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Empirical Validation of a Model for Predicting Students' Sense of Belonging and School Engagement as a Function of Classroom Management Practices

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Abstract

Over the last two decades, several studies have overlooked at-school belonging and engagement, two dimensions that are associated with several positive outcomes. However, the relative influence that contexts and interventions may have on these components has received much less attention. In this study, school belonging and engagement were examined as a function of the implementation and application of classroom rules. The study took place in two Moroccan schools, and participants were 238 students from 9th grade (101 boys, 137 girls; $M_{age} = 15.1$) living in the cities of Casablanca and Témara. They all completed a questionnaire that allowed to measure their belonging and engagement in conjunction with the manner in which rules are implemented and applied. Correlational and structural equation modeling methods were used to analyze the aforementioned relationships. Results showed that implementation of classroom rules had a positive effect on school belonging, which, in turn, had a positive effect on school engagement. These results indicated the need to conduct further empirical research to measure the contribution of classroom management practices on school belonging.

Keywords: empirical validation, theoretical model, sense of belonging, school engagement, classroom management practices.

Validación Empírica de un Modelo para Predecir el Sentido de Pertenencia y el Compromiso Escolar de los Estudiantes en Función de las Prácticas de Gestión del Aula

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Resumen

En este estudio, se examinó la pertenencia y el compromiso escolar en función de la implementación y aplicación de las reglas del aula. El estudio se llevó a cabo en dos escuelas marroquíes, y los participantes fueron 238 estudiantes de noveno grado (101 niños, 137 niñas; $M_{age} = 15,1$) residentes en las ciudades de Casablanca y Témara. Todos completaron un cuestionario que permitió medir su pertenencia y compromiso en conjunto con la forma en que se implementan y aplican las reglas. Se utilizaron métodos de modelado de ecuaciones correlacionales y estructurales para analizar las relaciones antes mencionadas. Los resultados mostraron que la implementación de las reglas del aula tuvo un efecto positivo en la pertenencia a la escuela, lo que, a su vez, tuvo un efecto positivo en la participación escolar. Estos resultados indicaron la necesidad de realizar más investigaciones empíricas para medir la contribución de las prácticas de gestión del aula en la pertenencia a la escuela.

Palabras clave: validación empírica, modelo teórico, sentido de pertenencia, compromiso escolar, prácticas de gestión del aula

On a daily basis, schoolteachers witness the majority of their students trying to form strong social bonds. They seek in relationships comfort and support that contribute to their adjustment to a variety of situations in the school setting. For example, several researchers noted that students who develop a sense of belonging tend to perform at higher levels (Goodenow, 1993a; Hagborg, 1994; Roeser et al., 1996), be more involved in extracurricular activities (Flynn, 1997), attend school in an assiduous way (Korpershoek et al., 2020), be more motivated toward learning (Goodenow, 1993a; Hagborg, 1994, 1998; Juvonen, 2006; Smith et al., 2020), and have more harmonious relationships (Hagborg, 1994).

On the other hand, a low level of belonging is a risk factor of dropout (Phan, 2013; Vera et al., 2018). In this sense, St-Amand et al. (2020a) showed that a low level of school belonging can lead to dropping out of school. Using the Psychological Sense of School Membership (PSSM), the most frequently used instrument to measure school belonging, St-Amand et al. (2020a) could predict school dropout: “Our results showed that the global PSSM score and the factors related to the sense of attachment to the school and the sense of being accepted had a significant link with the action of dropping out of school six months later” (p. 15).

Defining Students’ Sense of School Belonging

To designate the concept of belonging to which we just referred, researchers use various synonyms such as "school membership" (Goodenow, 1993b; Hagborg, 1998), "school belonging" (Uwah et al., 2008), "school connectedness" (Lewis et al., 2006; McGraw et al., 2008), “sense of school membership” (Isakson & Jarvis, 1999), “sense of school belonging” (Booker, 2007), and “youth connectedness” (Crooks et al., 2007), while very often measuring this concept with the most frequently used instrument in educational sciences: the Psychological Sense of School Membership (PSSM) (St-Amand et al., 2020a).

In the last 50 years, several definitions of the sense of belonging have been proposed by the scientific community, particularly in the fields of health sciences (Hagerty et al., 1992; Hagerty & Patusky, 1995; Tanay et al., 2013), psychology (Kestenberg & Kestenberg, 1988; Maslow, 1962, 1970; Mucchielli, 1972, 1980; Smith & Berg, 1987), management (Richer &

Vallerand, 1998), and the educational sciences (Deci et al., 1991; Goodenow 1993a; Janosz et al., 1998; Langevin, 1999; St-Amand et al., 2017a, 2017b; Wehlage et al., 1989; Williams & Downing, 1998). From these definitions, it is possible to extract definitional attributes, that is, elements often cited to describe this concept. Using the methodology of Walker and Avant (2011), St-Amand et al. (2017a) identified four definitional attributes: students must (1) feel a positive emotion towards school; (2) maintain positive social relationships with their peers and teachers; (3) perceive a synergy (harmonization) and a certain similarity with the members of the group; and (4) become actively involved in the school environment. The identification of these four definitional attributes resulted in a new definition of the sense of belonging to school that is increasingly used in the scientific community:

School belonging is a complex and multidimensional concept that includes an emotional, social, participatory, and adaptive dimension. In this context, the sense of school belonging is achieved when students develop positive social relationships with members of the school environment; social relationships are characterized by encouragement, valorization, acceptance, support, respect, and friendship. Belonging also refers to positive emotions, which could be described as emotional attachments, more precisely to a feeling of intimacy, feeling part of a supportive environment, and a sense of pride in the school. The sense of belonging is characterized by active participation in school activities (e.g., extracurricular activities) and teacher-led activities in the classroom, as well as the adoption of norms, standards, and values conveyed within the socio-educational environment. This feeling refers to the harmonization of the needs and desires of the student to those of the members of the group, an element reflecting the positive adjustment to the school environment (loose translation) (St-Amand et al., 2017a, p. 14).

Classroom Management and School Belonging

Belonging is an innate psychological need that, when satisfied, contributes positively to emotional well-being and to positive behaviors that trigger student learning (Osterman, 2000). While the family environment promotes the emotional well-being of students, the sense of belonging is more contextual and relates, among other things, to what happens in the classroom

in terms of teacher practices (Osterman, 2010). Graham and Morales-Chicas (2015) reported that the moment students feel respected in the classroom, they report having better perceptions of belonging to the school community. In addition, factors such as the promotion of pro-social values have been positively associated with students' sense of belonging to school (Anderman, 2002; Battistich et al., 1997; Freeman et al., 2007).

In recent years, a number of qualitative studies (Certo et al., 2003; Ozer et al., 2008; Verde, 2007) have revealed elements that foster school belonging. Ozer et al. (2008) indicated the idea that the quality of the social relationship between the pupil and the teacher, in this case mutual respect and benevolence, turns out to be elements that contribute to school belonging. The value of respect is seen in the effectiveness of the teacher's pedagogical practices as well as in the teacher's engagement in student learning. As for the notion of benevolence, students perceive it when the teacher knows their names, listens to them, displays high expectations in the classroom, encourages students on a daily basis, and cultivates a climate of justice during interventions, which are many elements related to classroom management. Verde (2007), for his part, raised the importance of displaying behaviors and practices aimed at meeting students' psychological needs such as belonging. These elements consist of improving social relations (e.g., interacting frequently with students, demonstrating justice and respect), having effective classroom management (e.g., maximizing the physical arrangement of the classroom, establishing good routines, preparing materials in advance, applying and implementing rules effectively), and using effective instructional practices (e.g., presenting relevant lessons, having high expectations, using humor in the classroom, questioning students, offering students choices). Finally, Certo et al. (2003) indicated that a positive perception of the classroom constitutes an element that positively influences the feeling of belonging.

Theoretically, the importance attached to the concept of belonging dates back several decades. For example, Maslow (1962, 1970) suggested that belonging is a basic need that must be satisfied to self-actualize as an individual. Maslow (1970) described self-actualization in these terms:

It may be loosely described as the full use and exploitation of talents, capacities, potentialities, and other factors. Such people seem to be

fulfilling themselves and to be doing the best they capable of doing, reminding us of Nietzsche's exhortation "become what thou art". They are people who have developed or are developing to the full stature of what they are capable (p. 150).

Since Maslow, many theorists have regarded the concept of belonging as a component of their theory. In their review of the literature, [Allen and Bowles \(2012\)](#) suggested some interesting theories that derive from the concept of belonging, such as parental involvement ([Epstein, 1992](#)), typologies of love ([Lee, 1973](#)), belonging and attachment ([Bowlby, 1969, 1973; Cohen, 1982, 1985](#)), and self-presentation ([Fiske, 2004](#)).

At the same time, many educational theorists also incorporated school belonging into their theories, emphasizing, among other things, the elements related to classroom management that can develop this basic need. Researchers indicated that the climate of justice and the clarity of rules/objectives structure the sense of belonging to the school community ([Newmann et al., 1992](#)). Others added that teacher reinforcements ([Wehlage et al., 1989](#)) and the quality of teaching help to develop and structure school belonging ([Finn, 1989](#)). More systemically, [Janosz et al. \(1998\)](#) developed a coherent model that integrates links between classroom management practices, school climates (belonging, justice, relational, security, educational), and student behaviors such as school engagement. These researchers determined a set of practices that can positively influence the feeling of belonging to the school community, such as a positive behavior support system. For these researchers, a positive behavior support system refers to the rules and procedures that govern proper conduct of learning activities. In order for it to be effective, certain fundamental elements must be present, notably at the level of the rules' implementation and their application: 1) The rules and consequences are clear and transparent; they are formulated in writing and presented at the start of the year while remaining accessible to all students (implementation). 2) The application of the rules must be rigorous and always consistent, regardless of the authority figure; confused and ambiguous rules affect their application and also their effectiveness. When teachers apply rules arbitrarily, this dilutes their impact while creating a feeling of injustice among students ([Janosz et al., 1998](#)). To avoid this climate of injustice, researchers insist on the importance of establishing democratic classroom management ([Leach, 2018; MacMath, 2008](#)). As [Leach \(2018\)](#)

pointed out: "democracy in schooling requires a learning environment where teachers and students are encouraged and empowered to engage in mutual dialogue over matters to do with teaching and learning" (p. 181).

Belonging and School Engagement

Several researchers indicated that school belonging positively influences students' academic development by stimulating academic engagement (Juvonen, 2006; Roeser et al., 1996; Wilson et al., 2015), as well as several other motivational components such as expectations of success, valuation of schoolwork, and the efforts made by students (Goodenow, 1993a; Smith et al., 2020). Other researchers pointed to the presence of a positive relationship between a sense of belonging and engagement in extracurricular activities (Flynn, 1997) or even mental health (Hagerty et al., 1992). Research also indicated a negative relationship between school belonging and cheating or being suspended from school (Hawkins et al., 2001; Jenkins, 1997) and more negative outcomes such as dropout (Mahoney & Cairns, 1997). Finally, Osterman (2000) underlined the importance attributed to belonging by mentioning, "[...] from a review of even these limited sources it is possible to conclude that belongingness is an extremely important concept. As a psychological phenomenon, it has far reaching impact on human motivation and behavior" (p. 359).

In the last 30 years, a number of theoretical works sought to model the links between school belonging and engagement. Newmann et al. (1992) developed a model directly linking school belonging and academic engagement, specifying that school belonging positively and directly influences student engagement. The theoretical and empirical work of Connell et al. (1994) instead presented a sequential model, in which students' sense of belonging (as well as sense of competence) influences school engagement, which, in turn, influences academic achievement.

The close relations between school belonging and school engagement at the elementary and secondary levels are also raised within other theoretical models explaining academic achievement (Finn, 1989; St-Amand et al., 2020b). Wehlage et al. (1989) proposed a model that suggests, among other things, that school belonging represents the basis of school engagement. These researchers emphasized the quality of pedagogical practices and the school's ability to promote the importance of schooling among students, and

therefore school engagement and belonging. However, in this theoretical context, the relationship between engagement and belonging is bidirectional in nature, whereas for the two previous models, school belonging appears to be rather a determinant of school engagement. For his part, Finn (1989) developed a dynamic model showing the close link between school belonging and school engagement. This model is based on the principle that optimizing participation in school activities is key to achieving positive results, which, in turn, stimulate or strengthen the development of school belonging. In this model, school engagement is preserved if the student displays the skills required to accomplish the requested tasks in a context where the explanations and expectations of the school environment are clear and appropriate.

These theoretical observations are reinforced by the work of Eccles and Roeser (2009), who developed a model emphasizing the importance of the social environment for student development and academic achievement. The stage–environment fit proposed that students experiencing a negative social environment will face significant difficulties (Gutman & Eccles, 2007). In contrast, students evolving in a social environment that meets their changing needs are more likely to achieve positive results. The teacher–student relationship is an essential component of school belonging (St-Amand et al., 2017a) and classroom management (Emmer & Sabornie, 2015), and Eccles and Roeser (2009) pointed out that it can influence school engagement: “Teachers who trust, care about, and are respectful of students, and who care specifically about students' learning, provide the social-emotional and intellectual scaffolding that students need to approach, engage, and persist on academic learning tasks” (p. 407).

Theoretical Perspective of this Study

Recent studies suggested that one of the most important determinants of school belonging is the quality of the relationship students develop with their teacher (Ahmadi et al., 2020; Dukynaitė & Dudaitė, 2017; St-Amand, 2018; St-Amand et al., 2017a). One way to develop healthy relations is the teacher's ability to implement and apply classroom rules to foster a climate conducive to learning (Emmer & Sabornie, 2015) and avoid fostering a climate of injustice (Janosz et al., 1998). Janosz et al. (1998) developed a systemic model of the socio-educational environment in which teachers' practices (e.g., application and implementation of classroom rules) directly and substantially contribute to improve the school climate and provide students with senses of

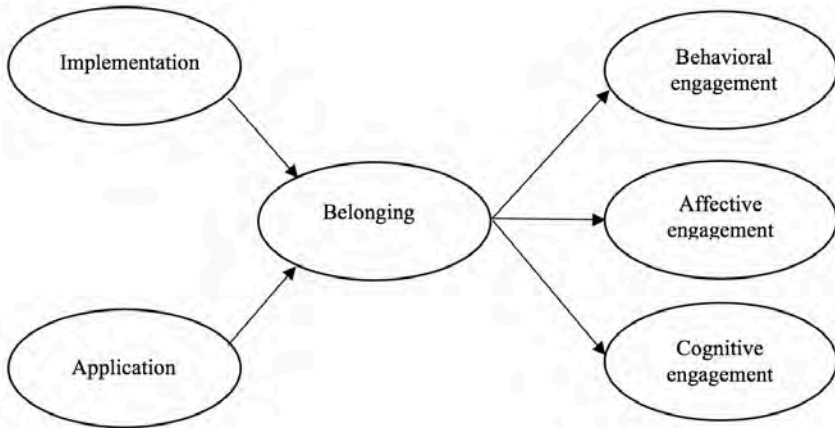
belonging, security, and justice. In turn, such a climate may influence students' behavior and support their school engagement, and many other elements related to the academic achievement and social adaptation. This theoretical perspective therefore implies that school climates mediate the effect of pedagogical practices on student behavior. However, it has never been empirically validated.

Objective and Hypotheses of this Study

The present study therefore aims to explain the emergence of school belonging and the different forms of school engagement (behavioral, cognitive, and affective) from the application and implementation of the classroom rules. Part of our model illustrated in Figure 1, derived from Janosz et al. (1998), shows the determinants of school engagement as a function of different groups of predictor variables; some of these groups (school belonging) show direct links with the different types of school engagement, while other variables (the variables associated with classroom management) indicate indirect links (and proximal) with school engagement.

Figure 1

Initial Model. Model inspired by the work of Janosz et al. (1998) describing the links between classroom management, school belonging, and school engagement.



The organization of these relationships within the model leads us to formulate three research hypotheses:

H1: Classroom management practices (application of classroom rules and implementation of classroom rules) have a positive effect on school belonging.

H2: School belonging has a positive effect on the three types of school engagement (cognitive, affective, and behavioral).

H3: Classroom management practices (application of classroom rules and implementation of classroom rules) affect the three types of school engagement (cognitive, affective, and behavioral) indirectly through school belonging.

Methodology

Design and Sample

Participants were recruited by convenience. More precisely, they included 238 students (101 boys, 137 girls) from two secondary schools located in the cities of Casablanca and Témara in Morocco. The sample was comprised of 9th graders ($M_{age} = 15.1$).

That data collection took place during the months of March and April 2019. A trained assistant visited their school during regular class time and administered the questionnaire. Students were instructed to respond to all questions and to keep their answers confidential. It took less than 20 minutes to complete the questionnaire. The questionnaire was comprised of 26 items that we translated into Arabic allowing to measure six different constructs. Participants had to indicate their level of agreement in regard to each item on a scale from 1 (strongly disagree) to 6 (strongly agree). Items of this study derived from the *Questionnaire sur l'environnement socioéducatif des écoles secondaire* [Questionnaire on the socio-educational environment of secondary schools], a questionnaire that has already been validated (Janosz & Bouthillier, 2007).

Measures

School belonging. To measure school belonging, we used a five-item subscale that assessed students' sense of school belonging to the school community (items: “*I feel proud to be a student at my school*”, “*I feel like I'm really part of my school*”, “*The other students at this school take my opinions seriously*”, “*Sometimes I feel as if I don't belong here*”, and “*I wish I were in a different school*”) (Janosz & Bouthillier, 2007). The last two items were reversed coded, and item scores were averaged to generate a score reflecting school belonging ($M = 3.91$, $SD = .98$, $\alpha = .66$).

School Engagement. Self-reported items were used to measure school engagement. These items represent three dimensions converging towards a more global concept measuring school engagement. In this study, the authors consider each of these three dimensions in a unique way, as suggested by most scholars in the field of school motivation (Fredricks et al., 2004).

First, behavioral engagement measures positive behaviors such as following classroom rules and adhering to classroom norms, as well as the absence of disturbing behaviors (Fredricks et al., 2004). To measure behavioral engagement, participants responded to the four-item subscale that assessed this dimension (Janosz & Bouthillier, 2007) (items: “*In the past 12 months, have you missed school without a valid excuse?*”, “*In the past 12 months, have you missed a class while you were in school?*”, “*In the past 12 months, have you disturbed your class on purpose?*”, and “*In the past 12 months, have you responded to a teacher by being unpolite?*”) ($M = 2.27$, $SD = 1.45$, $\alpha = .67$).

Second, affective engagement in school tasks refers to feelings, interest, perceptions, and attitudes towards school (Fredricks et al., 2004). To measure affective engagement, participants responded to the five-item subscale that assessed this dimension (Janosz & Bouthillier, 2007) (items: “*I like school*”, “*I have fun at school*”, “*What we learn in class is interesting*”, “*I am very enthusiastic when the job to be done is quite difficult*”, and “*Often I don't feel like stopping work at the end of a course*”) ($M = 4.59$, $SD = 1.18$, $\alpha = .65$).

Third, the cognitive dimension of school engagement relates to the psychological investment in learning school subjects (Fredricks et al., 2004). To measure cognitive engagement, participants responded to the three-item subscale that assessed this dimension (Janosz & Bouthillier, 2007) (items: “*How much effort are you willing to put into mathematics?*”, “*How much time are you willing to devote to mathematics?*”, and “*I want to learn more about what we do in mathematics*”) ($M = 5.30$, $SD = 1.49$, $\alpha = .75$).

Implementation of rules. This variable seeks to measure the practices that ensure that the rules are taught, known, and understood by students (Janosz & Bouthillier, 2007). To measure the implementation of rules, participants responded to the six-item subscale that assessed this variable (Janosz & Bouthillier, 2007) (items: “*The rules of this school are clear and easy to understand*”, “*The consequences (punishments) provided for in the code of life of the school are easy to understand*”, “*It is easy to get information about the rules of this school*”, “*Most people (students, teachers, etc.) know the rules of this school*”, “*Students know the consequences (punishments) they may receive if they do not follow the rules of this school*”, and “*We take the time to explain the rules of this school to the students*”) ($M = 3.97$, $SD = .98$, $\alpha = .68$).

Application of the Rules. This variable refers to the application of the classroom rules by the various members of the school staff (Janosz & Bouthillier, 2007). To measure the application of rules, participants responded to the four-item subscale that assessed this variable (Janosz & Bouthillier, 2007) (items: “*The teachers enforce the rules as provided for in the code of life of the school*”, “*The other adults who work at the school enforce the rules as provided for in the code of life of the school*”, “*Teachers intervene as soon as they realize that a student is breaking the rules*”, and “*The management enforces the rules as provided for in the code of life of the school*”) ($M = 4.27$, $SD = .98$, $\alpha = .67$).

Cronbach's alpha was used as a benchmark to quantify the degree of internal consistency of each of our scales. This indicator is considered by many researchers to be adequate for making such a judgment (Clark & Watson, 1995; Hinton et al., 2014; Murphy & Davidshofer, 2004; Nunnally & Bernstein, 1994; Peterson, 1994). To this end, Hinton et al. (2014) suggested that a result lower than .50 indicates a low internal consistency, that a result equal to or greater than .50 and less than .70 indicated moderate consistency, that a result equal to or greater than .70 and less than .90 indicated good consistency, and that a result of .90 or more indicated excellent consistency. Our Cronbach's alpha varied from .65 to .75, which is considered moderate to good consistency.

Analytical strategies

Preliminary Analyses. First, preliminary analyses indicated an acceptable distribution of the data, homogeneity of variance, and absence of multicollinearity. Following initial data processing and removal of outliers, missing data were processed using a technique called maximum likelihood (EM or expectation maximization). Since there was a very low percentage of missing data (5%), this technique correctly reflected the uncertainty of missing values and preserved important aspects of distributions, as well as important relationships between variables (Tabachnick & Fidell, 2013).

Main Analyses. Second, structural equation analyses were carried out on the modeling presented previously (see Figure 1). To perform this type of analysis, a first hypothetical model is usually tested. To examine whether this model adequately fits the data, different fit indices are needed: chi-square (χ^2), CFI, TLI, RMSEA. As Hu and Bentler (1999) suggested, a good model should

provide acceptable results on various fit tests. The global adjustment index used is χ^2 (also called chi-square likelihood ratio or generalized likelihood ratio). A non-significant value at the χ^2 index generally reflects a good fit (Tabachnick & Fidell, 2013).

Other indices have been used such as the CFI (comparative fit index) and the TLI (Tucker–Lewis index). Values greater than or close to 0.95 for these two indices indicate an appropriate fit of the data (Hu & Bentler, 1999; Kline, 2016). The RMSEA (root mean square residual error of approximation) requires a value of 0.06 or less to be considered as an adequate data fit (MacCallum et al., 1996).

From the various adjustment indices obtained while testing the hypothetical model, the modification indices (Lagrange multiplier) were used to improve the adjustment of the model; in modifying the hypothetical model, we made sure to respect the logic and consistency of the underlying theory (Perry et al., 2015). The preferred estimation technique in this research is the maximum likelihood. Maximum likelihood is a commonly used estimation method for this type of analysis. According to Kline (2016), this method is unbiased in addition to being efficient and consistent. To perform these statistical analyses, the SPSS-AMOS software (version 27) was used.

Results

Descriptive Statistics

Table 1 shows descriptive statistics for each variable that we included in the model and correlations between them. Means varied from 2.27 (behavioral engagement) to 4.59 (affective engagement), and standard deviations varied from .98 (application) to 1.49 (cognitive engagement). All correlations were significant ($p < .05$), except for the associations between cognitive engagement and application (.08, $p > .05$). The significant correlations varied from weak (.15, $p < .05$) to strong (.90, $p < .01$). Five variables displayed negative correlations with behavioral engagement: application (-.27, $p < .01$), implementation (-.24, $p < .05$), belonging (-.25, $p < .01$), cognitive engagement (-.28, $p < .01$), and affective engagement (-.20, $p < .01$). Our results showed that all other correlations were positive.

Table 1

Descriptive statistics (means and SDs) and Pearson correlations among all study variables

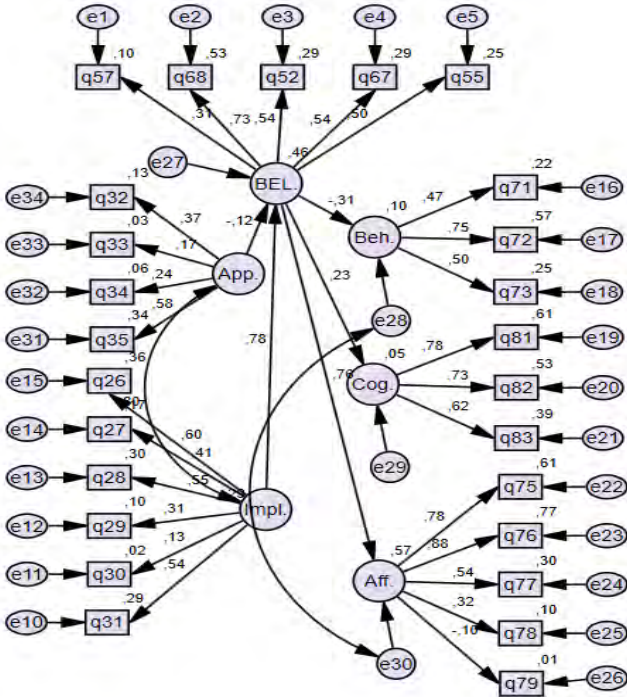
Variables	1	2	3	4	5	M (SD)
1. Application						4.27 (.98)
2. Implementation	.90**					3.97 (.98)
3. Belonging	.67**	.73**				3.91 (.87)
4. Cognitive engagement	.07	.15*	.26**			5.30 (1.49)
5. Affective engagement	.30**	.44**	.61**	.20**		4.59 (1.18)
6. Behavioral engagement	-	-.24*	-	-	-	2.27 (1.45)

Note. $N = 238$. * $p < .05$, ** $p < .01$

Structural Equation Modeling

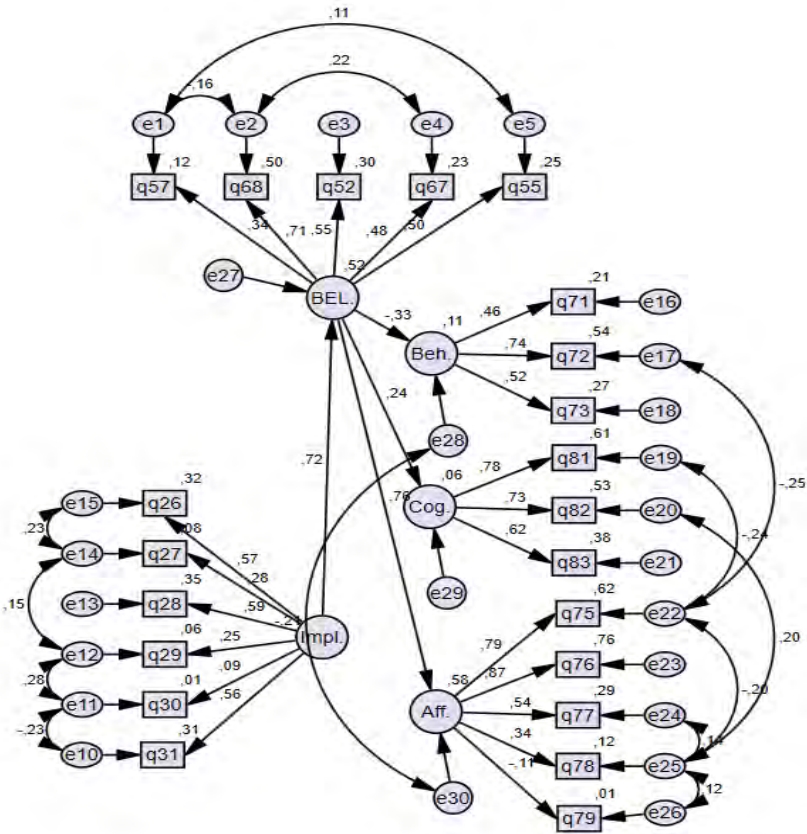
Hypothetical Model. Figure 2 illustrates the basic hypothetical model for examining the relationships between latent variables. More precisely, the latent variable, school belonging, mediates the relationships made up of classroom management practices (application and implementation of classroom rules) in order to explain the three types of school engagement (cognitive, affective, and behavioral). Since the hypothetical model (Model 1) did not fit well according to the criteria mentioned above (see Table 1), a number of modifications were made to improve the fit of the model.

Figure 2
Hypothetical model (Model 1)



Subsequent Models. Considering the modification indices, the link between the application of classroom rules and school belonging was removed because it was not significant. In addition, in Model 2, and according to the modification indices, several error terms were correlated (1 and 2, 1 and 5, 2 and 4, 11 and 10, 11 and 12, 12 and 14, 14 and 15, 17 and 22, 19 and 22, 20 and 25, 22 and 25, 24 and 25, 25 and 26). A definitive model (Model 2) could be developed between our variables of interest because the fit indices were all satisfactory (see Table 1). In the final model (Model 2), only the link between the application of classroom rules and school belonging was removed; all the other links of Model 1 were preserved (because they are significant).

Figure 3
Final model (Model 2)



The standardized coefficients for all the relationships between the variables of Model 2 (final model) are shown in Figure 3. The final model fitted the data better than the previous model according to the fit indices (see Table 1). Consequently, the final model was used to interpret the relationships between the variables. In the final model, school belonging was significantly associated with the three forms of school engagement. The strongest positive relationships in the final model are between school belonging and emotional

engagement, as well as between the implementation of classroom rules and school belonging.

Table 2
Results for the two models

Models	X ²	df	CFI	TLI	RMSEA
Model 1	480.19	293	.84	.82	.052
Model 2	251.876	191	.95	.94	.037

Discussion

The objective of this study was to better understand the links between classroom management, school belonging, and school engagement. We based the hypotheses of this study on the work of Janosz et al. (1998), several studies on academic motivation and classroom management, as well as on many theorists who integrated, to varying degrees, school belonging in the processes explaining perseverance, school failure, and academic achievement. The review of the literature led us to validate part of the model of Janosz et al. (1998), which had not yet been the subject of empirical validation with high school students.

Partial confirmation of hypothesis 1

The first hypothesis indicated that classroom management practices (implementation and application of classroom rules) have a positive effect on school belonging. This hypothesis was partially supported. Our results determined that the implementation of classroom rules promotes the development of a sense of belonging to school. This significant relationship between the two constructs can be explained by a democratic management of the classroom in which the teacher promotes a collaborative culture, a class without exclusion, the diversity of points of view, democratic values, and participation in decision-making — that is to say, so many elements at the base of a democratic class where the rules are decided in collaboration (Moliner et al., 2016). Conversely, classroom management directed solely by

the teacher can give rise to undemocratic practices such as threats to grades or disrespect for diversity (Karakuş, 2017) — in other words, in a classroom context where the voice of the students is not taken into account.

The non-significant relationship between the application of the classroom rules and school belonging (a relationship that we removed from the final model) can be explained through the interventions of the teacher that, potentially, may not foster a climate of justice, to which adolescents seems to be particularly sensitive. The climate of justice is notably marked by the feeling that the merit or the punishment goes to the behavior rather than to the student (Janosz et al., 1998; Peter & Dalbert, 2010). It is possible that the consequences linked to classroom rules not followed by the students were not the subject of discussions or agreements between the teachers and the students, thus giving rise, from the students' perspective, to a climate of injustice. Additionally, teachers may tend to act coercively (e.g., act aggressively) in enforcing classroom rules (Mainhard et al., 2011). This way of teaching the rules can negatively influence adolescents' affect and their perception of their teachers and the classroom environment. Since school belonging has an important affective dimension (St-Amand et al., 2017a), such behaviors can have a negative effect on this dimension and, therefore, on the students' overall sense of belonging.

Confirmation of Hypothesis 2

The second hypothesis indicated school belonging has a positive effect on the three types of school engagement (cognitive, affective, and behavioral). As expected, our results indicated that school belonging contributes significantly to eliciting all three forms of student engagement. These relations can be explained by the positive emotions that school belonging can elicit in students. To this end, Anderman and Freeman (2004) developed, to our knowledge, the only partially mediated model exposing the psychological mechanism underlying the relationship between school belonging, positive emotions, and school engagement. For these authors, school belonging can directly influence school engagement and can also have an indirect effect on school engagement, in particular through the partial mediating effect of students' positive emotions. Anderman and Freeman (2004) suggested that once school engagement is triggered by school belonging and positive emotions, school engagement can, in turn, positively contribute to academic achievement.

To this end, it appears that emotions can influence motivational processes. Researchers examined in detail the biological mechanisms underlying emotions. Citing the important roles of the prefrontal cortex and the amygdala, some authors notably argued that positive emotions facilitate decision-making and influence learning and memory, while creating the necessary motivation to act (Davidson et al., 2000). For their part, Fredrickson (2001) presented a theoretical model (broaden-and-build theory of positive emotions) aimed at better understanding the unique effect of positive emotions on the individual. This theory indicated that emotions such as joy, interest, pride, and love help to reach social, intellectual, psychological, and physical resources, while promoting the engagement of individuals. As this researcher put it: "Experiences of positive affect prompt individuals to engage with their environments and partake in activities" (Fredrickson, 2001, p. 219). Pekrun and Linnenbrink-Garcia (2012) reported several studies on cognition and neuroscience that showed that emotions are fundamentally important for learning and development. These researchers suggested that emotions influence cognitive processes contributing to learning such as perceptions, attention, social judgment, problem solving, decision making, and memory processes.

As for the negative relationship between school belonging and behavioral engagement, it suffices to examine a few items measuring this type of engagement to explain this negative relationship (e.g., During the last 12 months, did you miss school without a valid excuse? / In the last 12 months, did you miss a class while you were in school?). Given the way the items were developed, it is conceivable that the more a student displays school belonging, the less likely she/he is to disturb the class and skip school. This negative relationship makes perfect sense given the items used to measure behavioral engagement in this study.

Partial Confirmation of Hypothesis 3

Our third hypothesis indicated that classroom management practices (implementation and application of classroom rules) affect the three types of school engagement (cognitive, affective, and behavioral) indirectly through school belonging. This hypothesis was partially supported, which constitutes one of the most eloquent results with regard to the indirect contribution of classroom management (implementation of classroom rules) on the three types of school engagement and the central role of school belonging in these

relations (Janosz et al., 1998; St-Amand et al., 2020b). A successful implementation of the classroom rules can derive from the support students perceive in the school environment, which is a key element that contributes to school belonging (St-Amand, 2018; St-Amand et al., 2017a, 2020b). In this regard, Juvonen (2006) mentioned: "Students are presumed to comply and be motivated to learn when they feel supported and respected by their teachers" (p. 658). Along the same lines as Osterman (2010), Wehlage et al. (1989) suggested that positive social relationships between students and teacher can be viewed through the lens of supportive and benevolent teacher behaviors. These researchers proposed to offer (1) ongoing support for students with difficulties; (2) ongoing support for students to meet school standards; (3) constant support so that students feel included; and (4) constant efforts to help students establish and maintain respectful relationships. In light of these elements, these results confirm the need to carry out studies considering both the teaching practices and their expected impact on school belonging and, subsequently, on school engagement. Our results support the essence of the model developed by Janosz et al. (1998) that highlights the complex links between the many dimensions of the school environment.

Conclusion

As with all kinds of research, there are limitations to be noted. First, it should be noted that the influence of other teaching practices on school belonging should be considered. For instance, the impact of different types of humor could be investigated, including adequate humor (e.g., humor related to the content to be taught) and inadequate humor (e.g., humor that belittles others) (Wanzer et al., 2010). Practices such as supportive or cooperative learning could also be considered, in addition to time management (e.g., time spent teaching). What is more, the impact of different climates on the feeling of belonging, such as the climate of security, the relational climate, or the climate of justice, could also be explored using structural equation modeling (Bowen et al., 2004). Another limitation associated with this research relates to other psychological factors or mechanisms that may be considered in the process linking school belonging and school engagement (e.g., variables related to students' emotions, satisfaction with school, or mastery goal).

That said, we also believe that a longitudinal research design would provide a better understanding of the evolution of the links between these variables. For instance, few explanatory models have studied longitudinally the relationship between teaching practices, school belonging, and school engagement. To date, it is difficult to determine how these relationships evolve over the span of a school year. Longitudinal research could validate these dynamic relationships to assess the evolution of these relationships. This type of research would contribute to a more exhaustive understanding of these relations while allowing us to identify the riskiest periods for students during a school year in order to intervene at the right time. Conducted in different contexts and different cultures, we believe these studies could guide the adoption of specific pedagogical practices at key times of the school year. Finally, the analytical approach adopted presents limits. Since the analyses are correlational, it is not possible to establish a causal link between the variables proposed in this study. As [Tabachnick and Fidell \(2013\)](#) pointed out with respect to this statistical approach, "There is nothing causal, in the sense of inferring causality, about the use of SEM. Attributing causality is a design issue, not a statistical issue" (p. 687).

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