

Pressure From Above and Pressure From Below as Determinants of Teachers' Motivation and Teaching Behaviors

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When teachers are more supportive of autonomy and less controlling, students demonstrate higher levels of intrinsic motivation and self-determination. The purpose of this study was to examine social-contextual conditions that led teachers ($N = 254$) who taught classes from Grades 1 to 12 to be more autonomy supportive versus controlling with their students. Using structural equation modeling, the authors observed that the more teachers perceive pressure from above (they have to comply with a curriculum, with colleagues, and with performance standards) and pressure from below (they perceived their students to be nonself-determined), the less they are self-determined toward teaching. In turn, the less they are self-determined toward teaching, the more they become controlling with students.

A considerable amount of research in the last 25 years has explored how various aspects of students' social environment affect intrinsic motivation and autonomous self-regulation (Deci, Koestner, & Ryan, 1999), and, in turn, several educational outcomes, such as effort, quality of conceptual learning, school performance, and intention to persist in school (Fortier, Vallerand, & Guay, 1995; Grolnick & Ryan, 1987; Grolnick, Ryan, & Deci, 1991; Vallerand, 1997; Vallerand & Bissonnette, 1992; Vallerand, Fortier, & Guay, 1997). More specifically, research reveals that the degree to which teachers are autonomy supportive versus controlling has an important effect on students' intrinsic motivation and self-determination (Reeve, Bolt, & Cai, 1999; Rigby, Deci, Patrick, & Ryan, 1992; Vallerand et al., 1997). Given the importance of these dimensions of teaching behaviors for student's motivation, it is important to understand why some teachers provide primarily autonomy support and others do not.

Few studies have assessed the role of environmental conditions that lead teachers to adopt autonomy supportive or controlling behaviors toward students. Deci, Speigel, Ryan, Koestner, and Kauffman (1982) have suggested that contextual factors should affect whether supervisors create a climate that is primarily con-

trolling or primarily oriented toward supporting autonomy. For example, when higher authorities impose restrictions or when teachers are responsible for their students being able to perform up to standards, it is likely that teachers will become controlling with students. Deci et al. (1982) verified this hypothesis in a laboratory study. They observed that impressing on teachers that they were responsible for a student performing up to high standards leads them to be more critical of the student, to use more hints, more directive language, and to be more controlling than teachers who did not have to face such performance standards. Similar results were observed by Flink, Boggiano, and Barrett (1990) in a field experiment with teachers and students. These researchers found that teachers who were externally pressured to produce good student performance were more controlling and less effective in their teaching than teachers who were asked to help their students.

Harackiewicz and Larson (1986) proposed one other situational determinant of interpersonal behaviors: whether or not supervisors are expected to use rewards to motivate subordinates. As hypothesized by Harackiewicz and Larson, supervisors de-emphasized their own role as an independent source of information about the subordinates' performance and were more controlling when they had to administer rewards to their subordinates. However, when supervisors were not expected to use rewards for maintaining their subordinates' interest, the effect disappeared. In other words, Harackiewicz and Larson proposed that supervisors felt more responsible for their subordinates' task enjoyment and then became less controlling.

Research has also shown that individuals in a supervisory role may not only be subjected to pressure from higher authorities, they may also be subjected to various pressures from the subordinates. Barrow (1976) and Lowin and Craig (1968) have examined supervisors' reactions following an increase or decrease in the subordinate's performance and productivity. They observed that supervisors were more supportive, kind, and considerate when

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subordinates were perceived as productive. When subordinates were perceived as unproductive, supervisors became more controlling and relied on punishment to motivate them. Although not directly related to intrinsic motivation, many of these studies have shown that when supervisors have positive expectations of their subordinates, they are more supportive (Chaiken, Sigler, & Derlega, 1974; Rist, 1970; Rubovits & Maehr, 1973), they give clearer and more positive feedback (Brophy & Good, 1970; Cooper, 1979; Weinstein, 1976), they pay more attention to the subordinates (Cooper & Good, 1983; Rosenthal, 1974), and they provide the subordinates with more opportunities for learning difficult subject matter (Allington, 1980; Brophy & Good, 1970).

Extrapolating from research on behavioral confirmation processes (Snyder, 1984, 1992), Pelletier and Vallerand (1996) examined more specifically whether a supervisor's beliefs about a subordinate's intrinsic (or extrinsic) motivation could induce the supervisor to support autonomy (or to be controlling) with the subordinate, which in turn, would cause the behavior of the subordinate to confirm the supervisor's beliefs. These authors observed that when supervisors were led to believe that a subordinate was intrinsically motivated, rather than extrinsically motivated, they were more autonomy supportive and less controlling. These differences in teaching behaviors, in turn, elicited and nurtured behaviors of the subordinate that were consistent with the supervisors' initial beliefs. Subordinates who were perceived (unknown to themselves) to be intrinsically motivated came to demonstrate more intrinsic motivation when compared with subordinates whose supervisors believed them to be extrinsically motivated. These results support the idea that when individuals interact with others, they often use preconceived beliefs and expectations about them as guides to their interpersonal behaviors. Their interpersonal behaviors may not only prompt others to behave in ways that confirm the initial beliefs, but also lead others to maintain the same behavior in a subsequent situation. Skinner and Belmont (1993) observed similar results in the classroom. They examined the effects of three dimensions of teacher behavior (involvement, structure, and autonomy support) on student's engagement across the school year, as well as the reciprocal effect of student motivation on teacher behavior. Path analyses revealed that student engagement (measured in spring) was associated with the three dimensions of teacher behavior (as measured in fall). Their analyses also revealed that teachers' perceptions of student engagement predicted teachers' interactions with students across the school year.

Few studies examined how teachers' motivation could either affect directly their teaching behaviors or mediate the effect between contextual factors and teaching behaviors. For example, Garbarino (1975) found that rewarded teachers were more critical and demanding of their students than volunteer teachers. Consequently, students who were taught by rewarded teachers made more errors while learning a specific skill. Wild, Enzle, Nix, and Deci (1997, Study 2) observed that participants who were taught a skill by an extrinsically motivated teacher reported lower interest in learning and lower task enjoyment than those taught by an intrinsically motivated teacher. More importantly, when these students subsequently acted as teachers, their students reported lower levels of interest, task enjoyment, and positive mood. These studies suggest that contexts where pressure or rewards are used may affect directly teachers and lead them to become more controlling

with their students. Rewards and pressure may also decrease teachers' self-determined motivation toward their work, which in turn, may lead them to become more controlling with their students.

Finally, Deci, Schwartz, Sheinman, and Ryan (1981) proposed that adults tend to have a general orientation toward dealing with others that could be viewed as ranging from being supportive of autonomy to being controlling. In two studies, Deci, Schwartz, et al. (1981) and Deci, Nezlek, and Sheinman (1981) tested a scale designed to assess adults' orientations toward controlling children versus supporting autonomy. These authors in both studies found that children in classrooms with teachers oriented toward supporting autonomy had higher intrinsic motivation and self-esteem than children in the classrooms of teachers oriented toward use of controls to regulate behaviors. More recently, Reeve, Bolt, and Cai (1999) have evaluated the instrument's conceptual and predictive validity. Reeve et al. (1999) observed that teachers with a global disposition to support their students' autonomy, when compared with controlling teachers, actually showed a distinctive autonomy supportive style as measured by their interpersonal behaviors and attempts to support students' intrinsic motivation and autonomous self-regulation.

In sum, research has shown that when authorities impose restrictions about a curriculum, make teachers responsible for their students performance, and pressure or reward teachers to produce good student performance, and teachers believe that their students are extrinsically motivated or possibly not motivated toward school, it is likely that teachers will become controlling with students. It is possible that these conditions may directly affect teachers' behaviors or that they may undermine teachers' motivation toward their own work that, in turn may lead them to be more controlling with their students.

The purpose of this study was to propose and test alternative models of teachers' behavior on the basis of theory and research that have examined determinants of autonomy supportive and controlling behaviors. Because no past research has examined the empirical relations among possible determinants of teaching behavior, our goal was to test different theoretical models, examining relations across these potential determinants. We believe that comparing such models can be useful for two reasons. First, it may serve to integrate existing knowledge on determinants of autonomy supportive and controlling behaviors, especially pertaining to possible relationships between these determinants. Second, if proven valid, one of these models should provide a better understanding of the process that leads teachers to adopt an autonomy supportive or controlling orientation with their students. The proposed models are depicted in Figure 1.

The models are made up of four latent constructs. The first three represent determinants of teachers' behavior. The definition of these determinants is based on past research and recent development in the measurement of motivation derived from self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000). The first latent construct is teachers' perception of constraints at work. This construct is represented by three types of pressure experienced at work, namely, (a) teachers' perceptions of pressure associated with the importance of conforming to the school curriculum and performing up to standards, (b) teachers' perceptions of pressure coming from the school administration regarding discipline in class, and (c) teachers' perceptions of pressure associ-

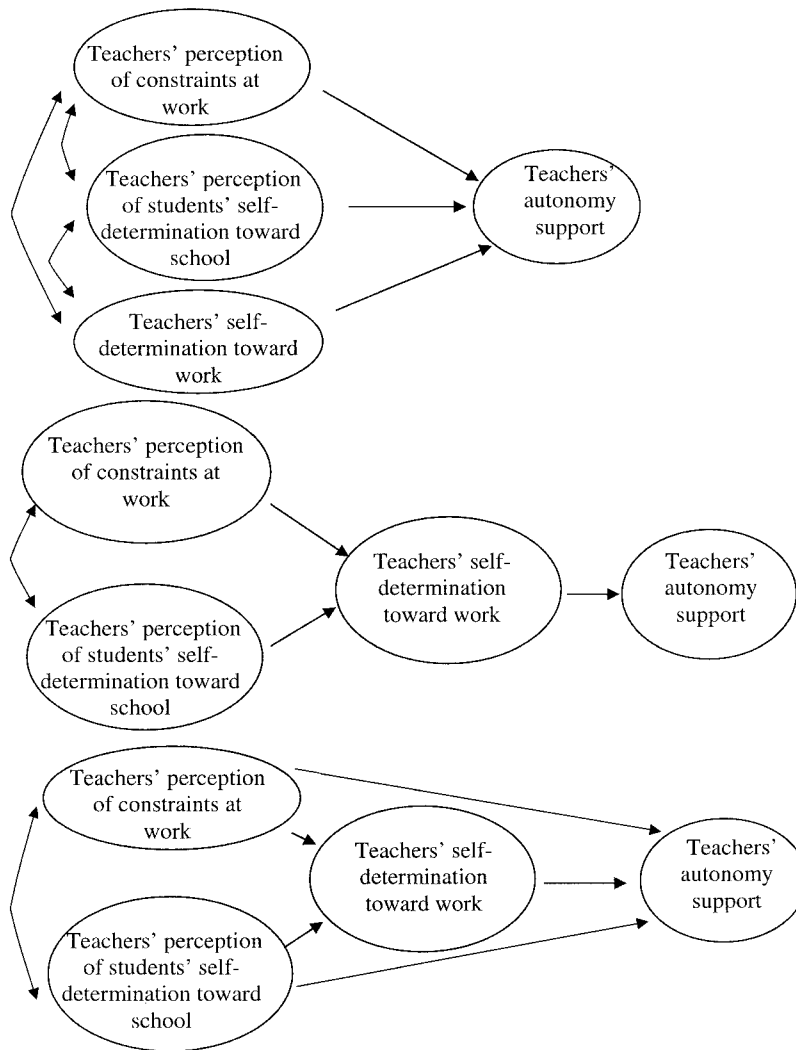


Figure 1. Proposed models of relationships between teachers' perceptions of constraints at work, their perceptions of students' self-determination toward school, their self-determination toward work, and their autonomy supportive orientation.

ated with conforming to colleagues' teaching. The second latent construct is teachers' perception of students' intrinsic or extrinsic motivation and autonomous regulation. The third variable is teachers' own intrinsic or extrinsic motivation and autonomous regulation toward work. The measurement of students' as well as teachers' motivation takes into account four forms of motivation, intrinsic motivation, extrinsic motivation by identified, introjected, and external regulation. The different forms of motivation have been found to relate as predicted by self-determination theory (Deci & Ryan, 1985, 1991; Vallerand, 1997) to various determinants and consequences, thereby providing construct validity for the continuum of self-determination underlying the scales. Finally, the last construct studied represents teacher's disposition to control students or to support their autonomy.

Model 1 represents a nonmediated model in which each determinant is specified to be directly associated with teachers' behavior. It is proposed that when teachers experience pressure at work,

when they perceive their students not to be self-determined, and when they are not self-determined toward their work, teachers would indicate that they are less autonomy supportive with students. Model 2 represents a mediated model in which relations between two of the determinants (pressure at work and beliefs about students' motivation) and teachers' behaviors are mediated by teacher's own motivation. In Model 2, it is proposed that when teachers experience pressure at work and when they perceive their students to be non-self-determined, they indicate that they are less self-determined toward their work. In turn, low levels of self-determination toward work are hypothesized to be negatively associated with teachers' autonomy-supportive behaviors. Finally, Model 3 represents a partially mediated model in which two of the determinants (pressure at work and beliefs about students' motivation) are specified to have direct effects on teachers' behavior, and in addition, indirect effects through teacher's own motivation.

Method

Participants and Procedure

The sample was composed of 254 teachers, 89 men and 165 women, from three different school boards of the province of Quebec. The teachers were all francophones and taught classes from Grades 1 to 12. On average, the teachers had 18.02 years of experience. Participation in the study involved completing a questionnaire package at home and returning it a week later to the school secretary. The teachers were informed that participation was voluntary and that their answers would remain completely anonymous and confidential. Participants were also informed that their data would be reported in group format and would only be used for research purposes.

Measures

Constraints at Work. The Constraints at Work scale, developed for the purpose of the present study, is composed of nine items (three items per subscale) designed to measure teachers' perceptions of three types of constraints or pressure at work. These items are regrouped in three subscales. The first subscale measures teachers' perceptions of pressure associated with colleagues (e.g., "You have to conform to your colleagues teaching methods"). The second subscale is designed to measure teachers' perceptions of pressure coming from the school administration (e.g., "You are evaluated in function of the degree of 'control' you have on your class"). The third subscale measures teachers' perceptions of pressure associated with the school curriculum (e.g., "It is important to complete the entire school curriculum"). The teachers had to answer each item on a 7-point scale, ranging from 1 (*does not correspond at all*) to 7 (*corresponds completely*).

Results of an exploratory factor analysis, using maximum-likelihood extraction procedure, supported the three-factor structure of the scale. All items loaded significantly on their target factor (all loadings were above .30), and only two items displayed cross-loadings. These two items were retained in the scale because the value of the loading on their target factor was larger than the value of the cross-loading. Correlations between the subscales were moderate, ranging from .29 to .40. This suggested that the factors shared a certain amount of common characteristics, but were also independent from each other. For the purpose of testing the structural model, the three subscales were used as three indicators of teachers' perceptions of pressure experienced at work ($\alpha = .73$).

Perception of Students' Motivation. The Perception of Students' Motivation scale is adapted from The Academic Motivation Scale (AMS; Vallerand, Pelletier, Blais, Brière, Sénécal, & Vallières, 1992, 1993) and measures teachers' perceptions of students' level of motivation toward school. Teachers had to assess students' reasons for attending school in general. The Perception of Students' Motivation scale is composed of 16 items grouped in 4 subscales designed to represent the motivational constructs identified by Deci and Ryan (1985). The original constructs can be placed on a continuum, according to the constructs' underlying level of self-determination. From the more self-determined to the least self-determined, the constructs are intrinsic motivation (e.g., "Because of the pleasure and satisfaction students experience while learning new things"), extrinsic motivation by identified regulation (e.g., "Because students think that this will help them choose their career path"), extrinsic motivation by introjected regulation (e.g., "Prove to themselves that they are intelligent persons"), and extrinsic motivation by external regulation (e.g., "In order to obtain a better income later on"). The teachers had to answer each item on a 7-point scale, ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*).

Results of an exploratory factor analysis, using maximum-likelihood extraction procedure, supported the four-factor structure of the scale. Also, correlations between the subscales supported the continuum of self-determination proposed by Deci and Ryan (1985). For the purpose of the

present study, four indices of students' level of self-determination toward school as perceived by teachers were computed. In agreement with prior studies that have used indices of self-determination (see Blais, Sabourin, Boucher, & Vallerand, 1990; Grolnick & Ryan, 1987, 1989; Grolnick et al., 1991; Ryan & Connell, 1989, for more information on the self-determination index; SDI), each indicator was created by using an item from each subscale and by giving a weight to each item as a function of the Intrinsic Motivation, Identified, Introjected and External Regulation, and Motivation subscales on the self-determination continuum. Intrinsic motivation and identified regulation items, because they are considered self-determined forms of motivation, were assigned weights of 2 and 1, respectively. Introjected and external regulations, because they are conceptualized as less self-determined forms of motivation, were assigned weights of -1 and -2, respectively. As there are four items per subscale, it was possible to generate four indicators of teachers' perception of students' level of self-determination toward school ($\alpha = .78$).

The Work Motivation Inventory. The Work Motivation Inventory (Blais, Lachance, Vallerand, Brière, & Riddle, 1993) measures teachers' level of motivation toward work. It is composed of 16 items grouped in 4 subscales designed to represent the motivational constructs identified by Deci and Ryan (1985, 1991) and Vallerand, Blais, Brière, and Pelletier (1989). These constructs can be placed on a continuum, according to their underlying level of self-determination. From the more self-determined to the least self-determined forms of motivation, the constructs are (a) intrinsic motivation (e.g., "For the satisfaction I feel while I master interesting challenges at work"), (b) extrinsic motivation by identified regulation (e.g., "Because this is the kind of work I have chosen to accomplish my career goals"), (c) extrinsic motivation by introjected regulation (e.g., "Because I absolutely must be good at this kind of work, otherwise I would be disappointed at me"), and (d) extrinsic motivation by external regulation (e.g., "In order to make money"). Teachers had to answer each item on a 7-point scale, ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*).

Blais et al. (1993) have shown that the Work Motivation scale possesses acceptable levels of validity and reliability. Results of confirmatory factor analysis supported the five-factor structure of the scale. Also, the temporal stability of the scale over a 6-month period was found to be moderately acceptable, with values ranging from .62 to .72. Finally, correlations between the subscales and various related constructs supported the continuum of self-determination proposed by Deci and Ryan (1985). For the purpose of the present study, four indices of teachers' level of self-determination toward work were computed. In agreement with prior studies that have used indices of self-determination (see Blais et al., 1990; Grolnick & Ryan, 1987, 1989; Grolnick et al., 1991; Ryan & Connell, 1989, for more information on the SDI), each indicator was created by using an item from each subscale and by giving a weight to each item as a function of the position of their respective subscale on the self-determination continuum. Again, intrinsic motivation and identified regulation items were assigned weights of 2 and 1, respectively. Introjected and external regulations were assigned weights of -1 and -2, respectively. As there are four items per subscale, it was possible to generate four indices of teachers' level of self-determination toward work ($\alpha = .80$).

Measure of teachers' autonomy support versus control orientation. The Problem in School Questionnaire, developed and validated by Deci, Schwartz, Sheinman, and Ryan (1981), is designed to measure adults' orientation toward control versus autonomy in their interactions with children. The scale is composed of eight vignettes, describing typical problems that occur in schools. Each vignette is followed by four items that represent four possible ways to deal with the problem presented (highly autonomy supportive, moderately autonomy supportive, moderately controlling, highly controlling). For the highly controlling items (HC) an adult (either a teacher or parent) is described as identifying the solution for the child and then taking actions to ensure that the solution is implemented (e.g., "Make the child miss tomorrow's soccer game so he can study for his

exam; soccer has way too much interfered with his school work"). For the moderately controlling items (MC), an adult identifies the solution and then attempts to get the child to implement it by emphasizing guilt or the child's well-being (e.g., "Tell the child that he should probably miss tomorrow's soccer game in order to prepare himself for his exam"). For the moderately autonomy supportive items (MA), an adult encourages the child to see how the other children are solving the problem (e.g., "See if other students are in the same situation than the child and suggest to the child that he prepare himself as well as the other students"). Finally, for the highly autonomy supportive items (HA), an adult encourages the child to consider various ways to solve the problem and identify a solution by himself (e.g., "Ask the child how he plans to rectify the situation"). The teachers had to answer each item on a 7-point scale, ranging from 1 (*not at all appropriate*) to 7 (*very appropriate*).

Deci et al. (1981) and Reeve et al. (1999) have shown that this scale possesses acceptable levels of validity and reliability. The level of internal consistency for each subscale was found to be acceptable and ranged from .63 to .80. The temporal stability of the scale over a 2-month period was also found to be satisfactory, with values ranging from .77 to .82. Finally, correlations between the subscales and correlations between the subscales and related constructs were consistent with the theoretical propositions of Deci and Ryan (1985). For the purpose of the present study, because there were eight vignettes, eight indicators of teachers' autonomy support were computed. Weights were assigned to each item as a function of their relative autonomy support or control [Global score = $(2 \times HA) + (MA) - (MC) - (2 \times HC)$]. The weighted scores were then summed to create a global score for each vignette. For parsimony purposes, these eight indicators were randomly paired in order to create four composite scores of teachers' autonomy support orientation ($\alpha = .71$).

Results

Preliminary Analyses

Data were preliminarily examined for the adequacy of the fit between their distribution and the assumptions of multivariate analysis. Results from the descriptive statistics of all indices under

Table 1
Descriptive Statistics

Variable	<i>M</i>	<i>SD</i>	Range
Teachers' autonomy support	8.95	0.46	-18-18
A	5.75	0.48	-18-18
B	5.97	0.43	-18-18
C	10.72	0.47	-18-18
D	13.36	0.47	-18-18
Constraints at work	11.76	0.20	3-21
Pressure from colleagues	5.90	0.14	3-21
Pressure from administration	10.56	0.28	3-21
Pressure to follow curriculum	18.82	0.25	3-21
Perception of students' motivation	-1.02	0.22	-18-18
1	-0.71	0.23	-18-18
2	-2.24	0.21	-18-18
3	0.00	0.24	-18-18
4	-1.14	0.24	-18-18
Teachers' motivation	2.19	0.25	-18-18
1	1.25	0.20	-18-18
2	3.20	0.23	-18-18
3	2.43	0.28	-18-18
4	1.89	0.29	-18-18

Note. Each indicator (A-D, 1-4) was created by using an item from each subscale and by giving a weight to each item as a function of the subscale's position on a continuum. See text for further explanation.

study revealed that the data were normally distributed with values for skewness and kurtosis within an acceptable range of -1 to $+1$. Table 1 contains descriptive statistics for all indices included in the analyses. An examination of the means indicates some fluctuations for the four indicators of teaching behaviors, but overall, teachers perceive their behaviors as supportive of autonomy. Teachers' perceptions of constraints at work are associated first with the pressure to follow a curriculum, second the pressure from the administration, and, to some extent, the pressure from colleagues. Teachers perceive students' motivation to be slightly non-self-determined but their own motivation toward their work to be slightly self-determined. Finally, there was no evidence of multicollinearity or singularity: All correlations between the indices were below .70 (Tabachnick & Fidell, 1996). Table 2 displays the correlations among the indices based on the 254 participants for whom we had completed data on all measures. The correlations among the four constructs used in the model are displayed in Table 3.

Measurement Model

We tested an initial measurement model, representing the hypothesized four-factor structure to assess whether the indices were adequately evaluating the latent constructs. As indicted previously, one factor represented the Work Climate variables (perceptions of pressure associated with colleagues, pressure coming from the school administration, pressure associated with the school curriculum), one factor represented Teachers' Perceptions of Students' Motivation Toward School (four indicators of perceived students' level of self-determined motivation), another factor represented Teachers' Motivation Toward Work (four indicators of teachers' level of self-determined motivation toward their work), and the final factor represented Teachers' Autonomy Support Versus Control Orientation (eight indicators were paired to create four composite scores of teachers' orientation). As suggested by Anderson and Gerbing (1988), we applied unit variance to all factors by setting latent unit variance to 1.0. This way, all pattern coefficients (the relations between the observed and latent variables) can be tested. Examination of each pattern coefficient is more meaningful at this stage than testing whether each factor variance is significantly different from zero. In addition, no constraints were imposed on the structural parameters, allowing the latent factors to correlate freely during assessment of the measurement model. This allows the assessment of interfactor correlations and reduces the potential for interpretational confounding between factors.

We tested this model using LISREL 8.3 (Jöreskog & Sorbom, 1996). Parameters were estimated by using maximum likelihood (ML) fitting function. The initial measurement model provided an adequate fit to the data, $\chi^2(84, N = 24) = 107.32, p < .01$, goodness-of-fit index (GFI) = .95, adjusted goodness-of-fit index (AGFI) = .92, comparative fit index (CFI) = .97, incremental fit index (IFI) = .97, parsimony comparative fit index (PGFI) = .66. Examination of pattern coefficients indicated that they were all significant and loaded on the appropriate factors. The interfactor correlations were moderate (the highest value is .36), indicating that each latent construct should be treated as a single construct. Table 3 displays the standardized estimates for this model. In sum, these results indicated that the data were consistent with a four-

Table 2
Bivariate Correlations Among All Measures

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Teachers' autonomy support A	—														
2. Teachers' autonomy support B	.34	—													
3. Teachers' autonomy support C	.24	.14	—												
4. Teachers' autonomy support D	.16	.27	.22	—											
5. Pressure from colleagues	-.13	-.06	-.05	.02	—										
6. Pressure from administration	-.11	-.02	-.02	-.06	.19	—									
7. Pressure to follow curriculum	-.14	.00	.05	.00	.18	.40	—								
8. Perception of students' motivation 1	.02	.02	-.02	.00	-.16	-.09	-.10	—							
9. Perception of students' motivation 2	-.11	-.19	-.14	-.06	-.03	.08	-.13	.26	—						
10. Perception of students' motivation 3	.00	-.02	.04	.02	-.07	-.02	-.09	.37	.28	—					
11. Perception of students' motivation 4	.07	-.06	.07	.00	-.12	-.05	-.13	.27	.35	.53	—				
12. Teachers' motivation 1	.13	.14	.07	.00	-.13	-.17	-.13	.11	-.02	.13	.07	—			
13. Teachers' motivation 2	.17	.23	.11	.14	-.08	-.11	.00	.00	-.04	.07	.14	.41	—		
14. Teachers' motivation 3	.21	.20	.18	.06	-.11	-.01	-.13	-.02	-.08	.06	.05	.35	.39	—	
15. Teachers' motivation 4	.22	.18	.21	.12	-.15	-.11	-.08	.00	-.05	.11	.16	.33	.42	.45	—

Note. Values of .12 and above are significant at $p < .05$. Values of .15 and above are significant at $p < .01$. Each indicator (A–D, 1–4) was created by using an item from each subscale and by giving a weight to each item as a function of the subscale's position on a continuum. See text for further explanation.

factor structure and all pattern coefficient estimates supported the hypothesized model.

Models of Teachers' Autonomy Support Versus Control Orientation

The models predicting teachers' autonomy orientation were estimated, using LISREL 8.3 (Jöreskog & Sorbom, 1996). Parameters were estimated by using ML fitting function. The statistical hypotheses that correspond with the structural portion of both models are described. For Model 1, the regression coefficients of teachers' autonomy support versus control orientation on teachers' self-determination toward work and teachers' perceptions of students' self-determination toward school were hypothesized to be positive and significant. The regression coefficient of teachers' autonomy support versus control orientation on perceptions of constraints experienced at work was hypothesized to be negative and significant. For Model 2, the regression coefficient of teachers' autonomy support versus control orientation on teachers' self-determination toward work was hypothesized to be positive and significant. The regression coefficient of teachers' self-determination toward work on teachers' perceptions of students' self-determination toward school was hypothesized to be positive and significant. Finally, the regression coefficient of teachers' self-determination toward work on perceptions of constraints experienced at work was hypothesized to be negative and significant. For Model 3, the regression coefficient of teachers' autonomy support versus control orientation on teachers' self-determination toward work and teachers' perceptions of students' self-determination toward school were hypothesized to be positive and significant. The regression coefficient of teachers' autonomy support versus control orientation on perceptions of constraints experienced at work was hypothesized to be negative and significant. The regression coefficient of teachers' self-determination toward work on teachers' perceptions of students' self-determination toward school was hypothesized to be positive and significant. Finally, the regression coefficient of teachers' self-determination toward work on perceptions of constraints experienced at work was hypothesized to be negative and significant. For the three models, the error estimations of the latent construct were expected to be significant and of moderate magnitude, correlations between exogenous factors were estimated, and all cross-loadings and item error covariances were fixed to 0.

The partially mediated model is the least constrained model, and the fully mediated and nonmediated models are each nested within this model. Therefore, comparison of the partially mediated model (Model 3) and the fully mediated model (Model 2) will indicate whether direct paths from the constraints at work and the beliefs about students' motivation latent constructs to the teacher behavior construct represent unique sources of variance in the prediction of teacher behavior or whether their effects on teacher behavior are mediated by teachers' motivation toward their work. Likewise, comparison of the partially mediated model (Model 3) and the nonmediated model (Model 1) will indicate whether direct paths from the three determinants to the teacher behavior construct represent unique sources of variance in the prediction of teaching behavior.

The nonmediated model (see Figure 1, Model 1) fit the data adequately. Although the chi-square statistic was significant, the

Table 3
Standardized Maximum Likelihood Estimates and Phi Values for the Measurement Model

Variable	Teacher's autonomy support	Constraints at work	Perception of students' motivation	Teachers' motivation
Teachers' autonomy support				
A	.56 (.68)			
B	.58 (.66)			
C	.36 (.87)			
D	.42 (.82)			
Pressure from colleagues				
		.41 (.83)		
Pressure from administration				
		.60 (.64)		
Pressure to follow curriculum				
		.59 (.65)		
Perception of students' motivation				
1			.47 (.78)	
2			.53 (.72)	
3			.69 (.53)	
4			.71 (.50)	
Teachers' motivation				
1				.55 (.70)
2				.83 (.31)
3				.61 (.63)
4				.85 (.27)
Teacher's autonomy support				
	.71	-.08	-.09	.26
Constraints at work				
	-.11	.73	-.10	-.12
Perception of students' motivation				
	-.11	-.18	.78	.11
Teachers' motivation				
	.36	-.25	.20	.80

Note. Numbers in parentheses are residuals. In lower part of the table, numbers under the diagonal are Phi coefficients, numbers above the diagonal are zero-order correlations, and numbers in the diagonal are Cronbach's alpha. Each indicator (A-D, 1-4) was created by using an item from each subscale and by giving a weight to each item as a function of the subscale's position on a continuum. See text for further explanation.

adequacy of the hypothesized model was found to be satisfactory as revealed by the fit indices, $\chi^2(87, N = 254) = 123.03, p < .01$, GFI = .94, AGFI = .92, CFI = .95, IFI = .95, PGFI = .68. However, Model 1 contained two nonsignificant structural paths: the paths of teachers' perceptions of students' self-determination toward school and perceptions of constraints experienced at work to teachers' behavior. The correlation between constraints at work and perception of students' motivation ($\phi = -.18$), between constraints at work and teachers' motivation ($\phi = -.24$), and between perception of students' motivation and teachers' motiva-

tion ($\phi = .20$) were all significant. The mediated model (see Figure 1, Model 2) fit the data well. Again, the chi-square statistic was significant, and the adequacy of the hypothesized model was found to be satisfactory as revealed by the fit indices, $\chi^2(87, N = 254) = 109.69, p < .01$, GFI = .95, AGFI = .92, CFI = .96, IFI = .96, PGFI = .68. As shown in Figure 2, all estimated parameters were significant and of acceptable magnitude. More specifically, the more teachers experienced constraints and pressure at work, the less they were self-determined toward their work ($\gamma = -.23$). Conversely, the more teachers believed that their students were

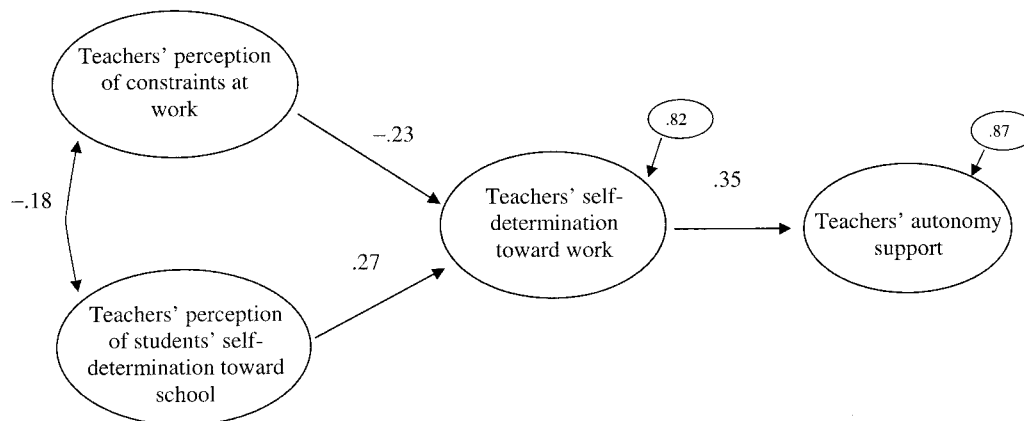


Figure 2. Final structural model (Model 2) with standardized maximum likelihood estimates for the relations among the latent variables.

being self-determined toward school, the more teachers were self-determined toward their work ($\gamma = .27$). The more teachers' were self-determined toward their work, the more they indicated being autonomy supportive ($\beta = .35$). The correlation between the two exogenous variables, constraints at work and teachers' perception of students' motivation was also significant ($\phi = -.18$). Finally, the partially mediated model (see Figure 1, Model 3) also fit the data well, $\chi^2(85, N = 254) = 107.35, p < .01, GFI = .95, AGFI = .92, CFI = .96, IFI = .96, PGFI = .68$. However, Model 3 contained three nonsignificant paths. Like Model 1, the paths of teachers' perceptions of students' self-determination toward school and perceptions of constraints experienced at work to teachers' behavior were nonsignificant. In addition, the path from teachers' perceptions of students' self-determination toward school to teachers' motivation toward their work became nonsignificant. As it was the case for Model 2, the correlation between the two exogenous variables, constraints at work and teachers' perception of students' motivation was also significant ($\phi = -.18$). In sum, although our analyses suggest that the more parsimonious mediated model (Model 2) is not significantly different from the partially mediated model (Model 3), $\chi^2(2) = 2.34, p > .01$, it fits the data more adequately. Teachers' perception of constraints at work and their perception of students' motivation explained 18% of the variance of teachers' motivation toward their work. In turn, teachers' motivation explained 13% of the variance of teachers' autonomy support.

Discussion

It has been well documented that autonomy-supportive environments, relative to controlling environments, tend to enhance intrinsic motivation and self-determined motivation. When we consider the education classroom, to a large extent, the environment is created by the teacher. Several studies in education have focused on the impact of teacher behavior—autonomy supportive versus controlling—on students' motivation (e.g., Deci, Schwartz, et al., 1981; Reeve et al., 1999; Ryan & Grolnick, 1986; Vallerand et al., 1997). Deci, Nezlek, et al. (1981) initially proposed that a teacher disposition (an orientation toward control or autonomy) was one important factor that could determine whether the classroom would be experienced as more controlling or supportive of autonomy for the students. This was followed by another study where it was proposed that when teachers feel pressured by superiors, they tend to become controlling with their students (Deci et al., 1982). Since then, other studies have examined the role played by other determinants of teacher behavior such as teachers' perception of students' motivation (Pelletier & Vallerand, 1996) and teacher's motivation toward their work (Garbarino, 1975; Wild et al., 1997). Given their role in determining teacher behavior, it is important to examine how these factors relate to each other or the relative contribution of each determinant of interpersonal behaviors in a context in which all factors could play a significant role.

The purpose of this study was to test a series of models, examining the degree to which possible determinants of teacher behaviors predicted teachers' disposition to control students or support their autonomy. Our analysis centered on three classes of determinants of interpersonal behaviors: pressure at work (pressure to comply with performance standards, with colleagues, or with a curriculum), teachers' perception of students' self-

determined motivation, and teachers' self-determined motivation toward their work. In line with the mediational model (Model 2), the analyses indicated that teachers' self-determined motivation toward their work, but not the two other determinants, accounted for unique variance in the prediction of teachers' disposition to be autonomy supportive with their students. The less they perceived pressure at work (pressure to comply with performance standards, with a curriculum, and with colleagues) and the more they perceived students to be self-determined toward school, the more teachers indicated they were self-determined toward their work. In turn, the more self-determined toward their work, the more they were autonomy supportive with their students. Although the amount of variance explained in both teachers' motivation (18%) and in teachers' autonomy support (13%) may appear somewhat limited, findings from all paths of the model have important implications in regard to teachers' behaviors toward their students.

Pressure at Work and Teachers' Motivation

The variable we labeled Pressure at Work included three types of pressure coming from the school environment. Preliminary analyses supported the factor structure of this construct. In line with studies by Deci et al. (1982) and Flink et al. (1990), the first type of pressure involved teachers' perception that they were responsible for their students' behaviors or students performing up to standards. The second type of pressure emphasized teachers' perception that they had to conform with colleagues' teaching methods or involvement in school activities. The third type of pressure was associated with teachers' perception that they had limited freedom in determining the course's curriculum or that they had to cover a specific curriculum determined by the school's administration. Empirical support was found for a negative relationship between pressure at work and teachers' self-determined motivation toward their work, not for a direct link between pressure at work and teachers' behavior. This result differs from results by Deci et al. (1982) and Flink et al. (1990), where a direct link was observed between teachers' perception that they were responsible for their students' behaviors and teacher controlling behavior. We tested this link in two alternative models (Model 1, the nonmediated model, and Model 3, the partially mediated model) and in both cases, the link was not significant. It is important to note, however, that Deci et al. (1982) and Flink et al. (1990) did not measure teachers' motivation toward their work and, consequently, could not assess the mediational role of this construct.

The direct association between pressure at work and teachers' self-determined motivation is, however, consistent with more recent studies inspired by self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000). According to this theory, the effect of external events on intrinsic motivation and self-determination depends on whether an individual perceives contexts as supportive of his or her autonomy (i.e., the individual is encouraged to make his or her own choices) or as controlling (i.e., the individual is pressured toward a specific activity or toward particular outcomes). Interestingly, by the same way students could become less self-determined when exposed to controlling teachers, our results indicate that when teachers are pressured by the school's administration or by colleagues to behave in a specific manner, they also indicate that they are less self-determined toward their work.

We believe that considering the climate experienced at work as a multidimensional construct could be fruitful. Future research from this perspective is encouraged as it could lead to a better understanding of the processes detrimental for teachers' motivation. In this vein, perceptions of being underpaid, having to teach subjects or having to use new technologies for which one is unprepared, may be added to the list of potential sources of pressure at work. It should also be noted that pressure could originate from other sources such as having to deal with parents concerned by the quality of their child's education or uncertainties related to threats of government budget cut to the educational system. Finally, future research could also examine the impact these factors may have in the private school system relative to the public school system. Because parents in the private school system pay more for the education of their child, they may have different expectations and they may put more pressure on the school's administration and their child's teacher.

Perceptions of Students' Motivation and Teachers' Motivation

An important direction of influence in our results runs from perception of students' motivation to teacher's self-determined motivation. Recent research by Pelletier and Vallerand (1996) and Skinner and Belmont (1993) found a direct link between perception of students' intrinsic-extrinsic motivation or self-determined motivation and teacher behavior (both studies did not include a measure of teachers' motivation). We tested the link between levels of self-determination and teachers' behavior in two alternative models (Model 1, the nonmediated model, and Model 3, the partially mediated model). Our analyses showed that the association between students' motivation and teachers' behavior was not direct but was mediated by teachers' motivation. This suggests that positive student engagement or students' intrinsic motivation is associated with more teacher engagement toward their work. By opposition, students who lack motivation may be perceived as aversive: They may make teachers feel incompetent or disliked by the student. As a result, teachers may like students who are not self-determined less, and they may have less desire to spend time with them (Pelletier & Vallerand, 1996). Given the pervasiveness of this effect, teachers may become less intrinsically motivated and less self-determined toward their work. Nevertheless, the relationship between student motivation and teacher motivation justifies the inclusion of separate measures of student and teachers' motivation in future studies on teacher behavior.

As shown by Skinner and Belmont (1993) and Pelletier and Vallerand (1996), one important implication of these results is that a teacher's beliefs about a student's motivational orientation sets in motion interpersonal behaviors toward the student, which in turn, may eventually cause the student's behavior to confirm the teacher's initial beliefs. Then, teachers use confirmed beliefs as a basis for evaluating the students' performance or as information that affects their interest to interact with the student in the future (Pelletier & Vallerand, 1996). Given the significance of autonomy-supportive versus controlling behaviors for intrinsically motivated behaviors, it becomes important to understand in future studies why a teacher may develop a specific belief about a student's motivational orientation.

Teachers' Motivation and Teachers' Autonomy Support or Control

The final link of our model involves the positive relationship between teachers' self-determined motivation toward their work and teachers' behavior. Our results indicate that the more self-determined teachers are toward their work, the more autonomy supportive they are with their students. These findings have important implications for self-determination theory and research. A first implication is that the present results add to this literature by showing that motivation can also predict interpersonal behaviors. So far, intrinsic motivation and self-determined motivation have been associated with a host of affective, cognitive, and behavioral outcomes (Vallerand, 1997). The present findings add another facet to these results and support self-determination theory's position that distinguishing between self-determined and non-self-determined behaviors could lead to important refinement in the prediction of human behavior. A second implication, is that because autonomy support is important for students' intrinsic motivation and self-determination, a better understanding of the conditions that affect teachers' motivation could be helpful to create contexts that lead teachers to be more supportive of autonomy and less controlling with their students. So far, research on motivation in the educational milieu has focused mainly on students' motivation not on teachers' motivation. Our results may offer a promising lead that begins to explain why teachers may be more or less self-determined toward their work and, consequently, how the classroom conditions may become more conducive to an autonomy supportive environment for students.

Although we find our results encouraging, important steps could be added to demonstrate the validity of our model, namely, whether it can predict both teachers' actual behaviors toward students and students' motivation. Reeve et al. (1999) have demonstrated how a teacher's disposition to control students or support their autonomy, as assessed by the Problems in Schools questionnaire (Deci et al., 1981), could lead to a distinctive motivating style as measured by teachers conversational behaviors, interpersonal style, and attempts to support students' intrinsic motivation and self-determination. However, they did not assess students' motivation. Future research could examine the full sequence proposed in our model and add to it by measuring students' motivation at the beginning of the school year and toward the end of the school year. A longitudinal design that includes students' motivation would be helpful for at least, three reasons. First, it could establish that teachers' behaviors are significant predictors of students' motivation and then add ecological validity to the model. Second, it would allow tests of reciprocal effects between variables. Thus, it could be possible to evaluate, for example, whether the pressure put on teachers increases or decreases as students in their classroom are more or less motivated. Third, the assessment of students' motivation at the beginning of the school year may shed some light on the origins or the development of teachers' beliefs regarding their students' motivation. This line of research may lead to important implications for our understanding of the reasons that could explain why individuals in a supervising role, like teachers, eventually develop implicit theories or global dispositions that affect their way of interacting with subordinates that are more or less self-determined toward an activity.

This study has some implications for educational practice. First, it highlights the importance of intervening into the patterns of school system–teacher interaction. The context may be fine for school systems that do not pressure teachers toward a specific teaching style or toward specific goals or for teachers that support autonomy with their students—together they may enrich the life of their students. However, for students whose motivation is low or for school systems that pressure teachers, the classroom experience may result in the further deterioration of teachers' motivation, the quality of teachers' interactions with their students, and students' motivation. Hence, changing the school conditions from those that undermine to those that enhance teachers' support of autonomy should be an important priority of reforms aimed at changing the educational system.

Second, our study also justifies the importance of informing teachers about the sequence of events that lead them to adopt an autonomy supportive or controlling style with their students. Given the centrality of teachers' behaviors for students' motivation, educating teachers about the source of the differences among the students may sensitize the teachers to new avenues for understanding and improving their engagement with students.

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