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Taking a step towards understanding interactions between teacher efficacy in behavior management and the social learning environment: a two-level multilevel analysis

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Abstract
Behavior management in the classroom is well known for being a challenge and a source of stress for preservice and experienced teachers alike. This means it may not only impact teachers' self-efficacy beliefs, but teachers' efficacy perceived by their students too, engendering effects on the social learning environment and vice-versa. This article aims at taking a step towards a better understanding of which aspects of the social learning environment preservice teachers and their students take into account when positioning themselves on behavior management efficacy. It then goes onto exploring how students' perception of teacher efficacy in behavior management varies across classes and how it interacts with the social learning environment through a two-level model analysis. Results showed that the social learning environment's dimensions are associated with the perception of teacher efficacy by students. On one hand, students perceive that efficacy in behavior management is linked to the social learning environment and therefore expect that an efficient teacher in this area will be able to create a healthy relationship with appropriate rules and class organization. On the other, when it comes to preservice teachers, findings seem to show the importance of the training program and how it supports self-efficacy beliefs throughout first teaching experiences as results go in the direction of confirming that these beliefs stabilize fairly early on, because unlike the students, the preservice teachers seem to take other aspects than the learning environment into account while evaluating their self-efficacy regarding behavior management. Finally, this research adds yet another element to the observation that effective behavior management within the classroom requires a positive relationship between teachers and their students. In addition, the way rules and organization are taken into account by students demonstrates the need for a proactive approach in which teachers' expectations are clear.

Keywords Teacher self-efficacy · Behavior management · Classroom management · Social learning environment · Preservice teacher · Secondary school

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Introduction

Mastering behavior management in the classroom is an essential component of a teacher's activity, because it promotes learning quality while having a positive effect on the social learning environment by making it safer and more orderly (Hattie, 2012; Martineau & Gauthier, 1999; Sieber, 2000), yet it remains a challenge for many, in particular pre-service teachers (Dicke et al., 2015). The most important causes of stress for beginning teachers relate to tasks with high psychological demands, such as showing perseverance and social skills in managing a student with behavioral difficulties (Harmsen et al., 2018). They are also linked to more general aspects, such as managing students who haven't done their homework, too much chatter in the classroom, or even complicated peer relationships, that can generate bullying situations, inducing negative emotions and dissatisfaction towards students (Harmsen et al., 2018). Different studies (e.g., Canisius Kamanzi et al., 2017; Klassen et al., 2012; Petiot et al., 2015) support this observation by showing that it is above all incidents linked to difficult student behavior that generate these negative emotions and this state of dissatisfaction among teachers—in particular among beginning teachers—which weakens their sense of self-efficacy. However, if the latter is impacted by a person's physiological state, it is also influenced—and positively this time—by mastery experiences (Bandura, 2013). Self-efficacy beliefs are important because just like stressful situations linked to student behavior, they are directly related to job (dis)satisfaction and can be predictors of a teacher's intent of leaving the profession (Aldridge & Fraser, 2016; Canisius Kamazi et al., 2017).

In classes with less behavioral disruptions, students rate the social learning environment more positively (Ingemarson et al., 2020). By promoting a healthy social learning environment for students, behavior management can have repercussions on learning. For example, by regulating peer reactivity in the classroom, the teacher helps create a safe environment in which students can feel comfortable enough to make errors, allowing the teacher to give feedback on subjects in which students do not have proficiency (Hattie, 2012). It can also have repercussions on students' behavior regarding their schoolwork and their homework by stimulating students' effort (Hopland & Nyhus, 2016).

While many researchers have been interested in teachers' difficulties relating to behavior management, little work in this field concerns secondary school classes specifically (e.g., Schwab et al., 2019). This is surprising since behavior management can be particularly challenging when it comes to adolescents with whom a number of strategies, although well suited for primary school students, lose their effectiveness (Malmgren et al., 2005), probably contributing to the fact that secondary school teachers seem to have to face bigger challenges leading to higher levels of emotional exhaustion (Lazarides et al., 2020).

The social learning environment and behavior management

The classroom's social learning environment is the subjective and multidimensional perception of the environment and of the functioning of personal and academic relationships between students and the teacher of a class by these same individuals (Author, 2004). It generally focuses on three domains (Tricket & Quinlan, 1979). Behavior management seems to play a role in all three of them.

The first domain is interpersonal relationships. Several studies highlight good relationships between students as being predictors of students' good behavior in the classroom

(Gaudreau et al., 2018; Müller et al., 2013; Rose et al., 2013). This supports the idea that teacher's actions are not enough to achieve optimal classroom management. Indeed, student–teacher relationships and the students' feeling of being accepted or not by the teacher also play an important role in behavior management (Harmsen et al., 2018; Schwab et al., 2019). In this study, we chose to focus on the dimensions of class cohesion, meaning peer relationships (e.g., students are happy to work together) and teacher proximity (e.g., trust between teacher and students), perceived by students and by pre-service teachers. By doing so, we aim to develop a better understanding of students' and preservice teachers' perceptions of relationships between students as well as between students and their teacher (Author, 2012).

The second domain concerns the maintaining or changing of the system, bringing together the dimensions of rules and organization and innovation. It concerns lessons' organization, instruction, and teacher expectations' clarity, on the one hand, and the presence of routines or variations in activities on the other. Class organization and clear expectations towards students contribute to effective behavior management within the classroom (Gaudreau et al., 2018), just as clear instructions and structured courses support sustained learning (Bissonette et al., 2005). Regarding innovation, it relates to the variety of the type of tasks to be done in class or at home. This type of variety can be double-edged because on the one hand, students, especially those with academic difficulties, need routines and activities that do not vary too often nor too quickly (Cèbe & Goigoux, 1999). But on the other hand, varying activities and didactic strategies helps capturing students' attention and promoting behavior management (Kounin, 1970). A recent study conducted in a similar context to ours has shown that teachers who perceive themselves as innovators have a high sense of self-efficacy in proactive behavior management (Villoz, 2019). It will therefore be interesting to see if we find similar results when it comes to preservice teachers and from the students' point of view.

Finally, the third domain focuses on goal orientation and personal development and brings together two dimensions: difficulty along with task orientation and involvement. This last domain is related to the lessons' rhythm, perceived classwork difficulty, and students' involvement and efforts regarding their learning (Author, 2012). Over the past twenty years, various studies have shown that learning difficulties very often go hand in hand with behavioral difficulties, hence the interest in taking these aspects into account when we are interested in behavior management (Hinshaw, 1992; Bissonette et al., 2017).

Perceived efficacy regarding behavior management

Self-efficacy is a current feeling about one's own ability to perform a task in a given situation, without comparison to other people (Bandura, 1977; Woolfolk Hoy, 2004). There are four known sources of self-efficacy. The first one is mastery experiences which, in this context, could be teaching or dealing with behavior management at school. The second one is vicarious experiences, meaning seeing others perform a certain task. For example, it could be observing an inservice teacher give lessons or fellow preservice teachers going through the same processes. The third one is verbal persuasion which can refer to feedback from a colleague or mentor. And the fourth one is positive physiological and emotional states, meaning the way one may feel or react during a specific task (Tschannen-Moran et al., 1998).

To be efficient in behavior management, teachers have to be flexible, meaning they must be able to adjust the various components of behavior management to the reality of their classrooms adequately, in order to be able to adapt to the learning environment

and more specifically to the students with whom they interact (Author, 2018; Gaudreau et al., 2015). It is complicated to define difficult behavior unambiguously since every teacher has their own perception of the events that take place in their classroom (Nash et al., 2016). Meaning that, what can be perceived by a teacher as behavior representing a negative risk, may be viewed as a positive challenge or even as something trivial by another. This is why it is not so much the types of student behavior that is intrinsically interesting, but rather the different perceptions of a situation considered being more or less difficult for the teacher to manage. Thus, we consider that any situation can be seen as difficult to manage, if it is perceived as such by the teacher.

Perceived efficacy regarding behavior management can be defined through four dimensions (Author, 2018). The first refers to efficacy in proactive management, which is everything a teacher does to prevent the occurrence of disruptive behavior, such as setting clear classroom rules and guidelines. The second, complementary, is efficacy regarding reactive management. It concerns the teacher's reactions following a particular behavior of the student (for example, an encouragement given for adequate behavior or a focused gaze towards a disruptive student). The last two dimensions refer to efficacy in proactive involvement of parents or a legal representative and reactive involvement of people outside the class. While one relates to the proactive inclusion of parents in order to make them partners in the management of their child's behavior, the other mainly aims at a remedial of complicated situations by calling on professionals outside the classroom when necessary (e.g., members of the school administration, social workers, mediators, or school psychologists).

Literature on classroom management, including behavior management, dating back around thirty years, highlights the importance of teachers' sense of self-efficacy in relation to this concept (Gaudreau et al., 2015). Indeed, a high feeling of self-efficacy on the part of the teacher is linked to teacher positive behavior towards classroom management practices and to students' behavior, meaning they are less stressed when it comes to difficult behavior and have better competencies when it comes to adapting interventions to students' needs (Gaudreau et al., 2015). Let's note, however, that although teachers' sense of self-efficacy is considered to be a reliable student and teacher behavior predictor (Brown et al., 2015), it is difficult, if not impossible, to know which comes first: positive behavior or the feeling of self-efficacy, given that they influence each other (Pajares, 1996).

Recent studies (e.g., Author, 2020) have shown that addressing behavior management during teacher training through self-efficacy could be an effective way to support pre-service teachers in this field. However, it is a subjective assessment of one's own efficacy, and we do not know if this feeling is linked to students' perception regarding the same object, meaning that a pre-service teacher with high beliefs regarding self-efficacy could be perceived as inefficient by students.

For beginning teachers, as well as for preservice teachers, it can sometimes be difficult to take a critical look at ones' actions in class, meaning that perceived self-efficacy may sometimes be quite different from what students perceive from their point of view. Although it is common to use student perception in research because it can lead to concrete improvements within the classroom, it is not recommended to use students' perceptions as the only assessment, but rather cross different actors' perceptions (Author, 2006), in the case of this study, students and pre-service teachers. Many studies on classroom or school learning environment only take into account teachers' or students' perceptions separately (e.g., Aldridge & Fraser, 2016; Aldridge et al., 2018).

Thus, this paper aims to take a step towards a better understanding of the links between students and preservice teachers' perceptions concerning two key concepts mentioned above: the social learning environment of the classroom and teacher efficacy regarding behavior management.

Several studies having emphasized the importance of contextual variables and their impact on teachers' self-efficacy (Lazarides et al., 2020); we are going to adopt a comparative approach through our first research question:

RQ1: Are the relationship between social learning environment and behavior management efficacy similar when viewed through the lens of student and teacher perceptions?

We are then going to explore the possibility of class effects on perceived teacher efficacy through an explanatory approach with our second research question:

RQ2: To what extent is the behavior management efficacy classroom-specific and dependent on the social learning environment as perceived by students?

The first part of this question will determine whether or not it is relevant to take into account the grouping structure (classes), alongside individual differences between students to explain variations at level 1 and level 2 through a two-level multilevel analyze, level one being the students and level two being the class. The second part of the question will allow us to analyze in what ways students' perceptions of the social learning environment relates to teacher self-efficacy in behavior management across classes.

Methods

Data was collected in a teacher training institution as well as in secondary schools in the canton of Fribourg, in Switzerland. Data measuring teacher efficacy and the learning environment in the classroom perceived by the teachers and their students were collected.

Sample

Six hundred eighty-six middle school students from 35 classes took part in this study. The average class size is of 21 students with a standard deviation of 4.09. No demographic information concerning students is available.

These classes were chosen through 35 preservice teachers in their last year of training who were solicited for a research project this study is part of. They answered the questionnaires and asked their students to complete the student versions of the same questionnaires. They included 23 women and 12 men for an average age of 26 years.

Training program context

During their last year of training, the preservice teachers went on a placement during which they were supposed to begin the school year with their pupils and finish in December. Throughout this last placement, preservice teachers were put in a high-responsibility situation, meaning they had to manage all of the aspects of teaching, including behavior

management as well as some administrative tasks for the school in which they worked. Key elements of the program they followed were access to on-line mentoring with feedback (Author, 2020) and to an on-site teacher trainer as well as their university courses on classroom management. Another important aspect of their training was that they went on different kinds of placements throughout nine semesters, allowing them to progressively go from vicarious experiences to mastery experiences, while being exposed to verbal persuasion and followed through emotional and physiological states, thus experiencing all four sources of self-efficacy throughout a rather long period of time (Tschannen-Moran et al., 1998). For example, these placements went from observing in-service teachers to taking on full responsibility of a class for several weeks. One placement even focused on specific aspects of a "difficult situation" (which varied from one preservice teacher to another as not all situations were seemingly difficult to all of them).

Paper questionnaire for students

The student questionnaire has two parts.

The first part is an adapted version of the scale of teacher self-efficacy regarding behavior management in the classroom for middle school teachers[1] (Author, 2018). The original scale was comprised of four dimensions and 16 items. Because of their inadequacy for students, five items were taken out of the original scale and were not adapted in the new version (e.g., I am able to anticipate and elaborate efficient strategies to manage difficult behavior in class), explaining why in this version we do not differentiate proactive from reactive involvement of people outside the class. Other adaptations included a change in pronouns and some simplifications of the vocabulary used. The final scale has 11 items measuring the students' perception of global teacher efficacy regarding behavior management ($\alpha = 0.90$) using a 10-point Likert scale (from 1 to 10), through items representing three theoretical dimensions such as (1) reactive management, "Your teacher is able to intervene as soon as someone starts disrupting the lesson (by chatting, standing up, etc.)"; (2) proactive management, "Your teacher is able to talk with you, his or her students, about your behavior within the classroom, without hurting your feelings"; and (3) involvement of people external to the class, regrouping the two following dimensions, presented in the theoretical framework, proactive involvement of parents or a legal representative, and reactive involvement of people outside the class, "Your teacher is able to contact your parents or those of a classmate to solve a discipline problem that happened in class." Because the original scale was modified, a CFA was conducted. We tested a model with 3 dimensions (SRMR = 0.05, RMSEA = 0.09, CFI = 0.94, TLI = 0.92, Chi2(41) = 243,245, $p < 0.001$, Chi2/df = 5.9). Even if the RMSEA was a little higher than the reference value (i.e., 0.08, McDonald & Ho, 2002) and the Chi2 significant (which is often the case in big samples, Byrne, 2001), the other indices were acceptable (CFI and TLI > 0.90; SRMR < 0.05, McDonald & Ho, 2002). In order to calculate perceived teacher efficacy through one general second-order score, across all 11 items, we modelized a model with 3 dimensions and one general second order factor. The fit indices were identical and the 3 dimensions load very well on the general factor ($\beta_{\text{proactive management}} = 0.97$; $\beta_{\text{reactive management}} = 0.80$; $\beta_{\text{involvement}} = 0.89$). This is why we decided to use a general factor in the subsequent analysis.

[1] Questionnaire titles were freely translated from French.

The second part is the student version of the Classroom Learning Environment Scale (Author, 2012). It is made up of 36 items divided into 3 domains and 6 dimensions: class cohesion, teacher proximity, rules and organization, innovation, student difficulty, and task orientation and implication. Students were asked to rate the learning environment of the classroom using a 6-point Likert (from 0 to 5).

Online questionnaire for teachers

The teacher questionnaire is made of three parts. The first part is comprised of demographic questions (age and sex). The second part is an adapted version of the scale of teacher self-efficacy regarding behavior management in the classroom for middle school teachers (Author, 2018). The third part is the Classroom Learning Environment (for teachers) Scale (Author, 2012). The number of items and dimensions is the same as in the version submitted to students so that a comparison can be made.

Analyses

Parametric tests

RQ1: Are the relationship between social learning environment and behavior management efficacy similar when viewed through the lens of student and teacher perceptions?

In order to answer our first question, and because of the sample size (>30), parametric tests were used (Hoskin, 2012; Mircioiu & Atkinson, 2017). We explored links between different variables using Pearson's correlations.

Variance components model

RQ2: To what extent is the behavior management efficacy classroom-specific and dependent on the social learning environment as perceived by students?

Answering this question helped us determine whether or not there is evidence of clustering in the data with respect to the dependent variable (Heck et al., 2014), in our case: the students' perception of their preservice teachers' efficacy regarding behavior management. To do so, we followed Heck et al.'s (2014) recommendations and test a class-effect by calculated am intraclass correlation coefficient (ICC).

The effect of class-level and student-level variables on teacher efficacy perceived by students was estimated using multilevel models (Bressoux, 2010; Goldstein, 2011). These models are used to study hierarchical data, were micro-unit (i.e., students), and are embedded in macro-unit (i.e., class or school). Progressive models were built. The first (model 0) is the null model and it is used to determine the structure of random effects. It allows us to study how the variance is shared between different levels: is there a variation in the perception of teacher efficacy between the students (inter-individual variance) and between the classes (inter-class variance)? In the following models, we added explanatory variables (fixed effects) to explain the variation of students' perception of their preservice teachers' efficacy at both levels (inter-individual and inter-class). It should be noted that a class level variable (e.g., the class size) can only explain a level 2 variation (i.e., the class effect). We tested model 1, assessing the effect of class variables related to the class size and to the

preservice teacher's age and sex. Finally, in model 2, we added variables related to students' perception of the six different dimensions related to the learning environment. In order to test if a new model is better than the old one, the difference between the log of the deviance between the two model must be greater than the value of a Chi2 where the degree of freedom correspond to the difference of parameter between the two models. We used the package "lme4" in R and a maximum likelihood (ML) estimation.

Results

RQ1: Are the relationship between social learning environment and behavior management efficacy similar when viewed through the lens of student and teacher perceptions?

The teacher self-efficacy score is high (cf. Table 1), meaning that most pre-service teachers feel efficient in behavior management. Students seem to agree as their perception score of the teachers' efficacy is even higher. When it comes to the social learning environment, the highest scores are found in *rules and organization* for both teachers and students, while the lowest concern students' *difficulties*, indicating that globally, the classes that participated in this study had a healthy learning social environment with relatively low rates of student difficulty.

Because these correlations were tested in two different groups with different sample sizes (preservice teachers ($N=35$) and their students ($N=686$)), we assessed and compared the significance of the differences between the average correlations in both conditions, using the Eid et al. (2013) method which is a z-test based on Fisher z-transformed score that takes the correlation coefficient into account as well as each sample size. Results showed that the differences between the average correlations are significant for two learning environment dimensions, namely teacher proximity ($p=0.01$) and task orientation and implication ($p=0.02$). We also observed a tendency towards significance related to rules and organization ($p=0.09$). In each case, the correlations were higher for the students than for the teacher.

RQ2: To what extent is the behavior management efficacy classroom-specific and dependent on the social learning environment as perceived by students?

Model 0 indicates that 27.8% of total variance is imputable to students' classes, meaning that class effect equals 27.8%. When explanatory variables linked to classes are added

Table 1 Classroom learning environment item examples and dimensions' internal homogeneity

Dimensions	Item examples	α
Class cohesion	There is a strong friendship between us, students	.66
Teacher proximity	Our teacher is close to us, students	.68
Rules and organization	Our teacher's instructions are always clear	.65
Innovation	Our teacher often suggests new activities	.64
Difficulty	Classwork is difficult for some of us	.59
Task orientation and implication	We are comfortable asking questions during lessons	.67

Table 2 Descriptive statistics

	Teachers' perception		Students' perception	
	M	*SD*	M	*SD*
Global teacher efficacy	7.76	*0.94*	7.81	*1.70*
Class cohesion	3.66	*0.48*	3.64	*0.85*
Teacher proximity	3.20	*0.48*	3.13	*0.91*
Rules and organization	3.97	*0.38*	3.89	*0.75*
Innovation	3.17	*0.61*	2.84	*0.91*
Difficulty	1.91	*0.54*	2.07	*0.92*
Task orientation and implication	3.55	*0.54*	3.23	*0.85*

Table 3 Comparison of correlations between teacher efficacy regarding behavior management perception and the social learning environment

	Teachers' perception of global BM efficacy	Students' perception of global BM efficacy
Class cohesion	.37*	.46**
Teacher proximity	.18	.53**
Rules and organization	.27	.48**
Innovation	.28	.36**
Difficulty	− .18	− .22**
Task orientation and implication	.06	.41**

* $p < 0.05$; ** $p < 0.01$

(model 1), the decrease in deviance is too low ($\Delta \log V = 1.8 < Chi2(3) = 7.81$) for the model to be considered being better adjusted. Thus, adding an explanatory variable such as class size or the teacher's age does not seem to explain the differences between classes.

In model 2, the decrease in deviance is important enough with respect to model 0 (ΔlogV = 617.6 < Chi2(124) = 150.99) so that the model can be considered a better fit. Thus, class cohesion, teacher proximity, rules and organization, task orientation and implication, and tendentially innovation explain 53.08% of inter-class differences and 34.76% of inter-student variations.

Discussion

First of all, descriptive statistics show that globally, our sample of preservice teachers have a high sense of efficacy and are also perceived as being highly efficient by their students (Tables 2, 3, and 4). Previous research shows somewhat contradictory results concerning preservice teachers' sense of efficacy: all indicate an inflated sense of efficacy until they reach the point when they have to teach on their own, after what some say they usually experience a decrease in self-efficacy beliefs (e.g., Hoy & Spero, 2005), while others observe an increase in self-efficacy following their first teaching experiences (e.g., Coppe

Table 4 Two-level model explaining global teacher efficacy perceived by students' variations across classes

	Model 0	Model 1	Model 2
Fixed effect			
Intercept	7.78 (0.17)	9.19 (1.49)	140 (0.54)
Class size		−0.02 (0.03)	
Gender prof		−0.43 (0.35)	
Age prof		−0.03 (0.05)	
Class cohesion			0.24 (0.10)*
Teacher proximity			0.54 (0.09)**
Rules and organization			0.58 (0.11)**
Innovation			0.19 (0.09)*
Difficulty			0.13 (0.08)
Task orientation and implication			0.22 (0.09)*
Random effect			
Class level	0.81 (0.90)	0.76 (0.87)	0.38 (0.62)
Student level	2.10 (1.45)	2.09 (1.45)	1.37 (1.17)
ICC	27.8%		
Log V	1994.2 (536)	1992,4 (533)	1376.6 (412)

* $p < 0.05$; ** $p < 0.01$

et al., 2021). This brings us to believe that at this early stage of teacher training, self-efficacy beliefs are simply not stabilized yet and they will fluctuate according to experience and to the training program in which they are studying. Because our sample of pre-service teachers is in its ninth and last semester of training, we can assume that they are no longer in this initial phase. Thus, these results are very encouraging for the training program they follow. A recent study shows that the way in which teachers begin their careers is important, because self-efficacy seems to stabilize very quickly (Lazarides et al., 2020). Key aspects of the training program regarding self-efficacy beliefs are explained in the "Methods" section of this paper. Without much surprise, the social learning environment is mostly perceived in a positive way. This can be explained by the fact that most placements took place in a context in which schools are fairly advantaged with low rates of behavioral problems, even though there are always a few exceptions.

In response to our first research question, our results show that preservice teachers and students don't take the social learning environment into account in the same way when positioning themselves on behavior management efficacy. While students rely on their perception of the social learning environment to determine whether their teacher is implementing effective classroom behavior management or not, teachers do not really seem to take into account the quality of the environment in their self-assessment. However, we must interpret these results with caution because of the small teacher sample size. This may seem inconsistent with a recent study showing that contextual variables influence behavior management practices (Massé et al., 2020), and the fact that teachers should take the quality of the learning environment into account when considering their competence. However, it could be explained by the fact that self-efficacy beliefs seem to be rather stable once they've been established, as explained previously (Lazarides et al., 2020). In addition, the fact that our sample consists of preservice teachers working in fairly advantaged schools also seems to positively impact the early development of a healthy sense

of efficacy (Lazarides et al., 2020). In addition, because they are teaching in experienced teachers' classrooms, we believe that their status as learners might lead preservice teachers to disregard the social learning environment and base their self-assessment mainly on their mentors' feedback on one hand; and on the other, the fact that their self-efficacy scores are rather high may act as a mediator on their perception (Klassen et al., 2012). This brings us to speculate that one possibility in overcoming stress and dropouts related to difficulties in behavior management could be to actively support pre-service teachers' self-efficacy through training programs that explicitly encourage the four known sources of self-efficacy: (1) performance accomplishments by successfully teaching and engaging in interactions with mentors and in-service teachers on topics related to classroom and behavior management; (2) vicarious experiences by putting pre-service teachers in situations in which they can witness everyday school activities and other teachers solving problems linked to behavior management; (3) verbal persuasion by belonging to a defined, stable group of pre-service teachers with who they share similar goals and with who they can share stories of success and challenges related to this topic, and by receiving constructive feedback from peers and mentors; and finally, (4) positive physiological and affective states through overcoming stress and anxiety or solving problems linked to behavior management (Menon, 2020).

When it comes to our second research question, our results indicate that the proportion of variation in perceived teacher efficacy that lies between classes is approximately 27.8%. Intraclass correlation coefficient's value can be considered an indication of substantial clustering of observations within level 2 units. Because results showed a significant variation at level 1 and level 2 that remained to be explained in the model, we then tested a level 2 component (variance of the perceived preservice teacher's efficacy in behavior management across classes).

Testing model 1 showed that age and gender did not significantly explain the variations between classes. It is encouraging to note that these elements, on which teachers don't have any control, don't enter into the evaluation of preservice teachers' efficacy by students. However, it would be relevant to check if the same is true when it comes to measuring other aspects such as which subjects are taught by the teacher or previous experience acquired through replacements, for example.

Testing model 2 allowed us to see that taking the social learning environment into account significantly explains the variations between classes. Adding student variables explained more than half of the variation between classes (53.08%) and more than a third of the variation between students (34.76%). Twenty-one percent of the variation between classes remains to be explained. These results encourage us to continue exploring this area to gain more information which could potentially lead us to more ways of improving education in classroom management.

The two dimensions of the social learning environment that students seem to take into account the most when evaluating preservice teachers' efficacy regarding behavior management within their class are the rules and organization as well as the teacher's proximity which confirms recent studies showing that when it comes to teaching practice regarding behavior management, the teacher-student relationship is central to achieving positive and efficient management, as well as setting clear expectations for students, as one would do when explaining rules and organization (Gaudreau et al., 2018). Interestingly, these results approach what has been observed in studies on parent–child relationships. For example, Baumrind's studies of parenting styles show that the most adaptive parenting style for children combines both parental demandingness (rules, discipline) and responsiveness (warmth and acceptance) (Baumrind, 1991; Maccoby & Martin, 1983). These findings

are also concomitant with the results of many recent studies showing the importance of establishing meaningful relationships between students and their teachers for both parties as on one hand, they benefit students' emotional well-being through supporting important aspects such as achievement emotions or self-concept of ability, and on the other, they support teachers' emotional wellbeing, thus lessening stressful feelings that often accompany negative behavior management (e.g., Clem et al., 2021; Freund et al., 2022; Hagenauer et al., 2015). Positive relationships have been central to classroom and behavior management strategies for several years now (Gaudreau et al., 2015) and it is interesting to see the way they are taken into account by students when evaluating different aspects of the social learning environment. When it comes to rules and organization, these relate directly to an important part of classroom management which is setting clear expectations (Gaudreau et al., 2015), thus explicitly helping students know what is expected of them. We can also link them to the direct instruction style of teaching which is known as being an effective teaching practice to teach specific concepts or skills, such as expected behavior in the classroom (Stein et al., 1998).

From a teacher education point of view, these findings are important as they can lead to the development of specific strategies when it comes to learning how to manage a classroom, and more specifically, how to manage behavior within the classroom, focusing on specific aspects of learning environment such as teacher proximity as well as rules and organization. As said previously, many studies show the importance of positive relationships. However, this is not an easy aspect to teach to future teachers as it doesn't relate to a specific field but refers to soft skills for teachers such as communication skills, leadership skills, or social emotional skills. Considering the fairly large amount of recent studies concluding that the teacher-student relationship is a key component to mastering behavior management within the classroom, we can only urge training programs to consider implementing these skills in a more explicit way.

Conclusion

This study showed that dimensions of the social learning environment are associated with the perception of teacher efficacy by students. More specifically, students associate behavior management efficacy more strongly to rules and class organization as well as to teacher proximity. Therefore, it can be anticipated that students will expect an efficient teacher in this area to be able to create a healthy relationship with appropriate rules and class organization. However, when it comes to preservice teachers' perceptions of the same concepts, they seem to take other aspects into account while evaluating their self-efficacy regarding behavior management. It would be interesting to consider longitudinal research throughout the training program to examine when young teachers change their benchmarks for self-assessment of behavior management skills.

This research also adds yet another element to the observation that effective behavior management within the classroom requires a positive relationship between teachers and their students. In addition, the way rules and organization are taken into account by students demonstrates the need for a proactive approach in which teachers' expectations are clear. Nevertheless, a fifth of the variation between classes remains to be explained. This calls for extra research in this field, in order to find out whether class fixed effects that have not been investigated in this study may have an effect on this variation, thus extending knowledge on how to improve behavior management on one hand and on how to lessen the

reality shock many preservice and beginner teachers face, linked to this specific aspect of teaching.

The main limits of this study reside in the small teacher sample and the fact that it is cross-sectional, meaning that we cannot reason in terms of cause and effects. It would be interesting to address this subject through longitudinal work to bring a better understanding of how the learning environment and perceived teacher efficacy interrelate across time. It would also allow us to see if the learning environment deteriorates over time as suggested by recent studies (e.g., Ingemarson et al., 2020), and if so, what implications this may have on teacher efficacy perceptions. Finally, the fact that no demographic data about students is available means that we could not test gender effects on students' teacher perception. It would have been interesting to know if girls and boys perceive teachers of the same gender in a more positive way and inversely.

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Declarations

Conflict of interest The authors declare no competing interests.

References

Aldridge, J. M., & Fraser, B. J. (2016). Teachers' views of their school climate and its relationship with teacher self-efficacy and job satisfaction. *Learning Environment Research, 19*, 291–307. https://doi.org/10.1007/s10984-015-9198-x

Aldridge, J. M., McChesney, K., & Afari, E. (2018). Relationships between school climate, bullying and delinquent behaviours. *Learning Environment Research, 21*, 153–172. https://doi.org/10.1007/s10984-017-9249-6

Author, P. A. (2004). *Perception des interactions maître – élèves : L'apport du regard des apprenants sur le profil interactionnel des enseignants en formation*. Fribourg: Imprimerie St-Paul.

Author, P. A. (2006). Le regard des élèves : Un apport à la formation initiale des enseignants. *Recherche Et Formation, 52*, 117–130.

Author, P. A. (2012). *Climat social de la classe (pour enseignant-e)*. Fribourg: Université de Fribourg.

Author, M. S. (2018). Sentiment d'efficacité personnelle en gestion des comportements, élaboration et validation d'une échelle de mesure. *Revue Suisse Des Sciences De L'education, 40*(3), 697–724.

Author, M. S. (2020). Pre-service teachers: Effects of a thinking journal on self-efficacy beliefs regarding behavior management. *Swiss Journal of Educational Research, 42*(2), 501–523. https://doi.org/10.24452/sjer.42.2.11

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215.

Bandura, A. (2013). *Auto-efficacité: Le sentiment d'efficacité personnelle*. Bruxelles: De Boeck.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *The Journal of Early Adolescence, 11*(1), 56–95. https://doi.org/10.1177/0272431691111004

Bissonette, S., Gauthier, C., & Castonguay, M. (2017). *L'enseignement explicite des comportements : Pour une gestion efficace des élèves en classe et dans l'école*. Montréal: Chenelière éducation.

Bissonnette, S., Richard, M., & Gauthier, C. (2005). Interventions pédagogiques efficaces et réussite scolaire des élèves provenant de milieux défavorisés. *Revue Française De Pédagogie, 150*, 87–141.
Bressoux, P. (2010). *Modélisation statistique appliquée aux sciences sociales*. De Boeck.
Brown, A. L., Lee, J., & Collins, D. (2015). Does student teaching matter? Investigating preservice teachers' sense of efficacy and preparedness. *Teaching Education, 26*(1), 77–93.
Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Lawrence Erlbaum Associates Publishers.
CanisiusKamanzi, P., Barroso da Costa, C., & Ndinga, P. (2017). Désengagement professionnel des enseignants canadiens: De la vocation à la disillusion. Une analyse à partir d'une modélisation par équations structurelles. *McGill Journal of Education, 52*(1), 115–134.
Cèbe, S., & Goigoux, R. (1999). L'influence des pratiques d'enseignement sur les apprentissages des élèves en difficulté. *Cahier Alfred Binet, 661*(4), 49–68.
Clem, A.-L., Rudasill, K. M., Hirvonen, R., Aunola, K., & Kiuru, N. (2021). The roles of teacher-student relationship quality and self-concept of ability in adolescents' achievement emotions: Temperament as a moderator. *European Journal of Psychology of Education, 36*, 263–286. https://doi.org/10.1007/s10212-020-00473-6
Coppe, T., Devos, C., & Colognesi, S. (2021). How failure experience combined with high teacher self-aspect importance puts self-efficacy at risk among student teachers. *European Journal of Psychology of Education*. https://doi.org/10.1007/s10212-021-00588-4
Dicke, T., Elling, J., Schmeck, A., & Leutner, D. (2015). Reducing reality shock: The effects of classroom management skills training on beginning teachers. *Teaching and Teacher Education, 48*, 1–12. https://doi.org/10.1016/j.tate.2015.01.013
Eid, M., Gollwitzer, M., & Schmitt, M. (2013). *Statistik und Forschungsmethoden*. Beltz.
Freund, A., Zriker, A., & Sapir, Z. (2022). Optimal educational climate among students at risk: The role of teachers' work attitudes. *European Journal of Psychology of Education, 37*, 207–226. https://doi.org/10.1007/s10212-021-00545-
Gaudreau, N., Frenette, E., & Thibodeau, S. (2015). Elaboration de l'échelle du sentiment d'efficacité personnelle des enseignants en gestion de classe (ESEPGC). *Mesure Et Évaluation En Éducation, 38*(2), 31–60.
Gaudreau, N., Verret, C., Massé, L., Nadeau, M.-F., & Picher, M. J. (2018). La scolarisation des élèves présentant des difficultés comportementales : Analyse écologique des conditions relatives à leur intégration au secondaire. *Revue Canadienne De L'éducation, 41*(2), 555–583.
Goldstein, H. (2011). *Multilevel statistical models*. John Wiley & Sons.
Hagenauer, G., Hascher, T., & Volet, S. E. (2015). Teacher emotions in the classroom: Associations with students' engagement, classroom discipline and the interpersonal teacher-student relationship. *European Journal of Psychology of Education, 30*, 385–403. https://doi.org/10.1007/s10212-015-0250-0
Harmsen, R., Helms-Lorenz, M., Maulana, R., & van Veen, K. (2018). The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition. *Teachers and Teaching, 24*(6), 626–643. https://doi.org/10.1080/13540602.2018.1465404
Hattie, J. (2012). *Visible learning for teachers*. Routledge.
Heck, R. H., Thomas, S. L., & Tabata, L. N. (2014). *Multilevel and longitudinal modeling with IBM SPSS* (2nd ed.). New York.
Hinshaw, S. (1992). Externalizing behavior problems and academic underachievement in childhood and adolescence: Causal relationships and underlying mechanisms. *Psychological Bulletin, 111*(1), 127–155. https://doi.org/10.1037//0033-2909.111.1.127
Hopland, A. O., & Nyhus, O. H. (2016). Learning environment and student effort. *International Journal of Educational Management, 30*(2), 271–286. https://doi.org/10.1108/IJEM-05-2014-0070
Hoskin, T. (2012). *Parametric and non-parametric: Demystifying the Terms.* Retrieved from https://www.mayo.edu/research/documents/parametric-and-nonparametric-demystifying-the-terms/doc-20408960
Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education, 21*(4), 343–356.
Ingemarson, M., Rosendahl, I., Bodin, M., & Birgegård, A. (2020). Teacher's use of praise, clarity of school rules and classroom climate: Comparing classroom compositions in terms of disruptive students. *Social Psychology of Education, 23*, 217–232. https://doi.org/10.1007/s11218-019-09520-7
Klassen, R., Wilson, E., Siu, A. F. Y., Hannok, W., Wong, M. W., Wongsri, N., Sonthisap, P., Pibulchol, C., Buranachaitavee, Y., & Jansem, A. (2012). Preservice teacher's work stress, self-efficacy, and occupational commitment in four countries. *European Journal of Psychology of Education, 28*, 1289–1309. https://doi.org/10.1007/s10212-012-0166-x

Kounin, J. S. (1970). *Discipline and group management in classrooms*. Rinehart & Winston: Holt.
Lazarides, R., Watt, H. M., & Richardson, P. W. (2020). Teachers' classroom management self-efficacy, perceived classroom management and teaching contexts from beginning until mid-career. *Learning and Instruction, 69*, 101346.
Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: Parent child interaction. In P. H. Mussen & E. M. Hetherington (ds), Handbook of child psychology: Vol. 4. *Socialization, personality, and social development* (4th edition, pp. 1–101). New York, NY : Wiley.
Malmgren, K. W., Trezek, B. J., & Paul, P. V. (2005). Models of classroom management as applied to the secondary classroom. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 79*(1), 36–39.
Martineau, S., & Gauthier, C. (1999). La gestion de classe au cœur de l'effet enseignant. *Revue Des Sciences De L'éducation, 25*(3), 467–496.
Massé, L., Nadeau, M.-F., Gaudreau, N., Verret, C., Lagacé-Leblanc, J., & Bernier, V. (2020). Facteurs influençant la fréquence d'utilisation de pratiques de gestion des comportements difficiles au secondaire. *Revue Canadienne Des Sciences Du Comportement, 51*(1), 67–77.
McDonald, R. P., & Ho, M.-H.R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods, 7*(1), 64–82. https://doi.org/10.1037/1082-989X.7.1.64
Menon, D. (2020). Influence of the sources of science teaching self-efficacy in preservice elementary teachers' identity development. *Journal of Science Teacher Education, 31*(4), 460–481. https://doi.org/10.1080/1046560X.2020.1718863
Mircioiu, C., & Atkinson, J. (2017). A comparison of parametric and non-parametric methods applied to a Likert scale. *Pharmacy, 5*(2), 26.
Müller, C. M., Begert, T., Hofmann, V., & Studer, F. (2013). Effekte der Klassenzusammensetzung auf individuelles schulisches Problemverhalten. Welche Rolle spielt das Verhalten der Gesamtklasse, der "Coolen", der "Extremen" und der persönlichen Freunde? *Zeitschrift für Pädagogik, 59*(5), 722–742.
Nash, P., Schlösser, A., & Scarr, T. (2016). Teachers' perceptions of disruptive behaviour in schools: A psychological perspective. *Emotional and Behavioural Difficulties, 21*(2), 167–180. https://doi.org/10.1080/13632752.2015.1054670
Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543–578.
Petiot, O., Visioli, J., & Desbiens, J.-F. (2015). Perceptions d'enseignants du secondaire concernant leurs inducteurs émotionnels en situation de classe. *Revue Française De Pédagogie, 193*(4), 41–56.
Rose, C. A., Espelage, D. L., Monda-Amaya, L. E., Shogren, K. A., & Aragon, S. R. (2013, july). Bullying and middle school students with and without specific learning disabilities. *Journal of learning disabilities*, 1–16. https://doi.org/10.1177/0022219413496279
Schwab, S., Eckstein, B., & Reusser, K. (2019). Predictors of non-compliant classroom behaviour of secondary school students. Identifying the influence of sex, learning problems, behaviour problems, peer relations and student-teacher relations. *Journal of research in special educational needs, 19*(3), 220–331. https://doi.org/10.1111/1471-3802.12444
Sieber, M. (2000). *Comment gérer l'indiscipline en classe ? Gérer l'indiscipline auprès d'élèves hyperactifs, oppositionnels ou provocateurs*. Editions universitaires Fribourg, Suisse.
Stein, M., Carnine, D., & Dixon, R. (1998). Direct instruction: Integrating curriculum design and effective teaching practice. *Intervention in School and Clinic, 33*(4), 228–234.
Trickett, E. J., & Quinlan, D. M. (1979). Three domains of classroom environment: Factor analysis of the classroom environment scale. *Journal of Community Psychology, 7*(3), 279–291.
Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research, 68*(2), 202–248.
Villoz, C. (2019). Sentiment d'efficacité personnelle en gestion des comportements et climat social de la classe: enquête menée auprès d'enseignants du cycle d'orientation du canton de Fribourg. Document inédit, Université de Fribourg, Fribourg, Suisse.
Woolfolk Hoy, A. (2004, April). *What do teachers know about self-efficacy?* Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

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Recent significant work by the authors in psychology of education:

Dessibourg, M. (2020). Preservice Teachers in Switzerland: Effects of a Thinking Journal on Self-Efficacy Beliefs Regarding Behaviour Management. *Swiss Journal of Educational Research, 42*(2), 501-523.

Dessibourg, M. (2018). Sentiment d'efficacité personnelle en gestion des comportements. Elaboration et validation d'une échelle de mesure. *Swiss Journal of Educational Research, 40*(3), 697-724.

Genoud, P.A., & Waroux, E.L. (2021). The impact of negative affectivity on teacher burnout. *International Journal of Environmental Research and Public Health*, *18*(24), 13124.

Genoud, P.A. (2021). Attitudes des élèves en mathématiques : Quand le contexte fait ressortir l'importance des émotions. *La Revue l'Evaluation en Education, 5*.

Hascoët, M., Pansu, P., Bouffard, T., & Leroy, N. (2018). The harmful aspect of teacher conditional support on students self-perception of school competence. *European Journal of Psychology of Education, 33*(4),615-628.

Hascoët, M., Giaconi, V., & Jamain, L. (2021). Students' math achievement in a Chilean context: importance of family socioeconomic status and role of math self-concept and parental expectations. *International Journal of Behavioral Development, 45*(2), 122-132.

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