

Motivation in the Classroom: Reciprocal Effects of Teacher Behavior and Student Engagement Across the School Year

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On the basis of a new model of motivation, we examined the effects of 3 dimensions of teacher ($n = 14$) behavior (involvement, structure, and autonomy support) on 144 children's (Grades 3-5) behavioral and emotional engagement across a school year. Correlational and path analyses revealed that teacher involvement was central to children's experiences in the classroom and that teacher provision of both autonomy support and optimal structure predicted children's motivation across the school year. Reciprocal effects of student motivation on teacher behavior were also found. Students who showed higher initial behavioral engagement received subsequently more of all 3 teacher behaviors. These findings suggest that students who are behaviorally disengaged receive teacher responses that should further undermine their motivation. The importance of the student-teacher relationship, especially interpersonal involvement, in optimizing student motivation is highlighted.

What are the factors that motivate children to learn? Educators and parents value motivation in school for its own sake as well as for its long-term contribution to children's learning and self-esteem. Highly motivated children are easy to identify: They are enthusiastic, interested, involved, and curious; they try hard and persist; and they actively cope with challenges and setbacks. These are the children who should stay in school longer, learn more, feel better about themselves, and continue their education after high school. Recent research has borne this out (Ames & Ames, 1984, 1985; Pintrich, 1991; Stipek, 1988).

Although motivated students are easy to recognize, they are difficult to find. Research shows that across the preschool to high school years, children's intrinsic motivation decreases and they feel increasingly alienated from learning (Harter, 1981). Why is it so difficult to optimize student motivation? Decades of psychological and educational research

have investigated the factors that promote and undermine motivation (for reviews see, Ames & Ames, 1985; Brophy, 1986; Dweck & Elliot, 1983; see also special issues, Pintrich, 1991; Schunk, 1990). Such research has provided a wealth of details about the psychological and social antecedents of motivation in the classroom.

In general, psychological research has focused on individual intrapsychic influences on motivation, such as attributions (Weiner, 1986), self-efficacy (Schunk, 1991), perceived ability (McIver, Stipek, & Daniels, 1991), perceived control and competence (Chapman, Skinner, & Baltes, 1990; Weisz & Cameron, 1985), self-concept (Wigfield & Karpathian, 1991), intrinsic motivation (Corno & Rohrkemper, 1985; Deci & Ryan, 1985), interest (Schiefele, 1991), learning strategies (Pintrich & De Groot, 1990), and goal orientations (Ames & Ames, 1984; Dweck & Elliot, 1983; Nicholls, 1984). In fact, Weiner (1990), in his review of the history of motivational research in education, summarized current motivational theories by pointing out that dominant perspectives are "varieties of cognitive approaches to motivation; the main theories today are based on the interrelated cognitions of causal ascriptions, efficacy and control beliefs, helplessness, and thoughts about the goals for which one is striving" (p. 620). This research is informative about the profile of student beliefs and attitudes that predict motivation.

In contrast to psychological research, educational research has focused on the teacher behaviors that should be effective in promoting student motivation. A wide array of teacher behaviors have been suggested. For example, in his review, Brophy (1986) included guidance, modeling, enthusiasm, provision of choice, sincere praise, reinforcement, and curiosity-, dissonance-, and interest-induction. A comprehensive model suggested by Keller (1983) includes four basic strategies: attention focusing, relevance, confidence building, and satisfaction.

Taken together, these discussions in psychology and education provide complementary perspectives on the links between teacher behavior and student motivation. The educational literature serves as a guide for discerning the actual

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This research was supported by a Faculty Scholars Award from the W. T. Grant Foundation, by Research Grant HD19914 from the National Institute of Child Health and Human Development, and by Training Grant 527594 from the National Institute of Mental Health.

We express our thanks to the students, teachers, parents, administrators, and staff of the school district in which this research project was conducted. Their cooperation, support, and cheerfulness made carrying out this research a pleasure. We also acknowledge the contributions of the other members of the Motivation Research Group: James P. Connell, Edward L. Deci, and Richard M. Ryan. The work of the research team for this project is recognized: Jeff Altman, Jennifer Herman, Thomas Kindermann, Michael Lynch, Cynthia Mellor-Crummey, Marianne Miserandino, Brian Patrick, Cara Regan, James Wellborn, and Peter Usinger.

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classroom practices that influence students' attitudes and beliefs, and the psychological literature explains how these beliefs influence student engagement in the classroom. Hence, a perspective on motivation is emerging at the intersection of the psychological and educational literatures. In this approach, research about classroom practices proceeds deductively from a strong theoretical and empirical position about the specific intrapsychic influences on student motivation to an analysis of the variety of classroom practices that have been found to influence these student attitudes and beliefs. Examples of this approach can be found in the research on intrinsic motivation, in which researchers have tested hypotheses about the aspects of classroom practice that influence children's goal orientations and hence the quality of their motivation (Ames, 1987, 1989; Deci, Connell, & Ryan, 1985; Maehr & Midgley, 1991). In a parallel vein, attributional theorists have focused on the specific teacher behaviors, such as unsolicited help, that lead children to make inferences about their abilities and efforts (Good & Tom, 1985; Graham & Barker, 1990). These new strands of research result in detailed knowledge about the kinds of instructional practices and interpersonal relationships that support student motivation and at the same time specify the mechanisms by which teachers influence students.

The present study is nested within a larger motivational model that was also constructed at the interface of the psychological and educational literatures (Connell, 1990; Connell & Wellborn, 1991; Deci & Ryan, 1985). This model has as its cornerstone the notion that the source of motivation is internal to the child, so that when the social surround provides for children's basic psychological needs, motivation will flourish. According to this model, the power of specific teacher behaviors (such as those described in the educational literature) would be derived from their effectiveness in providing for students' basic needs. The extent to which children's basic psychological needs are met or ignored in the school context is reflected in their self-system processes (attitudes and beliefs about the self). Consistent with psychological theories and research, this model posits that these self-appraisals are the proximal predictors of student motivation. This model of motivation has been used to identify the components of student engagement in the classroom and to derive relevant dimensions of teacher behavior (Connell & Wellborn, 1991). In the current study, we empirically examined the effects of teacher behavior on student engagement over the course of a school year. Of special interest were reciprocal influences, that is, the effects of student motivation on teacher behavior in the classroom (Newby, 1991).

Student Engagement

The target motivational outcome was student engagement versus disaffection with learning activities in the classroom. Engagement versus disaffection in school refers to the intensity and emotional quality of children's involvement in initiating and carrying out learning activities (Connell & Wellborn, 1991; Skinner, 1991). *Engagement* includes both behavioral and emotional components. Children who are en-

gaged show sustained behavioral involvement in learning activities accompanied by positive emotional tone. They select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration in the implementation of learning tasks; they show generally positive emotions during ongoing action, including enthusiasm, optimism, curiosity, and interest. The opposite of engagement is *disaffection*. Disaffected children are passive, do not try hard, and give up easily in the face of challenges. Disaffected children can be bored, depressed, anxious, or even angry about their presence in the classroom; they can be withdrawn from learning opportunities or even rebellious toward teachers and classmates. Engagement versus disaffection encompasses the typical behavioral and emotional constructs from most theories of achievement, intrinsic, and "effectance" (White, 1959) motivation. Such *motivational engagement* can be contrasted with the construct *cognitive engagement*, which refers to the level of thinking skills used by students (Blumenfeld, Puro, & Mergendoller, 1992; Corno & Rohrkemper, 1985).

It should be noted that a key issue for educators has been whether being motivated in school is enough. Educators have plausibly wondered whether it is likely that students who feel good about being in school may nevertheless fail to learn anything. According to our model, children who are engaged in ongoing learning activities should not only feel pride and satisfaction in their accomplishments but should also increase their actual competencies. Our own research shows that children who are more engaged in school do in fact earn higher grades, score higher on standardized tests of achievement, and show better personal adjustment to school (Skinner, Wellborn, & Connell, 1990). For example, in a study of 220 students in Grades 3–6, the correlation between teacher ratings of children's engagement versus disaffection and students' grades (awarded by other teachers) and achievement test scores was .55 and .40, respectively ($p < .001$).

Model of Motivation

As mentioned briefly before, our model holds that student engagement is optimized when the social context fulfills children's basic psychological needs (Connell & Wellborn, 1991). According to this perspective, these needs include the needs to be competent, autonomous, and related to other people. On the basis of these needs, dimensions of teacher behavior that should foster the fulfillment of the basic psychological needs of children can be derived.

First, the model specifies that children's need for competence is fostered when they experience their classrooms as optimal in structure. *Structure* refers to the amount of information in the context about how to effectively achieve desired outcomes; its opposite is chaos. Teachers can provide structure by clearly communicating their expectations, by responding consistently, predictably, and contingently, by offering instrumental help and support, and by adjusting teaching strategies to the level of the child. Empirical support for this proposition is derived from research on the antecedents of perceived control (broadly defined), including locus of

control, learned helplessness, self-efficacy, and attributional style (for a review, see Schunk, 1991; Skinner, 1991).

Second, children's need for autonomy in learning is promoted when they experience autonomy support. *Autonomy support* refers to the amount of freedom a child is given to determine his or her own behavior; the opposite of being supported is being coerced. Teachers can support autonomy by allowing children latitude in their learning activities and by providing connections between school activities and children's interests. Especially important in fostering autonomy is the absence of external rewards, controls, and pressures. Most of the components of autonomy support have been thoroughly studied by researchers interested in intrinsic motivation and the reward structures that undermine it (for reviews, see Deci & Ryan, 1985; Grolnick, Ryan, & Deci, 1989; Lepper & Green, 1975; Ryan, 1982; Ryan, Connell, & Deci, 1985).

The final category of teacher behavior, derived from children's need for relatedness, is involvement. Although involvement has been little studied in the achievement domain, researchers have suggested that children's needs for belongingness (Weiner, 1990), or their connectedness to a community of learners, may represent a fundamental motivator for children (Connell & Wellborn, 1991; Deci, et al., 1985). *Involvement* refers to the quality of the interpersonal relationship with teachers and peers; its opposite is rejection or neglect. Teachers are involved with their students to the extent that they take time for, express affection toward, enjoy interactions with, are attuned to, and dedicate resources to their students. Involvement has been the focus of research conducted within many socialization traditions, but especially within attachment theories (for a review, see Ainsworth, 1989; see Connell & Wellborn, 1991).

A key issue is the relationship among these dimensions of teacher behavior: Does too much structure lead to the experience of a rigid, coercive classroom that is devoid of autonomy support? Does too much autonomy support lead a student to feel abandoned, neglected, and longing for more teacher involvement? Our current position is that these three dimensions are conceptually independent and that it is possible to construct contexts that are high or low on any combination of dimensions. For example, teachers can provide high structure (clear information) that either is combined with a great deal of freedom (high autonomy support) or is very coercive (low autonomy support). It is, of course, an empirical question to determine the most common configurations in classrooms.

Not coincidentally, the major classes of teacher behavior identified by this model appear in educational descriptions of motivation-enhancing classrooms. For example, in an attempt to summarize the educational literature on motivation, Brophy (1983a) described as influential "sincerity of praise," which we include in the concept of involvement; "provision of guidance," which maps onto our structure construct; and "choice," which we include under autonomy support. The convergence between specific teacher behaviors is encouraging. We also argue that a strength of the present model is its provision of a theoretical frame that can be used to organize teacher behaviors into higher order

categories and to explain the mechanisms by which they should influence student motivation. The entire model is summarized in Figure 1.

Goals of the Study

A study was conducted across the school year to investigate the time-lagged relations among the three dimensions of teacher behavior (involvement, structure, and autonomy support) and children's active engagement in the classroom (behavior and emotion). In addition, the reciprocal relationship between children's engagement and teacher behavior was examined. A key proposition of the study was that both student and teacher behavior in the classroom would be mediated by their perceptions. The role of student and teacher expectations in the prediction of behavior is well documented in educational and social psychological literature (Brophy, 1983b; Jussim, 1989).

We tested a model that included (a) students' and teachers' perceptions of teachers' interactions with individual children and (b) children's engagement in the classroom measured in fall and spring of the same school year. The model posited that the relationship between teacher behavior and children's engagement was mediated by children's perceptions of teacher behavior toward the child. Children would be engaged to the extent that they felt their needs had been met by teachers' provision of involvement, structure, and autonomy support.

In addition, the model posited that the reciprocal relationship, namely, from student engagement to teacher behavior, would be mediated by teachers' perceptions of student motivation. That is, teachers would be likely to modify their behavior toward individual children on the basis of their perceptions of the students' behavioral and emotional engagement. Two kinds of reciprocal relations were possible (Kindermann & Skinner, 1991). On the one hand, teachers could *compensate* for student's lagging motivation: Teachers could respond to children who are relatively less engaged by increasing involvement, structure, or autonomy support. On the other hand, teachers could respond to children in ways that would *magnify* children's initial motivation: Teachers could respond to children who are passive and show negative emotion by being less involved, structured, or autonomy supportive. Data from fall and spring of the same school year were used to test each link in the proposed model.

Method

Subjects and Design

Participants in the study were 144 children, equally divided by sex and grade (Grades 3, 4, and 5), and their 14 female teachers from a rural-suburban school district in upstate New York. Children ranged in age from 7.99 years to 11.99 years (for Grade 3, $M = 8.74$ years, $SD = 0.41$ years; for Grade 4 $M = 9.72$ years, $SD = 0.44$ years; and for Grade 5, $M = 10.74$ years, $SD = 0.45$ years). Students' socioeconomic status was lower middle to middle class (measured by parents' occupation and educational attainment), and

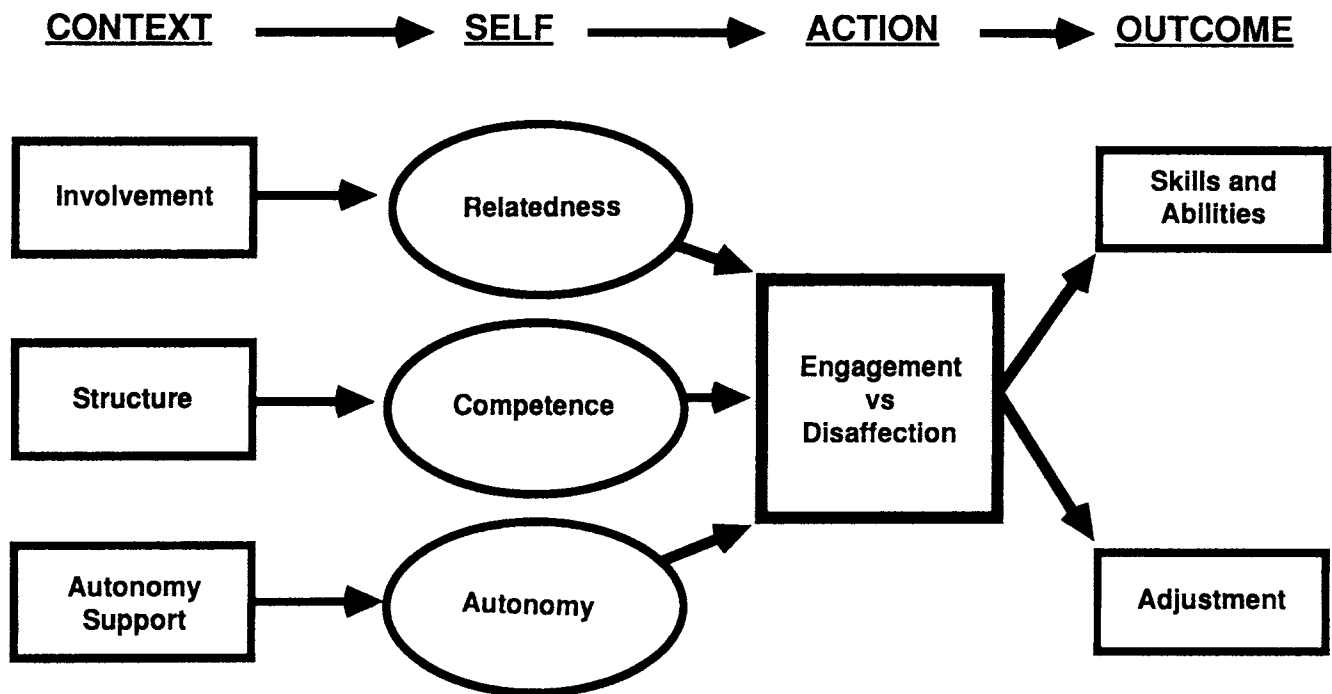


Figure 1. A motivational model of the effects of children's psychological needs on their engagement. (From "Competence, Autonomy, and Relatedness: A Motivational Analysis of Self-System Processes" [p. 51] by J. P. Connell and J. G. Wellborn, 1991, in M. R. Gunnar and L. A. Sroufe [Eds.], *Self Processes in Development: Minnesota Symposium on Child Psychology* [Vol. 23]. Hillsdale, NJ: Erlbaum. Copyright 1991 by Erlbaum. Adapted by permission.)

94% of the students were Caucasian, the remaining 6% were predominantly African-American. As part of a district-wide assessment, teachers and students completed questionnaires in both the fall (October) and the spring (April) of the 1988–1989 school year. Questionnaires were administered to students by trained interviewers during three 40-min sessions in their normal classrooms; all items were read aloud by one interviewer, and a second interviewer monitored understanding and answered individual questions. In general, teachers completed their questionnaires while the students were being tested.

Measures

Teacher involvement, structure, and autonomy support. Teacher context was assessed through teachers' reports of their interactions with each child in their classrooms (Wellborn, Connell, Skinner, & Pierson, 1988). Student perceptions of teacher context was assessed with individual child reports of their interactions with their teachers (Belmont, Skinner, Wellborn, & Connell, 1988). Items for the two reporters were constructed to be as parallel as possible and taking into consideration the difference between teacher and student vocabularies and the fact that children's scales sometimes needed more items to reach a satisfactory level of internal consistency. For all subscales except coercive behavior, both positive and negative items were included. All items were answered by using a 4-point answer format (*not at all true, not very true, sort of true, very true*). All summary scores were calculated by averaging the items within a scale (with negative items reverse coded), so all scale scores range from 1 to 4, with 4 indicating more positive teacher behavior.

Teacher involvement included items that tapped teachers' affection (liking, appreciation, and enjoyment of the student), attunement (understanding, sympathy, and knowledge about the student), dedication of resources (aid, time, and energy), and dependability (availability in case of need). Teacher reports consisted of 11 items, $\alpha = .83$, (e.g., "I enjoy the time I spend with this student"). Student perceptions included 8 items, $\alpha = .79$, (e.g., "My teacher doesn't know the real me"). Structure included items that tapped teacher clarity of expectations, contingency (consistency and predictability of response), instrumental help and support, and adjustment of teaching strategies. Teacher reports included 9 items, $\alpha = .70$, (e.g., "I change the rules about schoolwork for this student"). Student perceptions consisted of 28 items, $\alpha = .84$, (e.g., "I know what my teacher expects of me in class"). Autonomy Support included items that tapped teacher coercive behavior (control through force or authority; reverse coded), respect (acknowledging the importance of students opinions, feelings, and agendas), choice (encouraging students to follow their own interests or providing options), and relevance (providing a rationale for learning activities). Teacher reports consisted of 13 items, $\alpha = .90$, (e.g., "I let this student do classwork at his/her own pace"). Student perceptions included 25 items, $\alpha = .84$, (e.g., "My teacher tries to control everything I do").

Student engagement. Student engagement was assessed with children's reports of their behavior and emotion in the classroom. Teacher perception of student engagement was measured with teachers' reports of individual children's behavior and emotion in their classrooms (Wellborn, 1991). All items were answered in a 4-point answer format (*not at all true, not very true, sort of true, very true*). Again, each scale contained both positive and negative items, and as much as possible, items were constructed to be parallel across reporters. All summary scores were calculated by averaging

the items within a scale (after reverse coding negative items), so all scale scores range from 1 to 4, with 4 indicating more active behavioral or more positive emotional engagement.

Behavioral engagement items tapped students' effort, attention, and persistence during the initiation and execution of learning activities. Teacher perceptions consisted of 38 items, $\alpha = .88$ (e.g., "When faced with a difficult problem, this student doesn't even try"). Student reports included 29 items, $\alpha = .81$, (e.g., "When I'm in class, I usually think about other things"). Emotional engagement items tapped four kinds of emotional reactions in the classroom: interest (vs. boredom), happiness (vs. sadness), anxiety, and anger. Teacher perceptions included 24 items, $\alpha = .86$, (e.g., "In my class, this student appears worried"). Student reports consisted of 36 items, $\alpha = .79$, (e.g., "When I'm in class, I feel happy").

Results

The primary analyses focused on testing each link in the model of reciprocal relations between teacher behavior and student engagement, using to correlational and path analyses of the fall and spring data. Preliminary to these analyses, descriptive statistics were examined to determine the range and stability of each variable, as well as the concurrent relations between teacher behavior and student engagement.

Initial Analyses

For each scale score, Table 1 summarizes the mean and standard deviation at each time of measurement as well as the mean level difference and correlation between the two times of measurement. In general, stability coefficients for all the variables between fall and spring were high (average $r = .66$, range = .55 to .79). Stability also predominated for mean

level differences from fall to spring. Differences detected were relatively small; significant differences ranged from .08 to .11 on a 4-point scale. These highly stable constructs may make it difficult to detect predictors of change across the school year.

At both times of measurement, teachers and students reported high levels of teacher structure, with relatively less involvement, and even less autonomy support (for teacher reports, involvement vs. structure: fall $t = 4.68$, spring $t = 6.30$; structure vs. autonomy support: fall $t = 11.07$, spring $t = 13.35$; involvement vs. autonomy support: fall $t = 9.11$, spring $t = 9.59$, all $ps < .0001$; for students perceptions, structure vs. involvement: fall $t = 2.49$, spring $t = 3.92$; structure vs. autonomy support: fall $t = 11.63$, spring $t = 11.25$; autonomy support vs. involvement: fall $t = 6.71$, spring $t = 5.13$, all $ps < .0001$). This is not a surprising finding because teachers are trained to provide structure, whereas involvement is discretionary, and the support of autonomy is a relatively foreign notion to most teachers (deCharms, 1976). As can also be seen in Table 1, student engagement, as reported by both students and teachers, was high in both the fall and the spring of the school year.

Intraconstruct correlations. To examine the coherence within the components of teacher behavior and student engagement, the intraconstruct correlations were calculated for each reporter at each time of measurement. Students' perceptions of teachers' behaviors were not very differentiated across the components of involvement, structure, and autonomy support (range = .77 to .81, all $ps < .001$). Teachers' reports of their own behaviors were more differentiated (range = .27 to .65, all $ps < .01$). In addition, both teacher

Table 1
Descriptive Statistics for the Components of Teacher Context and Student Engagement

Variable	Fall		Spring		Fall and spring	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>r</i>	<i>t</i>
Teacher context						
Teacher report						
Structure	3.56	0.40	3.66	0.36	.67***	3.76***
Autonomy support	3.04	0.55	3.08	0.54	.79***	1.48
Involvement	3.37	0.41	3.41	0.41	.72***	1.91
Student perceptions						
Structure	3.17	0.45	3.11	0.53	.65***	-1.70
Autonomy support	2.86	0.53	2.79	0.56	.60***	-1.71
Involvement	3.09	0.63	2.98	0.71	.55***	-2.11*
Student engagement						
Student report						
Behavior	3.26	0.47	3.18	0.50	.72***	-2.66**
Emotion	3.15	0.54	3.14	0.54	.59***	-0.21
Teacher perceptions						
Behavior	3.12	0.68	3.22	0.72	.73***	2.14*
Emotion	3.48	0.48	3.59	0.48	.62***	3.09**

Note. $n = 144$ children, Grades 3–4, and $n = 14$ teachers. All scores could range from *not at all true* (1) to *very true* (4), with higher scores indicating more positive teacher behavior or higher student engagement, respectively.

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

Table 2
Concurrent Correlations Between Student and Teacher Reports of Teacher Context

Teacher context	Teacher reports					
	Involvement		Structure		Autonomy support	
	Fall	Spring	Fall	Spring	Fall	Spring
Student perceptions						
Involvement	.13	.23**	.01	-.01	.02	.10
Structure	.22**	.21**	.02	-.01	.11	.09
Autonomy Support	.12	.23**	.05	.01	.07	.20*

Note. $n = 144$ children, Grades 3–5, and $n = 14$ teachers. Correlations in boldface indicate corresponding constructs.

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

and student reports of student engagement showed high positive correlations between student behavior and emotion (teachers: .72 in fall and .76 in spring; students: .68 in fall and .71 in spring, all $ps < .001$).

Student and teacher reports. The comparison between teacher and student perceptions proved instructive. Concurrent correlations calculated between teacher and student reports revealed that, although teachers and students did not initially agree on their perceptions of teacher behavior (see Table 2), by spring, both teacher involvement and autonomy support were significantly, although modestly, correlated across reporters. However, teacher report of involvement was the highest correlate of student perceptions of all three teacher behaviors. When examining the correspondence across reporter for student engagement (see Table 3), the correlations were significant for student behavior but were lower for emotion. In fact, children's reports of their emotional engagement were more closely related to teacher perceptions of children's behaviors than to teachers' reports of student's emotions.

Concurrent relations between teacher behavior and student engagement. The correlations between teacher behavior and student engagement were examined separately for fall and spring (Table 4). Within reporter, all three aspects of teacher behavior were related to concurrent measures of students' behavioral and emotional engagement at both times of measurement. Intrateacher correlations ranged from .25 to .75; relations were consistently lower for the structure component of teacher behavior (average correlation for structure was .28, compared with .65 and .55 for involvement and autonomy support, respectively) and for student emotional engagement. For students, correlations were generally higher (range = .52 to .67) and more homogeneous across components of teacher behavior and student engagement.

These correlations can be interpreted as support for the notion that teacher behavior in the classroom is connected to student engagement. As noted previously, still at issue is (a) whether this connection represents an influence of teacher behavior on student engagement, of student engagement on teacher behavior, or both; (b) the direction of reciprocal effects, compensatory or "magnificatory" (Kindermann & Skinner, 1991); and (c) the mechanisms through which these reciprocal influences are mediated.

Fall-to-Spring Analyses

Of greatest interest were the time-lagged relations between teacher behavior and student engagement. These were examined in two steps. First, for descriptive purposes we examined each link in the proposed model separately, using time-lagged zero-order correlations. Second, to test the proposed model, we conducted a time-lagged path analysis (Figure 2). For the latter analyses, path-analytic techniques were combined with the time-lag data, so that in each step of the path analysis, the dependent variable was the target construct assessed in spring, and the independent variables were all those constructs that preceded the target construct in the model measured in the fall. All direct (unpredicted) links were also tested. For example, in the first step, student perceptions of teacher involvement in the spring was predicted from teacher report of involvement, structure, and autonomy support in the fall. In the second step, student behavior in the spring was regressed on teacher and student reports of all three teacher context components from the fall.

Teacher behavior to student perceptions of teacher behavior. The time-lagged correlations from the components of teacher context in fall to students' perceptions of teacher context in spring (Table 5), as well as the path analysis, showed that the only consistent predictor of student perceptions was teacher involvement. In other words, children whose teachers were highly involved with them, experienced their teachers not only as merely involved, but also as more structured and autonomy supportive. Conversely, students with whom teachers were less involved, perceived their

Table 3
Concurrent Correlations Between Student and Teacher Reports of Student Engagement

Student engagement	Teacher perceptions			
	Behavior		Emotion	
	Fall	Spring	Fall	Spring
Student reports				
Behavior	.31**	.35***	.29***	.17*
Emotion	.22**	.21**	.21**	.08

Note. $n = 144$ children, Grades 3–5, and $n = 14$ teachers. Correlations in boldface indicate corresponding constructs.

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

teachers not only as less involved but also as relatively more chaotic and coercive. This finding highlights the centrality of teacher warmth and affection to children's classroom experiences.

Teacher behavior to student engagement. The time-lagged correlations depicting the link from children's perceptions of teacher context to student report of engagement (Table 6) revealed strong relations from all aspects of students' classroom perceptions in fall to student engagement in spring. According to the path analyses, the unique predictors to students' behavioral engagement were students' perceptions of teacher structure, and the unique predictors of emotional engagement were their perceptions of teacher involvement. In addition, an unpredicted direct link was found to student behavioral engagement: teachers' reports of their involvement. Involvement had an effect on students' behavioral engagement over and above its effects through student perceptions.

Student engagement to teacher perceptions of student engagement. The time-lagged correlations of student report of engagement in fall with teacher perception of student engagement in spring showed a modest significant relation (Table 5). However, in the path analysis, the data were not consistent with a causal link between student and teacher reports of engagement. The standardized regression coefficients from student to teacher engagement (both behavioral and emotional) did not even approach significance. However, teachers' perceptions of student engagement in spring were predicted directly by teacher reports of their behaviors in the fall. Both student behavior and emotion were predicted by teacher involvement and autonomy support.

Teacher perceptions of engagement to teacher behavior. The connections from student engagement to teacher subsequent behavior were influenced primarily by student behavioral engagement, which uniquely predicted subsequent teacher involvement, autonomy support, and (less strongly) structure (Table 6). These relations were positive, indicating that children who were more behaviorally engaged subsequently received more contextual supports, whereas children who were less motivated were (a) relatively more neglected and coerced and (b) treated with less consistency and contingency.

The correlations from student emotion in the fall to teacher behavior in the spring also showed positive links from emotion to teacher involvement and autonomy support, which indicates that children who show more interest and enthusiasm in the classroom also receive more subsequent attention and freedom from teachers. The path analysis, in contrast, revealed that the unique effect of student emotion on subsequent teacher autonomy support was negative, which suggests that teachers attempted to compensate for children's negative emotional engagement. This suppressor effect suggests that, controlling for behavioral engagement, teachers responded to children who expressed more negative emotions (anxiety, boredom, anger, and depression) by allowing them more choices and encouraging them to follow their own interests (autonomy support).

Discussion

Summary of the Findings

Strong empirical support was found for a reciprocal relationship between teachers' behavior and students' engagement in the classroom. Teachers' interactions with students predicted students' behavioral and emotional engagement in the classroom, both directly and through their effects on students' perceptions of their interactions with teachers.

Teacher behavior influences students' perceptions of their interactions with teachers. Teachers' involvement with individual students had the most powerful impact on children's perceptions of the teacher. These findings indicate that teachers' liking for students is communicated to children and has pervasive effects on the way in which students experience their interactions with teachers. The affection, attunement, dedication of resources, and dependability expressed by the teacher shape the extent to which children feel that their needs are met, not only for relatedness but also for competence and self-determination. When teachers are less involved with students, students not only miss the involvement but also experience teachers as less consistent and more coercive. This relative lack of involvement must be viewed in the context of the overall high levels of involvement reported by teachers and perceived by students. Nevertheless, even in

Table 4
Concurrent Correlations Between Teacher Context and Student Engagement

	Teacher context											
	Teacher report						Student perceptions					
	Involvement		Structure		Autonomy support		Involvement		Structure		Autonomy support	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Student engagement												
Teacher perception												
Behavior	.75***	.67***	.30***	.25**	.72***	.64***	.12	.28***	.23**	.30***	.17*	.33***
Emotion	.58***	.59***	.31***	.25**	.39***	.46***	.14	.19*	.24**	.15	.20**	.21**
Student report												
Behavior	.26**	.23**	-.02	-.01	.20**	.23**	.65***	.60***	.67***	.59***	.60***	.59***
Emotion	.15	.11	.03	.04	.07	.10	.61***	.61***	.65***	.54***	.58***	.52***

Note. $n = 144$ children, Grades 3–5, and $n = 14$ teachers.

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

Table 5
Time-Lagged Correlations From Fall to Spring:
Predicting Teacher Behavior in Spring

Fall	Teacher behavior: spring		
	Involvement	Structure	Autonomy support
Teacher behavior	Student perception		
teacher report			
Involvement	.22***	.22***	.24***
Structure	-.01	-.01	.01
Autonomy support	.10	.09	.13
Student engagement	Teacher report		
teacher perception			
Behavior	.56***	.23***	.56***
Emotion	.36**	.11	.21**

Note. $n = 144$ children, Grades 3–5, and $n = 14$ teachers.

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

the context of generally high and relatively stable involvement, variations in teachers' involvement with children seems to be the most salient feature of student-teacher interactions at this age.

Teacher behavior influences student engagement. Children's engagement in learning activities is influenced both by their perceptions of teachers and directly by teachers' actual behaviors. Children's behavioral engagement (student report) is primarily a function of student perceptions of teacher structure. In other words, children who experience their teachers as providing clear expectations, contingent responses, and strategic help are more likely to be more effortful and persistent. Emotional engagement (student report) is predicted by teacher involvement; when children experience teachers as warm and affectionate, children feel happier and more enthusiastic in class. Teacher perceptions of both behavioral and emotional engagement are influenced uniquely by teacher involvement and autonomy support (teacher report).

Future studies that include assessments of self-system processes should be useful in explaining the effects of the dimensions of teacher behavior (Connell & Wellborn, 1991). For example, research suggests that contingencies and expectations (structure) have their effect on student engagement by influencing children's perceptions of control. In addition, the clear pattern of unique effects from involvement to student emotion might be explained by theories of attachment (Ainsworth, 1989). Teacher involvement may influence students' working models of their relationships with teachers. Children with secure working models may, in turn, feel happier in class; in contrast, children with insecure working models may be more anxious and depressed in classroom activities. (See Connell & Wellborn, 1991; Deci & Ryan, 1985; and Skinner et al., 1990, for empirical tests of the links from context to self to engagement.)

Student engagement influences teacher behavior. An important direction of influence runs from student engagement to subsequent teacher behavior. Teachers' perceptions of student emotional and behavioral engagement predict teachers' interactions with students across the school year. Strong support was found for reciprocal effects that are mag-

nificatory, in which positive student engagement elicits positive teacher behaviors. Teachers respond to children who have initially high behavioral engagement with more involvement, more autonomy support, and even to a degree, more contingency and consistency, and they respond to children who are more passive with correspondingly more neglect, coercion, and even inconsistency. Because these supports have an impact on children's subsequent engagement, this means that children who have high behavioral engagement are treated in a way that is likely to increase their active participation in class, whereas teachers deal with children who have lower behavioral engagement in a way that will exacerbate their initial passivity and withdrawal from learning activities. These cycles underline the urgency of intervening into existing patterns of interactions between students and teachers.

In addition, we found some suggestions that teachers attempt to compensate for children's negative emotional engagement. One interpretation of the suppressor effect is that, for children who are already highly engaged behaviorally, negative emotions lead to increases in teacher autonomy support (Patrick, Skinner, & Connell, 1993). Because we know that these teacher behaviors have a positive effect on subsequent student engagement, teachers' natural reactions to children's emotions can help to ameliorate their initial negativity. This finding should be considered with caution pending replication.

Why do teachers respond more negatively to lack of behavioral engagement? Recent laboratory studies have provided insights into these dynamics (see Deci & Ryan, 1985, for a review). First, student passivity is aversive. It may make a teacher feel incompetent or unlike by the student. As a result, teachers might like students less and so prefer to spend less time with the student (increased neglect). In addition, passivity can be interpreted as lack of internal motivation, which leads teachers to apply external pressure to participate in classroom activities (increased coercion). It should be noted that these reactions to student passivity are natural and are elicited across a variety of settings and roles (Deci & Ryan, 1985).

Table 6
Time-Lagged Correlations From Fall to Spring:
Predicting Student Engagement in Spring

Fall	Student engagement: spring	
	Behavior	Emotion
Student engagement	Teacher perception	
student report		
Behavior	.27***	.24**
Emotion	.20*	.18*
Teacher behavior	Student report	
student perception		
Involvement	.54***	.43***
Structure	.54***	.42***
Autonomy support	.51***	.39***

Note. $n = 144$ children, Grades 3–5, and $n = 14$ teachers.

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

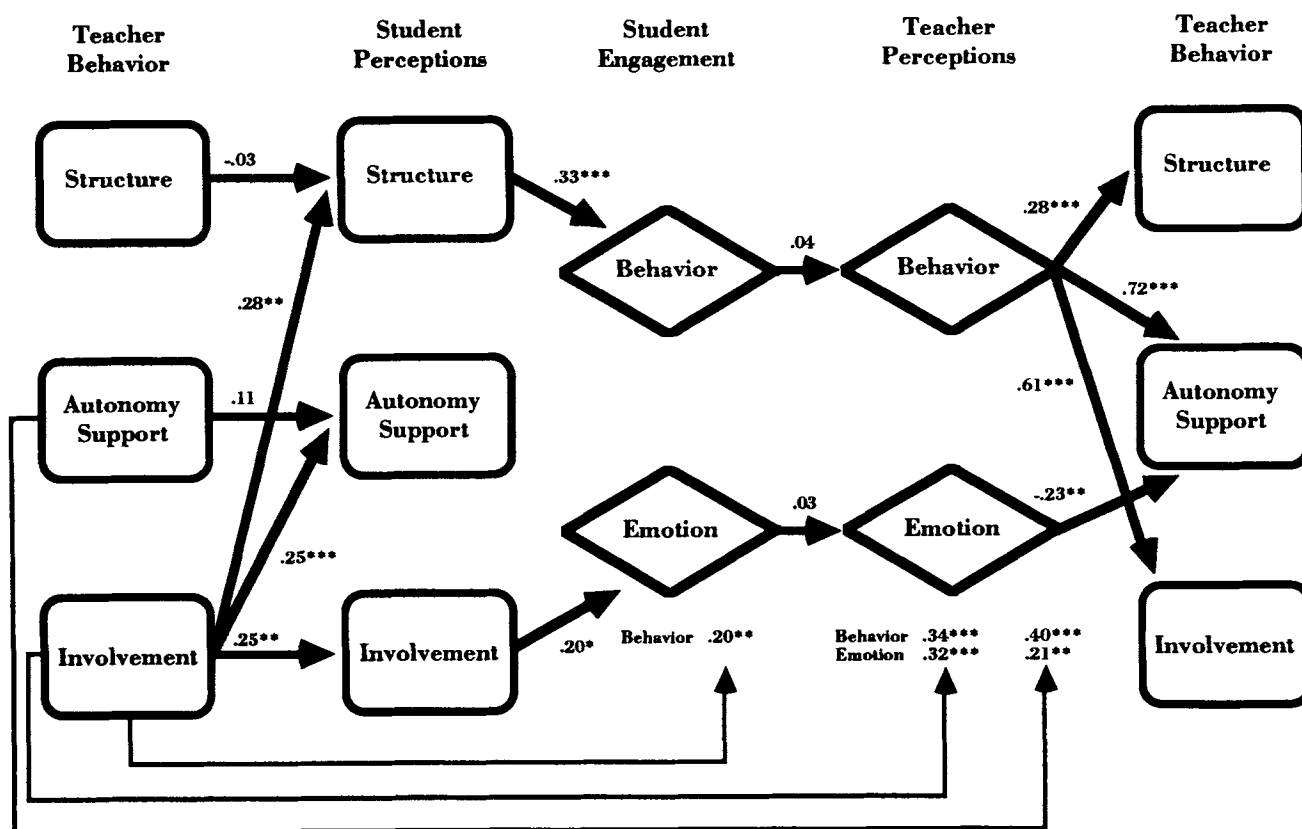
CONTEXT**ACTION**

Figure 2. Time-lagged path analysis of the reciprocal influences of teacher behavior and student motivation. (Thin lines denote unpredicted paths. At each step, Time 2 [spring] dependent variables and Time 1 [fall] predictor variables were used. $*p < .05$. $**p < .01$. $***p < .001$).

Given the pervasiveness of these magnificatory reciprocal effects, it is even more striking to find that teachers responded at all positively to negative emotionality. It would be reasonable to expect that negative emotions would be as aversive to teachers as passivity. The key may lie in the quality of negative emotions expressed by children of this age. The predominant negative emotions reported are anxiety and boredom. Student anxiety and boredom, rather than repelling teachers, may be taken as a signal that children need more interesting activities leading to increased autonomy support. It would be interesting to determine whether teachers continue to compensate for children's negative emotions as they become older and express more of qualitatively different emotions, such as anger or depression.

It is also important to note that teachers' compensatory reactions to negative student emotions were uncovered only when the effects of student behavior on teachers' reactions were controlled for. Taken alone, the same magnificatory (positive) relations are found: Teachers responded more negatively to children who expressed negative emotional engagement. Also, given the high correlation between student

behavioral and emotional engagement, it is likely that most students who have low engagement will receive subsequently less teacher support. Nevertheless, the effects of student emotion on teacher reactions warrants the inclusion of separate measures of student emotion in future studies on the reciprocal effects of student motivation and teacher behavior. Student emotion seems to influence subsequent teacher behavior.

Student and teacher perceptions of student engagement. The one link in the model for which no support was found was the notion that student reports of engagement causally contribute to teacher perceptions of engagement. Several explanations for this finding are possible. The simplest is that teacher and child reports of student engagement, rather than being causally related to each other, are both based on actual student behavior. This is consistent with the fact that (a) higher correlations were found between teacher and student reports of behavior than between teacher and student reports of emotion and (b) teacher perceptions of student emotion were more highly correlated with student reports of student behavior than with student reports of their emotion. Meas-

ures of actual student behavior in the classroom or of actual teacher–student interactions would be useful in filling in the outlines provided by student and teacher reports.

Implications for Research and Reform

Although the present study makes a compelling case for the reciprocal effects of teacher behavior and student engagement, much research is still needed. Some features of the present study that may be useful to incorporate into future studies include the use of time-lagged data, which allows the empirical examination of reciprocal effects between student and teachers, rather than just the assumption that the direction of effects is from teachers to students. Second, a fuller picture of the effects of students on teachers may be achieved by including indicators of both emotional and behavioral engagement of students as well as considering both compensatory and magnificatory reciprocal effects. Third, consistent with other research documenting strong effects of both teacher and student perceptions and expectations (Brophy, 1983b; Jussim, 1989; Marshall & Weinstein, 1986; Weinstein, Marshall, Sharp, & Botkin, 1987), this study points out the complementarity of information gathered from both student and teacher perspectives on teacher–student interactions and on student engagement. Teacher perceptions of student engagement were especially important as predictors of changes in teachers' subsequent treatment of students.

The study has multiple implications for educational practices. First, it highlights the urgency of intervening into the normal patterns of student–teacher interaction. If left to run their typical course, teachers tend to magnify children's initial levels of engagement. This is fine for students who enter the classroom motivationally rich; they will get richer. However, for students whose initial motivation is low, their typical classroom experiences may result in the further deterioration of their motivation. Hence, changing teacher behaviors from those that undermine to those that promote the engagement of discouraged children should be a top priority of educational reform.

Most important is empirical inquiry into the source of differences among teachers in their provision of involvement, structure, and autonomy support. Given their centrality to children's engagement, it is important to understand why some teachers provide optimal levels of all three motivational supports and others do not. If one educational goal is to encourage teachers to support children's motivation, then understanding the factors that influence teachers is critical. In summary, these findings sensitize us to new avenues for understanding and improving student engagement in learning activities.

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Received January 3, 1992

Revision received June 10, 1993

Accepted June 14, 1993 ■