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Student, Teacher, and Observer Perceptions of the Classroom Environment Before and After the Transition to Junior High School

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Abstract

Student and teacher perceptions of the classroom environment were assessed during mathematics instruction in 117 sixth grade elementary school classrooms and the following year in 138 seventh grade junior high school classrooms. Observer perceptions were collected in a subset of these classrooms. As hypothesized, after the transition students were given fewer opportunities for input, interaction and cooperation; whole class task organization and the use of social comparison increased; and student/teacher relationships deteriorated. Contrary to predictions, competition was more prevalent before than after the transition and the frequency of grading did not change. It is suggested that a "developmental mismatch" may exist between maturing children and the classroom environments they experience before and after the transition to junior high school.

Stimulated by evidence that children's achievement-related attitudes and beliefs become more negative during the early adolescent years, several researchers have become interested in the relation between the transition from elementary school to middle or junior high school and early adolescent development (e.g., Eccles, Midgley, & Adler, 1984; Harter, Whitesell, & Kowalski, 1988; Hawkins & Brendt, 1985; Nottelmann, 1987; Power, 1981; Schulenberg, Asp, & Petersen, 1984; Simmons & Blyth, 1987; Trebilco, Atkinson, & Atkinson, 1977; Ward, Mergen-

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doller, & Tikunoff, 1982). Some of these investigators have suggested that the transition is causally related to changes in early adolescents' motives, beliefs, values, and behaviors. Simmons and her colleagues advance a "developmental preparedness" hypothesis based on the belief that the timing of the transition to junior high school results in more disruption to the individual than would a similar transition a few years later "after the individual has developed a more mature sense of who he or she is" (Blyth, Simmons, & Carlton-Ford, 1983, p. 106). We have argued that the nature of the transition, as well as the timing, must be examined. A similar suggestion has been made by Simmons and Blyth (1987). Until recently, however, researchers have talked generally about the effects of a move from a smaller elementary school with self-contained classrooms to a large, departmentally-organized junior high school, but the possible role of the classroom environment as a mediating influence has largely been ignored, even in the seminal work by Simmons and her colleagues.

Recently the suggestion was made that systematic differences exist between pre- and post-transition classrooms that are particularly debilitating to children at this developmental stage. These differences in the classroom environment may contribute to the negative changes in student beliefs and behaviors that are sometimes associated with the move from elementary school to junior high school (Eccles & Midgley, in press; Eccles et al., 1984). Unfortunately, remarkably few studies have focused on differences in the classroom environment across school levels. A description of these studies will follow. In general, there is limited evidence suggesting that junior high school classrooms, in comparison to elementary school classrooms, offer fewer opportunities for student self-management and choice, and are characterized by a less positive teacher/student relationship, both of which could undermine students' interest in their academic subjects. In addition, there is some evidence that the shift to junior high school is associated with an increase in whole class task organization, between-classroom ability grouping, and external evaluation; practices that may increase the saliency of social comparison and ability self-assessment. This may have negative effects on some students' confidence in their ability and motivation to achieve; in particular those students who are not highly able or do not perceive themselves as highly able prior to entry into junior high school. The present study provides a direct test of these hypothesized changes in classroom environments.

Self-Management

Several studies suggest that early adolescents have fewer choices, participate less in decision-making, and perceive that they have less control over their academic lives after they make the transition to junior high school. For example, in what is the most comprehensive longitudinal study of classrooms before and after the transition to junior high school, Ward, Mergendoller, Tikunoff, Rounds, Osaki, and their colleagues at the Far West Laboratory followed students from the sixth grade in four feeder elementary schools to the seventh grade in one junior high

school (Ward et al., 1982). Classrooms were observed, teachers were interviewed, and student opinions were gathered in the spring of the sixth grade year and in the fall of the seventh grade year. Students were given choices among learning activities and assumed responsibility for numerous aspects of their classwork more frequently in the sixth grade than in the seventh grade (Rounds & Osaki, 1982). In a similar study Australian students were assessed two weeks before the end of the sixth grade year in four primary schools and again midway through the first term of their seventh grade year in either a suburban technical school or a neighborhood high school (Trebilco et al., 1977). Students, particularly those who moved to the technical school, reported more teacher control and fewer opportunities for decision-making after the transition than before. Finally, using longitudinal data collected in conjunction with the present study, both teachers and students reported that students had fewer decision-making opportunities in mathematics classrooms after than before the transition from sixth grade in elementary school to seventh grade in junior high school (Midgley & Feldlaufer, 1987). The study presented here does not include this measure of decision-making.

Task Organization and Evaluation Practice

Although there has been an increase in interest in the effects of task differentiation, competition, evaluation techniques, and grouping practices on student motivation and ability perceptions (e.g., Marshall & Weinstein, 1984; Rosenholtz & Simpson, 1984), few empirical studies have traced changes in these practices across grades or school levels. Rounds and Osaki (1982) report that whole group instruction was the norm in seventh grade junior high school classrooms, small group instruction was rare, and individualized instruction was not observed at all. The grouping that did take place was based on student ability and the various ability groups were given similar tasks that varied only in difficulty. Recitation and teacher-assigned seatwork predominated and all students were given the same assignments. Informal cooperation and collaboration among students was discouraged. In contrast, they found that sixth grade elementary teachers mixed whole group, small group, and individualized instruction within and across subject areas, sometimes combining students of similar ability and sometimes students of heterogeneous ability. In some cases students collaborated on projects. However, no differences between the evaluation practices of sixth and seventh grade teachers were reported in this study. This finding contrasts with reports from other researchers who have found that evaluation becomes more formal and frequent as students progress through school (Gullickson, 1985; Harter et al., 1988; Hill & Wigfield, 1984). For example, surveying elementary (third grade), junior high school (seventh grade) and senior high school teachers regarding their evaluation practices, Gullickson (1985) found substantial differences across grades. In junior high school there was less variety in evaluation techniques than in elementary school with objective tests becoming much more common as the basis for evaluation.

Teacher/Student Relations

There is limited evidence that teacher/student relations change after the transition to certain types of secondary schools. In the Trebilco et al. study (1977), for example, students reported less favorable interpersonal relations with their teachers after the transition to both the technical school and the high school than before. In a similar study, Hawkins and Berndt (1985) followed students from elementary school to two types of junior high schools: a traditionally organized junior high school and a school organized into groups of students headed by teacher teams. They found a significant decline in student perceptions of teacher support only for those students who moved into the traditional junior high school. Finally, truants in a study by Nielsen and Gerber (1979) reported that their relationships with teachers deteriorated after the transition and that their most negative experiences in junior high school were difficulties they encountered with adults.

In summary, although existing studies provide some support for the suggestion that there are systematic differences between elementary and junior high school classrooms, few longitudinal studies directly assessing this prediction exist, and those that do rely on limited samples. For example, although the study done at the Far West Laboratory (Ward et al., 1982) provides the richest data, this study was limited to one junior high school; whether these results will generalize remains to be tested.

The study reported here extends, in a number of ways, the limited research that has been done comparing the classroom environment before and after the transition to junior high school. First, a variety of classroom variables have been included to provide information about opportunities for student input, choice, and autonomy; competition and social comparison among students; task organization, grouping, and grading; and teacher warmth, support, and fairness. Second, student, teacher, and observer assessments of the classroom environment are included to provide multiple sources of information. Third, this research was conducted in a large sample of classrooms in ten school districts. The following hypotheses are tested:

1. After the transition to junior high school, students will have less autonomy and fewer opportunities for input and choice than before the transition.
2. After the transition to junior high school, there will be an increase in whole class task organization, competition and social comparison among students, and the use of grading, and a decrease in opportunities for cooperation and interaction among students.
3. After the transition to junior high school, teachers will be perceived as less caring, supportive, and friendly than were teachers before the transition.

METHOD

The data reported here were collected as part of a two year, four wave longitudinal study investigating the relation between changes in classroom and family environments during early adolescence and children's beliefs, motives, affects, and

behaviors across four domains: mathematics, English, social interactions, and physical activities. The classroom environment measures were designed for mathematics classrooms since junior high schools are often departmentalized and it was deemed important to focus on one subject matter area. Prior research has shown that students' achievement-related motives and attitudes differ by subject (Brush, 1980; Eccles, Adler, Futterman, Goff, Meece, & Midgley, 1983; Wigfield, 1984). In addition, this study builds on other work that has looked at the relation between classroom factors and achievement-related attitudes in mathematics (Eccles et al., 1983; Parsons, Kaczala, & Meece, 1982).

Sample

Twelve school districts located in middle-income communities in southeastern Michigan were recruited for this project. These communities are within a fifty mile radius of Detroit and many residents work in automobile-related industries. An effort was made to include school districts that varied in their ability grouping and evaluation practices. All teachers in those districts who taught mathematics to fifth or sixth graders scheduled to make the transition to middle/junior high school were asked to participate. Teachers and students in 143 pre-transition classrooms participated year one; students were followed year two into 138 post-transition classrooms. All participation was voluntary: 79 percent of all students enrolled year one agreed to participate; 95 percent of the eligible teachers agreed to participate. Analyses reported here are based on data collected at two of the four waves: fall, 1983 (wave one, year one) and fall, 1984 (wave three, year two).

Case Selection

The data from a subset of this sample were selected for this study. The student sample used in this study includes the 1788 students who completed a questionnaire both before and after the transition from sixth grade in an elementary school to seventh grade in a junior high school (fifth graders were excluded), and who had valid data on all of the classroom environment items. Most of the students excluded from this study were from two school districts where policy changed during the course of data collection so that some students did not move to a new school. The teacher sample included the teachers these students had for mathematics before and after the school transition: 102 sixth grade and 56 seventh grade teachers. A total of 117 pre-transition and 138 post-transition classrooms are represented. There are fewer teachers than classrooms because in some cases, particularly in junior high school, a teacher instructs more than one math class.

The observational data reported here includes a subset of the classroom described above: 116 pre-transition classrooms and 82 post-transition classrooms. At the junior high school level it was not feasible to observe all sections taught by the same teacher. The observation sample was selected so that all teachers were included at least once, and in the case of ability-grouped classrooms, at least one classroom from each ability level taught by a teacher was included.

Development of Measures

In order to develop a measure to tap aspects of the classroom environment that were hypothesized to change after the transition to junior high school a large number of widely used classroom environment measures were scrutinized. In particular, attention was focused on the *Classroom Environment Scale* (Moos, 1979); the *Quality of School Life Scale* (Epstein & McPartland, 1976); the *Individualized Classroom Environment Measure* (Fraser, 1982); the *Learning Environment Inventory* (Anderson & Walber, 1976); the *Dimensions of Schooling Questionnaire* (Traub, Weiss, Fisher, & Musella, 1972); the measures from the *School Climate Study* (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979); and the *Classroom Decision-Making Scale* (Lee, 1979). Strong theoretical considerations guided the selection and adaptation of items from these measures. Original items were also generated that were suited to the more specific objectives of the research. The pool of items included measures of the authority system, task organization, grouping practices, social comparison of abilities, competition among students, the use of public evaluation and discipline practices, and teacher behaviors that communicate values about subject matter. Both high and low inference items were included in the item pool. High inference items are intended to capture the spirit and context of statements and behaviors of teachers and students using some judgement and interpretation. An example of high inference item is, "The teacher seems to expect most students to do shoddy work or make stupid mistakes in math." On the other hand, low inference items report publicly observable speech, behavior, and physical characteristics of the classroom environment with minimal interpretation on the part of the rater. An example of a low inference item is, "Students work on the same math lesson at the same time." The combination of high and low inference items makes it possible to detect both formal and informal behaviors and practices that take place in the classroom. It was considered important to develop high inference items to measure subtle behaviors like teachers' warmth and supportiveness, teachers' use of sarcasm, and teachers' willingness to accept student ideas.

Through extensive pilot testing of the measure in upper-elementary and junior high school math classrooms, items were identified that were frequently not answered, or that had low variance or high skewness. These items were reworded or deleted as necessary.

Multiple Sources

The classroom environment measure that was developed has three forms: the *Student Classroom Environment Measure* (SCEM), the *Teacher Classroom Environment Measure* (TCEM), and the *Observer Classroom Environment Measure* (OCEM). The decision to use three sources to assess the classroom environment grew out of several concerns. Although some researchers believe that "neutral" observers provide a more objective assessment of the classroom environment, others believe that classroom participants (students and/or teachers) are more sensitive to the long standing attributes of the environment (e.g., Fraser & Walberg, 1981;

Moos, 1980). Observer perceptions were considered important for this study for two reasons. First, students are undergoing both physiological and social role changes that might affect their perceptions. It could be argued that student perceptions are affected by these changes and do not reflect real differences in the classroom environment. Second, the pre-transition teachers are a different group of teachers than the post-transition teachers. It could be argued that elementary and junior high school teachers perceive similar classrooms differently. Both student and teacher perceptions were included because classroom assessments by these two groups have been found to differ in systematic ways (e.g., Fisher & Fisher, 1983; Fraser & O'Brien, 1985; Moos, 1979) and it was considered important to get both perspectives. However, we agree in general with those who place high value on student perceptions, particularly in studies that link the classroom environment to student outcomes. Multiple sources were also used because some questions are asked more appropriately of one source than other. For example, teachers and students are better sources of information about semester-long grading practices than observers. Likewise, observers and students are better sources than teachers for information about the warmth, friendliness, and fairness of teachers.

Student Classroom Measure (SCEM). The SCEM was developed to tap students' perceptions of the following: competition and social comparison among students, the opportunity for cooperative learning among students, and their teacher's fairness, friendliness, and interest in mathematics. Table 1 illustrates the wording of items included in the SCEM composites. In order to show empirical support for the differentiation of these constructs, a principal components analysis was performed. This analysis confirmed that five dimensions underlie the items, based on a scree test of the characteristic roots. A common factor analysis was then performed and five factors were extracted. Finally, an orthogonal rotation was used to interpret the pattern of loadings on the five factors. These analyses were performed separately for the sample at year one and year two. The pattern of factor loading was similar both years. All items load at $>.30$; year one item loadings are univocal (i.e., items load on one and only one factor); year two, three items load on more than one factor (see Table 1). The year one pattern of loadings were used to decide the placement of these non-univocal items.

Teacher Classroom Environment Measure (TCEM). The TCEM was designed to assess general teaching and grading practices, discipline techniques, reward strategies, and opportunities for student autonomy and cooperative interaction. These constructs were assessed on the basis of teachers' reports. Table 2 illustrates the wording of items included in the TCEM composites. Three of the items were adapted from the *Measure of School Openness* (McPartland & Epstein, 1974). As a means of showing empirical support for the differentiation of dimensions that tap student input and autonomy, task organization, cooperation and interaction among students, and frequency of grades, a principal components analysis was performed. Using a scree test, four dimensions were found to underlie the item intercorrelations. Four factors were extracted and both orthogonal and oblique rotations were

TABLE 1

Comparison of Pre- and Post-Transition Classrooms Using Students' Perceptions

	Pre-Transition			Post-Transition				
Items in Composite	Factor Loading	Mean	*SD*	Factor Loading	Mean	*SD*	*T*-Statistic	Effect Size
Cooperation/Interaction		1.67	.50		1.56	.50	7.92**	.18
We get to work with each other in small groups when we do math.	.34	1.30	.66	.64	1.18	.50	5.86**	.15
During work time we can move around the classroom when we want to.	.36	1.73	.96	.47	1.49	.80	9.18**	.22
We get to pick which students we want to work with in math.	.36	1.48	.87	.54	1.36	.79	4.80**	.11
We can talk to each other during math time.	.64	1.71	.82	.59	1.77	.85	-2.70*	-.06
We help each other with math work.	.41	2.16	.95	.45	1.98	.91	6.43**	.16
Competition		3.25	.79		2.75	.92	20.11**	.47
Some kids try to be the first one to answer math questions the teacher asks.	.64	3.19	.96	.73	2.69	1.04	16.14**	.38
Some kids try to be the first ones done in math.	.62	3.31	.93	.69	2.79	1.07	17.39**	.41
Social Comparison		2.56	.81		2.66	.84	-4.38**	-.10
When math papers are handed back, we show each other how we did.	.56	2.43	.95	.62	2.48	.97	-1.80	-.04
When report cards come out, we tell each other what we got in math.	.60	2.69	1.02	.63	2.84	1.02	-5.14**	-.12
Teacher—Unfair/ Unfriendly		1.57	.59		1.61	.60	-2.89*	-.06
The teacher cares how we feel. (R)	.44	1.63	.94	-.65	2.10	1.05	-12.74**	-.30
The teacher is friendly to us. (R)	.64	1.50	.81	-.48+	1.69	.91	-7.47**	-.17
The teacher treats boys and girls differently.	-.55	1.57	.99	.52	1.34	.75	8.94**	.21
The teacher grades our math work fairly. (R)	.48	1.30	.73	-.40+	1.44	.81	-5.84**	-.14
The teacher treats some kids better than other kids.	-.66	1.69	1.07	.67+	1.61	.97	2.98*	.06

TABLE 1 (continued)

Items in Composite	Pre-Transition Factor Loading	Pre-Transition Mean	Pre-Transition *SD*	Post-Transition Factor Loading	Post-Transition Mean	Post-Transition *SD*	*T*-Statistic	Effect Size
The teacher criticizes us when we do poor work.	-.41	1.70	1.00	.43	1.60	.88	3.72**	.09
Teacher—Valuing of Math		3.28	.69		3.08	.74	9.86**	.23
The teacher tries to make math interesting in this class.	.53	3.29	.98	.70	2.96	1.11	10.43**	.25
The teacher likes math.	.44	3.50	.79	.46	3.65	.74	-6.30**	-.15
The teacher tells us why math is important.	.52	3.06	1.12	.46	2.63	1.15	13.16**	.31
Single Items Not In Composite								
We can work on math projects that we think up on our own.		1.82	1.04		1.47	.84	12.43**	.29
The teacher encourages us to say what we think.		2.96	1.13		2.54	1.15	12.47**	.30
The teacher asks us what we want to learn about in math.		1.77	.52		1.12	.41	3.59**	.05
Almost everyone in this class does the same math work at the same time.		3.07	1.17		3.40	.97	-9.94**	-.28

$N = 1788$

Items are scored on a four-point rating scale-*Not very often (No), Sometimes, Usually, Very often (Yes)*
R indicates that the scoring of the item has been reversed to reflect the direction of its factor loading.
One or two asterisks indicate significance at or below .01 and .001, respectively.
+ indicates the item also loaded on another factor.
Effect sizes were calculated using the following formula (Sharelson, 1981, p. 426, as cited in Lambert, Hatch, Kingston, & Edwards, 1986):

$ES = \bar{X}$ pre-transition $- \bar{X}$ post-transition / $(S_1^2 + S_2^2 - 2r_{12}S_1S_2^{1/2})$

where S_1 is the standard deviation of the pre-transition score, S_2 is the standard deviation of the post-transition score, and r_{12} is the correlation between the pre- and post-transition scores. A negative effect size indicates that the year two mean is greater than the year one mean.

used to interpret the pattern of loadings. Item loadings were quite similar using both rotations, however, because some of the factor intercorrelations were significantly different from zero, the patterns of loadings were interpreted using the oblique rotation. These analyses were performed on the year one and year two samples separately. Because the factor structure was similar both years, the common factor analysis was repeated on the pooled sample. Using an oblique rotation, the pattern of loadings on the four factors was interpreted. A higher criterion was set for item loadings on factors for the TCEM than on the SCEM because the TCEM sample is smaller than the sample of students. All items load on factors at $>.40$. Three items load on more than one factor; these items are best interpreted with the factor on which they had the highest loading (see Table 2).

Observer Classroom Environment (OCEM). The OCEM was designed to measure the following: opportunities for student input, task organization, competition among students, teacher control and student interaction patterns, teacher fairness and friendliness, and informal relations between the teacher and students. Table 3 illustrates the wording of items included in the OCEM composites. These constructs were assessed on the basis of observer reports. Using the same factor analytic procedures described for the SCEM and the TCEM, empirical support emerged for the differentiation of the constructs that were to be measured. Analyses were performed for the year one and year two samples separately and the factor structure was found to be similar. Common factor analysis was then performed to extract seven factors using the pooled sample. Finally, an orthogonal rotation was used to interpret the pattern of item loadings on the seven factors. Items load on factors at $>.40$; all item loadings are univocal (see Table 3).

Reliabilities and Intercorrelations among Composites

Composites were formed for items in the SCEM, TCEM, and OCEM by computing a mean of the items that were indicators of a particular factor. Cronbach's alpha reliability coefficient was computed for each composite. Table 4 presents reliability coefficients and intercorrelations among composites for each source (students, teachers, and observers). These intercorrelations are low to moderate indicating that these measures tap distinct but somewhat related dimensions of the classroom environment.[1] Internal consistency reliability is typically used as an estimate of random measurement error, (i.e., the quality of measurement). However, it should not be assumed that the organization of environmental features within a classroom will follow the same principles as the organization of traits within an individual. Classrooms are complex organizations and the same practices do not necessarily co-occur across all classrooms. For example, although two items such as "we can talk to each other during math time" and "we help each other with

[1]Intercorrelations among the ratings from different sources (e.g., students and observer) for similar classroom environment dimensions range from .06 to .45 but were not expected to be high because of the different wording and numbers of items on the scales from the various sources.

TABLE 2
Comparison of Pre- and Post-Transition Classrooms
Using Teachers' Perceptions

Items in Composite	Factor Loading	Pre Mean	Pre *SD*	Post Mean	Post *SD*	*F*-ratio	*Eta*^{2}
Student Input		2.54	.77	2.27	.70	8.64**	.03
Students can work on math projects they think up completely on their own.	.48	2.80	1.10	2.15	1.02	23.22***	.08
I ask students what they want to learn about in math.	.52	2.56	.87	2.52	.93	.19	.00
I encourage students to contribute quiz or test questions in math.	.72	2.26	.97	2.14	.91	1.00	.00
Task Organization		2.04	.71	1.67	.31	21.47***	.08
Most students in this class use the same math textbooks and materials.R	−.60	1.49	.74	1.17	.41	19.04***	.07
Students are given several alternative math assignments from which they can choose the ones to work on for that period.	.57+	1.91	.88	1.63	.75	7.32**	.02
Students are given the opportunity to work on their own for several days before checking with me.	.54+	1.92	.99	1.63	.95	5.75*	.02
Students work at a variety of different math activities and assignments at the same time in this class.	.69+	2.83	1.05	2.24	1.05	19.81***	.07
Cooperation/Interaction		3.47	.72	3.05	.87	17.25***	.06
Students are allowed to talk to other students while they work on their math.	.72	3.28	.89	2.96	1.00	7.04**	.02
Students are allowed to ask other students to help with their math work.	.86	3.67	.77	3.15	.89	24.62***	.08
Grades		3.90	1.02	3.98	1.15	.28	.00
I give grades on math homework assignments.	.92	3.89	1.32	4.07	1.25	1.31	.00
I give grades on math classwork.	.67	3.94	1.07	3.88	1.25	.14	.00
Single Item Not In Composite							
Students ask me how they are doing in math compared to other students in the class.		2.46	1.07	2.82	.97	7.79**	.03

Pre-transition $N = 117$, post-transition $N = 138$
Items are based on a 5-pount scale—1 = *Never*, 5 = *Always*
R indicates that the scoring of the item has been reversed to reflect the direction of its factor loading.
+ indicates item also loaded on another factor.
One, two, or three asterisks indicate significance level at or below .05, .01, .001, respectively.

TABLE 3
Comparison of Pre- and Post-Transition Classrooms
Using Observers' Perceptions

Items in Composite	Factor Loading	Pre Mean	Pre *SD*	Post Mean	Post *SD*	*F*-ratio	*Eta*^{2}
Student Input		1.09	.32	1.02	.87	3.78*	.02
Students suggest projects or topics to study in math.(*2*)	−.91	1.09	.34	1.01	.11	3.56*	.02
Students help choose the instructional materials they use in math.(*2*)	−.74	1.08	.33	1.02	.15	1.87	.00
Students decfide the order in which they do their math work.(*2*)	−.74	1.12	.38	1.04	.19	3.47	.01
Student Input-Contracts		1.03	.15	1.02	.11	.19	.00
Students sometimes negotiate written contracts with the teacher regarding math work.(*1*)	.88	1.03	.16	1.04	.19	.19	.00
Some students' grades in math are based on fulfilling a contract.(*1*)	.84	1.04	.20	1.02	.15	.49	.00
Students occasionally help to plan the weekly schedule in math. (*1*)	.60	1.02	.13	1.00	.00	1.42	.00
Task Organization		2.51	.40	2.63	.14	7.56**	.04
Most students do the same math homework.(*1*)	.65	1.92	.27	2.00	.00	6.96**	.04
Students work on the same math lesson at the same time.(*2*)	.93	2.74	.58	2.96	.19	11.29***	.05
Students use the same math textbooks andmaterials as other students in this class.(*2*)	.76	2.80	.55	2.95	.27	5.23*	.03
Competition		1.40	.34	1.34	.32	1.66	.00
Some students compete with each other to answer questions in math.(*1*)	−.64	1.66	.47	1.59	.49	1.04	.00
Some students compete with each other to get the best grade in math.(*1*)	−.63	1.29	.46	1.26	.44	.32	.00
Some students compete with each other to finish work first in math.(*1*)	−.64	1.40	.49	1.30	.46	2.46	.01
The teacher encourages students to compete with each other in math.(*1*)	−.53	1.23	.42	1.19	.40	.40	.00
Teacher Control/Student Interaction		1.78	.37	1.79	.39	.46	.00
The teacher expresses concern when students do things their own way.(*1*)	−.68	1.34	.47	1.41	.50	1.26	.00
The teacher is very concerned about procedure and form.(*1*)	−.71	1.41	.49	1.30	.46	2.45	.01
Students help each other with math classwork.(2R)	.43	2.21	.54	2.39	.56	5.41*	.03
Students talk freely with classmates during math time.(2R)	.49	2.15	.60	2.05	.61	1.50	.00

TABLE 3 (continued)

Items in Composite	Factor Loading	Pre Mean	Pre *SD*	Post Mean	Post *SD*	*F*-ratio	*Eta*^{2}
Teacher–Unfair/Unfriendly		1.25	.28	1.40	.30	11.42***	.05
Students are criticized for turning math work in late or failing to turn in assignments.(*1*)	–.54	1.34	.47	1.52	.50	7.14**	.03
The teacher says to some students or the class as a whole that they may get a bad grade or report card in math.(*1*)	–.59	1.11	.32	1.31	.46	12.47***	.06
The teacher is warm and suportive.(*1*R)	.46	1.08	.27	1.38	.49	30.82***	.14
The teacher seems pessimistic about the ability of students to be self-disciplining and responsible for their own behavior.(*1*)	–.56	1.28	.45	1.44	.50	5.78**	.03
The teacher seems to expect some students to do shoddy work or make stupid mistakes in math.(*1*)	–.58	1.29	.46	1.38	.49	1.57	.00
The teacher uses sarcasm.(*2*)	–.51	1.42	.55	1.43	.50	.34	.00
The teacher threatens to give more work, math tests, or to lower grades to control student behavior.(*2*)	–.57	1.24	.49	1.35	.55	1.96	.01
Teacher-Informal Relations With Students		1.39	.25	1.38	.24	.48	.00
The teacher has high academic expectations for most of the students in math.(*1*R)	.46	1.37	.48	1.52	.50	4.68*	.02
The teacher encourages students to express their own ideas or to try different ways of doing things.(*1*)	.65	1.40	.49	1.30	.46	1.75	.00
The teacher incorporates student suggestions in math work.(*1*)	.48	1.28	.45	1.26	.44	.15	.00
During math relevant side issues are sometimes discussed.(*1*)	.58	1.34	.47	1.45	.50	2.70	.01
The teacher emphasizes doing math for its own sake (because it's interesting or valuable, etc.).(*1*)	.40	1.58	.50	1.39	.49	6.91**	.03
Single Item Not In Composite							
Students sometimes choose their partners for math work.(*1*)		1.27	.44	1.10	.30	9.06**	.04

Pre-transition N = 116, post-transition N = 82
(*1*) indicates items are scored 1 = *False*, 2 = *True*
(*2*) indicates items are scored 1 = *Never*, 2 = *Sometimes*, 3 = *Often* or *Always*
(R) indicates that the scoring of the item has been reversed to reflect the direction of its factor loading.
One, two, or three asterisks indicate significance at or below .05, .01, .001, respectively.

math work" tap an environment where cooperation and student interaction is pres ent, it may be the case that in one classroom students can talk and help each othe but in another classroom students talk to each other but do not help one anothe with math work.

Procedures

A field staff, blind to the hypotheses, was hired to observe and rate classroom using the OCEM. Year one 15 observers rated classrooms; seven of these peopl plus one new staff person observed the year two classrooms. Before gathering data all members of the field staff participated in an extensive training program year on and a refresher program the second year, and achieved a reliability score each yea on the OCEM in two classrooms averaging at least .75. One observer sat in eac classroom for five consecutive days during October or early November each year. A the end of each five day period, the observer rated the classroom using the OCEM These observations were made prior to questionnaire administration.

The SCEM was included in a questionnaire measuring a large number o constructs; it was administered by field staff to students in their mathematic classrooms during the two class periods following the observation period. The SCEM was the first set of items on the day one questionnaire. Teachers completed a TCEM while students were filling out their survey questionnaires.

RESULTS

Relations among Composites

On the whole, students' perceptions of the various classroom dimensions are not highly correlated either year (see Table 4). However, student perceptions of thei teacher's valuing of math and their perceptions of the fairness and friendliness of their teacher are related both years. Student reports also include that there is some association between cooperative interaction in the classroom and the use of social comparison. Teachers see the classroom dimensions as highly related. The combined pre- and post-transition teacher sample reports that opportunities for student cooperation and interaction are associated with opportunities for student input and the use of a differentiated task structure in the classroom. Frequency of grading is not highly correlated with the other dimensions. It is not surprising that observers report that the use of negotiated contracts in the classroom and opportunities for student input are related, or that the use of contracts is associated with a differentiated task structure in the classroom. In addition observers report a moderate relationship between teacher control of student interactions and whole class task organization. However, observers do not see strong relationships among other constructs.

Comparison of Pre- and Post-Transition Classroom

In analyses comparing student perceptions before and after the school transition, pairwise *t*-tests were performed to assess changes in mean score on the SCEM

TABLE 4
Reliabilities and Intercorrelations for Composite Measures of Classroom Environment Dimensions

Composite		Number of Items	Cronbach's Alpha[a]		Intercorrelations among Composites[b]						
					I	II	III	IV	V	VI	VII
Student Perceptions (SCEM)											
			Year 1	Year 2							
I.	Cooperation/Interaction	5	.51	.65		.05	.26	−.07	.05		
II.	Competition	2	.58	.68	.04		.16	.07	.06		
III.	Social Comparison	2	.52	.59	.23	.16		−.00	.05		
IV.	Teacher—Unfair/Unfriendly	6	.70	.75	−.08	.08	.07		−.49		
V.	Teacher—Valuing of Math	3	.51	.56	.06	.10	.03	−.31			
Teacher Perceptions (TCEM)											
I.	Student Input	3	.70								
II.	Task Organization	4	.76		.43						
III.	Cooperation/Interaction	2	.77		.25	.27					
IV.	Grades	2	.60		.14	.10	−.04				
Observer Perceptions (OCEM)											
I.	Student Input	3	.85								
II.	Student Input—Contracts	3	.82		.30						
III.	Task Organization	3	.79		−.07	−.23					
IV.	Competition	4	.70		.11	.09	.01				
V.	Teacher Control/Student Interaction	4	.69		−.17	−.11	.26	−.07			
VI.	Teacher—Unfair/Unfriendly	7	.76		−.09	.01	.12	−.13	.24		
VII.	Teacher—Informal Relations with Students	5	.63		.17	.12	.09	.05	−.11	−.15	

[a]Cronbach's alpha for the SCEM composites were computed for year 1 and year 2 samples separately; alpha coefficients for the TCEM and OCEM composites were computed using the combined Year 1 and 2 samples.

[b]Correlations among the Year 1 SCEM composites are shown below the main diagonal; correlations among Year 2 SCEM composites are shown above the main diagonal. Correlation matrices for the TCEM and the OCEM composites are for the combined Year 1 and Year 2 samples.

composites.[2] Because both teachers and classrooms are different at year one an year two, analysis of variance was used to assess differences in mean scores on th TCEM and the OCEM scales. Tables 1, 2, and 3 present pre- and post-transitio means and standard deviations as well as tests of wave differences and effect size on the scales for students (SCEM), teachers (TCEM), and observers (OCEM) respectively.[3]

Autonomy and Input. Teacher, observer, and student perceptions confirm th hypothesis that students have less autonomy and fewer opportunities for input i their math classrooms after than before the transition to junior high school. Pre transition teachers report more opportunities for student input than post-transitio teachers ($F[1,253] = 8.64$; $p = .003$); this effect primarily reflects the difference i the opportunities for students to work on projects they think up on their own Similarly, observers say that pre-transition teachers allow more student input tha post-transition teachers ($F[1,196] = 3.78$; $p = .05$), primarily in terms of allowin students to suggest topics to study in math and to decide the order in which they d their math work.

Single item indicators from the SCEM support the reports of teachers an observers. Students say they can work on projects they think up on their ow ($t[1787] = 12.43$; $p < .0001$), their teacher encourages them to say what they thin ($t[1787] = 12.47$; $p < .0001$), and their teacher asks them what they want to lear in math ($t[1787] = 3.59$; $p = .0003$) more frequently before than after th transition.

Task Organization, Cooperation, Competition, Social Comparison and Grading It was hypothesized that there would be an increase in whole class task organiza tion, competition and social comparison among students, and the use of grading, a well as a decrease in student interaction and cooperation after the transition t junior high school. The reports of students, teachers, and observers provide suppor for some of these hypotheses. As predicted, both teachers (high scores = un differentiated task organization) and observers (high scores = differentiated task organization) report more whole class task organization in post-transition class rooms than in pre-transition classrooms ($F[1,252] = 21.47$; $p = .0001$ and ($F[1,187] = 7.56$; $p = .006$ respectively). In particular, observers report tha students use the same books and materials, work on the same assignment a the same time, and receive the same homework assignments more often in post transition than in pre-transition classrooms. Similarly, post-transition teachers

[2]Analyses were also performed for boys and girls separately. Significant wave differences on all five SCEM composites were found, mirroring the wave differences found when analyzing the total pre- and post-transition sample.

[3]Analyses were also performed using reports from students, teachers, and observers on items not included in our composites. When relevant, mean differences will be reported on these items for pre- and post-transition classrooms.

are more likely than pre-transition teachers to say that their students use the same math books and materials, are not given a choice of math assignments to work on, and do not work at a variety of math activities and assignments at the same time. Finally, using a single item from the SCEM students say that almost everyone in the class does the same math work at the same time more often after the transition than before ($t[1787] = -9.94; p = .0001$).

Data from students and teachers confirm the predictions regarding a decrease in the opportunity for student cooperation/interaction. Students report that they are able to work together in small groups, choose partners for math work, help each other, and move around the classroom more frequently before than after they enter junior high school ($t[1787] = 7.92; p = .0001$). Similarly pre-transition teachers report more opportunities for cooperation among their students than do post-transition teachers ($F[1,253] = 17.25; p = .0001$). In addition, using a single item observers report that students are able to choose their partners for math work more frequently in pre-transition classrooms than in post-transition classrooms ($F[1,196] = 9.05; p = .003$).

It was hypothesized that there would be an increase in student competition, social comparison, and frequency of grading after the school transition. The data provide mixed support for this hypothesis. There are significant differences between students' pre- and post-transition reports of competition, but in a direction opposite to the one hypothesized ($t[1787] = 20.11; p < .0001$). Before the transition, more than after the transition, students say that some kids try to be the first one to answer questions and to be finished with their math work. In contrast, using observers' reports of competition, no differences between pre- and post-transition classrooms emerged. In this case, observer perceptions did not confirm student perceptions. Thus, no support was found for an increase in overt competition among students after the transition to junior high school.

The hypothesis that the use of social comparison would increase after the school transition was confirmed by students ($t[1787] = -4.38; p < .0001$). In particular, students say that they compare grades on their report cards more after than before the school transition. Similarly, using a single item post-transition teachers report that students ask them how they are doing in math compared to the other students more often than pre-transition teachers report ($F[1,251] = 7.79; p = .005$). Thus, there is support for the hypothesized increase in social comparative behavior among students.

Finally, contrary to the predictions, there were no significant pre- versus post-transition differences regarding teacher reports of the frequency of giving grades on math classwork and homework assignments.

Student/Teacher Relationship. The hypothesis that post-transition teachers are perceived as less friendly, supportive, and caring than pre-transition teachers was confirmed by both student and observer reports. Students say that the teachers they have for mathematics after the transition to junior high school care less about them, are less friendly, and grade them less fairly than the teachers they have the last year

of elementary school (Teacher−unfair/unfriendly)($t[1787] = -2.89$; $p = .004$). In contrast to the general effect, individual items in this scale indicate that students think their elementary teachers treat students differently and criticize them if they do poor work more often than their junior high school teachers. As predicted, observers perceive pre-transition teachers to be less critical and more supportive than most post-transition teachers (Teacher−unfair/unfriendly) ($F[1,192] = 11.42$; $p = .0009$). More specifically, observers report that post-transition teachers, more than pre-transition teachers, tell some students or the class as a whole that they may get a low grade in math and criticize students for turning in math work late. In addition, observers report that post-transition teachers are less warm and supportive and seem more pessimistic about students' ability to be self-disciplining than pre-transition teachers. In contrast, on the OCEM composite assessing teacher-informal relations with students, no differences between pre- and post-transition teachers were observed.

Teacher Valuing of Math. Although no specific predictions were made regarding teachers' valuing of math or teachers' efforts to provide students with intrinsic reasons for studying math, changes in these attitudes and practices could relate to a decline in students' attitudes toward math. In these data students report that their pre-transition teachers, more often than their post-transition teachers, tell them why math is important and try to make math interesting (Teacher−valuing of math) ($t[1787] = 9.86$; $p < .0001$). In addition, observers perceive that pre-transition teachers more than post-transition teachers emphasize intrinsic reasons for doing math (see the item in the teacher-informal relations with students composite) ($F[1,192] = 6.91$; $p < .03$).

DISCUSSION

This study provides evidence that when students move from elementary school to junior high school they are faced with a changing classroom environment in mathematics. The nature of the change is provocative. First, students are given fewer opportunities to make suggestions regarding what they will learn and how they will learn it. Based on the research literature that has examined the effects of student autonomy and decision-making one would predict that this change would have a negative impact on student motivation (e.g., deCharms, 1980; Epstein, 1981; Richter & Tjosvold, 1980). Such an effect may be especially marked at this stage of life since children are entering puberty and are expressing a desire for more control over their lives (Lee, 1979; Lee, Statuto, & Kedar-Voivodas, 1983). In another study with the same sample reported here, Midgley and Feldlaufer (1987) found that students wanted more decision-making power in classroom after the transition to junior high school and received less. Teachers confirmed this decline in decision-making opportunities.

Second, there is evidence that classrooms change in ways that seem to encourage the use of social comparison and ability self-assessment. The increase in whole

class task organization and the decrease in opportunities for cooperative interactions among students make it likely that students will be more aware of and concerned about how they are performing relative to others in the class (Eccles et al., 1984; Marshall & Weinstein, 1984; Nicholls, 1979; Rosenholtz & Simpson, 1984). The findings indicate, in fact, that the use of social comparison increases after students move to junior high school. This comes at a stage of life when children are becoming increasingly self-focused and self-conscious (Elkind & Bowen, 1979; Simmons, Rosenberg, & Rosenberg, 1973), and when they are developing a more differentiated concept of ability, so that they no longer equate ability and effort but come to understand the notion of ability as capacity (Nicholls, 1986). For children who do not perceive themselves as highly able, this combination could result in lower self-concept of ability and less motivation to achieve.

Finally, there is evidence of a change in the student/teacher relationship after the transition to junior high school. As predicted, post-transition teachers are characterized as less caring, warm, friendly, and supportive than pre-transition teachers. These characterizations come from trained observers as well as from students. Again, one would expect a negative impact of these changes on student motivation, and again, this comes at a time when young adolescents have a particular need for positive relationships with adults other than their parents (Miller, 1970). At the same time students say that their post-transition teachers use less differential treatment and are less critical when they do poor work than their pre-transition teachers. Evidence reported by Parsons et al. (1982) suggests that criticism for poor work, especially from a warm adult, may convey a message that the teacher has high expectations for students, and consequently facilitate motivation.

We suggest that there may be a development mismatch between early adolescents and the classrooms that are provided for them in the junior high school; a mismatch that makes these differences between pre- and post-transition classrooms particularly salient and debilitating to some students. As children move through early adolescence they are becoming more knowledgeable and skillful and are developing cognitively. They are able to use critical thinking to explore open-ended questions or moral dilemmas rather than dealing primarily with rote, right answer memorization. They develop a more differentiated ability concept, moving from equating ability and effort to perceiving ability or intellectual capacity as relatively stable (Nicholls, 1986). They typically express a desire for more control over their lives (Lee, 1979). At the same time children are experiencing changes associated with puberty. They become increasingly self-focused, self-conscious, and concerned about themselves in comparison to others (Elkind & Bowen, 1979; Simmons et al., 1973). Relationships with friends and extra parental adults become especially important (Miller, 1984). Does it make sense to put these developing children in a classroom environment that is less demanding cognitively, that promotes ability evaluation and social comparison, that decreases opportunities for student self-management and choice, and that is more formal and impersonal? We suggest that there is a developmental mismatch resulting from changes in the classroom environ-

ment that are at odds with physiological, psychological, and cognitive changes in the early adolescent.

Some researchers have suggested that the transition to junior high school has a negative impact on some students because it is difficult to negotiate two major life transitions (puberty and the move to junior high school) at the same time (Blyth et al., 1983; Petersen, in press). We believe that the present study provides evidence that the nature of the transition must be considered as well as the timing. Although two simultaneous difficult life transitions could result in unusual stress on the individual, the transition to junior high school need not be inevitably difficult or stressful. The transition to a facilitative educational environment, even at this vulnerable stage of life, could result in more positive self- and achievement-related beliefs. Unfortunately, the data reported here indicated that the transition to junior high school may often involve a transition to a less rather than more facilitative classroom environment. This could account for some of the subject matter specific declines in motivation noted by Eccles et al. (1983). Whether such classroom level changes also influence more global measures of self-esteem would be interesting to determine. Simmons and Blyth (1987) did not find evidence of general declines in self-esteem or global self-concept measures among students except in females. Why? It is possible that classroom level environmental characteristics will only affect motivational constructs linked to that subject area, making direct comparisons of this study to studies like Simmons and Blyth problematic. Alternatively, perhaps the schools in the Simmons and Blyth study were not characterized by the types of differences uncovered in this study. Since Simmons and Blyth did not measure the classroom environment, it is difficult to distinguish between these two possibilities. Clearly, what is needed are more careful and in depth descriptions of environmental changes at both the classroom and school level. These normative descriptions are a very important first step before precise research can be undertaken on the processes and outcomes of various environmental changes at early adolescence. Studies such as these, when coupled with longitudinal assessments of students' beliefs, have the potential for helping us understand changes in student motivation and interest over the school years.

Some of the hypotheses did not receive support. Students see their pre-transition classrooms as more competitive than their post-transition classrooms, while observer reports indicate no difference in competition. As students become more self-conscious (Elkind & Bowen, 1979; Simmons et al., 1973), they may also avoid overt competition. It could also be that students are more likely to compete with students they come to know well across academic and social domains, as in the typical elementary school self-contained classroom and are less likely to compete with students they see for a limited time each day in one subject matter area. In addition, there begins to be converging evidence that although students may anticipate that junior high school will be more competitive and require higher level skills and understanding than elementary school, they may find themselves in less exciting, less competitive, routinized classrooms where the completion of lower level

tasks such as memorization and filling in answers on a worksheet is the norm (Mergendoller, Marchman, Mitman, & Packer, 1988; Rounds & Osaki, 1982; Trebilco et al., 1977; Walberg, House, & Steele, 1973). This may be particularly true in mathematics, since seventh grade math is often a review of concepts introduced at the elementary level (e.g., Rounds, Ward, Mergendoller, & Tikunoff, 1982). It will be important in future transition studies to assess the variety, complexity, and novelty of the curriculum being offered.

Contrary to what was predicted, students do not receive grades on homework and classwork more frequently in junior high school than in elementary school. However, the criteria that teachers use for assigning grades may change, making grading more salient or more strict. There is consistent and compelling evidence that students, on the average, receive lower grades after the transition to junior high school than before (Felner, Primavera, & Cauce, 1981; Finger & Silverman, 1966; Kavrell & Petersen, 1984; Schulenberg et al., 1984; Simmons & Blyth, 1987; Simmons, Blyth, Van Cleave, & Bush, 1979). Further work needs to be undertaken to determine whether these differences reflect true changes in performance, differences in teacher standards, or both. If junior high school teachers are using a stricter standard than elementary school teachers to evaluates student performance, an additional important influence on student motivation in association with the transition may have been uncovered.

Having multiple sources of information about the classroom environment is a strength of this study. Being able to ask some different questions of each source provides a richer picture of math classrooms than would otherwise be possible. The assessments from students, teachers, and observers show similar patterns of change across the transition from elementary school to junior high school, thus substantiating each other. The degree of convergence among the three sources suggests that if one is unable to use multiple sources for gathering information about the classroom, student perceptions can be used even during this period of physiological change. It is interesting that both students and observers see fewer associations among classroom dimensions than do teachers. Teachers may be inclined to report more associations because they feel responsible for providing a coherent and consistent classroom environment.

Although not the subject of this paper, it will be important to consider why post-transition classrooms are different from pre-transition classrooms. Are elementary and junior high school teachers inherently different? Are there differences in training that would account for the classroom differences? Does the departmentalized organization at the junior high school make these differences inevitable? Does the teacher socialization process differ in the two institutions? More research is needed in order to understand the determinants of differences in the classroom environment before and after the transition from elementary school to junior high school and in order to make recommendations regarding the type of school and classroom environment that will facilitate early adolescent development.

REFERENCE

Anderson, C. J., & Walberg, H. J. (1976).*The assessment of learning environments: A manual for the Learning Environment Inventory and the My Class Inventory.* Chicago, IL: University of Illinois.

Blyth, D. A., Simmons, R. G., & Carlton-Ford, S. (1983). The adjustment of early adolescents to school transitions. *Journal of Early Adolescence, 3,* 105–120.

Brookover, W., Beady, C., Flood, P., Schweitzer, J. & Wisenbaker, J. (1979). *School social systems and student achievement: Schools can make a difference.* New York: Praeger.

Brush, L. (1980). *Encouraging girls in mathematics: The problem and the solution.* Cambridge, MA: Abt Books.

deCharms, R. (1980). The origins of competence and achievement motivation in personal causation. In L. J. Fyans, Jr. (Ed.), *Achievement motivation: Recent trends in theory and research* (pp. 22–33). New York: Plenum.

Eccles, J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75–146). San Francisco, CA: Freeman.

Eccles, J., & Midgley, C., (in press). Stage/environment fit: Developmentally appropriate classrooms for early adolescents. In R. E. Ames (Eds.), *Research on motivation in education, Vol. 3.* New York: Academic Press.

Eccles (Parsons), J., Midgley, C., & Adler, T. F. (1984). Grade-related changes in the school environment: Effects on achievement motivation, In J. G. Nicholls, (Ed.), *Advances in motivation and achievement,* (pp. 283–331). Greenwich, CT: JAI.

Elkind, D., & Bowen, R. (1979). Imaginary audience behavior in children and adolescents. *Developmental Psychology, 15,* 38–44.

Epstein, J. L. (1981). *The quality of school life.* Lexington, MA: Heath.

Epstein, J. L., & McPartland, J. M. (1976). The concept and measurement of the quality of school life. *American Educational Research Journal, 13,* 15–30.

Felner, R. D., Primavera, J., & Cauce, A. M. (1981). The impact of school transitions: A focus for preventive efforts. *American Journal of Community Psychology, 9,* 449–459.

Finger, J. A., & Silverman, M. (1966). Changes in academic performance in the junior high school. *Personnel and Guidance Journal, 45,* 157–164.

Fisher, D. L., & Fraser, B. J. (1983). A comparison of actual and perferred classroom environments as perceived by science teachers and students. *Journal of Research in Science Teaching, 20,* 55–61.

Fraser, B. J. (1982). Individualized classroom environment questionnaire handbook. Unpublished manuscript. Western Australian Institute of Technology.

Fraser, B. J., & O'Brien, P. (1985). Student and teacher perceptions of the environment of elementary school classrooms. *Elementary School Journal, 85,* 567–580.

Fraser, B. J., & Walberg, H. J. (1981) Psychosocial learning environments in science classrooms: A review of research. *Studies in Science Education, 8,* 67–92.

Gullickson, A. R. (1985). Student evaluation techniques and their relationship to grade and curriculum. *Journal of Educational Research, 79,* 96–100.

Harter, S., Whitesell, N. & Kowalski, P. (1988). The effects of educational transitions on children's perceptions of competence and motivational orientation. Manuscript submitted for publication.

Hawkins, J. A., & Berndt, T. J. (1985, April). *Adjustment following the transition to junior high school.* Paper presented at the biennial meeting of the Society for Research in Child Development, Toronto.

Hill, K. T., & Wigfield, A. (1984). Test anxiety: A major educational problem and what can be done about it. *Elementary School Journal, 85,* 105–126.

Kavrell, S. M., & Petersen, A. C. (1984). Patterns of achievement in early adolescence. In M. L. Maeher (Ed.), *Advances in motivation and achievement* (pp. 1–35). Greenwich, CT: JAI.

Lambert, M. J., Hatch, D. R., Kingston, M. D., & Edwards, B. C., (1986). Zung, Beck, and Hamilton Rating Scales as measures of treatment outcomes: A meta-analytic comparison. *Journal of Consulting and Clinical Psychology, 54,* 54–59.

Lee, P. (1979). *A developmental study of children's prerogatives and constraints in several domains of school experience.* Report to the National Institute of Education under Grant No. NIE-G-78-0033, Washington, DC.

Lee, P. Statuto, C., & Kedar-Voivodas, G. (1983). Elementary school children's perceptions of their actual and ideal school experience: A developmental study. *Journal of Educational Psychology, 75,* 838–847.

Marshall, H. H., & Weinstein, R. S. (1984). Classroom factors affecting students' self-evaluations: An interactional model. *Review of Educational Research, 54,* 301–325.

McPartland, J. M., & Epstein, J. L. (1974). *Measure of school openness (Teachers' survey).* Johns Hopkins University: Center for Social Organization of Schools, Baltimore, MD.

Mergendoller, J. R., Marchman, V. A., Mitman, A. L., & Packer, M. J. (1988). Task demands and accountability in middle-grade science classes. *Elementary School Journal, 88,* 252–265.

Midgley, C., & Feldlaufer, H. (1987). Students' and teachers' decision-making fit before and after the transition to junior high school. *Journal of Early Adolescence, 7,* 225–241.

Miller, D. (1970). Adolescents and the high school system. *Community Mental Health Journal, 6,* 483–491.

Moos, R. H. (1979). *Evaluating educational environments.* San Francisco, CA: Jossey-Bass.

Moos, R. H. (1980). Evaluating classroom learning environments. *Studies in Educational Evaluation, 6,* 239–252.

Nicholls, J. G. (1979). Quality and equality in intellectual development: The role of motivation in education. *American Psychologist, 34,* 1071–1084.

Nicholls, J. G. (1986, April). *Adolescents' concepts of ability and intelligence.* Paper presented at the annual meeting of the American Educational Research Association. San Francisco, CA.

Nielsen, A., & Gerber, D. (1979). Psychosocial aspects of truancy in early adolescence. *Adolescence, 14,*313–326.

Nottelmann, E. D. (1987). Competence and self-esteem during the transition from childhood to adolescence. *Developmental Psychology, 23,* 411–450.

Parson, J. E., Kaczala, C. M., & Meece, J. L. (1982). Socialization of achievement attitudes and beliefs: Classroom influences. *Child Development, 53,* 322–339.

Petersen, A. C. (in press). The nature of biological-psychosocial interactions: The sample case of early adolescence. In R. M. Lerner & T. T. Foch (Eds.), *Biological-psychological interactions in early adolescence: A life span perspective.* Hillsdale, NJ: Erlbaum.

Power, C. (1981). Changes in students' attitudes toward science in the transition between Australian elementary and secondary schools. *Journal of Research in Science Teaching, 18,* 33–39.

Richter, F. D., & Tjosvold, D. (1980). Effects of student participation in classroom decision making on attitudes, peer interaction, motivation, and learning. *Journal of Applied Psychology, 65,* 74–80.

Rosenholtz, S. J., & Simpson, C. (1984). The formation of ability conceptions: Developmental trend or social construction? *Review of Educational Research, 54,* 301–325.

Rounds, T. S., & Osaki, S. Y. (1982). *The social organization of classrooms: An analysis of sixth- and seventh-grade activity structures.* (Report EPSSP-82-5). San Francisco, CA: Far West Laboratory.

Rounds, T. S., Ward, B. A., Mergendoller, J. R., & Tikunoff, W. J. (1982). *Junior high school transition study: Elementary school - junior high school comparison.* (Report EPSSP-82-3). San Francisco, CA: Far West Laboratory.

Schulenberg, J. E., Asp, C. E., & Petersen, A. C. (1984). School from the young adolescent's perspective: A descriptive report. *Journal of Early Adolescence, 4,* 107–130.

Sharelson, R. J. (1981). *Statistical reasoning for the behavioral sciences.* Boston: Allyn & Bacon.

Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence: The impact of pubertal change and school context.* Hawthorn, NY: Aldine.

Simmons, R. G., Blyth, D. A., Van Cleave, E. F., & Bush, D. (1970). Entry into early adolescence: The impact of school structure, puberty, and early dating on self-esteem. *American Sociological Review, 44,* 948–967.

Simmons, R. G., Rosenberg, F., & Rosenberg, M. (1973). Disturbance in the self-image at adolescence. *American Sociological Review, 38,* 553–568.

Traub, R. E., Weiss, J., Fisher, C. W., & Musella, D. (1972) Closure on openness: Describing and quantifying open education. *Interchange, 3,* (213), 69–84.

Trebilco, G. R., Atkinson, E. P., & Atkinson, J. M. (1977, November). *The transition of students from primary to secondary school.* Paper presented at the annual conference of the Australian Association for Research in Education, Canberra.

Walberg, H. J., House, E. R., & Steele, J. M. (1973). Grade level, cognition, and affect: A cross-section of classroom perceptions. *Journal of Educational Psychology, 64,* 142–146.

Ward, B. A., Mergendoller, J. R., & Tikunoff, W. J. (1982). Introduction to the Junior High School Transition Study. *Journal of Early Adolescence, 4,* 311–317.

Wigfield, A. (1984, April). *Relationships between ability perceptions, other achievement-related beliefs, and school performance.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

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