motivation and overall conduct only explained 6% of the variance in conduct. Boys get lower conduct grades than girls. The only significant reading-writing related predictor was the use of surface level strategies, which is negatively related to conduct (beta=.144, p<.01).

Discussion

While previous research has addressed the relationship between motivational (task/ability focused) goals, cognitive strategy use, and academic performance (Nolen, 1988; Elliot & Dweck, 1988), little work has examined the contributions of motivation and beliefs to the cognitive engagement of students in literacy activities.

The present study shows that once motivational goals and attitudinal dimensions are accounted for, gender and academic status are no longer related to the use of deep cognitive strategies in reading and writing; however, they are still related to the use of surface-level strategies such as copying and rehearsal. The present study supports other work showing a strong relationship between task focused goals and deep processing or "critical thinking" (Ames & Archer, 1988). Yet the present research is unique in specifically examining how these processes operate in the reading and writing skills of early adolescents.

The finding that students who value literacy activities and who are task-focused toward literacy activities tend to get lower scores on some standardized tests is intriguing. Part of this can be explained by the exact nature of the actual questions that appeared on our questionnaires. These questions, although asked in the actual context of the classroom, are not necessarily related to the actual content on the MEAP and the CTBS. Nevertheless, these data suggest that there may indeed be a mismatch between the purposes of standardized testing in literacy skills, and students' emotional/motivational orientations toward reading and writing activities.

This study is correlational, and the use of surveys in assessing these relationships may not be as strong as observational or experimental studies (Babbie, 1989). Nevertheless, these results do show some very strong relationships between motivation and cognition, and can serve as a basis for more detailed studies in the future.

The present study indicates that motivational goals and achievement-related attitudes are important predictors of deep strategy use for all children, regardless of their gender or academic status. Since deep processing is more likely than surface-level processing to lead to understanding and retention of material (Anderson, 1980; Entwistle & Ramsden, 1983), we need to consider how to promote these goals and attitudes. Our results have implications for classroom environment, suggesting that aspects which encourage students to adopt learning focused goals and positive affect toward literacy may have positive effects on students' use of certain types of cognitive strategies. Our findings suggest that educators should place a much greater emphasis on the relationships between motivational and affective factors with strategy usage, rather than referring to gender and academic classifications such as "at risk"

or "special education" when considering the ways in which adolescents approach reading and writing activities.

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Table 1: ANOVA Results

CONSTRUCT	GENDER	ACADEMIC STATUS	GRADE	INTERACTIONS
Ability Focus	2.56	0.920	0.053	Grade X Academic Status*
Learning Focus	5.41*	2.48*	1.70	None
Surface Strategies	15.25***	18.15***	2.80	None
Deep Strategies	10.12**	4.31**	2.73	Gender X Academic Status**
Self-Concept of Ability	1.347	0.91	0.03	None
Self-Efficacy	2.43	18.54***	4.27*	None
Value	8.09**	3.25**	0.75	None
Expectancy	3.76*	12.01***	0.84	None

* p<.05 ** p<.01 ***p<.001

Table 2: Multiple Classification Analysis

CONSTRUCT	GENDER		ACADEMIC STATUS			GRADE LEVEL		
	Male	*Female*	*LD*	*At Risk*	*Not at Risk*	*Grade 6*	*Grade 7*	*Grand Mean*
Learning Focus	-.08	.08						2.77
Surface Strategies	.13	-.13	.41	.20	-.16			2.58
Deep Strategies	-.10	.10	.02	-.14	.07			3.46
Self Concept of Ability			.01	-.36	.19			3.56
Self-Efficacy			-.37	-.23	.17	-.07	.07	3.52
Value	-.10	.09						4.14
Expectancy	-.07	.06	-.31	-.17	.13			3.77

Table 3: Zero-Order Correlations Among English Scales

	Ability Focus	*Deep Strategy*	*Learning Focus*	*Self Concept of Ability*	*Self-Efficacy*	*Surface Strategies*	*Value*	*Expectancy*	*Gender*
Ability Focus	1.00								
Deep Strategies	-.250**	1.00							
Learning Focused	-.346**	.652**	1.00						
Self-Concept Ability	-.133**	.292**	.273**	1.00					
Self-Efficacy	-.204**	.344**	.324**	.440**	1.00				
Surface Strategies	.453**	-.460**	-.416**	-.304**	-.395**	1.00			
Value	-.204**	.426**	.396**	.350**	.294**	-.346**	1.00		
Expectancy	-.169**	.343**	.319**	.728**	.483**	-.354**	.469**	1.00	
Gender	.066	.138**	.100*	.069	-.037	-.169**	.124**	.091*	1.00
Risk Factor	-.036	.115**	.056	.263**	.225**	-.234**	.099**	.231**	.098*

* $p \leq .05$
** $p \leq .01$

Table 4: Mutliple Regressions Predicting Deep and Surface Strategy Use

Variable	Deep Strategies	Surface Strategies
Self Efficacy	.059	-.151***
Gender	.052	-.092**
Special Education	.019	.134***
At Risk	-.031	.104***
Value	.136***	-.079*
Ability Focus	.054	.319***
Learning Focus	.486***	-.056
Expectancy	.017	-.067
Deep Strategy Use	---------	-.217***
Surface Strategy Use	-.185***	---------
Modifiable Intelligence	.094**	.024
R-Squared	.52***	.43***

Table 5: Regressions Predicting Achievement

Construct	*Gender*	*Self Efficacy*	*Modifiable Intelligence*	*Ability Focus*	*Value*	*Learning Focus*	*Surface Strategies*	*Deep Strategies*	*R-Squared*
Conduct	-.165***	.003	.008	-.032	-.019	.034	.144**	-.038	.06***
CTBS Reading Percentile	.033	.298***	-.043	.052	-.153***	-.182***	-.196***	.038	.14***
CTBS Reading (6)	.044	.286***	-.067	.066	-.144**	-.199***	-.197***	.060	.14***
CTBS Language Perc. (6)	.154***	.330***	-.033	.056	-.110*	-.136**	-.161**	.004	.16***
CTBS Language Grade (6)	.169***	.327***	-.034	.048	-.090*	-.169**	-.143**	.030	.16***
MEAP Cat. of Achv't.	.120*	.296***	-.129*	.003	-.121	.085	-.057	.015	.12***
MEAP Rdg. Story Selection	.221***	.265***	-.119*	.051*	.006	.017	-.101	-.062	.13***
MEAP Rdg. Info. Selection	----------	.137*	----------	----------	----------	----------	----------	----------	.04
English Grade (7)	.102	.205***	-.164**	.035	.058	-.082	-.212**	.131	.17***
Reading Grade (6)	.125*	.157**	.043	.021	.054	-.172*	-.241***	-.028	.11***
Language Arts (6)	.149**	.297***	.034	-.010	.044	-.109	-.166*	-.022	.17***
CTBS Total Percentile	.069	.318***	-.064	.075	-.151***	-.154**	-.208***	.004	.16***

Figure 1: Self-Efficacy and Self Concept of Ability by Academic Status

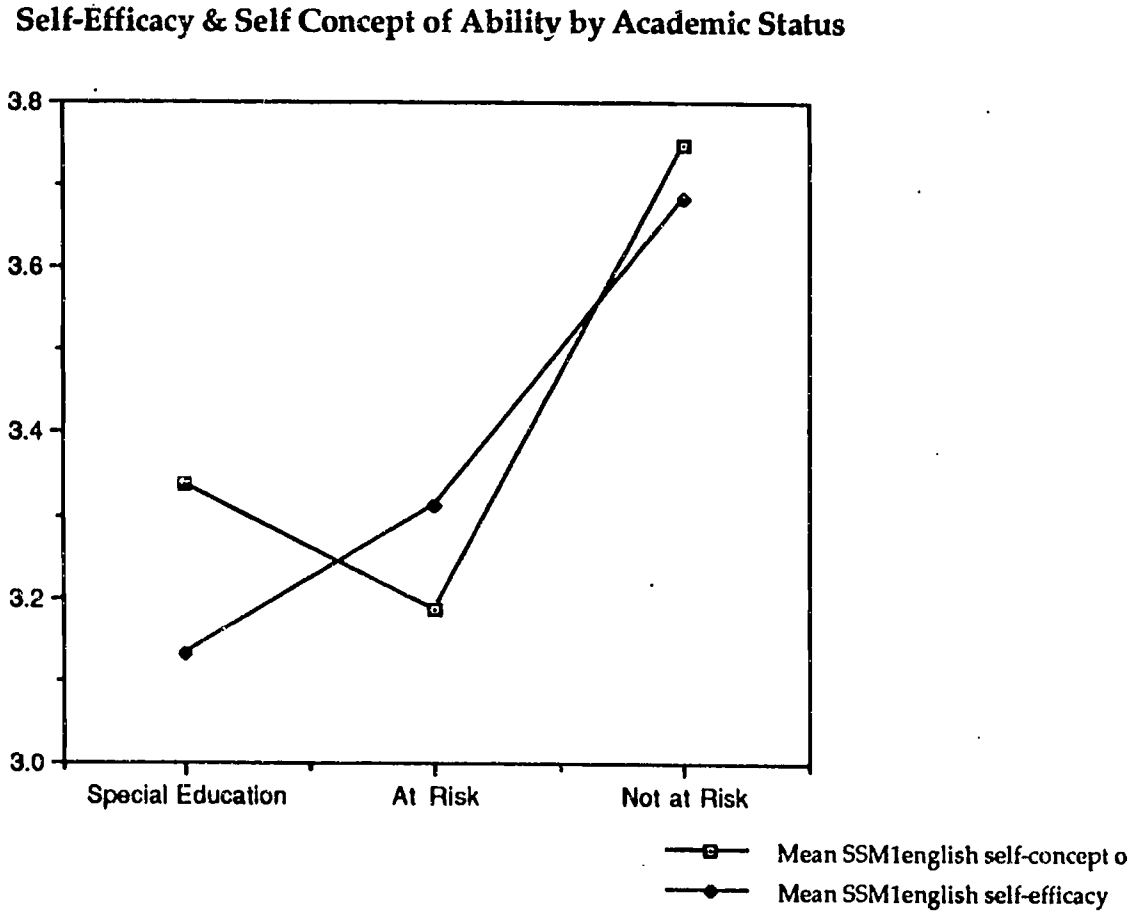


Figure 2: Expectancy and Value by Academic Status

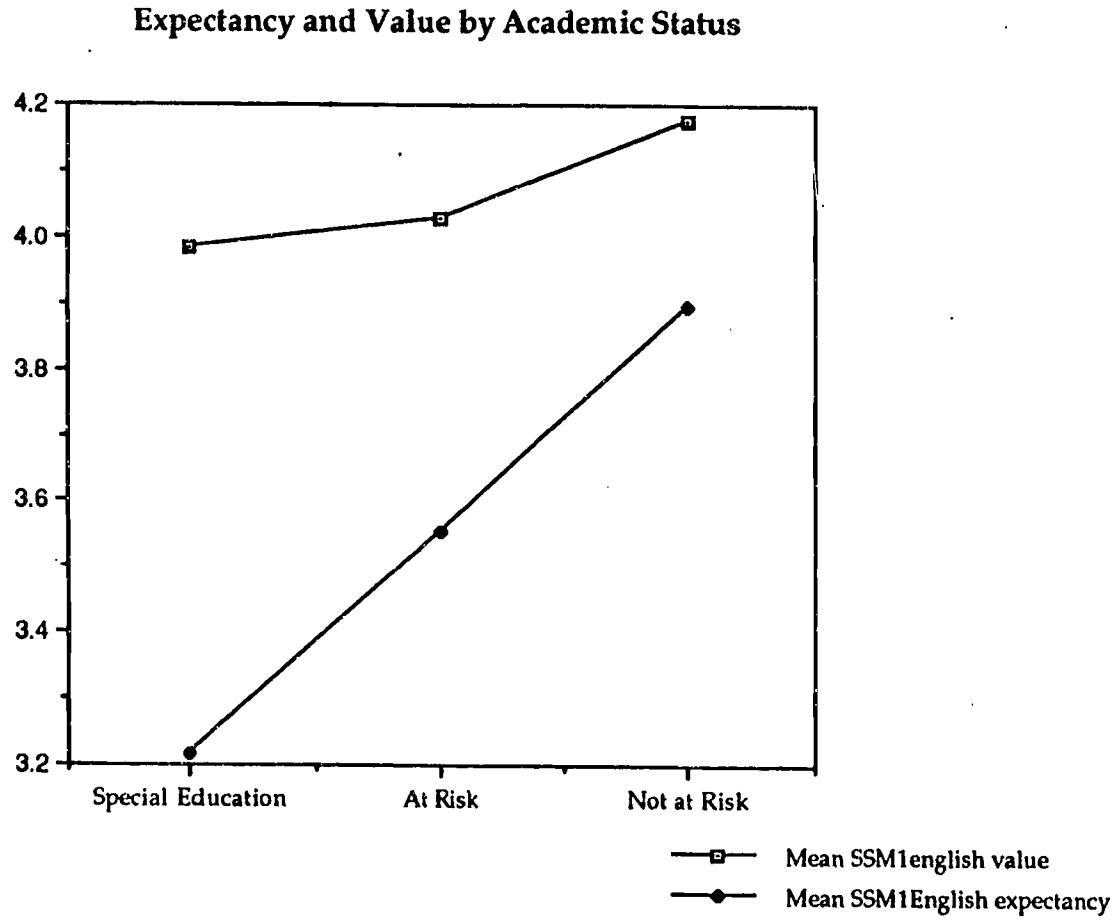


Figure 3 : Motivational Orientation by Academic Status

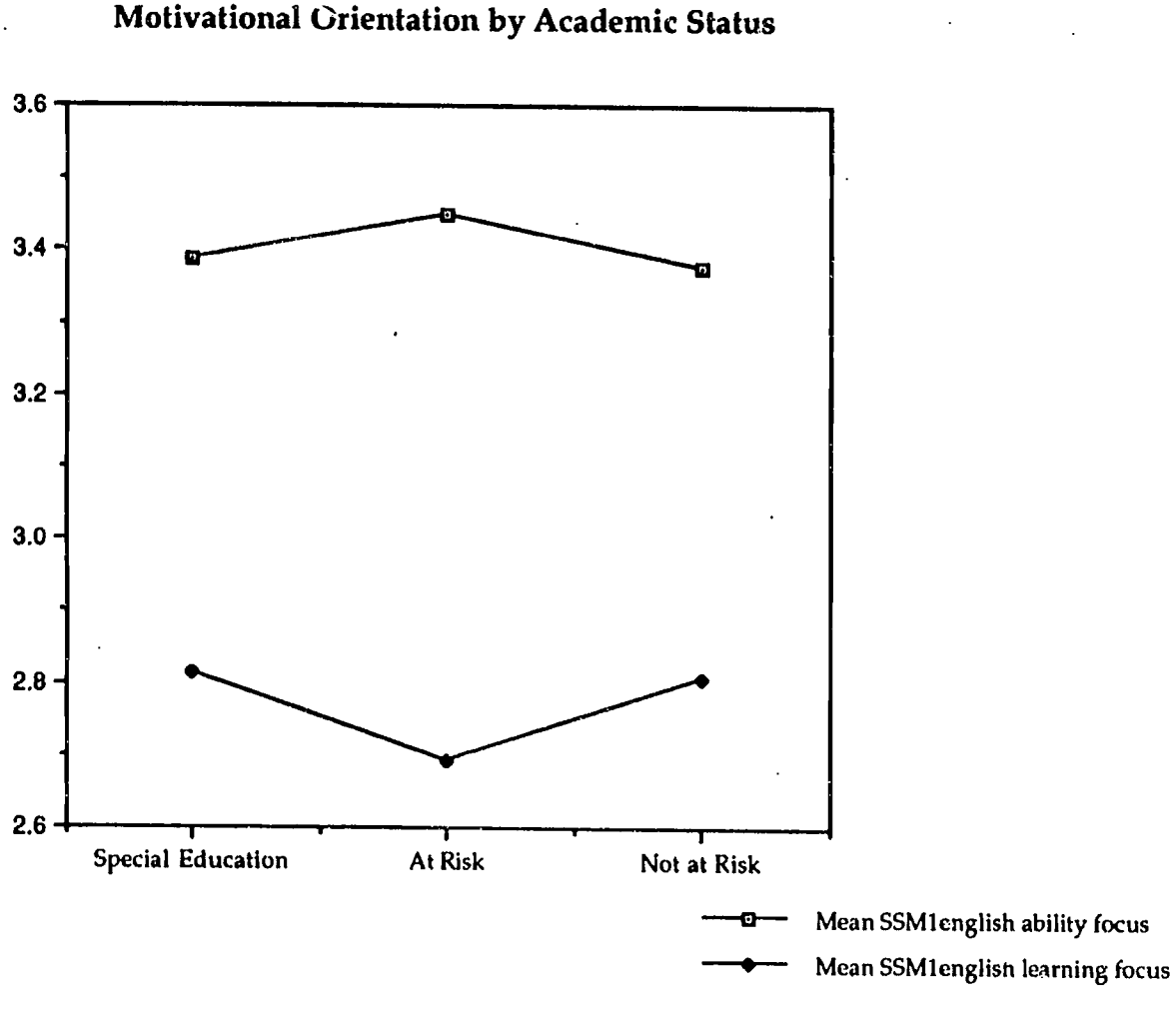
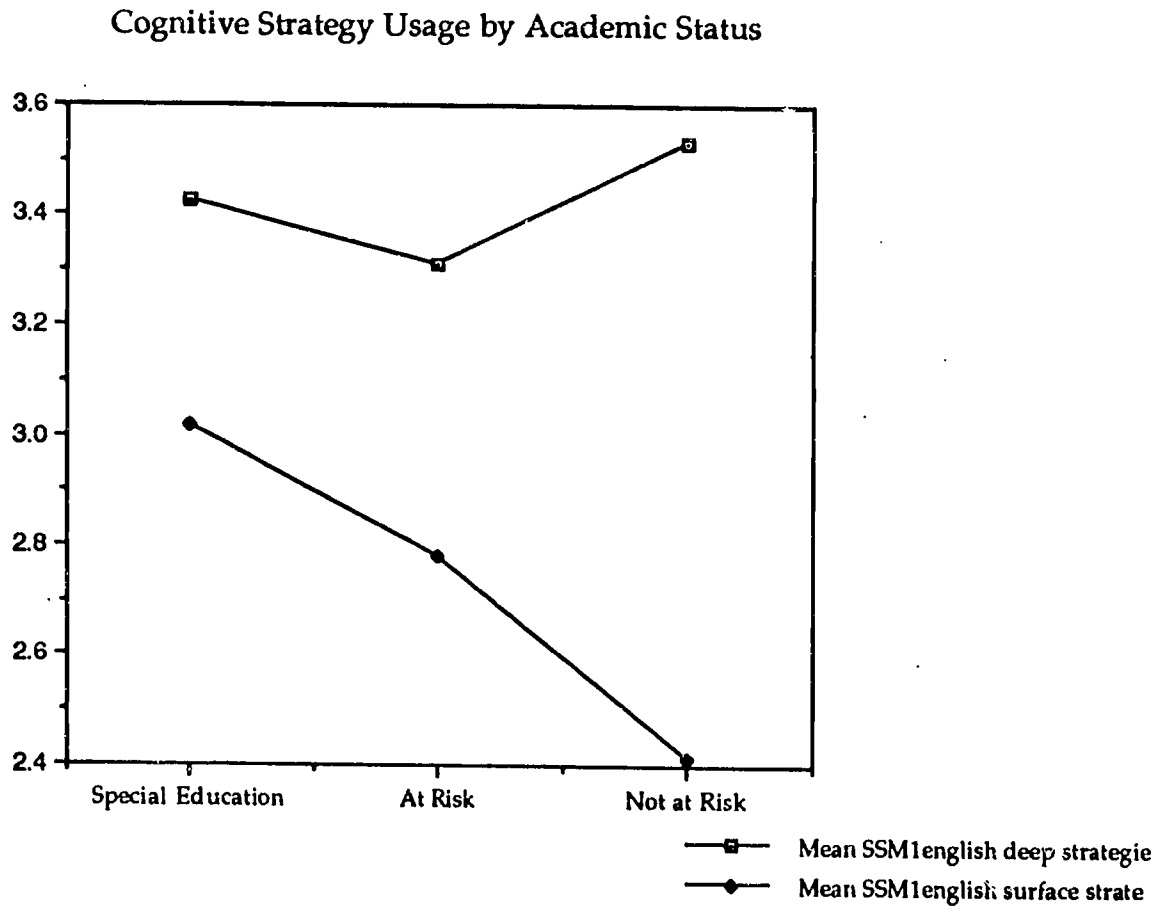


Figure 4: Strategy Use by Academic Status



Student Scales
Middle School Mini Domains - English
Constructs and Items

A. Goal Orientation - Ability-Focus (4)

12110 I do the work that is required in English, nothing more.
12111 I like work in English that is easy. alpha = .60
12117 In this class I only study things I know will be on a test or assignment.
12128 The main reason I do my work in English is because we get grades.

B. Goal Orientation - Task-Focus (4)

12113 Understanding the work in English is more important to me than the grade I get.
12115 The main reason I do my work in English is because it makes me feel good inside. alpha = .67
12121 I like English the best when the work is really hard.
12123 I like English work that I'll learn from, even if I make a lot of mistakes.

C. Self-Efficacy (4)

12109 Even the work in English is hard, I can learn it.
12118 No matter how hard I try, there is some English class work I'll never understand.(recoded) alpha = .65
12133 Some of the work we do in English is too difficult for me. (recoded)
12136 If I have enough time, I can do even the hardest problems in English.

D. Strategies - Surface (5)

12116 When the work in this class is difficult, I either give up or do the easy parts.
12125 When I am writing, I stop when I've reached the required length, even if I have more to say. alpha = .67
12131 When I have a writing assignment, I just start writing because I want to finish quickly.
12132 When I'm working on something difficult in class, I write down the first answer that comes to mind.
12140 When I have a reading assignment, I read it as quickly as I can.

E. Strategies - Deeper (8)

12112 I stop once in a while and think over what I'm writing in English.
12119 I try to connect new work in this class to what I've learned before.
12124 After I write something the first time, I try to make it better.
12127 When I am writing a report, I think about the main ideas before I start writing. alpha = .84
12129 When I make mistakes in English, I try to figure out why.
12130 In this class I spend some time thinking about how to do my work before I start it.
12135 I try to use the grammar we learn when I write stories.
12139 I ask myself questions while I read to make sure I understand.

25 questions