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The Classroom Environment and Students' Reports of Avoidance Strategies in Mathematics: A Multimethod Study

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The relation between the learning environment (e.g., students' perceptions of the classroom goal structure and teachers' instructional discourse) and students' reported use of avoidance strategies (self-handicapping, avoidance of help seeking) and preference to avoid novelty in mathematics was examined. Quantitative analyses indicated that students' reports of avoidance behaviors varied significantly among classrooms. A perceived emphasis on mastery goals in the classroom was positively related to lower reports of avoidance. Qualitative analyses revealed that teachers in high-mastery/low-avoidance and low-mastery/high-avoidance classrooms used distinctively different patterns of instructional and motivational discourse. High incidence of motivational support was uniquely characteristic of high-mastery/low-avoidance classrooms, suggesting that mastery goals may include an affective component. Implications of the results for both theory and practice are discussed.

By early adolescence some students have begun to purposefully withdraw effort, resist novel approaches to learning, and avoid seeking academic help when they need it. These avoidance strategies, often adopted to deflect attention from low ability, undermine performance and may contribute to the devaluation of learning and dropping out of school. Why would students engage in behaviors that undermine their performance and limit their ability to learn in different and original ways? Anecdotal information gathered in conversations with teachers suggests that they may ascribe avoidance strategies to factors such as laziness, devaluing of school, and lack of parental support.

The aim of this study was to examine aspects of the learning environment—the goals for achievement that are emphasized in the classroom and instructional practices—that are related to students' reports of the use of avoidance strategies in mathematics. Using a multimethod approach (e.g., Tashakkori & Teddlie, 1998) classroom contexts related to three avoidance strategies were examined: students' use of strategies aimed at withdrawing effort, resisting novelty, and avoiding seeking academic help. If aspects of the learning environment exacerbate or ameliorate the use of avoidance strategies, teachers can adjust their practices and thereby have a positive influence on student performance. These research questions are addressed:

1. How do students' perceptions of the classroom goal structure relate to their reports of the use of avoidance strategies?
2. How does teachers' use of instructional discourse relate to students' perceptions of the classroom goal structure and to their reports of the use of avoidance strategies?

The main contribution of the present study is providing a qualitative examination of teachers' discourse practices to help explain why students use avoidance strategies. Another contribution is the

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specific focus on both instructional and affective–motivational dimensions of teacher discourse as they relate to student avoidance strategies.

Roots of Avoidance Behaviors

Covington (1992) asserted that the search for self-acceptance is the highest human priority and that "in schools self-acceptance comes to depend on one's ability to achieve competitively" (p. 74). For many students, "to be *able* is to be *worthy*, but to do poorly is evidence of inability and is reason to despair" (p. 78). To protect self-worth, students who are uncertain about their ability to achieve competitively may develop strategies that deflect attention from their ability.

There are several strategies available to students who seek to protect self-worth by deflecting attention from their ability. Covington called these strategies "ruses and artful dodges" that are used as ploys in "the struggle to escape being labeled as stupid" (1992, p. 85). They include avoiding seeking help, resisting novel approaches to academic work, and purposefully withdrawing effort (self-handicapping). For example, many students perceive a threat to self-worth from both teachers and classmates when contemplating seeking help (Butler & Neuman, 1995; Ryan & Pintrich, 1997). Butler (1998) found that 10–12-year-olds with concerns about their competency were the least likely to request help when it was needed. Similarly, some students may prefer to avoid novel ways of solving problems and doing their work, fearing that they may make mistakes and appear unable. Finally, working hard can put self-worth at risk because trying hard and failing to do as well as others is compelling evidence of low ability (Covington & Omelich, 1979). By not trying, the student is able to stave off the public judgment of low ability and the causes of failure become uncertain. These avoidance strategies may protect students from negative judgments by others, but they are also likely to undermine performance.

Given recent work by Dweck and her colleagues on the early development of motivational problems in some children (e.g., Burhans & Dweck, 1995; Cain & Dweck, 1995), avoidance behaviors may be demonstrated by young children as well. However, they may become more frequent in young adolescents because at this age children move from the conception of ability as modifiable with effort to an understanding of the notion of ability as fixed (Nicholls, 1984; Nicholls & Miller, 1984). Having developed the schema that can lead to the use of avoidance strategies, young adolescents may forego their efforts to succeed to protect their public image of competence. However, as Nicholls (1984) pointed out, the nature of the context may influence which notion of ability students will invoke. Thus aspects of the classroom context may be related to students' use of avoidance strategies.

Relation Between the Classroom Context and the Use of Avoidance Strategies

A main purpose of this study was to examine the relation between the classroom learning environment and students' reports of avoidance strategies by focusing on different, but complementary, aspects of this environment. First, the relation between students' perceptions of the goal structure in the classroom and their use of avoidance strategies is discussed. Second, instructional practices that provide insights into these students' perceptions of the goal structure and their use of avoidance strategies are examined.

Students' Perceptions of the Classroom Goal Structure and Avoidance Behaviors

Many messages about the purposes for achievement behaviors are communicated by teachers and perceived by students (e.g., Ames, 1992b; Maehr & Midgley, 1996; Midgley, 1993; Nolen, 1988). One message that may be communicated to students is that demonstrating ability and outperforming others are the reasons for engaging in academic behavior (i.e., a performance goal structure). Another message may be that understanding, intellectual development, and improvement are the reasons for engaging in academic behavior (i.e., a mastery goal structure). When the emphasis is on relative ability and competition, students may seek ways to demonstrate that they are more able than others or at least to demonstrate they are not less able than others. They may perceive that asking for help, trying hard, and approaching their work in novel ways is a threat to their self-worth and thus purposefully avoid the use of strategies that might enhance their understanding and achievement. When the emphasis is on learning, understanding, and intellectual development, students are less likely to feel threatened and may not perceive a need to use these avoidance strategies.

Both experimental and survey-based research has shown that students are less likely to seek help under performance goal conditions than under mastery goal conditions (Butler & Neuman, 1995; Ryan, Gheen, & Midgley, 1998). Studies examining predictors of students' use of self-handicapping mirror the results reported previously for avoiding help seeking (e.g., Midgley & Urdan, 2001). Perceptions of a mastery goal structure in the classroom negatively predicted handicapping, and perceptions of a performance goal structure positively predicted handicapping. It is important to replicate these findings with a new sample of students and extend the findings by adding a qualitative component.

Although few studies have examined students' preference to avoid novel approaches to academic work, Dweck and her colleagues (e.g., Farrell & Dweck, 1985) found that students with mastery goals worked much harder and scored significantly higher in solving novel problems than did students with performance goals. These measures of effort and achievement are different from expressing a preference to undertake or to avoid novel tasks. However, it provides a rationale for extending the research examining the relation between the classroom goal structure and avoidance strategies by considering whether the same pattern emerges for avoiding novel ways to approach academic tasks.

Students may perceive a high emphasis on both goals in the classroom, an emphasis on one goal more than another, or a low emphasis on both goals. The issue of "multiple goals" is one that has been addressed in studies of students' personal goal orientations but not in studies assessing students' perceptions of the goal structure in the classroom. In most studies examining students' personal goals, the most facilitative pattern has been high mastery/low performance (e.g., Meece & Holt, 1993; Pintrich & Garcia, 1991; Wolters, Yu, & Pintrich, 1996) and one expected to be associated with low avoidance. There is also some evidence that espousing both high-mastery and high-performance goals is facil-

itative (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Elliot & Church, 1997; Pintrich, 2000; Wentzel, 1991, 1993). A high emphasis on performance goals may not be associated with the use of avoidance strategies if mastery goals are also salient. In contrast, perceiving a high emphasis on performance goals and a low emphasis on mastery goals in the classroom may be associated with the highest incidence of avoidance strategies. This question is important not only in terms of specific recommendations to teachers but also should provide insights into the current controversy regarding the facilitative nature of performance goals (e.g., Harackiewicz, Barron, & Elliot, 1998; Midgley, Kaplan, & Middleton, 2001).

Relation Between Instructional Practices and the Classroom Goal Structure

Although the relation between students' perceptions of the classroom goal structure and avoidance behaviors has been investigated, there has been little research about how instructional practices influence classroom goal structures. Ames (1992a, 1992b) has focused our attention on the relation among instructional practices in the classroom, the classroom goal structure, and students' beliefs and behaviors. Through their instructional practices, teachers send messages to students about the reasons for engaging in achievement behaviors. Ames argued that the goal structure is conveyed by a constellation of instructional strategies that are conceptually related, rather than by a particular instructional method. One of the most obvious needs is to describe actual (not hypothetical) instructional practices in real classrooms with all their complexity.

Very few researchers have used classroom observations to provide insights into the instructional practices that are associated with students' perceptions of the saliency of different achievement goals. Meece (1991) aggregated fifth- and sixth-grade students' survey reports of their personal achievement goals. She then used observational data to describe the differences between high- and low-mastery classrooms. Instructional practices that characterized high-, but not low-, mastery-focused classrooms were as follows: emphasizing the meaningfulness of learning, adapting instruction to students' developmental levels, providing teacher support for instructional activities, deemphasizing ability-related information, and emphasizing intrinsic reasons for learning. Patrick and her colleagues (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001) observed instruction in four fifth-grade classrooms that differed in students' perceptions of the emphasis on mastery and performance goals based on survey responses (e.g., high mastery/high performance, high mastery/low performance, low mastery/high performance, and low mastery/low performance). Two features distinguished classrooms with a high-mastery focus. First, teachers in high-mastery-oriented classrooms spoke about learning as an active process, whereas those in low-mastery-oriented classrooms endorsed a transmission model of learning. Second, the teachers in high-mastery-oriented classrooms expressed strong positive affect about learning and positive expectations for their students, whereas those in low-mastery-oriented classrooms expressed little enthusiasm about learning and did not convey high expectations for all. This second finding is interesting because it suggests that affect is a potentially important component of mastery goal structures. Yet it has received little attention. Finally, classrooms with a strong performance focus were characterized by the frequent mention of grades and evaluation.

Relation Between Teacher Discourse and Students' Use of Avoidance Strategies

There has been no research, to our knowledge, on the relation between the instructional practices teachers actually use in classrooms and students' use of avoidance strategies. What do teachers say during instruction and how does this relate to students' use of avoidance strategies? Are all practices equal or do some practices, or some combination of practices, appear to have a powerful relation to avoidance? Discourse analysis assumes that what teachers say sends powerful messages about what counts as learning in their classrooms, thus creating different instructional environments.

Classroom Discourse

The teacher's role in classroom discourse may signal to students whether teachers think that they are capable of learning and whether they are succeeding in meeting the teacher's expectations. If students perceive teachers as supporting their learning through what they say, the students may be less likely to adopt defensive measures such as avoidance strategies. Conversely, if students perceive teacher discourse as nonsupportive—as suggesting that they cannot or will not meet such expectations—they may then adopt avoidance strategies. The research literature has suggested certain classroom discourse practices as supportive (e.g., "scaffolded discourse"; Hogan & Pressley, 1997; Turner et al., 1998) or nonsupportive of learning (e.g., Mehan, 1985). In this study, teacher discourse was examined as it related to (a) instruction, (b) motivation, and (c) organizing classroom time and activities.

Supportive and Nonsupportive Forms of Instructional Discourse

Scaffolded instructional discourse provides for negotiation of meaning and transfer of responsibility (Gallimore & Tharp, 1990; Hogan & Pressley, 1997; Meyer, 1993) for learning to students. Negotiation is reflected both in teachers' attempts to build understanding with their students and to help them attain higher levels of competence. As students demonstrate increasing competencies, teachers withdraw assistance and they transfer responsibility for learning to the student. Transfer of responsibility increases student ownership while it holds students accountable for their learning. Negotiation, or building understanding, is a necessary prerequisite to transfer of responsibility. Supportive discourse patterns that reflect scaffolding—with their emphasis on learning, improvement, and understanding—are expected to contribute to the perception of a mastery-focused goal structure and to lower reports of avoidance strategies. When teachers send messages that they will help students learn and students are able to assume responsibility for their increased competence, then students should not fear appearing unable.

In contrast, nonscaffolded forms of instructional discourse are less oriented to assisting learning and are more focused on directing and assessing. For example, in the Initiation–Response–Evaluation cycle (I–R–E; Mehan, 1985), the teacher addresses

questions to the class, receives an answer from a volunteer, and then evaluates the answer. Alternatively, "telling" students what to think or do limits opportunity for student learning and autonomy while establishing the teacher as authority (Deci & Ryan, 1985). Such forms of instructional discourse usually do not offer "sufficient assistance, responsiveness, joint productive activity, or the building of common meanings and values" to support student learning (Gallimore & Tharp, 1990, p. 188). An over use of nonscaffolded, or controlling, instructional discourse patterns would be expected to contribute to the students' perceptions of the classroom goal structure as performance focused because they are characterized by language that is more evaluative. Similarly, because such nonscaffolded instructional patterns may not provide adequate support for learning, they might cause students to worry about appearing unable and thus to adopt avoidance strategies.

Supportive and Nonsupportive Forms of Motivational Discourse

Supportive instructional discourse, directed to the cognitive functions of teaching, may not be sufficient for students to feel confident about learning. Students may also need motivational and affective support through interaction with their teachers and peers. Recently, Goldstein (1999) reemphasized the motivational aspects of scaffolding (see also Wood, Bruner, & Ross, 1976). Goldstein asserted that when a teacher is pleasant and responsive, it builds trust and maximizes students' engagement and willingness to take on challenging tasks. Similarly, Brophy (1999) suggested that teachers can scaffold motivation to create an optimal match in the "motivational zone of proximal development." This motivational component would include such discourse practices as recruiting the students' interest, maintaining students' persistence, minimizing frustration and risk, or enhancing students' confidence (Lepper, Drake, & O'Donnell-Johnson, 1997). Facets such as these should engage students and encourage effort and persistence, thus making it less likely that students would worry about appearing unable.

Teacher discourse also may include nonsupportive motivational statements such as emphasizing grades over learning or correctness over understanding, making negative remarks or using sarcasm, or portraying errors as signs of incompetence (e.g., Ames, 1992a). Practices such as these would be more likely to highlight students' ability in a negative way and might encourage students to adopt strategies to protect their self-worth.

Supportive and Nonsupportive Forms of Organizational Discourse

Intertwined with goals for learning and motivational supports, effective classroom teachers use supportive organizational discourse so that the classroom can function smoothly and learning can take place (e.g., Evertson, Emmer, Clements, Sanford, & Worsham, 1989). Such organizational decisions, which are reflected in teacher discourse patterns, give predictability to the instructional lesson and may help students feel confident and successful in their class. Nonsupportive organizational discourse may communicate to students that the teacher is not in control of the learning environment or that she or he is unpredictable, thus causing some apprehension. Predictions about the relation of organizational discourse to the use of avoidance strategies were not made, but it is acknowledged that organization is an important function of teacher discourse. In summary, it is assumed that it is not only individual responses to students (e.g., a student who is having trouble learning) but also whether students perceive general patterns of discourse as supportive or nonsupportive that may encourage or discourage avoidance strategies.

Hypotheses

First, the relation between students' perceptions of the goal structure in the classroom and their use of and preference for avoidance strategies in a new sample of sixth-grade elementary school students is examined. Self-handicapping, the avoidance of help seeking, and a preference to avoid novelty are predicted to vary between classrooms. It is also predicted that perceptions of an emphasis on mastery goals in the classroom are negatively related to the use of avoidance strategies, whereas perceptions of an emphasis on performance goals in the classroom are positively related to the use of avoidance strategies. Then the relationship between teacher discourse and students' reports of avoidance strategies and the classroom goal structure is examined. It is expected that supportive instructional and motivational discourse will be associated with lower reports of avoidance strategies and with perceptions of a mastery goal structure. It is also expected that nonsupportive instructional and motivational discourse will be associated with higher reports of avoidance strategies and with perceptions of a performance goal structure.

Method

Participants

This study is a part of a larger longitudinal study focusing on the relation between the learning environment in mathematics classrooms and students' beliefs and behaviors during the transition from elementary to middle school. Participants in this study included 1,197 sixth-grade elementary school students and 65 sixth-grade classrooms in four ethnically and economically diverse school districts in three Midwestern states. Students were required to have parental permission to participate and 89% received permission. Only Euro-American and African American students were retained for the analysis of the survey data, and students who were Hispanic (4%), Asian (1%), and Other or Unknown (3.5%) were dropped. Five additional students were dropped because of missing data. Thus the present study includes 1,092 students (52% female, 70% Euro-American, and 30% African American). In most cases teachers taught math and the other core subjects to these students in self-contained classrooms.

In one district, researchers met with teachers in all 20 participating classrooms to ask if they would be willing to have observers in their classes in addition to participating in the survey component of the study. One teacher declined observations. The observed classrooms were then chosen randomly from the 2 or 3 participating classrooms in each school, resulting in 10 sixth-grade classrooms from 9 schools. One teacher withdrew from the study before all the data were collected. The 9 observed teachers ranged in experience from 1 to 30 years with a mean of 16. Two of the teachers were male and 3 were African American. The rest were Euro-American.

Procedures

Surveys

Students completed surveys in their classrooms in the late winter and spring of 1998–1999. Trained research assistants read the questions aloud.

Students were told that this was not a test and that only research staff would see their answers. The research staff solicited questions and put a sample item on the blackboard to illustrate the use of Likert-type scales. Research assistants arranged make-up times for absentees.

Survey Measures

The present study included five scales from the student survey. Ryan (Ryan et al., 1998; Ryan & Pintrich, 1997) developed the scale assessing the avoidance of help seeking. All the other scales were taken from the Patterns of Adaptive Learning Survey (Midgley et al., 2000) and have proven to be reliable and valid in a number of studies with young adolescents. Students responded to the items on a scale of 1 (*not at all true*) to 5 (*very true*).

Two scales from the student survey assessed students' reports of the use of avoidance strategies in the classroom, including self-handicapping and the avoidance of help seeking, and one scale assessed students' preference to avoid novel approaches to doing academic work. The items in these three scales formed three distinct factors. Two scales from the student survey assessed students' perceptions of the mastery and performance goal structure in their sixth-grade classrooms. Factor analysis confirmed that these were distinct scales. Scales, items, and alpha coefficients are included in the Appendix. In addition, information about student gender, ethnicity, and math standardized achievement scores and final grade in math in the sixth grade was collected from school records. Math grades were coded on a scale of 1 to 13 (13 = A+, 12 = A, 11 = A−, and so on).

Discourse Collection

Mathematics instruction was observed and audiotaped during the same two units of instruction in each of the nine classrooms. Classroom visits lasted for 5 days during a unit on factoring (e.g., least common multiple, greatest common factor, factor trees, etc.) in the fall of 1998 and for 5 days in the spring of 1999 for a unit on geometry (e.g., identifying and measuring angles, turns, etc.). Because of tape recorder malfunctions, three classrooms did not have a complete set of transcripts (10 lessons) available for analysis, but all classrooms had at least seven transcripts. All participating classrooms were using the Connected Mathematics curriculum (Lappan, Fey, Fitzgerald, Friel, & Phillips, 1998).

Nine classroom observers were trained to take observation notes to supplement audiotaped discourse. The notes provided context for the recordings so that the intent or consequences of a teacher statement or action could be discerned (e.g., when one teacher said "I'll wait" that was a cue for student attention; observers noted "children laughed" or "teacher put a silly expression on her face"). Observers received 10 hr of training, including comparing notes, to ensure a similar level of detail and focus. At least two observers were assigned to a classroom in order to avoid bias; however, only one observer was in a classroom at one time. Classroom observers sat in the back of the classroom during instruction. The observers integrated field notes with transcriptions of the audiotaped lessons into a document describing the entire lesson. Transcripts were typed using modified standard transcription symbols (adapted from Psathas, 1995) to ensure comparability. Within transcripts, teacher discourse was labeled as *whole class*, *small group*, or *individual instruction*. In the present study only discourse from whole-class instruction was analyzed. Because whole-class discourse simultaneously provides public messages about learning, performance, and expectations to all students, it was thought to be related most directly to students' reports of goal structures and avoidance strategies.

Discourse Coding of the Observations

Discourse Codes

A priori coding categories for teacher discourse were used to code the transcripts into three broad categories: instructional, organizational, and motivational discourse (see Table 1). Two coding subcategories, supportive and nonsupportive, were developed within each of these categories to capture the majority of teacher discourse during an instructional period. The two instructional discourse categories included scaffolding for understanding (supportive) and nonscaffolding (nonsupportive). Scaffolding for understanding was coded when teachers helped students build understanding (i.e., negotiation) and when teachers promoted student autonomy and held them accountable for their learning (i.e., transfer of responsibility). Nonscaffolding was coded when teachers asked questions with known answers (i.e., I–R–E sequences) or told students what to do and how to do it, supporting low-level understanding or compliance. The two organizational discourse categories included support for on-task behavior (e.g., teachers gave directions that helped maintain pacing and momentum, organized groups, or made smooth transitions between activities) and nonsupport (e.g., teachers interrupted learning because of off-task behaviors or made an abrupt transition to a different task). Similarly, the two motivational discourse categories included support (e.g., focus on learning, positive emotions, and peer support for collaboration) and nonsupport (e.g., focus on errorless learning, impersonal or negative affect, and individual success and failure). The forms of motivational support could appear independent of, or could cooccur with, instructional and organizational discourse. Therefore, any instructional or organizational response could be coded simultaneously as motivationally supportive or nonsupportive.

Coding Procedures

Using this coding system, Julianne C. Turner and Debra K. Meyer, who also had served as two of the nine observers, independently analyzed transcripts. Coders placed the transcripts in a database, read them, and marked the instructional, organizational, and motivational codes in a column to the right of the teacher discourse being classified. If any code cooccurred with an instructional, organizational, or motivational code, then it was identified in a second column. If a teacher response could not be coded (e.g., an ambiguous statement, a remark to another adult in the room, etc.), then *no code* was used. No code was used for 3% to 8% of teacher discourse, with a mean of 4.5% for the nine classrooms. A coded teacher response could range from a single word to the entire speaking turn. A coded response indicated that the categorization continued until the teacher's response ended or a different code was used.

Transcript coding was completed in three parts to establish validity of codes and reliability between coders. First, one fall transcript from each classroom was coded independently and then codes were compared to reach consensus on the use of discourse categories. This process allowed for the coding categories to be further refined and for coders to discuss ambiguity or disagreement. Then the coders established formal interrater reliability on the major subcategories of instructional (supportive and nonsupportive) and organizational codes. Interrater reliability included instances in which one coder changed codes, but the other coder did not. One fall and one spring transcript for each classroom were chosen randomly to compute interrater agreement to determine whether the instructional discourse categories were distinct from each other and organizational discourse. A Cohen's kappa of .60 or higher was considered to be a good measure of interrater reliability and these kappas corresponded to the preset goal of establishing approximately 80% or better agreement on each transcript. The average kappa across all discourse categories for the nine classrooms ranged from .67 to .75, representing a range of agreement from 78% to 84%. Once interrater agreement was established for a classroom, the remaining transcripts were coded independently by the two coders.

The third part of coding involved the newly developed categories for motivational support and nonsupport, which were central to the research questions. For this coding category, all the transcripts were reread jointly by the coders, and disagreements or coding errors were identified and resolved through consensus. Therefore, all transcripts were analyzed by both coders at least once and by one coder twice. Discourse analyses were completed prior to the analysis of the survey data to avoid bias.

Table 1
Discourse Codes

Code	Description	Example
	Supportive instructional discourse (scaffolding)	
Negotiating meaning	Adjusting instruction, simplifying, clarifying, or elaborating; highlighting concepts or key features or contrasts; modeling what students should do—"thinking aloud" with students.	"These—these numbers: $2 \times 5 \times 3$. Or $3 \times 5 \times 2$, $2 \times 3 \times 5$, $2 \times 5 \times 3$ [pointing to the numbers on the board as he says them aloud]—they're all the same numbers! You're using the same combination; you're just doing it in different orders. But you're still going to get 30, right?"
Transferring responsibility	Supporting strategic thinking and autonomous learning; holding students accountable for understanding.	"I am only talking about greatest common factors. She said that $2 \times 2 \times 3$ are the greatest common factors of 24 and 60. Alex, do you agree with that? Why do you agree with that? Why do you agree that these are the common factors of these two numbers?"
	Nonsupportive instructional discourse (nonscaffolding)	
Telling	Prescribing how students should think and act conceptually or emphasizing completion and accuracy over learning.	"That's what [the book] says right there, right? It says, 'You use a shortcut to write $2 \times 2 \times 5 \times 5$.'"
Initiating and evaluating (I–R–E sequence)	Asking a known-answer question or evaluating a student response without demonstrating understanding.	[Teacher question and answer regarding answers to math problems.] "You had to find the greatest common factor and least common multiple for each pair of numbers. What is the greatest common factor for the two numbers? The greatest common factor?"
	Organizational discourse	
Supportive	Making transitions into and out of activities and giving directions or answering questions about procedures.	[Teacher instructions to try the next problem.] "Okay, now multiply these numbers together and see what the least common multiple is between these two numbers. Multiply it together." [Teacher question regarding a student's writing on the overhead.] "Can you guys see that writing? Can you see?"
Nonsupportive	Commenting on student off-task or inappropriate behavior that detracts from learning or interrupting learning (abrupt transitions).	[Teacher instructions during student demonstration.] "Everybody should be paying attention. I don't want to see any pencils going! I don't want to see any chalk or anything! *All* eyes. Marco [snaps her fingers], turn around and face the front."
	Motivational discourse (supportive)	
Focus on learning	Focusing on the process of learning, challenging students, viewing errors as constructive, or supporting persistence.	April: (I don't understand this.) Teacher: You know what? That's why we're going to keep working on it today and tomorrow. You'll get it. Okay? We're just now starting it, April, so I don't expect you to fully understand it right away.
Positive emotions	Using enthusiasm or humor, or reducing anxiety; addressing emotional needs.	A student gives an incorrect answer and teacher responds, "Okay, he's probably just checking to see if I was awake."
Peer support and collaboration	Building collaboration, emphasizing joint goals—shared responsibilities.	"Marco, he's your partner, so come up with him."
	Motivational discourse (nonsupportive)	
Focus on errorless performance and completion	Emphasizing goals for completion, perfection, or high scores; or labeling an activity as too difficult for the students; or viewing errors as detrimental to learning.	"How you can tell, from the prime factorization of the number, whether the least common multiple of two numbers is the product of two numbers—oh, forget this one." [The teacher is overcome with the complexity and trying to explain it to the class. She looks at the observer and says, "Can you believe this?"]
Impersonal, insignificant, or negative affect	Using superficial, positive statements that deemphasize authentic accomplishments; or using threats, sarcasm.	"Remember yesterday when we took 100? And we showed all the different factor pairs that would make 100? How many recall that? Half of the (class) recalls that, the other half of the class is brain dead."
Individual success and failure	Emphasizing competition among students that "excludes" or socially compares students.	"Oh, how many got a hundred on the (test)? How many got a hundred on the (test)? Shannon and Ciara got a hundred on the (test)."

Results

The results have been organized to move from general findings to specific ones. First, the results of the analysis of the student survey data for the whole sample are presented. Second, the results of the analysis of the student survey data and the teacher discourse data for the nine classrooms that were observed are presented. Third are presented detailed analyses of the discourse in four classrooms that differed from each other in terms of students' perceptions of the goal structure and students' use of avoidance strategies.

Results From Analyses of the Student Data for the Sample as a Whole

Table 2 includes descriptive statistics for all variables and correlations among variables. Variables assessing student perceptions of the classroom goal structure were aggregated to the classroom level. Hierarchical linear modeling (HLM) was used to examine students nested in classrooms. HLM divides the total variation in each student behavior into a within-classroom component and a between-classroom component. Student-level and classroom-level parameters are estimated simultaneously. In the first step of the analysis, it was determined whether students' reports of handicapping, avoiding help seeking, and avoiding novelty varied between classrooms. That is, did students in some classrooms report using avoidance strategies more than students in other classrooms? A fully unconditional HLM analysis, analogous to an analysis of variance (ANOVA) with the classrooms acting as the grouping variable, was run for each avoidance strategy. The between-class chi-square variance estimates from these models indicated that the variance in avoidance strategies differed significantly between classrooms: self-handicapping, $\chi^2(64, N = 65) = 155.13$, $p < .001$; avoiding help seeking, $\chi^2(64, N = 65) = 101.03$, $p < .01$; avoiding novelty, $\chi^2(64, N = 65) = 112.91$, $p < .001$. Next, the intraclass correlation (ICC) for each variable was calculated and adjusted for the reliability of the variance estimate (λ) to determine the proportion of variance in each outcome that lay between classrooms. Results indicated the ICCs to be 13% for self-handicapping, 9% for avoiding help seeking, and 10% for avoiding novelty. The percentages of between-classroom variance in our outcomes are similar to those reported in other published HLM studies on similar topics (e.g., Anderman et al., 2000; Anderman & Young, 1994).

The same procedures were followed to determine the degree to which individual students' perceptions of their classroom goal structures were consistent within each classroom and were different between classrooms. Estimates of adjusted ICCs indicated that approximately 25% of the variance in students' perceptions of the classroom mastery goal structure and 35% of the variance in students' perceptions of the classroom performance goal structure lay between classrooms. Individual student perceptions were aggregated to the group level to measure goal structures from the perspective of the students in the classrooms.

In the second step, the HLM analyses were extended. The goal was to determine whether classroom characteristics (aggregated student reports of the goal structures) could explain variation in the average level of avoidance strategies between classrooms after controlling for student background characteristics (gender and ethnicity). The relationship of avoidance strategies with students' math grades, relative to other students in their own classrooms, was also taken into account. Teachers in each classroom may use different grading standards for assigning grades, and students are more likely to compare their own achievement with students within their own classes rather than across other classrooms. Thus, student math grades were centered at the group mean (i.e., within classrooms) to provide a within-classroom estimate of the relationship of grades to avoidance outcomes. Aggregated perceptions of mastery and performance goal structures were centered at the grand mean of classrooms. Gender and ethnicity were dummy variables and were not centered. Parameter estimates represent slopes in the original metric.

Results of the final models of aggregated student reports of the mastery and performance goal structures are presented in Table 3, Table 4, and Table 5. The intercept coefficient represents the estimated level of the avoidance outcome for male, Euro-American students (gender and ethnicity = 0), with an average math grade among their own classmates (group-centered grades = 0), in classrooms with an average level of perceived mastery and performance goal emphases (grand-mean centered goal structures = 0). Coefficients of class-level predictors of the intercept represent

Table 2
Descriptives and Bivariate Correlations

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
Student-level variables (n = 1,092)										
1. Self-handicapping	1.90	0.85	—							
2. Avoiding help seeking	2.13	0.91	0.49***	—						
3. Avoiding novelty	2.99	1.10	0.35***	0.50***	—					
4. Gender (1 = female)	0.52	—	−0.04	−0.01	0.08**	—				
5. Ethnicity (1 = African American)	0.30	—	0.12***	0.08*	0.02	0.06*	—			
6. Math grades	7.52	2.90	−0.27***	−0.33***	−0.19***	0.11***	−0.18***	—		
Classroom-level variables: Aggregated student perceptions (n = 65)										
7. Mastery goal structure	3.79	0.42							—	
8. Performance goal structure	2.92	0.71							−0.40**	—

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

Table 3
Goal Structures as Predictors of Self-Handicapping

Predictor	Estimation of intercept and slopes: Coefficient	*SE*	*t*
Intercept	1.89	0.05	41.14***
Class-level predictors of intercept			
Mastery goal structure: Aggregated student perceptions	−0.28	0.09	−2.95**
Performance goal structure: Aggregated student perceptions	0.01	0.06	0.13
Student-level controls			
Gender (fixed between-class variance)	−0.03	0.05	−0.63
Ethnicity (fixed between-class variance)	0.12	0.06	2.02*
Math grades (free between-class variance)	−0.09	0.01	−6.95***
Class-level predictors of variation in math grades slope			
Mastery goal structure: Aggregated student perceptions	−0.01	0.03	−0.39
Performance goal structure: Aggregated student perceptions	−0.02	0.02	−1.26

	Estimation of between-class variance: *df*	χ^2
Intercept	62	145.94***
Math grades slope	62	122.67***

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

the unit change in students' avoidance associated with a one-unit change in the classroom goal structure. Coefficients for the effects of student-level controls represent the unit change in the avoidance outcome associated with a one-unit change in the student characteristic. In preliminary analyses, the relationship between self-handicapping and math grades and between self-handicapping and ethnicity varied significantly between classrooms. In other words, in some classrooms the effect of grades or ethnicity on self-handicapping was significantly steeper (or shallower) than in other classrooms. Preliminary analyses also revealed that the relationship between avoiding help seeking and math grades varied between classrooms. In these cases, the between-class slope variance

Table 4
Goal Structures as Predictors of Avoiding Help Seeking

Predictor	Estimation of intercept and slopes: Coefficient	*SE*	*t*
Intercept	2.09	0.04	47.79***
Class-level predictors of intercept			
Mastery goal structure: Aggregated student perceptions	−0.29	0.10	−3.05**
Performance goal structure: Aggregated student perceptions	−0.03	0.06	−0.57
Student-level controls			
Gender (fixed between-class variance)	0.06	0.05	1.14
Ethnicity (free between-class variance)	0.02	0.07	0.34
Class-level predictors of variation in ethnicity slope			
Mastery goal structure: Aggregated student perceptions	0.28	0.17	1.61
Performance goal structure: Aggregated student perceptions	0.02	0.10	0.15
Math grades (free between-class variance)	−0.12	0.01	−10.05***
Class-level predictors of variation in math grades slope			
Mastery goal structure: Aggregated student perceptions	0.05	0.03	1.46
Performance goal structure: Aggregated student perceptions	0.02	0.02	1.02

	Estimation of between-class variance: *df*	χ^2
Intercept	52	69.92*
Ethnicity slope	52	70.56*
Math grades slope	52	91.94***

Note. The chi-square statistics are based on 55 of 65 classrooms that had sufficient data for computation.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5
Goal Structures as Predictors of Avoiding Novelty

Predictor	Estimation of intercept and slopes		
	Coefficient	*SE*	*t*
Intercept	2.87	0.06	49.95***
Class-level predictors of intercept			
Mastery goal structure: Aggregated student perceptions	−0.19	0.12	−1.70†
Performance goal structure: Aggregated student perceptions	0.09	0.07	1.32
Student-level controls			
Gender (fixed between-class variance)	0.25	0.06	3.84***
Ethnicity (fixed between-class variance)	−0.04	0.08	−0.48
Math grades (fixed between-class variance)	−0.09	0.01	−6.80***
	Estimation of between-class variance		
	df		χ^2
Intercept	62		110.98***

† $p < .10$ (marginally significant). *** $p < .001$.

of the student level predictor was set "free," and whether the classroom goal structures helped explain this variation in slopes was examined. Therefore, coefficients of class-level predictors of student-level slopes represent the effect that a one-unit change in classroom goals has on the relationship between a freely varying student-level predictor and the avoidance outcome. Chi-square estimates of between-class variance indicate whether the level of the avoidance outcome (and any free varying student-level slopes) still differ significantly between classrooms.

To investigate the possibility of interaction effects of perceived classroom performance and mastery goals on student avoidance, an interaction term for perceived performance and mastery emphases as a class-level predictor of the intercept was included. To create this interaction term, perceptions of classroom mastery and performance goals were first aggregated and then centered at the grand mean of classrooms, and their product was calculated. The classroom mastery and performance goal interaction term was not a significant predictor for any of the avoidance outcomes. To confirm these results, the analysis was replicated at the student level with ordinary least squares regression analysis, using ungrouped data and unaggregated perceptions. Again, interaction effects of perceived mastery and performance goals were not significant for any of the avoidance outcomes. Thus, the final HLM models do not contain classroom mastery and performance goal interaction terms.

Comparing between-class variance estimates from the fully unconditional models and the final HLM models revealed that the final models explained 23% of the between-class variance in self-handicapping, 20% of the between-class variance in avoiding seeking help, and 9% of the between-class variance in avoiding novelty. The significant chi-square estimates of between-class variance in all models indicated that a significant proportion of variance between classrooms in avoidance remained unexplained. To test the fit of the models, procedures suggested by Snijders and Bosker (1999) were followed. Specifically, the deviance statistics from the fully unconditional models and the full models were compared using a chi-square distribution, with the differences in the number of parameters used for degrees of freedom. Results of the deviance tested indicated that the full models provided an improved fit of the data for all of the outcomes. The model fit significantly improved for self-handicapping, $\chi^2(9) = 121.33$, $p < .01$, avoidance of help seeking, $\chi^2(14) = 144.64$, $p < .01$, and avoidance of novelty, $\chi^2(5) = 62.46$, $p < .01$.

The goal of this study was to examine classroom characteristics and student avoidance strategies, and thus the issue of variance between classrooms is important. Although estimates suggest that the total explained variance between classrooms in avoidance behaviors is small, it is important to note that HLM provides rather conservative estimates of between-level relationships. This study is about the classroom environment and avoidance strategies. Consequently, although large portions of variance were not accounted for, the HLM analyses are still highly appropriate, given that the goal of this article was to examine classroom level effects on individual students' reported use of avoidance strategies. The fact that our models explained 23%, 20%, and 9% of the between-classroom variances is important and supports the goals and research questions posed in this study. Most striking is the finding that students' aggregated perceptions of a classroom emphasis on mastery goals emerged as a significant negative predictor of all three avoidance strategies, above and beyond students' gender, ethnicity, and grades. Thus, in classrooms in which students perceived that there was a greater emphasis on learning, improving, and understanding, there were also lower levels of reported self-handicapping, avoiding help seeking, and preference for avoiding novelty. Students' aggregated perceptions of the performance goal structure in the classroom did not emerge as a significant predictor of these outcomes. This nonsignificant relationship held even when performance goals were considered as the sole classroom-level predictor, without mastery goal structure in the model.

Results From Analyses of the Nine Observed Classrooms

Student Survey Data

Separate analyses were performed to establish the generalizability of the HLM results found in the full sample to the subset of nine observed classrooms. A one-way ANOVA using students' perceptions of the mastery goal structure as the dependent variable demonstrated that there were significant differences among the nine classrooms, $F(8, 156) = 10.99$, $p < .001$. This construct was selected because it emerged as a classroom-level predictor of avoidance strategies in the HLM analysis. A multivariate analysis of variance using self-handicapping, avoiding help seeking, and avoiding novelty as dependent variables revealed significant differences among the 9 observed teachers, $F(24, 447) = 2.16$; $p = .00$. Means and standard deviations for the student survey variables for all nine classrooms are provided in Table 6 to illustrate how the four classrooms selected for further analysis compared with the other classrooms in the study.

Table 6
Means (and Standard Deviations) for Survey Variables in Observed Classrooms

Classroom[a]	Mastery goal structure	Performance goal structure	Self-handicapping	Avoiding help seeking	Avoiding novelty
Anderson ($n = 14$)					
M	2.96	3.20	2.83	2.56	3.59
SD	1.19	1.28	0.85	0.97	1.09
Christian ($n = 16$)					
M	3.99	3.60	2.15	2.19	3.01
SD	0.72	1.05	0.75	0.92	1.23
Davis ($n = 23$)					
M	4.38	1.91	1.75	2.19	2.83
SD	0.45	0.90	0.75	0.91	1.02
Guthrie ($n = 21$)					
M	3.95	2.93	1.63	2.08	2.77
SD	0.83	0.96	0.79	1.13	1.00
Hayes ($n = 10$)					
M	3.98	1.66	2.25	2.08	2.92
SD	0.64	0.53	1.30	0.85	0.90
Marks ($n = 26$)					
M	3.48	3.82	1.69	2.04	2.80
SD	0.79	0.96	0.76	0.72	0.91
Parsons ($n = 16$)					
M	3.02	3.02	2.63	2.86	3.84
SD	0.95	0.95	0.91	0.97	1.20
Robinson ($n = 18$)					
M	4.79	3.94	1.39	1.71	2.97
SD	0.32	0.57	0.54	0.69	1.10
Weber ($n = 21$)					
M	3.78	4.28	2.15	2.14	2.63
SD	0.63	0.62	1.04	0.59	0.93

[a] All teacher names are pseudonyms.

Discourse Data

Table 7 shows discourse percentages across all coding categories for each of the 9 observed teachers. These percentages represent the within-teacher proportions for each category during whole-class instruction. In the motivational discourse column, the percentages represent all discourse classified as supportive or nonsupportive, whether occurring independently of, or in conjunction with, an instructional or organizational code. The percentages in parentheses represent the independent motivational codes.

As Table 7 illustrates, the majority of whole-class teacher discourse, 52% to 68%, fell within the instructional discourse categories, although patterns of discourse varied. Teachers were similar in their proportions of negotiating meaning, but they varied considerably in transferring responsibility to the student and in their use of nonscaffolded discourse (e.g., "What is 24 divided by 3?"). Even though mathematics instructional discourse has been criticized as mostly "right answer" teacher talk (Lampert, 1990), only 2 of the 9 teachers had high percentages of nonscaffolded discourse. Not surprisingly, 20% to 30% of teacher discourse was organizational in nature and did not differ much among teachers. This teacher discourse was generally positive and supported student learning. Teacher organizational discourse that was classified as nonsupportive varied more, ranging from 1% to 14%. Table 7 also demonstrates that the proportions of teacher discourse in the motivational category varied considerably across classrooms. Within the category of supportive motivational discourse, teachers made more statements that were independent of instructional and organizational moves than in conjunction with them. The frequency of supportive motivational statements distinguished classrooms more than the nonsupportive statements.

Given the complex qualitative patterns of teacher discourse, they were triangulated with the student self-reports of goal structures and avoidance strategies to answer the question: How is teacher discourse related to students' perceptions of the classroom goal structure and use of avoidance strategies?

Differing Patterns in Four Classrooms: High- and Low-Avoidance Teachers

Student Survey Data

A series of planned comparisons were undertaken to compare students' perceptions of the mastery goal structure in the nine observed classrooms as well as reports of avoidance strategies across those classrooms. Family-wise alpha levels were controlled at .05 with the use of a Bonferroni adjustment. The analysis indicated that students in classrooms taught by Mr. Parsons and Ms. Anderson[1] perceived a significantly lower emphasis on mastery goals than those in most other classrooms. Mr. Parsons differed from all teachers except Ms. Anderson and one other; Ms. Anderson differed from all teachers except Mr. Parsons. Students in classrooms taught by Ms. Davis and Ms. Robinson perceived a

[1] All teacher names are pseudonyms.

Table 7
Percentages for Discourse Categories Across All Lessons in All Observed Classrooms

Classroom[a]	Instructional discourse			Organizational discourse		Motivational discourse[b]	
	Negotiation	Transfer of responsibility	Nonscaffolding	Supportive	Nonsupportive	Supportive	Nonsupportive
Anderson	26	24	13	21	9	8 (6)	1 (0)
Christian	36	8	18	20	6	11 (8)	5 (4)
Davis	24	13	19	27	2	20 (14)	1 (1)
Guthrie	30	9	18	26	1	18 (14)	2 (1)
Hayes	23	5	24	27	14	10 (7)	2 (1)
Marks	19	10	32	23	10	7 (5)	2 (1)
Parsons	26	8	33	20	3	6 (5)	4 (2)
Robinson	28	19	9	24	4	23 (14)	1 (1)
Weber	31	13	24	20	4	7 (4)	5 (4)

[a] All teacher names are pseudonyms. [b] Includes teacher responses made in conjunction with instructional or organizational discourse of support or independently. Percentage of independent motivational responses are in parentheses.

significantly higher emphasis on mastery goals than most other classrooms. Students in classrooms taught by Ms. Davis perceived a significantly higher emphasis on mastery goals when compared with students in classrooms taught by Mr. Parsons and Ms. Anderson as well as by 2 other teachers. Students in Ms. Robinson's room differed significantly from all other classrooms except Ms. Davis's classroom. Students in classrooms taught by Mr. Parsons and Ms. Anderson reported significantly higher uses of avoidance strategies than did students in classrooms taught by Ms. Davis or Ms. Robinson.[2]

Discourse Data

Table 8 presents teacher discourse patterns for the high-avoidance/low-mastery classrooms (Parsons and Anderson) and the low-avoidance/high-mastery classrooms (Davis and Robinson). The *z* scores represent the comparison across all 9 teachers in the study. To more easily compare across the four classrooms that differed on student avoidance strategy reports, the percentages and *z* scores[3] for each category of discourse codes are presented. These standard scores appear below each percentage in Table 8.

Patterns of Teacher Discourse in Four Classrooms

In each of the four classrooms, distinct discourse patterns characterized mathematics instruction. In this section the four separate patterns are described. In the next section, patterns of supportive and nonsupportive cognitive and motivational patterns and their relation to students' avoidance behaviors are compared.

Ms. Robinson. Ms. Robinson demonstrated a unique pattern of instructional and motivational discourse in her low-avoidance/high-mastery classroom. Most of her instructional discourse was directed to understanding procedures and concepts rather than asking students to provide "correct" answers. She accomplished this through negotiation of understanding and transferring responsibility to students when they had demonstrated mastery. Almost half of her total classroom discourse was devoted to these forms of instructional scaffolding (negotiation, 28%; transfer of responsibility, 19%). In addition, 23% of her discourse consisted of motivational support. She emphasized that all students could learn and that she expected that of every student. These frequent motivational messages were hallmarks of her instructional discourse, which was highly "motivational" in comparison with the other 8 teachers. Within Ms. Robinson's discourse pattern were frequent intrinsic messages about learning, instances of humor, support for students' efforts and anxieties, and encouragement of their peer collaborations. Thus, a pattern of accountability coupled with very strong emphasis on learning, understanding, and motivational support characterized the discourse in Ms. Robinson's classroom.

Ms. Davis. In this low-avoidance/high-mastery classroom, Ms. Davis also combined an emphasis on understanding and developing student independence as mathematical thinkers with strong motivational support. Her instructional discourse combined a focus on instructional scaffolding (negotiation and transfer of responsibility) with opportunities to clarify, review, and summarize important concepts (nonscaffolding). For example, in 19% of her discourse Ms. Davis used nonscaffolding sequences of right-answer questions at particular points in the lesson to ensure that students had the basic understandings necessary to learn new and more complex concepts. She used these known-answer sequences to review at the beginning of a lesson, to reinforce a point during a lesson (when she sensed some confusion), or as a summary at the end. In addition to asking what, Ms. Davis also asked why. Thirteen percent of her instructional discourse required students to explain or evaluate their answers (transfer of responsibility). Motivational support was used in 20% of her discourse to send messages that students were learning and achieving and to encourage those who were having difficulty. She modeled this caring as she coached students who had difficulty answering questions. A pattern of high cognitive and motivational support coupled with moderate accountability characterized the discourse in Ms. Davis's classroom.

Ms. Anderson. Ms. Anderson's discourse was unusual because of its strong emphasis on transfer of responsibility (24%). The

[2] In all cases, we also used analysis of covariance, controlling for scores in math on the State Standardized Achievement Test. The same highly significant differences emerged.

[3] Because scaffolding codes could be used simultaneously with motivational codes and because organizational codes are not included, percentages will not add up to 100%.

Table 8
Percentages (and Standard Scores) for Discourse Categories in Low- and High-Avoidance Classrooms

	Low-avoidance classrooms		High-avoidance classrooms	
Discourse pattern	Robinson[a]	Davis	Parsons	Anderson
		Instructional		
Scaffolding				
Negotiation	27.96% (0.13)	24.02% (−0.67)	26.05% (−0.28)	26.21% (−0.23)
Transfer of responsibility	19.11% (1.13)	13.39% (0.19)	7.56% (−0.77)	24.26% (1.98)
Nonscaffolding	9.37% (−1.51)	19.17% (−0.25)	32.69% (1.50)	13.18% (−1.02)
		Motivational		
Supportive	22.53% (1.66)	19.86% (1.24)	6.13% (−0.96)	8.31% (−0.61)
Nonsupportive	0.73% (−1.04)	1.39% (−0.63)	3.88% (0.86)	0.87% (−0.92)

[a] All teacher names are pseudonyms.

central feature of her lessons was to explain, defend, or evaluate mathematical thinking. Although such practices have been found to facilitate students' growth as mathematical thinkers, they necessarily depend on earlier processes of building adequate factual knowledge and understanding. The time Ms. Anderson spent building understanding (negotiation, 26%) and checking factual knowledge (nonscaffolding, 13%) was low in comparison with the high level of accountability in the discourse. The low use of motivational support (8%) indicated that Ms. Anderson did not provide frequent encouragement or reassurance to her class that they were learning. A pattern of cognitive support and high demands (e.g., student accountability) but low motivational support characterized Ms. Anderson's classroom discourse in this high-avoidance/low-mastery classroom.

Mr. Parsons. The central feature of Mr. Parsons' discourse was the very frequent use of nonscaffolding discourse (33%). Right-answer sequences dominated most classes, either in checking homework or in performing procedures. Homework checking consisted of asking for the correct answer and evaluating a student's answer. If students did not know the answer, Mr. Parsons asked another student, but did not usually stop to explain the answer. When students worked at the board, the teacher evaluated problems as correct or incorrect, then moved on. Rarely were students asked to explain or were held accountable (transfer of responsibility, 8%). Mr. Parsons did often model problem solving (i.e., negotiation, 26%) on the board when he introduced new concepts. Instead of explaining or elaborating on the mathematics, he often used a known-answer I–R–E discourse to question students about the answers. For example, he asked for students to give him the correct answers as he modeled how to factor numbers. There was little discussion about the important concepts in a lesson and little explanation of why an answer was correct. Given the emphasis on correct answers, supportive motivational discourse was quite infrequent in this classroom (6%). In addition, there were relatively frequent instances of nonsupportive motivational discourse (4%). Therefore, the pattern of discourse in this high-avoidance/low-mastery classroom was characterized by high demand for correctness and low support, both cognitive and motivational.

Relation Between Teacher Discourse and Students' Use of Avoidance Strategies

In this section excerpts from the mathematics lessons on factorization are presented to compare the distinctive discourse patterns in the four classrooms. The qualitative comparisons of the teachers' varied discourse patterns suggest how they may have encouraged or discouraged avoidance behaviors. The differences in instructional discourse in the four classrooms are discussed first, followed by the differences in motivational discourse. Organizational discourse is not discussed because it did not differ among the classrooms.

Instructional discourse in low-avoidance classrooms. The discourse of Ms. Robinson, and Ms. Davis was characterized by a higher percentage of scaffolding (negotiation and transfer of responsibility) than nonscaffolding. Because scaffolding is aimed at helping students understand, rather than evaluating knowledge, and gives students opportunities to make knowledge their own, it should encourage mastery goals and discourage avoidance strategies. Scaffolded discourse communicates to students that teachers think they can learn and are there to support them.

One of the most common ways that teachers negotiated meaning was to ask students whether they understood. Ms. Robinson, a low-avoidance/high-mastery teacher, did this frequently, making it very clear that she wanted students to tell her if they didn't understand and making explicit reference to avoiding help seeking:

> Yesterday when I was done instructing you, you guys seemed to understand. Is there *anyone* who said, 'Well, Mrs. Robinson, I don't remember [pause] how to make a factor tree.' And don't look around and say to yourself, 'I'm not going to raise my hand because I don't want Jennifer to think I'm dumb,' [slight laughter] If you don't remember, *please* raise your hand.

In the following example from Ms. Robinson's classroom, Jason admitted that he did not understand how to factor 100. Ms. Robinson asked Julia to demonstrate her understanding in front of the class "in kid talk" to help Jason. Then she called Jason up to the overhead to see if he could explain it. Jason's (J) explanation was halting, but Ms. Robinson (T) supported him by elaborating on his answer each step of the way.

T: [to Jason] Did you understand that? Did you?

J: Yeah.

T: You sure? You need it explained again? You come up and explain it to her. Oh, yes, darling. Come on down. Come on down!

J: She said that she took . . . She broke 4 into—into a factor of 2. . . .

T: She took the number 4.

J: She took the number 4 and she took 2 out. Two 2s out of the 4.

T: She factored, okay.

J: She factored it out and then she put 2 × 2, then 25, she put 25, five 5s . . .

T: She factored 25 into what two numbers?

J: 5.

T: 25 she factored down into factor pairs. What two numbers?

J: 5.

T: 5s.

J: And then she said 2 × 2 × 5 × 5 equals 100.

Then Ms. Robinson asked Jason to multiply the numbers to demonstrate that he understood the concept. It was common for Ms. Robinson to negotiate understanding with students and then give them responsibility for demonstrating their understanding. As evidence that she expected her students to learn, Ms. Robinson transferred responsibility more than most of her colleagues (19.11%, $z = 1.13$). It appeared that students saw these strategies as supportive rather than evaluative because they vied for the chance to explain concepts to their peers.

Similar to Ms. Robinson, Ms. Davis also used negotiation and transfer of responsibility to help students learn and then gave them opportunities to demonstrate their understanding. In the following lesson, Ms. Davis (T) guided a student who was having difficulty factoring 100. She gave hints and then asked the students (S) to explain to him why he should follow certain procedures.

T: [to Aaron] Try it this way. Factor each of these numbers. Okay, now you've got it. [Aaron still appears confused.]

T: You're a good sport, aren't you? Yes, sorta [the teacher saying what Aaron may be thinking]. Help him out here [directed to the students in the class]! What does he need to do? Is 4 a prime number? How many factors do we need?

S: There's two factors.

T: Help him out here, did he choose the right factors [to the class]?

T: Oh, it should be a 2 there. 2 × 2 = 4. . . . How about the 25? Marie?

S: You need to put another line under the 25.

T: Because?

S: It's not a prime number and you need two factors. . . .

Unlike Ms. Robinson, Ms. Davis's discourse patterns showed lower frequencies of negotiation and transfer combined with higher uses of nonscaffolding. Although overuse of nonscaffolding patterns could communicate evaluation (see Mr. Parsons, following), nonscaffolding intertwined with scaffolding also can emphasize what is important to learn as well as to establish prior knowledge or demonstrate competence. Ms. Davis (T) used nonscaffolding, such as asking for correct answers, to review or state important information and then elaborated with explanations. In this excerpt she is trying to help Sara (S) understand that once one has all prime numbers, factoring has been completed.

T: We talked about this about three times now. Is it possible that we can find a longer [factor string] than 6? [pause] No. Because why? Sara?

S: Because they're all prime numbers?

T: Because they're all prime numbers as Marie so efficiently told us.

This pattern seemed effective in Ms. Davis's class because it clarified what was important and correct so students could proceed confidently to apply the information.

Ms. Robinson and Ms. Davis appeared to model, hint, and elicit support from other students to help their students learn. Throughout our fall and spring observations their students were active participants in instructional discourse that stressed understanding and explanation. Perhaps because they knew their teachers and peers would help, students in these classrooms did not seem to need to adopt avoidance strategies to appear able to others.

Instructional discourse in high-avoidance classrooms. Ms. Anderson used transfer of responsibility more than any of the other observed teachers (24.26%, $z = 1.98$), and yet her students reported high-avoidance strategies and a low-mastery goal structure. Ms. Anderson used negotiation and transfer of responsibility strategies almost equally (26% vs. 24%), unlike Ms. Robinson (28% vs. 19%) and Ms. Davis (24% vs. 13%), who used negotiation strategies to build understanding more than transfer strategies that held students accountable for learning. The result of this instructional pattern may have been that Ms. Anderson's students were never sufficiently confident that they understood an idea before they were asked to "prove it." It was rare for Ms. Anderson to model or "talk a student through" a process the way Ms. Robinson did. It was also rare for her to give feedback about whether something was correct, as Ms. Davis did. Instead, she often asked the students to provide explanations and then responded to student efforts with comments to the rest of the class such as "Do you agree?" and "Is she right?" In addition, Ms. Anderson often asked multiple questions, which may have confused or overwhelmed students. The following excerpt illustrates Ms. Anderson's (T) typical use of questions, which might not have supported negotiated meaning. The students (S) were discussing the factors for 24 and 60.

T: Okay, so these numbers—those factors that I put on the [black] board—are the prime factorizations of these two numbers. Do you agree? Marcus, do you agree? Okay, Vanessa, do you agree that these are the prime factorizations of these numbers? Darryl, tell me why you agree with that, why you know that they are correct?

S: [responds]

T: And what does that tell me? When they're prime?

S: [responds]

T: That these factor numbers are all prime, what does that tell me? Vanessa, do you want to help him? I am picking on them because they were absent yesterday and I want to make sure that they are with us. . . . can you . . . he says that these are all prime, how does he know that these are all prime, do you know? Who knows why these are all prime, Dion?

S: [responds]

T: Okay, do you agree with that, Marcus?

S: I know that, it just doesn't click.

T: It didn't click, that's all right, you've been sick for a couple of days, that's the reason I am reviewing a little bit. That's okay. Vanessa, do you know what Dion said?

Ms. Anderson's students did not always have the opportunity to build competence before she asked questions such as "Do you agree?" Her high frequency of scaffolding also may have been undermined by her practice of calling on students who were not paying attention or who had been absent. Also, in this excerpt, Ms. Anderson called on 2 more students without waiting for an answer from Marcus, the first student. This practice may have implied that she did not believe Marcus was capable of giving the answer. As a result, some students may have been uncertain of whether they could be successful in this classroom and felt the need to protect themselves from negative judgments by others. Thus, high use of transfer of responsibility may need to be balanced with sufficient negotiation of understanding to avoid making students feel a need to protect self-worth by adopting avoidance strategies.

Mr. Parsons was a high-avoidance/low-mastery teacher whose instructional discourse reflected a greater proportion of nonscaffolded discourse (32.69%, $z = +1.50$) than most of his colleagues. As described previously, his discourse was characterized by known-answer or right-answer questions followed by implicit or explicit evaluation of student responses. Unlike Ms. Davis, he did not use this form of discourse to clarify or explain but to record the right answer. Although Mr. Parsons did use negotiation in his discourse (usually during direct instruction), it was often overshadowed by long sequences of known-answer discourse. Thus, the students may have perceived a lack of emphasis on helping them learn, understand, or improve. In the following excerpt, the class was learning how to factor larger numbers, as in the previous examples. Mr. Parsons (T) was asking students (S) for all possible two-factor pairs of 360 using the numbers 1 through 20. He used primarily I–R–E discourse processes, exemplified by the short and rapid correct-answer questions about factors.

T: Now you said 6 times what? 60. What else do you got? . . .. Is there a 7?

S: No.

T: Is there an 8?

S: Yeah.

T: There is? . . .

T: When I call you . . . when I call you. Boys, settle down, you're getting on my nerves. Okay, then you have 10 times what?

S: 10 times 36.

T: 10 times 36. Then what do you have? What's something else? 12? Is it right? Did you already check? Don't give me an answer without checking . . . .

T: 14?

S: Yes.

T: Figure it out. How about 15? What's 16?

S: 24. 26 . . .

T: What is it, 26 or 24? . . .

T: Yes it does, 18 times 20 [equals 360]. What do you mean, 20 doesn't work?

In contrast to Ms. Robinson and Ms. Davis, who supported their students' understanding, and Ms. Anderson, who attempted to get students to evaluate their learning, Mr. Parsons' instructional discourse rarely reflected support for helping students understand why they had made errors, as in this example during homework correction:

T: . . . [Problem] number 5, 293, what [kind of number] is it, Kayla?

S: Oh, never mind I got that wrong.

T: [Teacher ignores her comment and gives the answer.] What is it? What is it, 293? It is a prime number you can't do anything . . . .

Because Mr. Parsons typically did not respond to mistakes and misunderstandings with explanations or allow students to explain their strategies, his students may have felt vulnerable to public displays of incompetence and adopted more avoidance strategies.

In summary, Ms. Robinson and Ms. Davis were adept at building students' understanding and giving them opportunities to demonstrate competence. Ms. Anderson and Mr. Parsons did not seem to build students' understanding sufficiently before they asked them to demonstrate their competence and that may be one reason why their students reported a higher use of avoidance strategies.

Motivational discourse in low-avoidance classrooms. Throughout their discourse, Ms. Robinson and Ms. Davis coupled their strong emphases on learning with frequent instances of encouragement, noting progress, encouraging intrinsic interest in mathematics, and providing opportunities for collaboration. About one fifth of their classroom discourse offered these forms of motivational support. It was common for these teachers to recognize when students had learned or improved with genuine praise. For example, when a student urged Ms. Robinson to call on a "smart kid" to solve a problem, Ms. Robinson responded: "All of you are smart." Both Ms. Robinson and Ms. Davis referred to the interest and challenge of the mathematics. For example, when Ms. Robinson wanted to encourage students to move to the more difficult task of finding three factors (vs. two) for a number, she said, "*Now* here comes a challenge!" Ms. Davis tried to pique student interest in the mathematics by introducing a homework question in a very dramatic way: "What a controversy we're about to have here!"

One of the most common characteristics shared in the discourse of Ms. Robinson and Ms. Davis was that they frequently evoked student laughter as part of the math lesson. Although both teachers seemed to use jokes as a way of injecting some good feeling into the lesson, the repertoire was never distracting. Ms. Robinson often teased good naturedly, as in this example:

This is finding the *least common multiple*, not the greatest common factor. They have two different sets of rules. That's why I didn't introduce it on the same day because I didn't want you to get confused. I was confused, so I kept working on it, working on it. Now I kinda see the light. Or is that the overhead light? [student laughter]

Ms. Davis (T) had a humorous way of asking students to participate, as in this example when she called on a student (S) who hadn't volunteered:

> T: Roger, do you feel unappreciated today, have I ignored you? Neglected you?
>
> S: I don't mind.
>
> T: You don't mind! [students laugh] Okay, that was not the hoped for response. I was supposed to have a tearful "Oh yes, Ms. Davis." Roger, please read . . .

It is plausible that these instances lessened tension and encouraged students to view their mathematics classes as more enjoyable. Furthermore, teacher humor was characteristic of both the low-avoidance/high-mastery classrooms, whereas it was notably absent in the high-avoidance/low-mastery classrooms.

Perhaps most striking about these teachers' motivational discourse was the way they provided encouragement to students. In one example, Maria was factoring a problem at the board, but she was having difficulty. Ms. Davis incorporated positive feedback ("You are right, Maria, that is fine") with humor ("This time Maria is saying 'Why did I ever choose that first factor?'") to help her. In addition, she gently chided the class that had noticed Maria's difficulty with: "Could you do this if it were you up there? Well, you are going to get the chance."

Ms. Robinson explicitly told her students that they could learn. While Jewel was factoring a problem in front of the class, she got discouraged and commented, "I don't know what to do." Ms. Robinson responded, "No, uh uh, don't say 'I don't know what to do.' . . . No, no, if I can do it, you can do it." After Jewel had successfully completed the problem, Ms. Robinson said to Jewel: "Okay, now what do you have to say?" Jewel replied: "I'm not stupid!" Ms. Robinson asserted: "That's right. Good job."

Motivational discourse in high-avoidance classrooms. There was much less overt motivational support in the instructional discourse of Mr. Parsons and Ms. Anderson. Only 6% of Mr. Parsons's discourse and 8% of Ms. Anderson's discourse supported intrinsic motivation, offered interpersonal support, or encouraged social collaboration. Ms. Anderson seemed to have a clear interest in mathematics, but did not appear to communicate that to her students concretely. In terms of encouragement, Ms. Anderson occasionally commented, "Good attempt" and asked students if they needed "time to think" when she called on them. When students made mistakes it was not uncommon for her to query, "Is it okay to make these mistakes, guys?" However, such well-intentioned statements may have become lost in her multiple-question strategy and in her frequent use of "Do you agree?" In a class with such high-cognitive demands, it is possible that students' reports of high-avoidance strategies indicated a need for more encouragement, reminders of progress, and reasons for doing difficult mathematics than Ms. Anderson provided. Without a supportive context of encouragement, students may have become anxious about whether they appeared unable.

Mr. Parsons's motivational discourse differed from other teachers in that it had one of the highest percentages of nonsupportive discourse (4%, $z = 0.86$). Although 4% does not appear to be a high proportion of nonsupportive statements, it stood out in comparison with the other 3 teachers' proportions of nonsupportive statements (0.73% to 1.39%). The nonsupportive motivational category was a distinctive feature of Mr. Parsons's discourse. He did not display the interest in mathematics that Ms. Robinson and Ms. Davis did. In commenting on the possibility for other answers, he said, "There's quite a few possibilities, and there probably is another one, but I don't know. I don't want to check into it." Rather than encouragement, Mr. Parsons's comments may have borne more sarcasm and impatience than those of the other teachers. For example, when students didn't recall the definition of a prime number, he prompted, "What did I tell you? What did I tell you?" He often showed annoyance when students gave wrong answers. For example, when a student had trouble doing a problem at the board, Mr. Parsons directed, "Serena, sit down. Barry, come up and fix that." This nonsupportive discourse was in contrast to Ms. Davis and Ms. Robinson, who verbally worked students through their difficulties. Mr. Parsons's discourse may have implied that he did not feel responsible when students were incorrect or confused; rather, he held them responsible for their lack of understanding. In addition, Mr. Parsons sometimes made disrespectful comments to students. In dismissing a student who was talking in class, he said, "Charley, go talk to the lockers."

In summary, Ms. Davis and Ms. Robinson created contexts for approaching mathematical learning by infusing much of their instructional discourse with explicit statements that encouraged students and communicated that they were competent learners. Ms. Anderson and Mr. Parsons used supportive, affective discourse much less frequently. Within their two classrooms, students experienced contexts that were low in motivational supports, although instructional supports may have been present. Thus, the contexts of the high-avoidance classrooms lacked motivational supports in the instructional discourse, and the contexts of the low-avoidance classrooms shared intrinsic, personal, and social supports for approaching learning. It appears that such differing instructional contexts, as reflected in teacher discourse patterns, corroborated students' differing reports of mastery goal structures and use of avoidance behaviors in the four classrooms.

Discussion

Summary and Interpretation of Findings

In this study, the relation between aspects of the classroom environment and students' reported use of avoidance strategies in mathematics was examined. Using survey data and hierarchical linear modeling, it was found that self-handicapping, avoidance of help seeking, and a preference to avoid novel approaches to engaging in academic work varied significantly among the 65 participating classrooms. Students reported using avoidance strategies significantly less in classrooms perceived as emphasizing learning, understanding, effort, and enjoyment. Triangulation of two complementary sources of evidence, classroom discourse and student reports of classroom goal structures, suggested how teachers might create contexts that encouraged or discouraged adoption of avoidance strategies. Students reported lower incidences of avoidance strategies in classrooms in which teachers provided instructional and motivational support for learning. In those classrooms, teachers helped students build understanding, gave them opportunities to demonstrate new competencies, and provided substantial motivational support for learning. Our data indicate that teachers conveyed mastery messages to their students, in part, through explicit admonitions to students not to feel inadequate or ashamed when they did not understand. By modeling their own thinking processes, mastery-oriented teachers demonstrated that being unsure, learning from mistakes, and asking questions were

natural and necessary parts of learning. Students reported higher incidences of avoidance strategies in classrooms in which teachers devoted little attention to helping students build understanding and in which motivational support was low.

Contrary to our predictions, perceptions of a performance goal structure in the classroom were not related to higher reports of avoidance behaviors, as some studies have found (e.g., Midgley & Urdan, 1995; Urdan, Midgley, & Anderman, 1998). Ames and Archer (1988) suggested that fostering a mastery goal structure, rather than reducing a performance goal structure, may be related to adaptive patterns of learning and motivation. In a preliminary study, Urdan and Midgley (2000) found that change in the mastery goal structure during the transition to middle school and over 2 years within the middle school was a more powerful predictor of student outcomes than change in the performance goal structure. It is also possible that the negative effects of a performance goal structure may become more pronounced after students make the transition from elementary to middle school (Anderman & Midgley, 1997). Additionally, researchers have now partitioned personal performance goal orientations into two components: (a) wanting to demonstrate ability (an approach component) and (b) wanting to avoid the demonstration of lack of ability (an avoidance component). The avoidance component is more strongly related to maladaptive outcomes, including avoidance behaviors, than the approach component (e.g., Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997). In this study, the scale assessing the perceived classroom emphasis on performance goals includes some items that could be conceptualized as assessing the approach component and some items that could be conceptualized as assessing the avoidance component. A scale focusing specifically on the avoidance component of the classroom performance goal structure might be more predictive of avoidance strategies.

Theoretical Implications

There are two important theoretical implications of this study. First, as revealed in the instructional discourse, a mastery goal environment appears to consist of both cognitive and motivational, or affective, components. Instructional discourse patterns that supported students both cognitively and motivationally were characteristic of the low-avoidance/high-mastery classrooms. Conversely, instructional discourse practices that emphasized cognitive aspects such as "final answers" or sharing reasoning but did not adequately build understanding or overtly address the motivational concerns of students were typical of high-avoidance/low-mastery environments. Previous characterizations of mastery goal structures have focused mostly on cognitive features. This study demonstrated that mastery goal structures may describe a holistic aspect of the classroom environment that supports students both cognitively as learners and motivationally, which includes supporting effort and evoking humor, giving personal attention and encouragement, and providing a context of peer support.

Other researchers have also found support for the interrelationship between cognitive and affective aspects of classroom environments. Our findings are consistent with Goldstein's (1999, p. 665) explanation that "adults and children are motivated to enter into teaching–learning encounters by the pleasure, the growth, and the interpersonal connection they provide," thus meshing the cognitive and affective aspects of learning environments. This finding is also consistent with that of Patrick et al. (2001), who found that teachers in classrooms with high-mastery goal structures exhibited both academic and affective support, whereas teachers in low-mastery classrooms exhibited one or the other, but not both. In addition, Roeser, Midgley, and Urdan (1996) found that middle-school students' perception of an emphasis on mastery in the learning environment was positively correlated with their perception of caring, respectful teachers. Similarly, Skinner and Belmont (1993) found that, in addition to providing structure (i.e., instructional support) and opportunities for autonomy, teacher involvement (e.g., taking time for, expressing affection toward, enjoying interactions with, and being attuned to students) was also a predictor of student motivation. Thus, such mastery-oriented statements such as "My teacher wants me to understand . . ." may involve a complex interpretation of instructional and interpersonal goals and relationships.

A second finding of theoretical importance was that it was the combination of instructional practices, rather than one salient feature, that described differences among classroom contexts in terms of students' perceptions of the classroom and their reports of avoidance behaviors. Both Ms. Robinson and Ms. Anderson used extensive instructional scaffolding, but only in Ms. Robinson's classroom did teacher discourse consist of high levels of cognitive and motivational support. Thus, although scaffolding transfer of responsibility is considered an autonomy-supportive instructional move, it appears that this autonomy needs to be balanced with teacher support cognitively (i.e., negotiation) and affectively (i.e., motivational support).

A further example of the complexity of instructional practices was the use of nonscaffolded discourse. Although I–R–E patterns that emphasize correct answers can be overused (as demonstrated by Mr. Parsons), they can also be effective if used in combination with instructional scaffolding, as demonstrated by Ms. Davis. As Marshall and Weinstein (1986) noted, it is the interaction of various elements in the classroom that influence students' motivation, rather than the salience of one or two factors. Our findings demonstrate the complexity of instructional interactions and students' psychological interpretations and caution against facile interpretations of data that are not illuminated by studies of the classroom context.

Limitations

There are several limitations of this study. Avoidance behaviors were investigated in math classrooms only, and it will be important to examine these hypotheses in other subject domains. In addition, our sixth-grade participants were in elementary schools. On the basis of past research, it is possible that the findings would have been different if measured in a middle-school context. Future studies should examine these questions in both middle- and high-school contexts. In terms of the qualitative measures, our classroom observation results may present the "best face" of students and teachers. Teachers and students may monitor their responses in light of being observed and audio recorded (i.e., the researcher changes the environment by her observations). Such a limitation to the classroom observational research may have influenced the low incidence of the nonsupportive motivational discourse.

Further Research

From a theoretical perspective, additional research should be directed toward investigations of the relationships between goal

structures and avoidance strategies. In the quantitative analysis, the expected relationship between performance goals and engagement in avoidance behaviors was not found. It may be that the effect of performance goals on avoidance behaviors depends on the level of teacher affective support in the classroom. That is, an emphasis on performance goals with low support may be positively related to avoidance, whereas an emphasis on performance goals with high support may not be associated with the use of these debilitating strategies. That hypothesis was not able to be tested in the quantitative component of this study because we did not include a scale assessing perceived motivational support on the student survey. The classroom observations suggest that high-mastery teachers are supportive. It may be that definition of a mastery environment needs to be expanded to include aspects of the social-relational context of classrooms. Although recent work on goal theory has been directed to expanding our understanding of performance goals (e.g., Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Midgley et al., 2001), our research suggests that scholars also need to devote more research effort to explaining and defining mastery goals.

Future research should also build on the information emanating from the qualitative analysis regarding the relationships among instruction, goal structures, and avoidance strategies. For example, some of the discourse data suggest that the relationship between instructional scaffolding and avoidance strategies depends on the level of supportive motivational discourse used by the teacher.

It would be beneficial for future research to consider relations among teachers' instructional scaffolding, students' avoidance behaviors, achievement, and continuing motivation to learn. It would be expected, however, that instructional discourse and goal structures related to avoidance behaviors would also be related negatively to student achievement, given that in avoiding opportunities to engage academically students would limit their prospect of increasing learning and understanding. Thus the development of avoidance behaviors at this age may well predict negative academic and motivational outcomes for these early adolescents.

There is merit in continuing to examine the effects of multiple goal structures in quantitative studies. To our knowledge, this is the first quantitative analysis that included an analysis of the interaction between the mastery and performance goal structure in predicting student beliefs and behaviors. No significant interactions between the two perceived goal structures emerged. Unlike some studies examining the interactions between students' personal achievement goals in predicting students' beliefs and behaviors (e.g., Bouffard et al., 1995; Elliot & Church, 1997; Pintrich, 2000; Wentzel, 1991, 1993), we did not find that an emphasis in the classroom on both performance and mastery goals was associated with a lower use of avoidance behaviors by students.

The finding that high-mastery/low-avoidance mathematics classrooms had high levels of motivational support coexisting with what appeared to be effective cognitive patterns of support raise further complex pedagogical questions. These include: What is the "effective" balance between negotiating understanding and transferring responsibility? When do nonsupportive instructional strategies such as known-answer I–R–E patterns become "too much" and deter from learning? Under what conditions could high levels of transfer of responsibility be successfully initiated and maintained? How content-specific are instructional practices and contexts?

In conclusion, our results underscore the importance of the mastery goal structure in the classroom for deterring students' use of avoidance behaviors. Moreover, our findings suggest that a mastery learning environment is related to "caring about learning," which fuses the cognitive and the affective components of teaching and learning. An essential avenue to creating such a classroom is by attending to the positive relationships that teachers develop with students and the messages they send about learning through their instructional interactions.

References

Ames, C. (1992a). Achievement goals and the classroom motivational climate. In D. F. Schunk & J. L. Meece (Eds.), *Student perceptions in the classroom* (pp. 327–348). Hillsdale, NJ: Erlbaum.

Ames, C. (1992b). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84,* 261–271.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80,* 260–267.

Anderman, E. M., Eccles, J. S., Yoon, K. S., Roeser, R. W., Wigfield, A., & Blumenfeld, P. C. (2001). Learning to value math and reading: Individual differences and classroom effects. *Contemporary Educational Psychology, 26,* 76–95.

Anderman, E., & Midgley, C. (1997). Changes in personal achievement goals and the perceived classroom goal structures across the transition to middle level schools. *Contemporary Educational Psychology, 22,* 269–298.

Anderman, E. M., & Young, A. J. (1994). Motivation and strategy use in science: Individual differences and classroom effects. *Journal of Research in Science Teaching, 31,* 811–831.

Bouffard, T., Boisvert, J., Vezeau, C., & Larouche, C. (1995). The impact of goal orientation on self-regulation and performance among college students. *British Journal of Educational Psychology, 65,* 317–329.

Brophy, J. (1999). Toward a model of the value aspects of motivation in education: Developing appreciation for particular learning domains and activities. *Educational Psychologist, 34,* 75–85.

Burhans, K. K., & Dweck, C. S. (1995). Helplessness in early childhood: The role of contingent worth. *Child Development, 66,* 1719–1738.

Butler, R. (1998). Determinants of help seeking: Relations between perceived reasons for classroom help-avoidance and help-seeking behaviors in an experimental context. *Journal of Educational Psychology, 90,* 630–643.

Butler, R., & Neuman, O. (1995). Effects of task and ego achievement goals on help-seeking behaviors and attitudes. *Journal of Educational Psychology, 87,* 261–271.

Cain, K. M., & Dweck, C. S. (1995). The relation between motivational patterns and achievement cognitions through the elementary school years. *Merrill-Palmer Quarterly, 41,* 25–52.

Covington, M. V. (1992). *Making the grade.* Cambridge, England: Cambridge University Press.

Covington, M. V., & Omelich, C. L. (1979). Effort: The double-edged sword in school achievement. *Journal of Educational Psychology, 71,* 169–182.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218–232.

Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70,* 461–475.

Evertson, C. M., Emmer, E. T., Clements, B. S., Sanford, J. P., & Worsham, M. E. (1989). *Classroom management for elementary teachers.* Boston: Allyn & Bacon.

Farrell, E., & Dweck, C. S. (1985). *The role of motivational processes in transfer of learning.* Unpublished manuscript.

Gallimore, R., & Tharp, R. (1990). Teaching mind in society: Teaching, schooling, and literature discourse. In L. C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical psychology* (pp. 175–205). Cambridge, England: Cambridge University Press.

Goldstein, L. S. (1999). The relational zone: The role of caring relationships in the co-construction of mind. *American Educational Research Journal, 36,* 647–673.

Harackiewicz, J. M., Barron, K. E., & Elliot, A. J. (1998). Rethinking achievement goals: When are they adaptive for college students and why? *Educational Psychologist, 33,* 1–21.

Hogan, K., & Pressley, M. (Eds.). (1997). *Scaffolding student learning*: *Instructional approaches and issues.* Cambridge, MA: Brookline Books.

Lampert, M. (1990). When the problem is not the question and the solution is not the answer: Mathematical knowing and teaching. *American Educational Research Journal, 27,* 29–63.

Lappan, G., Fey, J. T., Fitzgerald, W. M., Friel, S. N., & Phillips, E. D. (1998). *Connected mathematics.* Menlo Park, CA: Dale Seymour Publications.

Lepper, M. R., Drake, M. F., & O'Donnell-Johnson, T. (1997). Scaffolding techniques of expert human tutors. In K. Hogan & M. Pressley (Eds.), *Scaffolding student learning*: *Instructional approaches and issues* (pp. 108–144). Cambridge, MA: Brookline Books.

Maehr, M. L., & Midgley, C. (1996). *Transforming school cultures.* Boulder, CO: Westview.

Marshall, H. H., & Weinstein, R. S. (1986). Classroom context of student-perceived differential teacher treatment. *Journal of Educational Psychology, 78,* 441–453.

Meece, J., & Holt, K. (1993). A pattern analysis of students' achievement goals. *Journal of Educational Psychology, 85,* 582–590.

Meece, J. L. (1991). The classroom context and students' motivational goals. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 7, pp. 261–285). Greenwich, CT: JAI Press.

Mehan, H. (1985). The structure of classroom discourse. In T. van Dijk (Ed.), *Handbook of discourse analysis* (Vol. 3, pp. 119–131). London: Academic Press.

Meyer, D. K. (1993). What is scaffolded instruction? Definitions, distinguishing features, and misnomers. In D. J. Leu & C. K. Kinzer (Eds.), *Examining central issues in literacy research, theory, and practice. Forty-second yearbook of the National Reading Conference* (pp. 41–54). Chicago: National Reading Conference.

Middleton, M., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology, 89,* 710–718.

Midgley, C. (1993). Motivation and middle level schools. In P. Pintrich & M. L. Maehr (Eds.), *Advances in motivation and achievement: Motivation in the adolescent years* (Vol. 8, pp. 219–276). Greenwich, CT: JAI Press.

Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology, 93,* 77–86.

Midgley, C., Maehr, M. L., Hruda, L. A., Anderman, E., Anderman, L., Gheen, M., et al. (2000). *Manual for the Patterns of Adaptive Learning Scale.* Ann Arbor: University of Michigan.

Midgley, C., & Urdan, T. (1995). Predictors of middle school students' use of self-handicapping strategies. *Journal of Early Adolescence, 15,* 389–411.

Midgley, C., & Urdan, T. (2001). Academic self-handicapping and performance goals: A further examination. *Contemporary Educational Psychology, 26,* 61–75.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328–346.

Nicholls, J. G., & Miller, A. T. (1984). Developments and its discontents: The differentiation of the concept of ability. In J. G. Nicholls (Ed.), *Advances in motivation and achievment* (pp. 185–218). Greenwich, CT: JAI Press.

Nolen, S. B. (1988). Reasons for studying: Motivational orientations and study strategies. *Cognition and Instruction, 5,* 269–287.

Patrick, H., Anderman, L. H., Ryan, A. M., Edelin, K. C., & Midgley, C. (2001). Teachers' communication of goal orientations in four fifth-grade classrooms. *Elementary School Journal, 102,* 35–38.

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology, 92,* 544–555.

Pintrich, P. R., & Garcia, T. (1991). Student goal orientations and self-regulation in the college classroom. In M. L. Maehr & P. Pintrich (Eds.), *Advances in motivation and achievement: Goals and self-regulatory processes* (Vol. 7, pp. 371–402). Greenwich, CT: JAI Press.

Psathas, G. (1995). *Conversation analysis: The study of talk-in-interaction.* (Vol. 35). Thousand Oaks, CA: Sage.

Roeser, R., Midgley, C., & Urdan, T. (1996). Perceptions of the school psychological climate and early adolescents' self-appraisals and academic engagement. *Journal of Educational Psychology, 88,* 408–422.

Ryan, A. M., Gheen, M. H., & Midgley, C. (1998). Why do some students avoid asking for help? An examination of the interplay among students' academic efficacy, teachers' social–emotional role, and the classroom goal structure. *Journal of Educational Psychology, 90,* 1–8.

Ryan, A. M., & Pintrich, P. R. (1997). Should I ask for help? The role of motivation and attitudes in adolescents' help seeking in math class. *Journal of Educational Psychology, 89,* 329–341.

Skaalvik, E. M. (1997). Self-enhancing and self-defeating ego orientation: Relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology, 89,* 71–81.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85,* 571–581.

Snijders, T., & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling.* Thousand Oaks, CA: Sage.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches.* Thousand Oaks, CA: Sage.

Turner, J. C., Meyer, D. K., Cox, K. C., Logan, C., DiCintio, M., & Thomas, C. T. (1998). Creating contexts for involvement in mathematics. *Journal of Educational Psychology, 90,* 730–745.

Urdan, T., & Midgley, C. (2000, May). *Developmental changes in the relations among goal structures, motivational beliefs, affect, and performance.* Paper presented at the 7th Workshop on Achievement and Task Motivation, Leuven, Belgium.

Urdan, T., Midgley, C., & Anderman, E. M. (1998). The role of classroom goal structure in students' use of self-handicapping. *American Educational Research Journal, 35,* 101–122.

Wentzel, K. R. (1991). Social and academic goals at school: Motivation and achievement in context. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement: A research annual* (Vol. 7, pp. 185–212). Greenwich, CT: JAI Press.

Wentzel, K. R. (1993). Motivation and achievement in early adolescence: The role of multiple classroom goals. *Journal of Early Adolescence, 13,* 4–20.

Wolters, C. A., Yu, S. L., Pintrich, P. R. (1996). The relation between goal orientation and students' motivational beliefs and self-regulated learning. *Learning and Individual Differences, 8,* 211–238.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem-solving. *Journal of Child Psychology and Psychiatry, 17,* 89–100.

(*Appendix follows*)

Appendix

Scales, Items, and Alpha Coefficients

Avoiding Novelty (α = .84)

1. I would choose math problems I knew I could do, rather than those I haven't done before.
2. I would prefer to do math problems that are familiar to me, rather than those I would have to learn how to do.
3. I like math concepts that are familiar to me, rather than those I haven't thought about before.
4. I don't like to learn a lot of new concepts in math.
5. I prefer to solve math problems as I have always solved them, rather than trying something new.

Avoiding Help Seeking (α = .81)

1. When I don't understand my math work, I often guess instead of asking someone for help.
2. I don't ask questions during math, even if I don't understand the lesson.
3. When I don't understand my math work, I often put down any answer rather than ask for help.
4. I usually don't ask for help with my math work, even if the work is too hard to do on my own.
5. If my math work is too hard for me, I just don't do it rather than ask for help.

Self-Handicapping Strategies (α = .82)

1. Some students put off doing their math work until the last minute. Then if they don't do well, they can say that is the reason. How true is this of you?
2. Some students purposely don't try hard in math. Then if they don't do well, they can say it's because they didn't try. How true is this of you?
3. Some students fool around the night before a math test. Then if they don't do well, they can say that is the reason. How true is this of you?
4. Some students purposely get involved in lots of activities. Then if they don't do well in math, they can say it is because they were involved with other things. How true is this of you?
5. Some students let their friends keep them from paying attention during math or from doing their math homework. Then if they don't do well, they can say their friends kept them from working. How true is this of you?
6. Some students look for reasons to keep them from studying math (not feeling well, having to help their parents, taking care of a brother or sister, etc.). Then if they don't do well on their math work, they can say this is the reason. How true is this of you?

Perceived Classroom Performance-Focused Goal Structure (α = .82)

1. My teacher points out those students who get good grades in math as an example to all of us.
2. My teacher lets us know which students get the highest scores on a math test.
3. My teacher tells us how we compare in math with other students.
4. My teacher makes it obvious when certain students are not doing well on their math work.
5. My teacher lets us know if we do worse in math than most of the other students in class.

Perceived Classroom Mastery-Focused Goal Structure (α = .75)

1. My teacher thinks mistakes are okay in math as long as we are learning.
2. My teacher wants us to understand our math work, not just memorize it.
3. My teacher really wants us to enjoy learning new things in math.
4. My teacher recognizes us for trying hard in math.
5. My teacher gives us time to really explore and understand new ideas in math.
6. My teacher encourages us to find unusual ways to solve math problems.

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