

Adapting, implementing, and evaluating the effects of a comprehensive school reform program: the case of School-Wide Positive Behavior Interventions and Supports in French-speaking Belgium

By Caroline Deltour

Under the Direction of Prof. Ariane Baye

Thèse présentée en vue de l'obtention du grade de
Docteur en sciences de l'éducation

Année académique 2021-2022

Jury members:

Prof. Dominique Lafontaine, University of Liège

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Abstract

This dissertation aimed at examining the adaptation, implementation, and evaluation of a comprehensive school reform in French-speaking Belgium, that is School-Wide Positive Behavior Interventions and Supports (SWPBIS).

The general introduction points out the importance of school climate and the role of teachers' collective efficacy based on results from international surveys and on the literature. The research context and SWPBIS are presented, before introducing the research project, its objectives, and the hypotheses. The introduction closes on an overview of the dissertation.

The five articles introduce the results of the five conducted studies.

The first one is a systematical and critical review of the existing literature concerning SWPBIS, its implementation and numerous outcomes.

The second article is a comparison of SWPBIS implementation in three French-speaking contexts. This exploratory study's goals were to highlight the similarities and differences between the implementation in the three contexts and to analyze the unmissable facilitating factors that anyone interested in implementing SWPBIS should be aware of.

The third article is the result of cross-cultural study on school climate and mental health in teenagers. The study aimed at cross-culturally validating a school-climate survey and investigating the relation between school climate and mental health for secondary school students.

The fourth article presents the results of the cultural adaptation of SWPBIS to the school context of French-speaking Belgium and the outcomes of SWPBIS implementation on school climate for all stakeholders: staff members, students, and parents. Results concerning the impact of SWPBIS implementation on tardiness and absenteeism are also presented.

The fifth article examines the outcomes of SWPBIS implementation on teachers' collective efficacy.

The five articles are followed by a general discussion in which the initial hypotheses are confronted to the results of the five conducted studies. Then, the discussion takes additional arguments, mainly linked to the sustainability of the system and its outcomes, into

consideration. The school-wide characteristic of the program, the implementation fidelity, the importance of data-based decision-making and the impact SWPBIS implementation can have on students' SES background are developed.

Résumé

Cette thèse vise à examiner l'adaptation, la mise en œuvre et l'évaluation d'une réforme scolaire globale en Belgique francophone, à savoir le *School-Wide Positive Behavior Interventions and Supports (SWPBIS)*.

L'introduction générale souligne l'importance du climat scolaire et le rôle de l'efficacité collective des enseignants sur la base des résultats d'enquêtes internationales et de la littérature. Le contexte de la recherche et le *SWPBIS* sont ensuite présentés, avant d'introduire le projet de recherche, ses objectifs et les hypothèses. L'introduction se termine par un aperçu du contenu de la thèse.

Les cinq articles présentent les résultats des cinq études réalisées.

Le premier article est une revue systématique et critique de la littérature existante relative au *SWPBIS*, à sa mise en œuvre et à ses nombreux résultats.

Le deuxième article est une comparaison de la mise en œuvre de *SWPBIS* dans trois contextes d'enseignement francophone : le Québec, la France et la Belgique francophone. Les objectifs de cette étude exploratoire étaient de mettre en évidence les similitudes et les différences entre la mise en œuvre dans les trois contextes, ainsi que d'analyser les facteurs facilitants incontournables que toute personne intéressée par la mise en œuvre de *SWPBIS* devrait connaître.

Le troisième article est le résultat d'une étude cross-culturelle sur le climat scolaire et la santé mentale des adolescents. L'étude visait à valider de manière interculturelle une enquête sur le climat scolaire et à étudier la relation entre le climat scolaire et la santé mentale des élèves du secondaire.

Le quatrième article présente, d'une part, les résultats de l'adaptation culturelle de *SWPBIS* au contexte d'enseignement de la Belgique francophone et, d'autre part, les résultats de la mise en œuvre de *SWPBIS* sur le climat scolaire pour toutes les parties prenantes : membres du personnel, élèves et parents. Les résultats concernant l'impact de la mise en œuvre de *SWPBIS* sur les retards et l'absentéisme sont également présentés.

Le cinquième article examine les résultats de la mise en œuvre de *SWPBIS* sur l'efficacité collective des enseignants.

Les cinq articles sont suivis d'une discussion générale dans laquelle les hypothèses initiales sont confrontées aux résultats des cinq études menées. La discussion prend ensuite en considération des arguments supplémentaires, principalement liés à la durabilité du système et de ses résultats. La caractéristique du programme à l'échelle de l'école, la fidélité de la mise en œuvre, l'importance de la prise de décision basée sur les données et l'impact que la mise en œuvre du SWPBIS peut avoir sur le contexte socio-économique des élèves sont développés.

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Under your eyes is the result of a rich and inspiring journey that started in May 2015 when I met Monique Nelen. She was looking for people to help her collect fidelity data across the Netherlands for her own PhD dissertation. I reached to her because Professor Rob Horner had told me the Netherlands were doing good in implementing SWPBIS when I contacted him in the first place to find out how I could get information about the program in Europe.

Monique offered to train me and to take part to her large fidelity assessment. She gave me the occasion to meet people dedicated to their schools such as Audrey Klunders and Ryan Slenders. Thanks to them (and many others), I discovered what SWPBIS really was and the serenity it can bring into a school.

Later I met the whole Windesheim and Fontys teams who spread SWPBIS around the Netherlands and who still contribute to its growth. They even helped disseminate SWPBIS across Europe with the creation of the PBS-Europe network and the yearly international conference in Utrecht. The networking offers collaboration possibilities I also benefitted from.

A year later, in June 2016, before my master dissertation on SWPBIS in the Netherlands was ready, I met the Minister of Education to propose her the SWPBIS pilot project. Professor Ariane Baye believed it was possible to implement the program in French-speaking Belgium and she offered me to lead the implementation and to start a Ph.D. I would not be writing these lines if she had not had faith in the project, but also in me.

I warmly want to thank all the staff members I had the opportunity and pleasure to work with. They trusted me and accepted to start the long SWPBIS journey. Because they wanted to make a difference in the lives of their students, they accepted to be trained and guided through a process not all the schools would have accepted. Sometimes they doubted, but they never gave up and together we tried to problem solve the situations. I do not want to name them all because I fear to forget some of them, but they will recognize themselves.

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“Nine-tenths of education is encouragement”

Anatole France

Introduction

Results from international surveys

According to the PISA 2018 results, about 33% of the students in OECD countries responded that it is noisy during their lessons and that students do not listen to the teacher (OECD, 2019). In French-speaking Belgium, the percentage was 36.5% of the students, which was higher than in the Dutch or German-speaking communities. Furthermore, over 50% of the students in French-speaking Belgium stated that there is noise and disorder during most lessons (Crépin et al., 2019). And about 25% of the students from the OECD countries admitted that it takes a long time before they start working during the lesson or that the teacher must wait an extended period for students to quiet down (OECD, 2019). This percentage rose to 38.2% for students from the French-speaking community of Belgium. Yet again, it was higher than for the Dutch or German-speaking communities, whose results were respectively of 27.9% and 26.6% (Crépin et al., 2019). Conversely to what was observed on average across OECD countries, the disciplinary climate did not improve in French-speaking Belgium. And “differences across schools are also large. As much as 11% of the variation in the index of disciplinary climate lies between schools, on average across OECD countries, which is a larger proportion than for other indices analyzed” (OECD, 2019, p. 66-67). It means that in a majority of countries advantaged schools benefit from a better disciplinary climate (OECD, 2019). In French-speaking Belgium, the variation in the index of disciplinary climate between schools is 8.8%, whereas it is 6.6% for the Dutch-speaking community. French-speaking Belgium is doing better than the OECD average, but the situation can still be improved.

Other enlightening results from the PISA 2018 report speak to student absenteeism and its link to disciplinary climate. Skipping school is more likely to occur among students being bullied rather than students who are successful at school, who benefit from a better school climate or who experience a greater connectedness to school. Truancy also has consequences such as falling behind in school, dropping out of school or getting a badly paying job later—situations faced most frequently by chronic absentees from a disadvantaged background (OECD, 2019). About 21% of students responded that they had skipped class for a whole day at least once, and 27% answered they had skipped some classes at least once in the last two weeks. Once again, students enrolled in socio-economically disadvantaged schools were more likely to have

skipped school for a whole day than students attending socio-economically advantaged schools (OECD, 2019).

Being late for school is more frequent but has less serious consequences. About 50% of the students responded that they had been late for school at least once in the past two weeks. There was a wide variation in student truancy and lateness across schools.

These results concur with previous research showing that problem behaviors are as powerful a predictor of school leaving as absenteeism and poor academic results (Balfanz et al., 2007).

TALIS 2018 provided further interesting results that reflect teachers' opinions on classroom climate. It showed that middle school teachers in French-speaking Belgium spend 20% of classroom time managing discipline, on top of other administrative tasks (10%). This means that only 70% of the time spent in class can be devoted to teaching and learning. This is less than in the six other school systems studied (Austria, Finland, France, the Dutch community of Belgium, the Netherlands and the United Kingdom, because of the cultural similarities) where an average of 77% of the time spent in class is dedicated to teaching and learning. On the classroom climate evaluation, 40% of the middle school teachers in French-speaking Belgium mentioned deleterious elements to a positive classroom climate. When compared to the six other culturally comparable school systems noted above, the results for this group were also worse. Teachers' sense of efficacy is also lower in this school system than in others (Quittre & Dupont, 2019).

These results are enlightening because they reflect practices and impressions from the field. And even though the results cannot be generalized to all teachers and all teaching levels, the outcomes are coherent with elements from the literature.

As a matter of fact, behaviors perceived as problematic by teachers have been growing, and managing discipline in the classroom is a factor that influences the choice to leave a teaching career (Maroy, 2008; Debarbieux & Fotinos, 2012).

The results from TALIS and PISA highlight a common reality experienced by students as well as teachers: that a bad disciplinary climate can be harmful in many ways. Indeed, reducing problem behaviors and improving school and classroom climates would greatly benefit students as well as teachers.

The importance of school climate

Definition

School climate refers to shared beliefs, values, and attitudes that shape interactions between students, teachers, and administrators. Together, these elements determine the parameters of acceptable behaviors recognized as the norm in school settings (Kuperminc et al., 1997). For Haynes et al. (1997), which Bradshaw et al. (2014) drew heavily on, school climate represents the quality and consistency of interpersonal relationships. For other authors, school climate refers to the quality and characteristics of school life (Cohen et al., 2009; Gage et al., 2016). More recently, the notion of school climate was expanded to include safety and the physical environment (Wilson, 2004; Zullig et al., 2010). Another definition, meanwhile, develops the idea that school climate is the “atmosphere for learning” present within a school (Howard et al., 1987, as cited in Suldo et al., 2013). This atmosphere arises from the feelings that people develop towards their school and whether the school provides the conditions for learning to occur.

Factors influencing school climate

School climate is comprised of both psychological and institutional attributes (Modin & Ostberg, 2009). Each of the actors in the school contributes to the school climate. However, it is more than an individual experience; it is a group phenomenon that is more psychological than physical. A multitude of factors therefore influence the school climate (Cohen et al., 2009). One of the fundamental dimensions of school climate is the relational aspect, which involves the way people feel connected to each other in the school. It is really about students’ attachment to a responsible adult at the school who cares about them. While school climate is largely a result of teacher-student social interactions, it is also influenced by educational and social values (Bradshaw et al, 2014).

While all the factors determining school climate have not yet been clearly established, one important facet appears to be the functioning of the school, also called organizational health. This includes a strong emphasis on academic achievement, friendly and collegial relationships among staff members, respect for all members of the school community, supportive leadership, consistent disciplinary policy, attention to safety issues, and engagement of families as well as the surrounding community (Bradshaw et al., 2008).

Outcomes linked to school climate

There seems to be a clear consensus in the literature regarding the need to develop a healthy school climate (Caldarella et al., 2011), as research suggests that when young people feel safe and attached to their school, they are better protected from harmful influences and better prepared to make good decisions regarding academic success and personal well-being (Booren et al., 2011). Students with a sense of belonging to their school community demonstrate greater acceptance of authority and regulation of classroom behavior; whereas feeling insecure and not part of the school community represent elements that have been associated with deleterious outcomes (Goldweber et al., 2013; Wilson, 2004). Disorganized schools with high rates of conflict can specifically exacerbate the manifestation of problematic behaviors and can contribute to the development of school-related problems such as academic failure and absenteeism (Goldweber et al., 2013; Hawkins et al., 1992). Whereas a positive school climate has been linked to a number of beneficial behavioral and social skill outcomes, as well as academic achievement (Gage et al., 2016).

School climate that refers to the quality and characteristics of school life (Cohen et al., 2009, Gage et al., 2016) thereby influences student outcomes in terms of social behaviors and skills, as numerous research studies have highlighted (Gage et al., 2016; Gottfredson et al., 2005; McIntosh et al., 2006). Therefore, improving school climate is a promising way to prevent social and behavioral difficulties. Furthermore, success in acknowledging students' expected behaviors has been linked to school environments and school climates that are effective, safe, preventive, and positive (Bradshaw et al., 2008; 2009; Gage et al., 2016; Horner et al., 2010), thus supporting the relationship between school climate and behaviors. However, all the facets of school climate that may prove to be predictors of student outcomes in behavior and social skills are not yet clear.

According to Bradshaw et al. (2014), school climate is a significant predictor of dropout rates, absenteeism, school exclusion, and aggressive and violent behavior. A positive school climate is associated with lower rates of absenteeism (Cohen et al., 2009). Hendron and Kearny's research in 2016 presented evidence that school climate is inversely related to absenteeism severity. And, as students feel that they are safe, cared about, supported, and kindly pushed to learn, academic achievement should increase. Other types of harassment research have also highlighted that students who perceive their school as unsafe and unsupportive are more likely to engage in bullying (Bradshaw et al., 2008, Goldweber et al., 2013).

On the other hand, a positive school climate makes teachers and students want to spend a substantial amount of their time in the school because it feels like a place where living and learning happen in pleasant conditions (Suldo et al., 2013). The quality and consistency of interpersonal relationships within the school community, which are major components of school climate, contribute to children's cognitive, social, and physical development, according to Bradshaw and colleagues (2014).

Other research on school climate has demonstrated a relationship between school climate and student self-concept (Cohen et al., 2009) and that the two aspects of school climate (i.e., positive teacher feedback and engagement) affect student self-esteem (Hoge et al., 1990).

In 2017 Berkowitz et al. conducted a systematic review on the associations between socio-economic background, school climate, and academic achievement. Their conclusion clearly demonstrated that school climate can weaken the connection between SES and academic achievement. Eighty-four percent of the 78 studies surveyed found a compensatory positive contribution of quality school climate to academic achievement. “Such climates provide an additive value to academic achievement beyond the negative contribution of poor SES background” (Berkowitz et al., 2017, p. 452). Or, in other words, positive school and classroom climates diminish the negative effect of poor socio-economic status on achievement. In the light of the PISA 2018 results, this latest finding underlines the need to improve school climate when inequity is an issue.

Another recent work, Payne’s report for the National Institute of Justice (2018), highlights that “students in schools with a positive and communal school climate demonstrate stronger academic achievement and engagement, better socio-economic health, and lower levels of absenteeism, truancy, dropping out, and victimization” (p. 1). This work also emphasizes the importance of relationships between all members of the school community for school climate: “Trusting relationships are ‘the glue’ that binds together an effective school climate” (Payne, 2018, p. 8).

School climate research in a French-speaking context

Many school climate studies are conducted in the English-speaking world, but French-speaking countries have also invested in school climate research. Among the different published research

on this subject, there is the work led by Éric Debarbieux in France, in a school context that culturally resembles French-speaking Belgium.

Debarbieux, who initially specialized in the field of violence, redirected part of his research to the issue of school climate. Indeed, school climate has many consequences including its role in the behavioral problems of students who engage in violence in schools (Debarbieux, 2012). School climate is also, according to Debarbieux (2012), a predictor of the success of intervention programs to curb this type of violence. Debarbieux's (2012, 2015) research is consistent, on a theoretical level, with that conducted in English-speaking contexts.

According to Debarbieux (2015), school climate has different facets, namely relationships, teaching/learning, safety, the physical environment, and a sense of belonging. Debarbieux (2015) noted many effects of a positive school climate. First, he observed positive consequences on learning through a greater motivation to learn, a stronger sense of belonging, a decrease in absenteeism (which plays into school exclusion), as well as a greater sense of school justice. These conclusions were drawn from the results of two national surveys on school climate and victimization done by the Observatoire International de la Violence à l'École. The first was conducted in 2010 on a randomized sample of high school students (n=12,326). The second survey took place in 2011 with a randomized sample of middle school students (n=14,212) (Debarbieux et al., 2012).

The author then presented the effects on school safety and risk behaviors. The clarity of the rules, the sense of justice, and the quality of the interrelations between all stakeholders were seen to have an impact on safety and risk behaviors. Debarbieux (2015) subsequently highlighted the effect of a positive school climate on peer harassment. The visible presence of caring adults in the hallways and classrooms prevents violence. The involvement of all adults and the adoption of clear and consistent guidelines for dealing with threats make it easier for young people to seek help. Finally, developing a relationship with the family and parental involvement in the process of establishing a positive climate make it possible to sustain the effects of such a climate.

Other research done in Quebec by Janosz et al. (1998) and Poulin et al. (2015) agrees on the components of a healthy and positive school climate as well as the impact of such a climate on an educational system, affecting both its mission and its members. The consensus on the importance of this component of school culture thus crosses linguistic boundaries.

School climate measurement

Studies investigating school climate and its outcomes mainly target one stakeholder at a time (e.g., staff members or students) and sometimes both of them. But to date, no study has targeted the three stakeholders: staff member, students, and parents. Furthermore, the questionnaires used to measure a perceived school climate do not include questions on all of the three dimensions that constitute school climate (i.e., engagement, safety, and environment). Yet, according to Gase et al. (2017), when investigating the outcomes of interventions intended to improve school climate, it is necessary to consider its multidimensional nature. Gase et al. (2017) even revealed in their study that students see a strong association between engagement and safety and student outcomes, whereas school climate perceived by staff members shows limited association with student outcomes.

The quality and reliability of the school climate measurement instrument therefore plays an important role in research on the topic.

The role of teachers' collective efficacy

As the TALIS 2018 results pointed out, teachers' sense of efficacy is lower in the French-speaking Belgian school context (Quittre & Dupont, 2019). However, teachers' efficacy can play an important role in student success. Teachers' collective efficacy can specifically influence student success because it can counteract the impact of the students' socio-economic situation on their learning, as found in previous research (e.g., Eells, 2011; Sun et al., 2017).

Collective efficacy is defined as the collective perception that teachers in each school can make a difference in their students' education that goes beyond the educational impact of their families and communities (Tschannen-Moran & Barr, 2004).

According to this definition and to the outcomes stemming from an increase in teachers' collective efficacy, improving this type of efficacy is another avenue to consider when reforming an educational system and working to improve student success.

Preliminary Conclusion

Recognizing all the elements from the PISA and TALIS 2018 studies as well as from the literature and research on school climate and collective efficacy highlights the need to find

solutions that improve the general school climate and allow teachers to manage discipline collectively and effectively inside and outside the classroom. The major issues our school context needs to solve include devoting more time to teaching and learning, which indirectly decreases dropout rates and inequity, as well as improving teachers' sense of efficacy and decreasing students' sense of injustice by improving school climate.

Research context

The Pact for Excellence in Education

The above issues are aligned with the objectives of the Pact for Excellence in Education (Pacte pour un Enseignement d'excellence). Indeed, an important school reform is currently being implemented in French-speaking Belgium. The Pact for Excellence in Education is organized around five major goals expressed in the form of strategic axes. Concretely, at the school level, these axes are divided into seven objectives intended to improve the educational system (Circulaire 7434 du 15 janvier 2020 portant sur les plans de pilotages). The targeted objectives are to:

1. Significantly improve students' knowledge and skills;
2. Increase the graduation rate of young people enrolled in high school;
3. Reduce the differences in academic outcomes between the most and least socio-economically advantaged students;
4. Gradually reduce the grade repetition and dropout rates;
5. Reduce school changes within the core curriculum;
6. Gradually increase the inclusion of students with special needs in regular education; and
7. Improve the well-being-at-school indices and the school climate

To help schools situate themselves, indicators were or will be created, one of them being the school climate indicator. This example speaks to the growing importance of school climate in the French-speaking school system in Belgium, as elsewhere.

Evidence-based education

This reform—the Pact for Excellence in Education—also includes a section dedicated to evidence-based education. Evidence-based education is quite new in French-speaking countries and therefore needs to be defined. Evidence-based education is a change process that uses

rigorous scientific research to guide educational policy and practice. Advocates of this approach support the idea that significant improvements will occur if and only if:

- educational teams and policy makers have a range of available programs or practices for which there is strong evidence of effectiveness, and
- public policy supports the use of proven programs and practices and the development and evaluation of promising innovative projects (Baye & Bluge, 2016).

This means that rather than implementing reforms based on pedagogical trends or strong pedagogical convictions, the recommendations for new practices must be based on evidence from experimental research. Until now, this type of research, at least in the field of education, has been scarce in French-speaking Belgium. According to Slavin (2008, 2015), specific stages have to be followed when introducing evidence-based education.

First, the existing body of research on useful interventions targeting essential issues for a school system has to be investigated. Knowing which programs are developed and assessed worldwide and particularly in a system resembling ours is the first step. The most reliable interventions must have been thoroughly assessed and/or must include randomly assigned intervention and control conditions. This general investigation helps identify programs that are ready to be tested after some local/cultural adaptations, as well as programs that could lead to greater changes and those that seem unsuitable to the local conditions.

Second, information on effective programs must be widely known. This step requires a specific communication tool dedicated to effective programs, like a website or platform. The tool needs to be continuously updated to reflect research developments.

Third, intervention programs need to be developed. At this point in the process, decisions must be made about intervention programs that can be tested in the school system, the adaptations that will be necessary, and the evaluation criteria that will be used. Program assessment can start with a pilot study. When feasibility is ensured, large-scale evaluation with random assignment can then be considered and arranged.

Fourth, the programs have to be disseminated. When an intervention has proven effective in a school context, it can be shared widely. This stage requires communication tools and incentives for schools to motivate teachers and administrators to adopt the program and to implement it as

developed. Staff buy-in is an unequivocal requirement: an 80% staff buy-in rate must be ensured by secret vote (Slavin, 2004).

Fifth, the areas of intervention can be expanded. After successfully implementing a small number of programs in targeted intervention areas, an evidence-based approach can be extended to other fields or other education levels. At each stage of the process, it is important to stress rigorous evaluation of the intervention, the voluntary character of program adoption, and implementation fidelity.

Sixth and last, assess the impact of the reform at a national (or local) level. If the reform was targeting specific areas or education levels and was used in the whole school system, faster improvements should be noticed in these areas or education levels (Baye & Bluge, 2016).

Among the existing programs aiming to improve school climate, the interest for School-Wide Positive Behavior Interventions and Supports (SWPBIS) and its effects is growing worldwide and in Europe too (e.g., Goei et al., 2013; Nelen et al., 2020; Nylen et al., 2021; Sørli & Ogden, 2015; Sørli et al., 2016). SWPBIS has been in use for more than ten years in the Netherlands, whose educational system is comparable to that of French-speaking Belgium.

As evidence-based education advocates for practices with proven effectiveness and for evaluating promising projects, it was logical, on our opinion, to apply the stages of evidence-based education to a SWPBIS pilot project in French-speaking Belgium.

School-Wide Positive Behavior Interventions and Supports

School-Wide Positive Behavior Interventions and Supports (SWPBIS) is “a multitiered framework for organizing and achieving capacity to implement effective academic and behavioral practices” (Sugai & Horner, 2020). It was developed and framed by Horner and Sugai, among others (Sailor et al., 2009) and is currently used in more than 26,000 schools in the United States and in several European countries such as the Netherlands, Finland, Norway, and Denmark.

SWPBIS is a systemic approach (Horner et al., 2010) designed to establish a social culture within each school and individualized behavior support, both of which are necessary for a school to become a safe and effective learning environment for all students (Sugai & Horner, 2009).

The SWPBIS system emerged in the 1990s in response to the failure of zero-tolerance policies that were implemented to counteract the rise of problematic behavior in schools. These zero-tolerance policies led to a substantial increase in the rate of temporary and/or permanent exclusions in American education and subsequently raised questions about the racial disparity in exclusion rates (Skiba & Sprague, 2008). Various research studies (Colvin et al., 1993; Nelson et al., 1998; Sprick et al., 1998) showed that preventing inappropriate behavior by making rules explicit and supporting positive behavior at the school level was more effective than stigmatizing specific individuals.

SWPBIS is based on four key elements: (a) the systematic and formal consideration of measurable academic outcomes and social behaviors, (b) the systematic and formal use of information or data to guide decision-making and the selection of effective behavioral interventions, (c) the implementation of empirically based research interventions that support students' academic success and pro-social behaviors, and (d) the implementation of systemic supports created to improve the relevance and sustainability of implemented practices. The combination of the above elements, described as a broad range of systemic and individualized strategies, allows for social and academic learning outcomes while decreasing the occurrence of behavioral problems (Sugai & Horner, 2002; 2006).

SWPBIS is based on the Response-to-Intervention model (RTI) (Fuchs et al., 2003), which is defined by six characteristics that can be applied across the different axes: (1) interventions are based on empirical research, (2) interventions are organized along a continuum of three tiers within which the intensity of interventions increases, (3) the standardized problem-solving protocol is used for evaluation and decision-making, (4) decision-making is based on explicit data for assessing student progress and for adjusting instructions and interventions, (5) emphasis is placed on evaluation and on ensuring implementation fidelity, (6) close follow-up of students identified as at-risk who do not meet the universal level of intervention (Fuchs et al. 2003).

Concretely SWPBIS consists of implementing tiered behavioral interventions. Tier 1 involves defining, teaching, monitoring, and positively reinforcing a small number of values expressed in terms of expected behaviors. It concerns all students, both inside and outside the classroom.



Source: <http://www.smithton.stclair.k12.il.us/response-to-intervention-rti.html>

Tier 1 also organizes an in-depth reflection on the policy for managing problem behaviors within the school, to harmonize, as much as possible, the consequences that follow inappropriate behaviors demonstrated by students.

For Tier 1 interventions, it is necessary to define clearly, explicitly, and coherently both the expected behaviors and the associated reinforcement system, as well as the continuum of consequences related to behaviors that do not match expectations. Staff members must also get accustomed to collecting and using data to guide decision-making.

The goal of universal prevention is to establish a school culture in which learning time is maximized and in which students know what behaviors are expected and valued. Students should be able to see that school expectations are predictable, consistent, safe, and positive. As in other examples of RTI interventions, SWPBIS anticipates that actively investing in prevention will partially prevent behavior problems from occurring, through an ongoing assessment system, and will prevent an escalation of problems through consistent, logical, and mostly immediate interventions.

Once Tier 1 implementation is completed with fidelity, schools can move on to implementing tier 2 and 3 interventions, addressing students requiring moderate or intensive monitoring. Tier

2 interventions are designed for approximately the 15% of students who exhibit adjustment difficulties despite exposure to universal prevention methods, but whose behavior problems do not represent a serious risk to others or themselves (Anderson & Borgmeier, 2010; Hawken et al., 2009). The goals of this level of intervention are to reduce the frequency of student behavior problems and prevent their escalation (George et al., 2009).

The underlying idea for implementing Tier 2 interventions is to offer closer support to groups of students who have more difficulty adopting the expected behaviors.

Tier 3 interventions are highly individualized and target a very small number of students over the course of a school year, approximately 3 to 5%. These tertiary interventions are often based on the functional assessment of the students' behaviors. Functional behavior assessment, or FBA, is a specific process that allows a trained individual to understand what need(s) the student's problematic behavior addresses. FBA can lead to a behavioral intervention plan, which proposes, over a longer period, alternative behaviors students can be taught that will help them gradually reach the expected behaviors. Tier 3 interventions are also called wrap-around measures and most of the time imply external partnerships with experts of different fields.

Sugai and Horner (2020) emphasize five important stages in the SWPBIS implementation process: exploration, installation, initial implementation, full implementation, and sustained and scaled implementation. These stages are considered dynamic and were conceptualized by Fixsen et al. (2005).

Since its inception, SWPBIS has been the focus of numerous empirical studies. In fact, a journal dedicated specifically to studies on SWPBIS was created: the *Journal of Positive Behavior Interventions*. The studies report results in terms of the effectiveness of the program: improvement of the school climate, reduction of problem behaviors, but also reduction of absenteeism and dropout rates (e.g., Sprague et al., 2001; Bradshaw et al., 2012). Other types of research investigate the quality and fidelity of implementation as well as the impact of implementation on outcomes (e.g., Bradshaw et al., 2009; Tobin et al., 2012). Finally, others focus on the sustainability of the program and its impact on the daily life of the school and its actors (e.g., McIntosh et al., 2009; 2013).

Research project

The aim of this research project is to adapt and implement a French version of SWPBIS (Soutien aux Comportements Positifs or SCP¹) in pilot schools. The other purpose of the research project is to investigate, through a quasi-experimental design, the outcomes resulting from the adaptation and implementation of the program and its effect on several variables: improvement of the perceived school climate, increased school attendance, and the perceived teachers' collective efficacy.

While SWPBIS is currently implemented in many countries, this was not the case in Fédération Wallonie-Bruxelles (FWB) four years ago. Moreover, studies on the program's effectiveness are always linked to the specific school context in which it is being used and to the problems that characterize that school context such as an unsafe school climate, a high dropout rate, low academic performance (Horner et al., 2014). It was therefore appropriate to test the effectiveness of the French version of SWPBIS, by first adapting it to our school system and then implementing it in pilot schools while also assessing control schools.

The social relevance and value of the system lie in its preventive aspect, which allows for the management of challenges that schools regularly face in FWB nowadays. Indeed, as mentioned above, managing discipline problems is one of the factors that influences teachers' choice to leave the profession (Maroy, 2008; Debarbieux & Fotinos, 2012). The scientific research has shown that behavioral problems are also one of the strong predictors of students dropping out, along with absenteeism and low academic performance (Balfanz et al., 2007). Furthermore, teachers and supervisors' expectations may not necessarily be understood by all students and may fuel a sense of injustice among students and weigh on the school climate (Blaya, 2001; Debarbieux, 2015).

Implementing SWPBIS by defining, teaching, monitoring, and positively acknowledging a small number of values expressed in terms of expected behaviors will address these particular challenges in FWB schools. By improving school climate, the occurrence of problematic behaviors will decrease and the extent of the remaining problem behaviors will reduce. In addition, the reduction in problem behaviors will save instructional time, which should lead to improved student academic performance and a greater sense of collective efficacy on the part

¹ This research project is funded by the Administration Générale de l'Enseignement en Fédération Wallonie-Bruxelles as part of the Pact for Excellence in Education.

of staff members. By improving the general school climate and by acknowledging students' expected behaviors, the quality of student-teacher relationships will also improve. As a consequence, truancy and absenteeism should decrease.

Objectives

Thus, our objective was to follow up on experiments and research conducted elsewhere by:

1. Investigating the body of existing research on SWPBIS outcomes;
2. Adapting SWPBIS to the context of French-speaking schools in Belgium and implementing the program in pilot schools there;
3. Comparing SWPBIS implementation in French-speaking schools in Belgium to other school contexts that are similar to FWB in different ways (language and functioning); and
4. Validating existing evaluation tools in the FWB school context and studying the impact of SWPBIS implementation on different variables (school climate, absenteeism, and teachers' collective efficacy) before dissemination in case of success.

Hypotheses

The hypotheses we have been basing our work on are presented below:

1. The body of existing research on SWPBIS implementation and outcomes will be robust and empirically supported.
2. SWPBIS implementation in the context of French-speaking schools in Belgium will be quite similar to implementation in comparable contexts: barriers and enablers will be common.
3. SWPBIS implementation is feasible in the school context of French-speaking Belgium and fidelity will be achieved.
4. Compared to the control schools, school climate will improve for all stakeholders (staff members, students, and parents) in the experimental schools.
5. Compared to the control schools, student absenteeism and lateness will decrease in the experimental schools.
6. Compared to the control schools, teachers' collective efficacy will improve in the experimental schools.

Overview of the dissertation

The first article is a systematic and critical review of the existing literature concerning SWPBIS implementation and its numerous outcomes. Through this work, we aim to investigate the body of existing research presenting the potential outcomes and the quality of SWPBIS implementation. As far as quality and reliability are concerned, not all research designs are equal, thus it becomes important to question the quality of the studies according to the implementation stages for evidence-based practices in education.

The second article is a comparison of SWPBIS implementation in three French-speaking contexts: Quebec, France, and Belgium. The purpose of this exploratory work is twofold: first, it highlights the similarities and discrepancies between the three ways SWPBIS is being implemented. These are called the local adaptations in the stages of implementing evidence-based practices. And second, it analyzes the unavoidable facilitating factors that any country interested in implementing SWPBIS should keep in mind.

The third article is the result of a cross-cultural study we had the opportunity to take part in. Researchers from 13 countries worked together to cross-culturally validate a school climate survey and investigate the link between school climate and mental health in teenagers. Validating a school climate measurement tool was a prerequisite to assessing SWPBIS implementation in the FWB school context.

The fourth article is considered central to the research project. This article presents the results of the cultural adaptation of SWPBIS to the French-speaking school context in Belgium and the outcomes of SWPBIS implementation on school climate for all school stakeholders: teachers, students, and parents. This paper also presents findings concerning the impact of SWPBIS implementation on absenteeism and lateness.

The fifth article studies SWPBIS outcomes concerning teachers' collective efficacy. As recommended by Finnish colleagues also implementing SWPBIS, we included the measurement of teachers' collective efficacy in our study design. Indeed, implementing SWPBIS requires the whole staff to work together in harmony to manage discipline. Therefore, there was an interest in measuring this variable and adding this study to the research project.

The five articles are followed by a general discussion summarizing the different study results and providing additional arguments to take into consideration when questioning the

implementation and effectiveness of SWPBIS in the school context of French-speaking Belgium. The dissertation closes with the limitations of this work and its implications for future research, before ending with the general conclusion.

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FIRST ARTICLE:

Deltour, C., Dachet, D., & Baye, A. (soumis). School-Wide Positive Behavior Interventions and Supports et les effets qu'on peut en attendre. (School-Wide Positive Behavior Interventions and Supports and its Expected Effects)

School-Wide Positive Behavior Interventions and Supports (SWPBIS) and its Expected Effects

Résumé

Le dispositif de *School-Wide Positive Behavior Interventions and Supports* est une approche *whole-school*, avant tout préventive, visant l'amélioration du climat scolaire et la prise en charge des problèmes de comportement. Son adoption et sa présence grandissante dans plusieurs pays d'Europe amènent à questionner son efficacité au travers des nombreuses études dont il a déjà fait l'objet. Cette revue systématique et critique de la littérature de recherche sur les effets qu'on peut attendre du *SWPBIS* poursuit un double objectif : d'une part de recenser les recherches menées sur leur sujet, ainsi que les différents types d'effets liés à sa mise en place ; et, d'autre part, d'évaluer les qualités méthodologiques des recherches recensées.

Mots-clés : évaluation, efficacité, résultats de recherche, méthodologie, comportement, discipline à l'école, expulsion

Abstract

School-Wide Positive Behavior Interventions and Supports is a whole-school approach, primarily preventive, aimed at improving school climate and managing behavioral problems. Its adoption and growing presence in several European countries have led to question its effectiveness, based on the numerous studies that have already been conducted on the subject. The objective of this systematic and critical review of the literature on effects that can be expected from SWPBIS implementation is twofold: on the one hand, to identify the research conducted on the subject, as well as the different types of effects linked to its implementation; and, on the other hand, to evaluate the methodological qualities of the research identified.

Keywords: evaluation, efficiency, research outcomes, methodology, behaviour, school discipline, expulsion.

Introduction

France has recently seen growing interest in the issues of school climate, violence, and bullying. One result was the adoption of a law on July 8, 2013, that recognized the importance of enabling students to learn in a calm school environment that promoted student well-being and good working conditions for teachers. Thus an emphasis was placed on the importance of managing violence and lack of safety through preventive means. All teaching institutions were invited to take action on the problem (Blaya & Cohen, 2016; Debarbieux, 2004; Debarbieux & Moignard, 2016).

In its policy message on schools, the European Commission (2015) encouraged all EU member countries to implement whole-school, evidence-based strategies targeting prevention and early intervention. The European Union believes that a school-wide approach involving all the stakeholders in the educational community is the way to put an end to early school leaving and to encourage school success for all students.

This whole-school approach engages the entire school community in cohesive, collective, and collaborative action based on a multidisciplinary and differentiated approach, in order to support each student in the most fitting manner. The goal is to institute a culture—a positive and safe school climate—that will contribute to improving the school success of every student while supporting their emotional, social, and psychological wellness.

The focus of this article, the School-Wide Positive Behavior Interventions and Supports (SWPBIS) program, is one of these whole-school approaches. SWPBIS has been implemented in 26,000 schools in the United States, as well as in Canada, Norway, Finland, Denmark, and the Netherlands.

Referred to as *Soutien aux Comportements Positifs* (SCP) in the French-speaking world, SWPBIS was adapted in the Canadian province of Quebec and has been in use for more than 10 years. In France, pilot projects are underway in several academies (Kubiszewski, 2018). In French-speaking Belgium, early results are now available for a research project to culturally adapt the program and examine its effects on school climate and collective teacher efficacy (Deltour et al., 2021; Deltour et al., in press). Since SWPBIS is gaining ground in French-speaking teaching environments, it is pertinent to take an interest in the program, how it works, and the effects that can be expected once it has been implemented.

SWPBIS is a flexible approach in that, apart from the essential principles, it must be adapted to the context and culture of the school in which it is being applied. The goal of SWPBIS is to create a positive, safe learning environment by preventing behavior problems. To achieve this, it defines clear, observable behavioral expectations set out in positive language. These expectations are taught explicitly to students (Bissonnette, 2017), reinforced on posters to ensure sustainability, and supported by systematic feedback and symbolic or tangible reinforcement. These mechanisms of feedback and positive reinforcement are central to SWPBIS. Another key element of the approach is collecting and using data to guide the implementation and regulation of interventions as they apply to behavior and learning (Sugai & Horner, 2009).

SWPBIS can be described as a preventive approach since it addresses all students. SWPBIS places great importance on organizing the learning environments in order to adopt judicious behavioral interventions that are effective and lasting. The program is based on the characteristics of the Response-to-Intervention (RTI) model, which suggests interventions that increase in intensity according to the results obtained in previous levels. Three characteristics operationalize SWPBIS: (a) the integration of four elements: results, system organization, practices, and data; (b) empirically supported intervention choices; and (c) a continuum of behavioral supports (Sugai & Horner, 2009).



Source: <https://www.hatchingresults.com/blog/2017/3/multi-tiered-multi-domain-system-of-supports-by-trish-hatch-phd>

A systemic approach

School-Wide Positive Behavior Interventions and Supports is a systemic approach—meaning here that it is applied at all levels and by all stakeholders—intended to institute support for the social culture as well as for individual student behaviors. These elements are required for a school to become a safe, effective learning environment (Sugai & Horner, 2009).

SWPBIS is defined as a framework that enables schools to adopt and implement a continuum of evidence-based interventions to help all students develop pro-social behaviors and important academic skills. Within this framework, the focus is on the process rather than a specific curriculum, intervention, or practice. The idea of a continuum underscores how the behavior practices are organized in a support system with increasing levels of intensity, also known as the Response-to-Intervention model (Sugai & Horner, 2009; Sugai & Simonsen, 2012).

The education team is asked to review its disciplinary policy in light of the common values underpinning the interventions. Positive feedback must be the norm in preventing behavior problems, and the entire team must apply the same standards. Once agreed upon in a collegial manner, the universal prevention tools are presented to all the students: (a) to support pro-social behavior, (b) to prevent the occurrence of problem behaviors, and (c) to maximize the teaching opportunities and thus encourage academic success (Sugai & Horner, 2009).

The three-tiered system of increasing intensity consists of (1) the initial intervention of universal prevention targeting all students in the institution (base of the pyramid); (2) secondary interventions designed to reduce or eliminate risk factors in certain students (applies to approximately 15 to 20% of students) by providing them “protective” strategies; and (3) tertiary interventions for students with verified problem behaviors (3 to 5% of students), intended to reduce the complexity, intensity, and severity of the behaviors. The third level of intervention is typically multidisciplinary, involving different types of experts (school and other types of psychologists; social workers; external mental health, addiction, or school perseverance specialists; and others). These interventions are highly individual and designed for each student’s specific needs (Sugai & Horner, 2002, 2006).



Source: <https://www.pbis.org/topics/school-wide>

What are the expected results of SWPBIS implementation?

Researchers have been studying the effectiveness of SWPBIS for more than 20 years and most of the resulting studies were conducted in the United States. In fact, the *Journal of Positive Behavior Interventions*, specialized in SWPBIS practices (applied in schools and elsewhere), began publication in January 1999. More recently, empirical studies considering the effectiveness of adapting (SW)PBIS in other cultural and teaching contexts have been published (Nelen et al., 2016).

Method

We conducted a systematic review of the literature to examine (Petticrew & Roberts, 2006) the outcomes of SWPBIS implementation. Our literature review followed an explicit, logical, organized, and reproducible protocol to exhaustively summarize the evidence (and conclusions) available on a specific program, which was pedagogical in this case (Grant & Booth, 2009; Li Wan Po, 1998; Ng & Benedetto, 2016). The three essential elements of this protocol were the studies' inclusion and exclusion criteria, research methodology, and selected method of synthesis.

The inclusion and exclusion criteria for our study were defined before the research began. This systematic review focused on experimental and quasi-experimental studies as well as those using alternative causal research designs such as propensity score matching. The review considered the cognitive, behavioral, and social outcomes of SWPBIS. Only studies conducted in teaching environments (kindergarten, elementary, secondary) were included. The studies must have taken place in schools that had explicitly implemented Tier 1 of SWPBIS (universal prevention) throughout the entire school. They must also have examined a sample of at least two experimental schools and two control schools (Cheung & Slavin, 2016). The intervention must have lasted at least one year (de Boer et al., 2014) and must have been conducted by teachers in the schools, not by the researchers (Cheung & Slavin, 2016; de Boer et al., 2014).

The criteria for excluding articles included: (1) a non-relevant subject; (2) publication before 2002, before SWPBIS was formalized; (3) a focus on programs that do not include the main principles of SWPBIS (shared values demonstrated through expected behaviors for different spaces in the school, explicit teaching of the behaviors, positive reinforcement of the behaviors, common policy to manage inappropriate behaviors, and data-based decision making); (4) SWPBIS not implemented universally throughout the school (for example, articles on interventions in Tier 2 or 3 only); (5) a different research design followed than those mentioned above; (6) results presented from anything other than a primary study; and (7) doctoral theses and other publications that were not blind peer reviewed.

As part of this systematic review, we conducted two distinct searches in the scientific literature. The first search used the ERIC bibliographic database of educational research. To guarantee a comprehensive search, a search equation was created to combine all the terms used to refer to SWPBIS (Positive Behavior Supports, School-Wide Positive Behavioral Interventions and Supports, etc.), the methodological terms (quasi-experimental design, randomized controlled trials, etc.), and the terms for the educational levels under investigation (elementary schools, secondary education, etc.). The full search equation is presented in Appendix 1. This search located 604 bibliographical references in ERIC.

The second, more traditional bibliographic search was done on three general science search engines (Google Scholar, Isidore, and JURN), in the international journal specializing in SWPBIS (*Journal of Positive Behavior Interventions*), on ResearchGate, and in the bibliographies of previously published reviews (Chitiyo et al., 2012; Gage et al., 2018; Gage et

al., 2020; Grasley-Boy et al., 2021; Horner et al., 2010; Lee & Gage, 2020; Mitchell et al., 2018; Solomon et al., 2012). This search identified 127 references.

Following the review of the identified bibliographic references based on the inclusion and exclusion criteria, 39 articles were retained. Some of these articles had analyzed data from the same study and thus were grouped together. The flowchart below in Figure 1 illustrates the selection process.

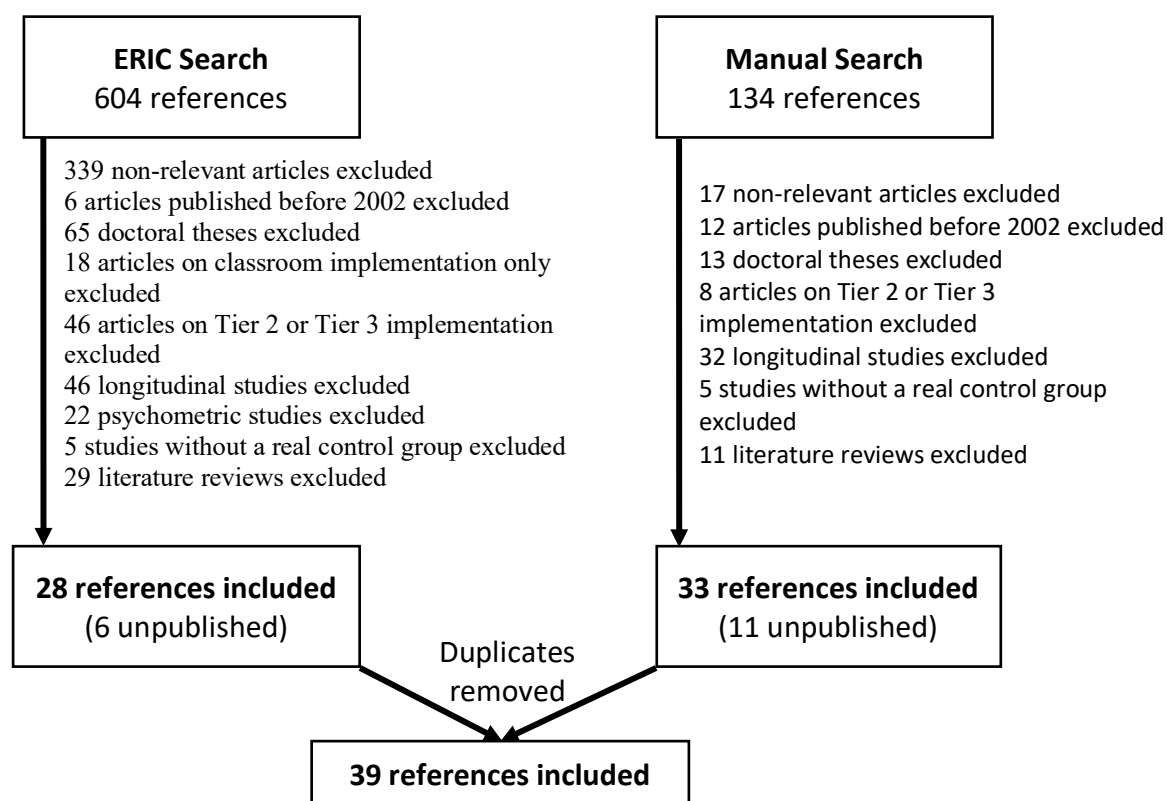


Figure 1: Flowchart

Of these 39 references, the Australian article by Yeung et al. (2009) was excluded. Although the study used a quasi-experimental design, the impact of SWPBIS did not consider the variables examined in our review. In addition, several references referred to the results from the same study and were thus grouped together. As such, 28 unique studies were identified.

To quantify the outcomes of SWPBIS, the systematic literature review includes a meta-analysis (Cochrane Collaboration, 2017; Li Wan Po, 1998) based on the 39 included sources. The effect sizes of the meta-analysis and their standard error were calculated using *What Works Clearinghouse, Version 4.1* (2020). In general, Hedges' *g* was used in calculating the effect size on the continuous variables. Cox's *d* was used to calculate the effect sizes on the dichotomous

variables before being converted into Hedges' g using the formula by Borenstein et al. (2009) to make it possible to work in the same metric.

$$g = \omega \frac{y_i - y_c}{\sqrt{\frac{(n_i - 1)S_i^2 + (n_c - 1)S_c^2}{n_i + n_c - 2}}} \text{ where } \omega = 1 - \frac{3}{(4N - 9)}$$

$$d_{\text{cox}} = \frac{\ln \left(\frac{\frac{\text{Treatment incidence}}{\text{Control incidence}}}{\frac{\text{Treatment no-incidence}}{\text{Control no-incidence}}} \right)}{1.65}, \text{ then } g = \left(1 - \frac{3}{4N - 9} \right) \ln OR \frac{\sqrt{3}}{\pi}$$

These formulas could not be used for two situations. In the multivariate analysis of variance (Bradshaw et al., 2010), we followed the recommendations of Steyn and Ellis (2009) to calculate the effect sizes based on Wilk's lambda distribution. For the multilevel analyses (Waasdorp et al., 2012), we relied on the recommendations from Borenstein and Hedges (2019).

To ensure consistency with previous studies measuring SWPBIS effectiveness, the number of schools (N schools) was used to calculate effect size. Effect size averages and the standard error were calculated according to the meta-analysis model for random effects (Borenstein et al., 2009).

The methodological quality of the included studies was also assessed. Six criteria were used to rate each study included in the review on a scale of one to six points. The six criteria are listed below:

- Research design quality: One point was given for randomized controlled trials as they lead to a better estimation of the outcomes than other causal designs that are not purely random (Cook, 2002; Cheung & Slavin, 2016).
- Sample size: One point was attributed to studies that compared at least 30 experimental schools and 30 control schools. Smaller sample sizes can lead to overestimated effects (Cheung & Slavin, 2016; de Boer et al., 2014).
- Duration of SWPBIS implementation: One point was given to studies that measured SWPBIS effectiveness for at least the five years needed to successfully implement an educational program throughout an entire school (Borman et al., 2002, 2003).
- Data collection instruments: Half a point was allocated to studies that used an external data collection tool (meaning the tool was not created by the researchers and/or teachers involved in the project) and another half a point was given to studies that used a non-

inherent data collection tool (the tool was not created solely to measure the SWPBIS effects). Data collection instruments that do not have these two characteristics tend to lead to an overestimation of the observed effects (Cheung & Slavin, 2016; de Boer et al., 2014).

- Group equivalence at pre-test on socio-demographic variables (Baye et al., 2019; Cook, 2002; Slavin, 2008): Half a point was given to studies whose group equivalence at pre-test was half a standard deviation and a full point was given to studies whose group equivalence at pre-test was at least one standard deviation.
- Group equivalence at pre-test on variables of interest (Baye et al., 2019; Cook, 2002; Slavin, 2008): Half a point was attributed to studies whose group equivalence at pre-test was half a standard deviation and a full point was attributed to studies whose group equivalence at pre-test was at least one standard deviation.

Allocating a score for each criterion made it possible to generate a quality rating for each included study, which then shed light on the overall quality of the SWPBIS research done until now.

To render the results of this meta-analysis intelligible, they are presented distinctly based on the three effect ranges examined: (1) socio-affective effects, (2) cognitive effects (with these first two categories targeting students), and (3) effects on teachers.

Socio-affective effects

The range of socio-affective effects resulting from SWPBIS consists of a diverse group of distinct variables. Before presenting the effects of SWPBIS implementation on these variables, it is essential to describe them more fully and to explain which methods of measuring them were used in the studies included in this review.

The first facet of variables regarding the socio-affective effects of SWPBIS deals with student behavior, and more specifically, inappropriate or problematic behavior. In the United States, where a vast majority of the studies in this review were conducted, inappropriate or problematic student behaviors were recorded by schools, reported to the administration, and then entered into a database. These data, called office discipline referrals (ODRs), combined all the incidents linked to problematic behaviors exhibited by students, whether major or minor, and regardless of the sanctions assigned in light of the incidents. Indeed, the consequences of such behavior

were grouped as another type of data used to examine the behavioral effects of SWPBIS. In the United States, inappropriate or problematic student behavior typically results in one of two types of sanctions: the students are temporarily removed from class or they are temporarily suspended. The two types of suspension are in-school suspension (ISS), which takes place in the school, and out-of-school suspension (OSS), which takes place off campus, i.e., at the student's home. At some schools, the administration did not consistently collect behavioral data in such a systematic manner. In these cases, the researchers used alternative means to gather data by asking teachers to fill out a questionnaire on the number of behavioral incidents that had occurred inside and outside the classroom in the previous week. The questionnaires (Problem Behavior in the School Environment Last Week and Problem Behavior in the Classroom Last Week) were validated through psychometric assessment (Kjøbli & Sørli, 2008; Sørli & Ogden, 2007).

The second expected effect of SWPBIS implementation is a perceived improvement in school climate. School climate is assessed based on the presence of three elements: engagement (everything having to do with relationships and their quality), safety, and the environment. Outcomes were observed on several of these elements. For clarity, the observed effects were grouped under the general headings of school climate or class climate. School climate is typically measured by questionnaires in which respondents select their answer choice on a Likert scale to show their level of agreement with the proposed statements.

A third expected outcome of SWPBIS is complementary to the element of safety in the school climate, specifically a reduction in bullying. Studies have been done to investigate the effects of this particular program on reducing bullying and it seemed important to include them in this review. The main objective of SWPBIS is not to reduce bullying, even though its use does lead to this result.

The last socio-affective effect concerning students is an increase in the number of days in attendance at school. Since school absenteeism is one of the observable symptoms of dropping out, improving attendance, and thus SWPBIS's indirect impact against dropping out, was also worth addressing individually.

The effect sizes in this first section were calculated using the various measures noted above. Table 2 presents all the behavioral effects of SWPBIS found in the 22 references that recorded such data. Table 1 summarizes the results. Note that, on average, the quality of the included

studies that considered the socio-affective effects of SWPBIS was rated 3.03 on our six-point scale.

The average effects reported in the meta-analysis demonstrated the expected reduction in problem behaviors, improvement in class/school climate, reduction in bullying, and decrease in absenteeism.

Table 1: Meta-analysis of socio-affective effects of SWPBIS on students

Outcome	#	Mean effect	Standard deviation	CI (95%)		p value
				Lower	Upper	
Temporary exclusions	9	-0.27	0.08	-0.42	-0.12	0.0003
Disciplinary procedures	4	-0.71	0.25	-1.20	-0.23	0.004
School/class climate	4	+0.17	0.18	-0.18	+0.52	0.34
Expulsions	4	-0.32	0.29	-0.89	+0.25	0.27
Bullying	4	-0.004	0.06	-0.12	+0.11	0.72
Problem behavior	3	-0.56	0.13	-0.82	-0.29	<0.0001
Absenteeism	3	-0.13	0.06	-0.24	-0.01	<0.0001

Notes: # represents number of studies; CI is 95% confidence interval; the mean effect was calculated following a random-effects meta-analysis model; the statistical indices presented in this table were calculated following the recommendations of Borenstein et al. (2009.)

Table 2: Socio-affective effects of SWPBIS on students

Author(s) (date)	Design	Sample size	Location and duration	Outcome(s)	Effect size	Standard error	Quality
Experimental research							
Bradshaw et al. (2010) Bradshaw et al. (2012) Bradshaw et al. (2015) Waasdorp et al. (2012)	Randomized controlled trial	21 schools in EG and 16 schools in CG	Maryland 4 years	Disciplinary procedures	$g = -0.85$	0.44	3/6
				Temporary exclusions	$g = -0.08$	0.32	
				Bullying	$g = -0.03$	0.38	
Horner et al. (2009)		36 schools in EG and 37 schools in CG	Illinois, Hawaii, and Chicago 1 year	School/class climate	$g = +0.39$	0.31	4.5/6
Ward & Gersten (2013) Smolkowski et al. (2016)	Randomized controlled trial	17 elementary schools in EG and 15 elementary schools in CG	USA 1 year (3 years of implementation)	Temporary exclusions	$g = -0.13$	0.35	4/6
				Bullying	$g = -0.21$	0.35	
				Tardiness	$g = +0.15$	0.35	
				Absenteeism	$g = -0.14$	0.35	

Quasi-experimental research							
Borgen et al. (2019)	Difference-in-difference	2,365 schools of which 244 were implementing SWPBIS	Norway 8 years (5 years of implementation)	Bullying	$g = +0.01$	0.07	3/6
Borgen et al. (2021)	Difference-in-difference	2,366 of which 216 were implementing SWPBIS	Norway 8 years (4 years of implementation)	School drop out	$g = -0.01$	0.07	2/6
Flannery et al. (2014)	Quasi-experimental	8 <i>high schools</i> in EG and 4 <i>high schools</i> in CG	USA 3 years (2 years of implementation)	Disciplinary procedures	$g = -0.45$	0.61	1/6
Gage et al. (2018)	Propensity score matching	1,755 schools of which 119 schools in EG and 119 schools in CG	USA (Georgia) 1 year	Temporary exclusions	$g = -0.62$	0.13	4/6
				Problem behavior	$g = -0.64$	0.13	
Gage et al. (2019 b)		905 schools of which 118 schools in EG and 118 schools in CG	USA (Georgia) 1 year	Bullying	$g = -0.02$	0.13	4/6

Gage et al. (2019 a)		3,513 schools of which 593 schools in EG and 593 schools in CG	USA (Florida) Two times a whole school year	Temporary exclusions	g = -0.26	0.06	4/6
				Expulsions	g = -0.08	0.06	
Gage & Stevens (2018)		1,051 schools of which 135 schools in EG and 35 schools in CG	USA (South Carolina) 1 year	Temporary exclusions	g = +0.08	0.12	4/6
Grasley-Boy et al. (2019)		6,754 schools of which 544 schools in EG and 544 schools in CG	USA (California) 1 year	Temporary exclusions	g = -0.11	0.06	4/6
				Expulsions	g = +0.03	0.06	
Lee et al. (2021)		1,403 schools of which 122 schools in EG and 122 schools in CG	USA (Georgia) 1 year	Temporary exclusions	g = -0.51	0.13	4/6
				Expulsions	g = -0.26	0.13	
Molina et al. (2020)		Quasi-experimental	3 experimental <i>middle schools</i> and 3 control <i>middle schools</i>	USA (south Texas) 1 year	Disciplinary procedures	g = -0.47	0.66
	Absenteeism				g = +0.12	0.65	

Nelson et al. (2002)	Comparison to a normative group	35 elementary schools of which 8 were implementing SWPBIS	USA 4 years (3 years of implementation)	Disciplinary procedures	$g = -0.80$	0.40	1/6
				Temporary exclusions	$g = -1.32$	0.41	
				Expulsions	$g = -1.34$	0.42	
				School/class climate	$g = +0.21$	0.39	
Pas et al. (2019)	Propensity score matching	1,316 schools of which 859 in EG and 457 in CG	USA (Maryland) 7 years (6 years of implementation)	Temporary exclusions	$g = -0.21$	0.06	5/6
				Absenteeism	$g = -0.13$	0.06	
Sørlie & Ogden (2007)	Quasi-experimental	4 elementary schools in EG and 4 in CG	Norway 20 months (3 years of implementation)	Problem behavior	$g = -0.83$	0.64	1/6
				School/class climate	$g = -0.07$	0.6	
Sørlie & Ogden (2014) Sørlie & Ogden (2015)		28 schools in EG and 20 in CG	Norway (4 years)	Problem behavior	$g = -0.19$	0.29	1/6
				School/class climate	$g = +0.01$	0.29	

Notes: EG = experimental group; CG = control group

Effects on students' academic performance

Before discussing the expected effects of SWPBIS on students' school performance, it is helpful to understand how these data were measured. In the United States, each state organizes tests, which are usually standardized, at different points in students' school career to evaluate their attainment of academic skills. These skills systematically include reading, which incorporates comprehension and mastery of the teaching language, and mathematics. Other subjects may also be assessed, such as the sciences, social sciences, arts, and humanities. These additional subjects are discussed here as a composite measure.

The effect sizes presented in this section were calculated with the instruments noted above. Table 4 presents all the academic effects of SWPBIS found in the 15 references that collected such data. Table 3 presents a summary of the results. Note that, on average, the quality of the included studies that considered the academic effects of SWPBIS was rated 3.35 on our six-point scale.

Table 3: Meta-analysis of SWPBIS effects on students' academic performance

Outcome	#	Mean effect	Standard deviation	CI (95%)		P value
				Lower	Upper	
Reading	10	+0.16	0.12	-0.08	+0.40	0.20
Math	9	+0.02	0.04	-0.05	+0.10	0.57
Academic performance measure	6	+0.27	0.21	-0.15	+0.69	0.09

Notes: # represents the number of studies; CI is 95% confidence interval; the mean effect was calculated following a random-effects meta-analysis model; the statistical indices presented in this table were calculated following the recommendations of Borenstein et al. (2009).

One particular observation must be highlighted: The results of SWPBIS implementation on students' academic performance were very uneven, sometimes even contradictory. Knowing that the main goals of applying such a program are to first and foremost improve socio-affective variables, such as problematic behavior and school climate, it is undoubtedly useful to question the progress noted by some authors in the area of academic skills. Insofar as the RTI model was first developed to evaluate learning (Fuchs et al., 2003), before being applied to behavior, American schools were likely to have implemented learning-specific support programs at the

same time as SWPBIS. It was not always possible to know if this was the case for the studies included in our review, yet we felt it necessary to raise the issue.

Table 4: SWPBIS effects on students' academic performance

Author(s) (date)	Design	Sample size	Location and duration	Outcome(s)	Effect size	Standard error	Quality
Experimental research							
Bradshaw et al. (2010)	Randomized controlled trial	21 schools in EG and 16 in CG	Maryland 4 years	Reading	g = 0.00	0.32	3/6
				Math	g = +0.28	0.33	
Horner et al. (2009)		36 schools in EG and 37 in CG	Illinois, Hawaii, and Chicago 1 year (5 years of implementation)	Reading	g = +0.29	0.27	4.5/6
Ward & Gersten (2013)		17 elementary schools in EG and 15 in CG	USA 1 year (3 years of implementation)	Reading	g = -0.03	0.35	4/6
				Math	g = 0.00	0.35	
Quasi-experimental research							
Borgen et al. (2019)	Difference- in-difference	2,365 schools of which 244 were implementing SWPBIS	Norway	Academic performance measure	g = -0.01	0.07	3/6

Borgen et al. (2021)	Difference-in-difference	2,366 schools of which 216 were implementing SWPBIS	Norway 8 years (4 years of implementation)	Academic performance measure	$g = -0.02$	0.07	2/6
Gage et al. (2015)	Propensity score matching	936 schools of which 150 in EG and 150 in CG	USA (Connecticut) 4 years	Reading	$g = 0.00$	0.12	4/6
				Math	$g = 0.00$	0.12	
Gage et al. (2017)	Quasi-experimental	Data included an average of 2,032.8 schools of which an average of 235 schools were implementing SWPBIS	USA (Florida) 12 years	Reading	$g = +0.12$	0.07	4/6
				Math	$g = +0.10$	0.07	
Houchens et al. (2017)	Propensity score matching	1,021 schools of which 151 in EG and 151 in CG	USA (Kentucky) 1 year	Academic performance measure	$g = 0.00$	0.11	4/6
LaFrance (2011)	Quasi-experimental	2,889 schools of which 88 in EG and 44 in CG	USA (Florida) 1 year	Reading	$g = +0.73$	0.19	2/6
				Math	$g = +0.18$	0.18	

Madigan et al. (2016)		21 schools in EG and 28 in CG	USA (Kentucky) 9 years (4 years of implementation)	Academic performance measure	g = +1.24	0.29	2/6
Molina et al. (2020)		3 experimental middle schools and 3 control middle schools	USA (south Texas) 1 year	Academic performance measure	g = -0.14	0.65	1/6
Nelson et al. (2002)	Comparison to a normative group	35 elementary schools in one district of which 8 were implementing SWPBIS	USA 4 years (3 years of implementation)	Reading	g = +1.16	0.32	1/6
				Math	g = +0.21	0.29	
				Academic performance measure	g = +0.56	0.14	
Pas et al. (2019)	Propensity score matching	1,316 schools of which 859 in EG and 457 in CG	USA (Maryland) 7 years (6 years of implementation)	Reading	g = -0.32	0.06	5/6
Math				g = -0.06	0.06		
Ryoo et al. (2018)		1,084 schools of which 33 in EG and 33 in CG	USA (Minnesota) 3 years	Reading	g = +0.01	0.24	4/6
				Math	g = +0.01	0.24	
Ryoo & Hong (2011)		57 schools in EG and 57 in CG	USA (Minnesota) 5 years	Reading	g = 0.00	0.19	5/6
				Math	g = 0.00	0.19	

Notes: EG = experimental group; CG = control group

Effects on teachers, their perception of school climate, and their perception of efficacy

Table 6 presents all the effects of SWPBIS on teachers found in the eight reference documents that reported such data. Table 5 summarizes the main results. Note that, on average, the quality of the included studies that addressed the effects on teachers of SWPBIS was rated 2 on our six-point scale.

Like their students, the teachers seemed to have seen benefits from the implementation of SWPBIS throughout the school, in the various aspects of school climate as well as in school leadership, personal teaching efficacy, and collective teaching efficacy. These are valuable outcomes for teachers given the context in many schools, where staff often find their work arduous and teachers leave the profession, whether early on or later in their career (Lothaire et al., 2012).

Table 5: Meta-analysis of SWPBIS effects on teachers

Outcome	#	Mean effect	Standard deviation	IC (95%)		P value
				Lower	Upper	
Collective efficacy	3	+0.39	0.24	-0.09	+0.86	0.21
Self-efficacy	2	+0.41	0.35	-0.28	+1.09	0.24
Class climate	2	+0.23	0.26	-0.29	+0.74	0.39

Notes: # represents the number of studies; CI is 95% confidence interval; the mean effect was calculated following a random-effects meta-analysis model; the statistical indices presented in this table were calculated following the recommendations of Borenstein et al. (2009).

Table 6: SWPBIS effects on teachers

Author(s) (date)	Design	Sample size	Location and duration	Outcome(s)	Effect size	Standard error	Quality
Experimental research							
Bradshaw et al. (2008) Bradshaw et al. (2009) Bradshaw et al. (2010)	Randomized controlled trial	21 schools in EG and 16 in CG	Maryland 5 years (from 2002 to 2007)	School climate	$g = +0.24$	0.33	3/6
Quasi-experimental research							
Deltour et al. (2021)	Quasi- experimental study	4 experimental schools and 5 control schools	French- speaking Belgium	Collective efficacy	$g = +0.72$	0.62	1/6
Houchens et al. (2017)	Propensity score matching	1,021 schools of which 151 in EG and 151 in CG	USA (Kentucky) 1 year (2010– 2011)	School leadership	$g = +0.21$	0.12	4/6
Kelm & McIntosh (2012)	Quasi- experimental study	2 experimental schools and 3 control schools	Canada 1 year (2009– 2010)	Self-efficacy	$g = 0.78$	0.34	1/6

Sørli & Ogden (2007)	Quasi- experimental study	4 elementary schools in EG and 4 in CG	Norway 20 months (3 years of implementation)	Class climate	$g = +0.48$	0.62	1/6
				Collective efficacy	$g = +0.56$	0.63	
Sørli & Ogden (2014)		28 schools in EG and 20 in CG	Norway (4 school years)	Class climate	$g = +0.17$	0.29	1/6
Sørli & Ogden (2015)				Collective efficacy	$g = +0.28$	0.29	
Sørli et al. (2016)				Self-efficacy	$g = +0.08$	0.29	

Notes: EG = experimental group; CG = control group

Final discussion

This review highlighted that the expected effects of SWPBIS are varied and encompass key fields in European teaching contexts. The evidence of the program's effectiveness on the important variables outlined above was strong and based on high-quality empirical research.

The expected effects of SWPBIS on student behavior, school climate, attendance, and academic performance were largely underscored in the studies retained for this systematic review. The same was true for the outcomes on teachers regarding school climate and their personal and collective feeling of effectiveness, even though these areas were less examined than those affecting students. While the effects were clearly present, studying them does not reduce the importance of evaluating the methodological quality of the studies that presented them.

Several gauges of methodological quality were found in all the studies. First, regarding sample sizes, Cheung and Slavin (2016) estimated that, for the methodological quality of a study to be demonstrated, each group must contain at least 30 analysis units as well as two schools. If the program is tested in only one experimental school, the outcome of the intervention could be confused with the characteristics of the school itself. The authors further explained that samples that are too small risk leading to an overestimation of the effects of the intervention (Cheung & Slavin, 2016; de Boer et al., 2014). All the studies considered in this review were conducted with large, even very large, samples. The smallest sample in the studies had two experimental schools and three control schools (Kelm & McIntosh, 2012), while the largest comparison included 593 schools in each group (Gage, Grasley-Boy, et al., 2019). In general, 17 of the 28 studies we examined compared at least 30 experimental and 30 control schools

A second quality measure lies in the amount of time the program is in effect. In school-wide interventions, the duration of the intervention has a positive effect on the target population (Borman et al., 2002, 2003). In addition, from the standpoint of ecological validity, an intervention applied over too short a time is not desirable when we take into account that change is assessed over time (Baye et al., 2019). All the interventions in the included studies were in effect for at least one year. Regarding SWPBIS, the average implementation period for the universal prevention phase typically ranged from two to three years, depending on the school level (Nese et al., 2019). Only four of the included studies (out of 28) in this review recorded the effects for longer than the five years Borman et al. (2002, 2003) deemed necessary to sustainably implement an educational program throughout an entire school.

A third sign of methodological quality is found in the measurement instruments used in the studies (Cheung & Slavin, 2016; de Boer et al., 2014). All the measurement instruments used to assess the effects of SWPBIS were standardized instruments, meaning they were external and not created by the researchers and/or teachers involved in the project (e.g. academic skills tests designed by each state or country) and that they were non-inherent, meaning they were not created solely to measure the effects of SWPBIS (e.g. the ODRs must be recorded anyways). Using standardized measurement instruments prevents a biased overestimation of the effects stemming from the intervention's implementation (de Boer et al., 2014), which can occur, for example, when a study uses instruments designed by the researchers themselves.

While some methodologies are clearly valid, others may be questionable. In fact, several studies were done on groups that were not comparable at the outset. In some cases, the groups were not comparable from the start on socio-demographic variables (e.g. percentage of students from disadvantaged backgrounds). In other cases, the groups were not comparable on the dependent variables (e.g. average number of behavior problems per student per year). This methodological problem underscores the importance of having, right at the start of the study, the most comparable groups on socio-demographic variables and the variables to be studied. To investigate the impact of a particular intervention, we must be able to attribute the effects to the intervention and not to differences between the groups studied (Baye et al., 2019; Slavin, 2008).

A second problem regarding methodological quality arises when too few randomized controlled trials are performed. On this issue, Cook (2002) stated that, in education as in other fields, reliance on randomized controlled studies is the best way to establish causality between the intervention implementation and the outcomes. Further, Cheung and Slavin (2016) suggested that the presented effects are generally proportionally greater in quasi-experimental studies than in randomized controlled studies. When we applied the strict criteria defining randomized controlled and quasi-experimental studies, only three studies were included for socio-affective effects, three for academic performance, and two for the effects on teachers.

The effects cannot be considered without examining the methodological quality as well. However, for lack of better evidence, we have to use what is available (Petticrew, 2015). This is why, despite the methodological drawbacks mentioned, choosing to implement such a program to obtain the effects noted in the included studies remains relevant.

Besides the methodological aspects of the studies on the topic, implementation fidelity is another element that must be considered when examining the effects of SWPBIS implementation. Measuring the degree to which a program's components are implemented compared to the original protocol helps us understand why some effects do not occur. The question of implementation fidelity is becoming more common in SWPBIS research and in other more general research on implementing interventions in educational settings. As such, almost 69% (27/39) of the retained studies mentioned the data gathered on implementation fidelity. However, only seven studies quantified the impact of greater fidelity.

This review has also spurred ideas for other research avenues on this rapidly expanding program. Conducting more randomized controlled trials that follow all the strict requirements of such a design would fulfil the goal of improving the methodological quality of studies on SWPBIS. Another perspective to investigate is the effects of SWPBIS in countries besides the United States. This critical review of the literature was intended to include research from the United States as well as from other countries, but Norway was the only other country that had conducted studies that met the inclusion criteria. Since the program has been applied elsewhere to a greater extent in recent years, it seems pertinent and timely to verify the effects obtained outside of its original context. Further, a number of studies relied on data that was non-inherent to SWPBIS such as the data on suspensions, class removals, etc. These data are altogether misaligned with the project's aim regarding students with behavioral problems. For example, the data regarding the program's effects on well-being, pro-social behavior, the risk of emotional and behavioral disorders, self-management, or on-task and disruptive behavior are more subtle socio-affective and behavioral data to use to study the range of expected effects.

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Annexe 1 : équation de recherche bibliographique

La recherche bibliographique effectuée dans le cadre de cette revue systématique de la littérature a été réalisée sur la base de données *ERIC*. Une brève exploration de ce thésaurus nous a permis de cibler les descripteurs utilisés pour inventorier les études qui nous intéressaient. Afin d'être exhaustif et d'éviter de faire du bruit avec un trop grand nombre d'études, nous avons décidé d'utiliser trois types de descripteurs : les descripteurs d'intervention ; les descripteurs de design d'étude ; et les descripteurs de niveau d'éducation. Au sein d'une même catégorie de descripteurs, les termes choisis ont été reliés par l'opérateur booléen « OR ». Les catégories elles-mêmes ont été reliées par l'opérateur booléen « AND ».

<i>Intervention Descriptors</i>	<i>Study Design Descriptors</i>	<i>Education Level Descriptors</i>
Positive Behavior Supports/ or Positive Behavioral Interventions and Supports.mp or School-wide Positive Behavioral Interventions and Supports.mp or PBIS.mp or SWPBIS.mp or SWPBIS.mp	ABA design*.mp or ABAB design*.mp or Academic Achievement/ or Achievement Gains/ or Alternating treatment*.mp or Best practices/ or Causal.mp or Causal analysis.mp or Comparative Analysis/ or Comparison group*.mp or Complier Average Causal Effect.mp or Control groups/ or Educational Attainment/ or Educational program evaluation.mp or Educational Research/ or Effect Size/ or Effectiv*.mp or Evidence/ or Experiment control.mp or Experimental Curriculum/ or Experimental design.mp or Experimental Groups/ or Experimental method.mp or Experimental Programs/ or Experimental Schools/ or experimentation.mp or Group intervention.mp or Hierarchical Linear Modeling/ or Impact.mp or Instructional Effectiveness/ or Instructional Improvement/ or Instrumental Varibale.mp or Intervention/ or Linear regression.mp or Matched Groups/ or Meta Analysis/ or Mixed Methods Research/ or	Elementary Schools/ or Elementary School Curriculum/ or Elementary School Students/ or Elementary Education/ or Elementary School Science/ or Elementary Secondary Education/ or Elementary School Mathematics/ or Elementary School Teachers/ or Grade 1/ or Grade 2/ or Grade 3/ or Grade 4/ or Grade 5/ or Grade 6/ or Grade 7/ or Grade 8/ or Grade 9/ or Grade 10/ or Grade 11/ or Grade 12/ or High Schools/ or High School Equivalency Programs/ or Intermediate Grades/ or Junior High Schools/ or Kindergarten/ or Middle

	Multiple Regression Analysis/ or Outcomes of Education/ or Posttests/ or Pretests/ or Pretests Posttests/ or Program Effectiveness/ or Program Evaluation/ or QED.mp or Quasi experimental.mp or Quasiexperimental Design/ or Randomized Controlled Trials/ or RCT.mp or Regression Discontinuity Design.mp or "Regression (Statistics)"/ or School based intervention.mp or Simultaneous treatment*.mp or Single case design*.mp or Single subject design*.mp or Standardized Tests/ or Structural Equation Models/ or Systematic review.mp or Treatment compliance.mp or Treatment effectiveness.mp or Treatment outcome.mp	Schools/ or Preschool Education/ or Primary Education/ or Primary School.mp or Secondary Education/ or Secondary School Curriculum/ or Secondary School Mathematics/ or Secondary Schools/ or Secondary School Science/ or Secondary School Students/ or Secondary School Teachers/
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Cette première recherche nous a permis d'identifier 475 études. Cependant, la base de données *ERIC* n'utilise pas systématiquement des descripteurs de niveau d'éducation pour classer les études en sciences de l'éducation. Il est donc indispensable d'effectuer une seconde recherche bibliographique sans ces descripteurs. Dans ce contexte, nous avons connecté les « descripteurs d'interventions » et les « descripteurs de design d'étude » avec l'opérateur booléen « et » pour obtenir 972 études. Nous avons ensuite ajouté certaines limites à notre équation de recherche. Nous avons limité notre recherche aux études menées en maternelle, à l'école élémentaire, au collège ou au lycée. Cinq cent quatre-vingt-une études ont été retenues.

<i>Intervention Descriptors</i>	<i>Study Design Descriptors</i>
Positive Behavior Supports/ or Positive Behavioral Interventions and Supports.mp or School-wide Positive Behavioral Interventions and Supports.mp or	ABA design*.mp or ABAB design*.mp or Academic Achievement/ or Achievement Gains/ or Alternating treatment*.mp or Best practices/ or Causal.mp or Causal analysis.mp or Comparative Analysis/ or Comparison group*.mp or Complier Average Causal Effect.mp or

PBIS.mp or SWPBIS.mp or SWPBIS.mp	Control groups/ or Educational Attainment/ or Educational program evaluation.mp or Educational Research/ or Effect Size/ or Effectiv*.mp or Evidence/ or Experiment control.mp or Experimental Curriculum/ or Experimental design.mp or Experimental Groups/ or Experimental method.mp or Experimental Programs/ or Experimental Schools/ or experimentation.mp or Group intervention.mp or Hierarchical Linear Modeling/ or Impact.mp or Instructional Effectiveness/ or Instructional Improvement/ or Instrumental Variable.mp or Intervention/ or Linear regression.mp or Matched Groups/ or Meta Analysis/ or Mixed Methods Research/ or Multiple Regression Analysis/ or Outcomes of Education/ or Posttests/ or Pretests/ or Pretests Posttests/ or Program Effectiveness/ or Program Evaluation/ or QED.mp or Quasi experimental.mp or Quasiexperimental Design/ or Randomized Controlled Trials/ or RCT.mp or Regression Discontinuity Design.mp or "Regression (Statistics)"/ or School based intervention.mp or Simultaneous treatment*.mp or Single case design*.mp or Single subject design*.mp or Standardized Tests/ or Structural Equation Models/ or Systematic review.mp or Treatment compliance.mp or Treatment effectiveness.mp or Treatment outcome.mp
limit 5 to (early childhood education or elementary education or elementary secondary education or grade 1 or grade 2 or grade 3 or grade 4 or grade 5 or grade 6 or grade 7 or grade 8 or grade 9 or grade 10 or grade 11 or grade 12 or high school equivalency programs or high schools or intermediate grades or junior high schools or kindergarten or middle schools or preschool education or primary education or secondary education)	

Afin d'éviter les doublons, nous avons associé ces deux équations de recherche sur *ERIC* avec l'opérateur booléen « OR ». Finalement, nous avons enregistré 604 études dans la base de données *ERIC*.

SECOND ARTICLE:

Deltour, C., Baye, A., Bissonnette, S., & Kubiszewski, V. (submitted). Adopting SWPBIS Outside the USA? Description of Its Implementation in Three French-Speaking Contexts and Facilitating Factors.

Adopting SWPBIS Outside the USA? Description of Its Implementation in Three French-Speaking Contexts and Facilitating Factors

Abstract

School-wide Positive Behavior Interventions and Supports (SWPBIS) has been credited with many positive student outcomes and consequently has been imported throughout the world. Yet how other countries have adapted SWPBIS to their context requires further documentation. Indeed, the characteristics of its dissemination may be crucial for implementation quality and obtaining convincing effects. The aim of this paper is to present the diverse SWPBIS implementation characteristics in three French-speaking contexts (Quebec, France and Belgium) and measure its fidelity to the original program in each context. The scientific coordinators of SWPBIS in each context were interviewed and fidelity data were obtained using the School-wide Evaluation Tool, the Benchmarks of Quality and/or the Tiered Fidelity Inventory. The data collected suggest that a variety of importation characteristics on several key elements must be present for effective implementation. Three elements that require particular attention to facilitate implementation were also highlighted: leadership, resource allocation, and school coaching. This article thus provides the international scientific community and schools or academic authorities considering adopting SWPBIS an overview of the variety of ways it has been adopted and the resulting fidelity to the original version.

Keywords: SWPBIS, school-wide intervention, implementation fidelity, cultural adaptations, French-speaking contexts

Many countries have put inclusion and reduction of inequalities in schools on their agenda, so measures that can help address these issues effectively are of particular interest to policy makers, researchers, and education professionals. Among the measures designed to provide a healthy school environment that addresses these issues, School-wide Positive Behavior Interventions and Supports (SWPBIS) offers a promising approach. The positive effects associated with SWPBIS, originally designed in the United States, have been documented when it is implemented with fidelity (e.g., Flannery et al., 2014; Freeman et al., 2015, 2016; Gage et al., 2018). However, implementing a framework, with fidelity, from a country that is culturally different from the one wishing to adopt it is a not straightforward task. To date, the way in which non-Anglo-Saxon countries apply SWPBIS remains poorly documented. And yet the way it is implemented, beyond tools and procedures, is pivotal to its fidelity and outcomes. In this paper, we examine the diversity of SWPBIS implementation modalities in three French-speaking contexts and the implementation fidelity measured in these diverse contexts.

Positive SWPBIS outcomes

The effects of adopting SWPBIS have been documented for more than twenty years. Rigorous empirical research has reported improvements in school climate, attendance, and achievement, and decreases in behavioral problems (e.g., Bradshaw et al., 2010, 2012; Caldarella et al., 2011; Flannery et al., 2014; Gage et al., 2018; Horner et al., 2009; Pas et al., 2019; Smolkowski et al., 2016; Ward & Gernsten, 2013). The growing awareness of these positive effects is sparking interest in SWPBIS outside the United States, especially in European countries (e.g., Kubiszewski, 2018; Goei et al., 2013; Nelen et al., 2020; Nylén et al., 2021; Sørli & Ogden, 2015) and in Africa (e.g., Tunisia, Lesotho).

SWPBIS implementation characteristics: An important factor underlying its fidelity and effects

The question of implementing SWPBIS with fidelity concerns the entire scientific community interested in this framework. Indeed, many studies (Flannery et al., 2014; Freeman et al., 2015, 2016; Gage et al., 2018; Houchens et al., 2017; Sørli & Ogden, 2007, 2015) link the results obtained to implementation fidelity. Implementation fidelity, also sometimes referred to as treatment integrity, is defined according to Blakely et al. (1987, cited by Mowbray et al., 2003) as the proportion of a program's components that are implemented and the way they are implemented with respect to the original protocol (Orwin, 2000; cited by Mowbray et al., 2003).

Thus, it is not enough to apply parts of SWPBIS; it is necessary to implement it as designed (Keller-Margulis, 2012).

From this perspective, the context in which a program is implemented, and the methods used play a fundamental role. As Savignac and Dunbar (2014) pointed out, “an effective program, coupled with quality implementation, increases the likelihood of achieving positive outcomes” (p. 1). There is an entire field of research, called implementation science, dedicated to studying the characteristics that ensure quality implementation for any type of program. Syntheses of research in this area (e.g., Durlak & DuPre, 2008; Savignac & Dunbar, 2014) highlight several factors that enable fidelity. From these factors, three broad categories emerge in particular: (a) the constitutive elements of the general implementation context (e.g., local policies, level of implementation steering), (b) the readiness of the community (e.g., cultural proximity to the program being applied, preliminary training time, resources available for implementation), and (c) the characteristics of the implementation itself (e.g., guidance by someone familiar with the program).

Given the international nature of the dissemination of SWPBIS, the conditions of implementation in various educational systems may be quite disparate from those of its original context, namely the United States. A more precise understanding of the main obstacles and levers to implementation, as well as the possible adjustments or adaptations, could make it possible to anticipate potential pitfalls and, ultimately, to facilitate the implementation of SWPBIS in other cultural contexts.

The current study

SWPBIS is a culturally and contextually flexible approach. In light of the encouraging effects associated with it, many countries are adopting this prevention framework. This has given rise to singular implementation conditions for adapting to the local cultural, political, administrative, and educational framework, which, in turn, raises the question of the diversity of SWPBIS implementation characteristics. Does this diversity shed light on sub-elements that may guarantee fidelity? As SWPBIS tends to be exported, it is necessary to offer an overview of the “invariables” as well as possible “mutations” of local applications. This paper encourages reflection on the characteristics associated with higher levels of implementation fidelity.

The objective of this article is to report on the diversity of SWPBIS implementation characteristics in three French-speaking contexts, in Quebec, France, and Belgium, as well as on the levels of fidelity obtained after one to two years of implementation. On this basis, we discuss the possible links between implementation variations and their associated fidelity.

Method

Participants

This study is based on interviews conducted with the researchers (n=4) responsible for SWPBIS implementation and/or its scientific evaluation in three French-speaking countries. The participants were: in Quebec, one researcher involved in SWPBIS implementation in 37 elementary schools and 8 high schools; in France, one researcher coordinating the evaluation of SWPBIS in 19 elementary schools and 11 middle schools; in Belgium, two researchers involved in SWPBIS implementation and its evaluation in 4 elementary (pre-K to grade 6) schools, 1 middle school and 2 high schools. These participant profiles were targeted because their unique and meta position allowed them to see the realities of applying SWPBIS in several schools in their context. Further, they were also familiar with the scientific literature on SWPBIS and implementation science and thus shared a common frame of reference.

Procedure for highlighting the characteristics of SWPBIS implementation in the three French-speaking contexts

Firstly, we selected all eight key components in Savignac and Dunbar's table (2014) on the main factors influencing the implementation process. Then, in the light of Durlak and DuPre's literature review on implementation (2008), we added four community level factors that impacted SWPBIS adoption in our three contexts. Thus, the interview guide comprised 12 major factors that influence successful implementation. Those factors included: features related to the organizations implementing the program (e.g., staff selection, coaching, partnerships, leadership, management system), features related to the practitioners (e.g., characteristics and skills), those related to the program itself (e.g., training and technical assistance), and the context in which the program was implemented (e.g., policy, readiness, and research). The interviews were conducted separately for each country, then recorded and transcribed in a common table.² The table allowed the three contexts to be compared based on each feature. The

² The table of interview results is available on request from the authors.

content of the interviews revealed differences and similarities between the three contexts. All the researchers noted 12 important features that had the most influence on fidelity in their context. These 12 features are listed in Table 1. They were then used as a framework for the description of each context in the “Results” section.

Table 1: Focus features for describing each of the implementation characteristics in the three contexts

General context of implementation	
1.	Macro-systemic context (including policy/legislative) in line with SWPBIS inputs and aims
2.	Initial thematic focus leading to the implementation of SWPBIS (e.g., improving school climate, supporting schools with “performance gaps,” managing disruptive behavior, school inclusion, etc.)
3.	Manner of “discovery”/“importation” of the SWPBIS and coach training
4.	Method of introducing SWPBIS to schools (e.g., from academic authorities, researchers) and getting a buy-in
5.	Primary location of implementation steering (e.g., research – university vs. educational field – educational authorities)
State of readiness	
6.	Profile of coaches (researchers only, education professionals only, planning for profile hybridization)
7.	Methods of continuous training for coaches
8.	Organization of the transfer of skills and the training of new coaches
9.	Cultural and professional proximity to the elements and practices suggested by SWPBIS (endorsement of an educational mission beyond pedagogical or academic missions, familiarity with data-based decision-making procedures, etc.)
10.	Budget and resources available for implementation (financial resources, overtime payments, teacher substitution, etc.)
Characteristics of the implementation	
11.	Methods for supporting the schools (proximity of the schools’ support, frequency of meetings, etc.)
12.	Principal leadership

Implementation fidelity measurement

Three tools were used to measure SWPBIS implementation fidelity. The School-wide Evaluation Tool was completed in each of the three contexts. In addition, the Benchmarks of Quality was also administered in France and the Tiered Fidelity Inventory in Belgium.

School-wide Evaluation Tool (SET) – The SET (Horner et al., 2004) is a direct observation and survey tool consisting of 28 items that assess the extent to which schools implement Tier 1 SWPBIS practices. It takes approximately two hours per school for an external trained evaluator to review the permanent products and interview students, administrators, teachers, and other staff. The SET generates a “total” score ranging from 0 to 100%. A school is considered to have achieved fidelity when its total score reaches or exceeds 80%. The internal consistency of the SET has been documented with an alpha of .96 and test-retest reliability is .97 and inter-rater agreement is .99 (Horner et al., 2004). It should be noted that the SET uses a so-called “blended” method of fidelity assessment and allows through the combination of different types of interviews, observations, and review of materials, an overview of the school as a whole, as recommended by Mowbray et al. (2003) and has been recognized as the most objective and straightforward of fidelity assessments (Bruhn et al., 2015).

Benchmarks of Quality (BoQ) – The BoQ (Cohen et al., 2007) is a self-reported measurement tool of 53 items used to assess implementation fidelity of Tier 1 SWPBIS. The BoQ items are organized into 10 fields defined as critical for implementation and are aggregated in a total score. In implementation, fidelity is achieved when the result obtained is 70% or higher (Cohen et al., 2007). The BOQ has an internal consistency of .96 as measured by alpha, test-retest reliability yields a correlation of .94, and inter-rater reliability is also established by a correlation of .87 (Cohen et al., 2007).

Tiered Fidelity Inventory (TFI) – The TFI (Algozzine et al., 2014) assesses the fidelity of each of the three tiers of SWPBIS with a single instrument, through a scale of scores for each tier listed separately or through an overall score. This is a self-reporting measurement tool, intended to be completed by the SWPBIS team with the coach as facilitator. Tier 1 consists of 15 items. Schools achieving a score of 70% or higher on the TFI are considered to be adequately implementing Tier 1. The internal consistency of the Tier 1 measure is documented by an alpha of .97. Several studies have demonstrated evidence of its content validity, factor structure, as well as reliability (Massar et al., 2017; McIntosh et al., 2017).

Results: Description of the implementation characteristics in three French-speaking contexts and the fidelity levels obtained

Characteristics of the implementation in Quebec

Over the past 20 years, Quebec schools have faced many challenges with respect to behavior management. On the one hand, school staff have been facing more complex behavior management since 2000, when an educational reform advocating the inclusion of special needs students in regular classes began. On the other hand, actors in the milieu have developed a keen awareness of intimidation and violence at school. In addition, the adoption of Bill 56 in 2012, aimed at preventing bullying and violence, requires schools to have an action plan in place to deal with these phenomena. This context has created a strong demand for developing programs that improve behavior management in schools.

Since 2009, SWPBIS has been formally implemented in Quebec schools under the supervision of a researcher from a Canadian university. It is estimated that there are more than 125 schools from about 15 school service centers (SSCs)³ that use SWPBIS. These schools and their SSCs have signed research agreements with the Canadian university to be accompanied by the team of the researcher in charge. The three-year research agreements provide for SWPBIS implementation in the targeted schools of the SSCs according to a response to intervention (RTI) model or a three-tier intervention model.

The implementation process typically begins with the research team presenting SWPBIS and the method of implementation in schools under the RTI model to the SSC leaders. This presentation provides school administrators and principals with a clear understanding of the SWPBIS system, the proposed method of implementation, and the associated costs. Following the presentation, school principals interested in the project notify the SSC, which then identifies pilot schools, usually two, that will be designated to undertake the project. The Canadian university team suggests that the SSC identify professionals in their organization who are recognized by their peers for their expertise in behavior management, to monitor SWPBIS implementation in the pilot schools and to eventually act as coaches to bring SWPBIS to other SSC schools that request it. This measure aims to ensure SWPBIS sustainability by transferring

³ A school service center is a local institution in Quebec that governs the public preschool, elementary, high school, vocational and adult education institutions in its area. Its mandate is to support and provide guidance to the schools.

the expertise of the university team to SSC professionals so that the organization builds a team of practitioners who can continue the project in the pilot schools and assist new institutions once the research agreement is signed.

The university team meets with the directors of the SSC pilot schools to ensure their commitment to the project. Afterwards, the staff of the pilot schools are given a presentation on SWPBIS by the university team and asked to vote anonymously on whether they support the project. SWPBIS is only implemented if 80% or more of the school staff formally commit to participating in implementing it in the classroom and school. In addition, the principal's leadership is assessed by school staff, using a questionnaire designed for this purpose, to ensure that the principal has the skills required to lead such a change. Previous work has shown the critical influence of principal leadership on the success of SWPBIS (Bissonnette, & St-Georges, 2014). Once commitments are secured and the leadership assessment is successful, a SWPBIS team is formed in each of the pilot schools to prepare and implement the whole system. It should be noted that coaches designated by the SSC attend all SWPBIS activities in the pilot schools.

The SWPBIS team, comprised of the principal and a few representative members of the school staff, receives a five-day training session from the university team in the spring, prior to implementing SWPBIS, to prepare for the universal Tier 1 interventions that will be implemented at the beginning of the next school year. SWPBIS team members are released from their day-to-day activities and provided substitutes when they need to participate in training days. The same is true for Tier 2 and Tier 3 training sessions. However, training at these levels is only for a few members of the SWPBIS team who are more specialized in working with special needs students. When SWPBIS is implemented, the SWPBIS team meets monthly (for a half day) with the university team to evaluate and analyze the system and the related behavioral data.

During the three years of SWPBIS implementation, the staff of the pilot schools receive various training sessions from the university team to improve behavior management: classroom management, behavior function, active supervision of students during monitoring, corrective interventions for misbehavior, reinforcement system, use of software to enter behavioral data,

etc. These training sessions are usually provided during the SSC professional development days⁴ and are discussed and planned by the SWPBIS team.

After each intervention tier is implemented in the pilot schools, the coaches who participated in the RTI/SWPBIS implementation can provide guidance to new SSC schools that request SWPBIS. Thus, as soon as Tier 1 interventions are fully implemented in the pilot schools, the coaches can work with other SSC schools to implement the same intervention tier using the same methods, under the supervision of the university team. The same applies to implementation of Tier 2 and Tier 3 interventions in other SSC schools. The buddy system used to develop the coaching expertise seems to be effective, because the SSCs that began SWPBIS 10 years ago are continuing to implement it in 2021 (Bissonnette, Bourgeois et Audet, 2021).

Characteristics of the implementation in France (academy of Besançon)

In France, law 2013-595 passed on July 8, 2013, pointed to school climate as a major lever for supporting positive student outcomes. Improving school climate was then set as a goal for all French schools. This context provided a favorable basis for implementing measures such as SWPBIS. In 2014, the academy⁵ of Besançon (enrolment of approximately 213,000 students) in collaboration with the local university sent school-climate assessment questionnaires to middle schools and high schools. The results quickly led education professionals to note margins for progress, to question the existence of levers of improvement, and to ask for guidance in working on school climate. The academic authorities chose SWPBIS (because it is evidence-based and presented as adaptable) as an exploratory measure to respond to the teams' request. They also wanted to examine its implementation and effects in a few pilot schools before considering potential large-scale dissemination. A delegation traveled to Canada (Ontario) for an immersive week-long training session. The group included academic leaders and education professionals who intended to become coaches of the method. Back from Canada, the members of the delegation initiated SWPBIS implementation in a dozen middle schools. In the interest of educational continuity, the elementary schools attached to the middle schools (about 20) were also offered the program. Each of the participating schools received a

⁴ Day off for students but reserved for teachers and school staff for workshops, updates, and various activities. The school calendar provides for 200 days, of which 180 are classroom days with students and 20 are instructional days.

⁵ In France, an academy is an administrative district of the Ministry of Education. There are 30 academies in France covering a given geographical area. Each academy is headed by a rector appointed by the president of the Republic. Local governance is ensured within a rectorate.

presentation of SWPBIS by one or two members of the delegation, and a buy-in of at least 80% of the staff was required to initiate the implementation. Depending on the context, this buy-in was measured by the raising of hands or an anonymous vote (immediately following the presentation or in the following days). When the 80% was reached, a local SWPBIS-team was formed to start the project. The academic authorities steered and coordinated the SWPBIS implementation, at no particular financial cost to the schools themselves, and they established a partnership with the university to examine the implementation and its effects.

In the academy of Besançon, the coaches were professionals in the field of education,⁶ selected by the rectorate on the basis of their experience in “adult education.” They were required to demonstrate particular interest in the issue of school climate, its dimensions and the measures enabling improvement. Some of these coaches were members of the delegation that went to Canada for the initial training and all of them benefited from occasional conferences containing, for example, theoretical background in education underlying SWPBIS, further details on the dimensions covered by SWPBIS, or information on its implementation in other countries. The few new coaches who joined the group (as reinforcements or to replace departures) were mostly from institutions where SWPBIS had already been implemented. They shadowed a “senior” coach in schools for a short period. The skills transfer was carried out in an informal and disparate manner depending on the senior coach involved in the mentorship.

In France, coaches reported that a significant barrier that weakens local SWPBIS implementation is often teachers’ heterogeneous view of their own missions (i.e., as essentially involving the transmission of academic knowledge to students who are asked to naturally behave as expected vs. involving educational support for students who may not fit typical school standards). In elementary schools, the professionals seemed to share an awareness of the educational dimension of their profession (i.e., the role they play in supporting students in their overall developmental trajectory and the need to work together toward that end). This educational mission is perceived and invested in a more contrasted manner in high schools, thus undermining the receptiveness and involvement of all those working to implement a systemic measure such as SWPBIS.

⁶ These professionals had various profiles: elementary school teachers, high school teachers (in French, physical and sports education, economics and management), district pedagogical advisors, a principal educational advisor, a policy officer with a background in psychology.

With regard to the resources allocated, an academic budget was made available by the rectorate to finance the coaches' travel expenses to the schools. Coaches from high schools were paid overtime or relieved of part of their main duties. Coaches from elementary schools were given time off (as they are not eligible for overtime), but the coaching mission often involved an investment that exceeded the amount of time off.

The members of SWPBIS teams frequently met on their own time at school (at lunchtime or outside of class hours). In some exceptions, they were replaced in class or during work time so they could attend meetings or were paid overtime.

Support was initially planned for three years, with a meeting between a coach and a school SWPBIS team scheduled every four to five weeks. Group meetings and/or training sessions with the entire school team were sometimes organized, but were rare. Indeed, common times dedicated to training and the replacement possibilities in the institutions are very limited. Further, the academic authorities were approached by other schools also expressing needs on the issue of school climate, so the coaches' activities became more diverse over a constant amount of available time.

The French coaches and teams described the characteristics of leadership (e.g., daily involvement in the educational policy being implemented, ability to arbitrate when necessary, availability, and ability to listen to teams) as essential to SWPBIS implementation. Although the scientific literature highlights leadership as a factor providing strong support for successful implementation and leadership questionnaires were available, the rectorate did not make the school coaching conditional on leadership characteristics. On the one hand, this seems to have made certain coaching and implementation situations uncomfortable, but on the other hand, the rectorate did not want to automatically deny certain dynamic teams with a collective "power to act" access to an approach, tools, and reflections that would benefit students and school climate. It should be noted that a major hindering factor to implementation was management personnel turnover: during the three years of the research project, half of the schools experienced a principal change, which systematically led to the stagnation or, more often, the decline of SWPBIS.

Finally, the coaches pointed out that even for school leaders with good leadership skills who were able to mobilize their teams effectively, maintaining the enthusiasm and motivation of

their staff was ultimately weakened by limited resources (leading to a large reliance on “volunteer work”).

Characteristics of the implementation in Belgium (Wallonia-Brussels Federation)

SWPBIS implementation was proposed by a Belgian university to the Ministry of Education as a research project within the framework of a major reform of the educational system in the Wallonia-Brussels Federation (FWB). This reform—the Pact for Excellence in Education—includes a section dedicated to evidence-based education. The reform also places more emphasis on micro-piloting, and as such schools are therefore committed to achieving quantified objectives in various areas. To help schools situate themselves in relation to a standard, indicators were also created, such as a school climate indicator. Another major change taking place in education in FWB is the introduction of compulsory collaborative work at all levels of education, which started September 1, 2019.

SWPBIS was proposed primarily to schools that were “audited” and shown to have a performance gap on various indicators such as student performance, team turnover, and school climate. All the SWPBIS pilot schools can therefore be described as “high-need” schools.

Preparation for implementation in the schools began in September 2017, after a presentation of the project to all staff members and the tallying of staff buy-in, by various means at first and by secret ballot later. Four schools chose the project initially; three more schools joined later. In total, the project included four elementary schools (pre-K to grade 6), one middle school, and two high schools.

The first four schools implemented SWPBIS “location by location” (preparation at a specific location, implementation in that location; preparation at a second location and so on), as recommended by the certified trainers from the Netherlands during the Belgian coaches’ initial training. The three schools that joined the project later benefited from the implementation method practiced in Quebec, i.e.: one year of preparation, then a launch in all locations at the same time.

The first university coaches supporting SWPBIS schools received a four-day training session from Dutch colleagues with a rather theoretical review of all the components of the system, followed by school visits. When new coaches joined the team, their training took the form of peer mentoring following the explicit teaching model: modeling, guided practice, and

independent practice. In addition, thanks to a collaboration with experienced SWPBIS practitioners from Quebec, coaches were able to visit Quebec schools and exchange practices among themselves. These exchanges helped FWB coaches expand their knowledge and diversify their practices.

The type of support offered to the schools implementing SWPBIS could be described as “very tight” for three years. At the first schools involved in the project, where the Dutch location-by-location implementation method was used, coaches went to the schools every week for about two hours per week for a year and a half. Once the implementation of Tier 1 was completed, the coaches were present in the schools every two weeks and then once a month. In the schools where the Quebec implementation modality consisted of one year of preparation before implementation, the coaches provided eight days of training before SWPBIS implementation and then participated in follow-up meetings every two weeks once the project was in place. Follow-up meetings then decreased to once a month. It should be noted that for both implementation methods, Tier 2 and 3 training days were added to regular field attendance. Finally, when Tier 2 monitoring was set up, follow-up meetings took place every two weeks, at least at the beginning of the implementation. During the third year of support, the aim was to achieve autonomy by starting in-house coaching whenever possible. The person taking over the coaching had to be willing to do so and considered an appropriate choice by their peers for this task.

The following are three elements that may have posed difficulties for implementation fidelity in FWB. FWB teachers, as those in other European education systems, are reluctant to change (Maroy, 2006). Thus, while a baseline buy-in of at least 80% of all staff was required to launch SWPBIS, this initial buy-in did not guarantee the evolution of usual teaching practices towards SWPBIS practices. This is even truer when it comes to classroom teaching practices. In FWB, the pedagogical freedom of the teacher in the classroom is an argument often used to avoid change. And, in any case, profound changes in practice are slow. Finally, despite a major decree on the “Missions de l'Enseignement” (1997) emphasizing the global nature of the educational task, some teachers, especially in high school education, continue to believe that globally educating students, beyond teaching, is not their responsibility, but that of the family. They reject the high school’s secondary mission of behavioral education. Discipline problems may be seen as the sole responsibility of dedicated personnel such as educators.

Concerning the resources provided for SWPBIS teams at the various preparation stages, it should be highlighted that almost all the meeting times allocated to preparation took place during school time. Concretely, all members of the SWPBIS team were present and freed of their class duties. For the implementation follow-up meetings, however, the situation differed depending on the school's level. Since high schools have a certain latitude in organizing teachers' schedules, they were able to assign specific times for SWPBIS in the official schedule of the SWPBIS team members. Yet the elementary schools had no choice but to request collaborative work time to follow up on the SWPBIS implementation. However, these collaborative times include all school activities, not just SWPBIS. So when the legal quota for collaborative time is exceeded, there is no choice but to rely on volunteer work. This situation became the norm in the four elementary schools implementing SWPBIS.

A final constraint that arose from analyzing the SWPBIS implementation in FWB concerns principal turnover, which occurred in almost all the SWPBIS schools. Variable levels of support for the project were also observed depending on whether the principal was the initiator of the project and had decided to propose SWPBIS to staff members, or whether the project had been advised by the upper echelons of the school's hierarchy. Principals who were "forced" to implement SWPBIS were almost always absent from the preparation meetings and did not visibly support the project in the eyes of the staff members.

Implementation fidelity in the three French-speaking contexts

The implementation fidelity rates after one to two years of SWPBIS implementation in each of the three contexts are presented in Table 2. The School-Wide Evaluation Tool scores indicate an average fidelity ranging from 48 to 91%. While more than 10 years of research and experimentation in Quebec schools led to fidelity ranging from 75 to 97%, schools in France and Belgium, having less time and organizational distance, did not yet achieve the fidelity threshold after one and a half to two years of implementation. However, the results can also be considered based on the scores obtained using other fidelity measures. Indeed, in France, where the BoQ was used in addition to the SET for elementary and high schools, scores suggest that 42% of elementary schools (in which the SET could not be administered) achieved fidelity. Whereas the TFI used in Belgium suggests that more than 75% of schools could be considered "at fidelity".

Table 2. Level of Tier 1SWPBIS implementation according to the SET, the BoQ and/or the TFI in each of the three French speaking contexts

		Quebec			France			Belgium ^{c,d}	
	n	Mean % (SD)	% at	n	Mean % (SD)	% at Fidelity ^a	n	Mean % (SD)	% at Fidelity ^a
<i>Fidelity</i>		[Min%-Max%]	Fidelity ^a		[Min%-Max%]			[Min%-Max%]	
<i>measurements</i>									
SET									
All schools	45	90.9 (6.29)	91%	11	48 (11.3)	0%	4	66 (10.5)	0%
		[72.1-100]	(n=41)		[32-67]			[54.8-77]	
- Elementary schools	37	92 (5.50)	97%	/ ^b	/ ^b	/ ^b	3	62.5 (9.4)	0%
		[72.5-100]	(n=36)					[54.8-73]	
- Middle schools	8	85.85 (7.2)	75%	11	48 (11.3)	0%	1	77	0%
		[72.1-91.3]	(n=6)		[32-67]				
BoQ									
All schools	/	/	/	30	54.4 (17.9)	26.6%	/	/	/
					[21.4-85.9]	(n=8)			
- Elementary schools	/	/	/	19	60.4 (16.8)	42%	/	/	/
					[21.4-85.9]	(n=8)			

- Middle schools	/	/	/	11	44.2 (15.6)	0%	/	/	/
					[22.4-68.2]				
TFI									
All schools	/	/	/	/	/	/	4	74.5 (13.4)	80%
								[53.3-86.5]	(n = 4)
- Elementary schools	/	/	/	/	/	/	3	75.7 (15.2)	75%
								[53.3-86.5]	(n = 3)
- Middle schools	/	/	/	/	/	/	1	70	100%
									(n = 1)

SET: School-wide Evaluation Tool administered in 2018 after 18 months of SWPBIS implementation in Belgium; in 2018 after 17 to 29 months of SWPBIS implementation in France; between 2012 and 2019, after 12 months of SWPBIS implementation in Quebec.

BoQ: School-wide Benchmarks of Quality administered in France in 2018 after 17 to 29 months of SWPBIS implementation.

TFI: Tiered Fidelity Inventory administered in Belgium in 2018 and 2020 (according to the starting year of implementation) after 18 months of implementation.

^a% Fidelity = proportion of schools that attained implementation fidelity according to the BoQ fidelity criterion (70%), the SET fidelity criterion (mean at 80% of implementation for both, the mean implementation and the Behavioral Expectation Taught subscale) and the TFI fidelity criterion (70%).

^bDue to a limited budget and the time-consuming SET process (which is therefore “expensive” to administer), it was not possible to use it for the 19 initial elementary schools exploring SWPBIS in France.

^cDue to Covid-19, the Belgian schools that started implementing SWPBIS later in the pilot project have not yet been assessed for fidelity after 18 months.

^dOnly the fidelity scores of the four schools that first joined the Belgian project are included in this table.

Discussion

The objective of this paper was to describe the characteristics of SWPBIS implementation in three French-speaking contexts to grasp the “invariables” or “mutations” and to measure the associated implementation fidelity. From these descriptions, we note a common macrosystemic characteristic: the existence of a legal and institutional framework that focuses on the elements covered by SWPBIS. Although these elements sometimes differ from one country to another (prevention of violence, school climate, collaborative work at the school level, evidence-based education), having a public policy that shares the same principles as the SWPBIS seemed to be a key factor in its implementation in the three countries. In addition, three other elements of the 12 mentioned above—leadership, resources, and type of support—are discussed more specifically in the following paragraphs. Indeed, the participants from the three contexts identified these as particularly decisive for implementing SWPBIS.

While school leadership is a common cross-cultural lever for supporting SWPBIS implementation, the actual circumstances differed in the three contexts. Quebec adopted a preliminary means of measuring leadership across the board. In France and in FWB, however, the support provided by the coaches was not conditioned by such a measure. Furthermore, this adaptation from Quebec appears somewhat delicate to adopt elsewhere. In fact, reservations about evaluating professionals are more prominent there, and the importance of collegiality (beyond the leadership of a directorate) is frequently brought to the forefront (Bezes et al., 2011). Moreover, for the Belgian context, since people accepting positions of responsibility are difficult to find and retain, the very idea of evaluating their leadership is risky. Nevertheless, more than 90% of Quebec schools achieved implementation fidelity after one year of coaching. Even if the method adopted for this article advises caution on attributing rapid implementation, using a tool to measure the leadership that would condition SWPBIS implementation is likely important. Another finding tends to support this postulate: before the introduction of this measurement was implemented, only half of Quebec schools achieved fidelity (Bissonnette, 2015).

Regarding resources, research on the quality of implementation and maintenance of practices over time (Lohrmann, 2013; McIntosh et al., 2016) emphasizes their importance and this was

no exception in our three contexts. When comparing the three implementation contexts, the kind of resource that seems to weigh most heavily in a quality implementation is the amount and quality of time staff have to prepare and then concretely implement the set of SWPBIS practices. In fact, in contexts where SWPBIS teams were given scheduled time, organized, and freed up from their class duties, the training and preparation of the various implementation stages was accomplished in a serene atmosphere, and fidelity was achieved. On the contrary, in contexts where teams implemented SWPBIS essentially on a voluntary basis and during meeting times added to their already numerous tasks, implementation took longer, and fidelity was less present. This finding echoes the results of previous work on the perceived barriers and facilitators of implementing SWPBIS (e.g., Bambara et al., 2012; Lohrmann et al., 2013; Nese et al., 2016). When public and academic authorities wish to adopt SWPBIS, there must be emphasis on the importance of providing substitutes for teachers so they can attend meetings. The experiences of the three French-speaking contexts suggest that the gamble on economy and volunteer work could slow down the implementation and, possibly, the achievement of the expected effects.

The type and quality of support is the third element that appeared to be important in the three French-speaking implementation contexts. Implementing evidence-based practices in a school context requires access to regular coaching by professionals in the field. Freeman and her colleagues (2017) describe coaching as fulfilling an essential function through a transfer of knowledge and skills from the professionals in the system to staff members and teachers. This transfer is made possible through professional development activities regarding school-wide or classroom practices. Regular support also provides access to “technical” assistance (manuals, data management, software), which is another key factor in quality implementation (Durlak & DuPre, 2008; Savignac & Dunbar, 2014). Furthermore, the contexts that achieved the greatest level of implementation fidelity were those that offered professional coaching, which enabled broader sharing of knowledge and skills. Conversely, fidelity was lower in contexts where coaching was done on a more infrequent and irregular basis by professionals with less experience in SWPBIS practices. Bastable et al. (2020) highlighted the importance of coaching in three specific areas: support for teams in planning the different phases of implementation and regulation, help in collecting and using data correctly, and sharing knowledge and skills. In their study, support for data collection, data-based decision making, and modeling of

SWPBIS practices correlated positively with implementation fidelity. Considering these findings, it is important that both school system authorities and schools are well informed of the importance of having an expert from outside the school who is trained in all the key components of SWPBIS.

Limitations and future research

Although SWPBIS is becoming increasingly popular internationally, to our knowledge, a cross-cultural description of its implementation characteristics is unprecedented in the scientific landscape. The ambition of this overview is to inform the international scientific community and any school wishing to embark on the SWPBIS adventure of a variety of implementation characteristics and their fidelity to the original version. However, the innovative and uncustomary nature of the approach used in this article has led to certain limitations. First is the absence of a common tool to measure implementation fidelity in an identical and broad manner regardless of the context. Indeed, while the SET was used in all three contexts as an external fidelity measurement tool, it could not be administered in French elementary schools, and the internal measures of fidelity were either different with the BoQ or the TFI, or non-existent. To overcome this limitation, it may be necessary to intensify the existing international initiatives around SWPBIS. Using common tools would encourage participation in cross-cultural approaches as early as the design stage of implementation protocols. A second drawback of this study is the limited number of contexts covered by this international comparison. Although the results give an idea of the elements that cause differences in implementation (sometimes appearing encouraging for implementation fidelity and other times deleterious), a broader and more systematic description of international implementation should be developed for future comparative work. A final limitation may be the subjectivity in judging the importance of the various factors that influenced implementation. It is possible that the researchers overestimated the weight of certain elements due to their knowledge of the literature and therefore of the ideal implementation modalities observed in other contexts. For this first study, it is nevertheless this participant profile that seemed best suited to compiling a cross-cultural description based on both their scientific knowledge and familiarity with the contexts.

Conclusion

Adapting a universal prevention system from the United States, such as SWPBIS, to French-speaking school contexts represents a real challenge. Indeed, school staff members may express reservations based on a variety of reasons: the very origin of the project, its so-called “behaviorist” components, the use of a reinforcement system, its quality as an evidence-based approach, or the explicit teaching of behavior. In contexts where these reluctances/difficulties multiplied, the factors identified as critical in this three-way comparison—leadership, resources, and coaching—could be of paramount importance. However, if careful and contextualized planning is done beforehand, it is likely that the implementation will be greatly facilitated.

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Third ARTICLE:

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A Multinational Study Exploring Adolescent Perception of School Climate and Mental Health

Abstract

School climate is a topic of increasing importance internationally. The current study investigated the established measurement invariance of an eight-factor school climate scale using a multinational sample of secondary students. School climate factor means across 14 international groups were compared and findings on the association between school climate factors and mental health were also investigated. Findings, from this study, illustrate several cross-national similarities regarding the ways in which secondary students perceive school climate and the influence of school climate on student mental health. These findings can support school psychologists' efforts to identify strategies and supports that improve the school environment in areas that are most consistently related to student experiences, such as school safety and school connectedness. Implications, limitations, and future directions are discussed.

Keywords: school climate, cross-cultural, mental health, international

School climate is a multidimensional construct that represents perceptions of various aspects of the educational environment. School climate refers to the beliefs, values, and attitudes that shape interactions between and among students, teachers, and administrators within a school (Cohen et al., 2009; Kuperminc et al., 1997). A positive school climate is associated with increased academic achievement (Koth et al., 2008), school completion, and positive social, emotional, and behavioral outcomes (Hough et al., 2017; Lester & Cross, 2015). Conversely, a negative school climate has been correlated with an increased likelihood of youth engaging in risky behaviors and peer victimization (Bear et al., 2011; Koth et al., 2008).

There has been increasing interest in improving school environments and enhancing student outcomes in countries around the world. The European Commission called for a shift in policy in 2018 to promote a balanced system of school assessment. For example, the Serbian Ministry of Education, Science, and Technological Development has integrated a “School Report Card” assessment tool that, in addition to achievement scores and school demographic data, includes evaluations of the educational environment (European Commission, 2018). In Spain, a national State Observatory of School Climate was created to support educational environments in which students can thrive through the exchange of practices and research via conferences and websites (Office of Equity and Quality in Education, 2012). In the United States, the Every Student Succeeds Act (ESSA) has shifted how school accountability is both conceptualized and evaluated (U.S. Department of Education, 2016). As a requirement of ESSA, states must include at least one nonacademic measure (e.g., school climate and attendance) as part of annual accountability data; this requirement acknowledges the importance of the interrelationship between educational environments and student outcomes. School climate assessment is an effective mechanism for accountability, a viable source of information for documenting and measuring students’ needs in the learning context, and an initial step in school improvement planning.

Although the above efforts reflect an educational interest in enhancing school climate research, accountability measures, and support for interventions, multinational studies examining student perceptions have been limited. The 2018 edition of the worldwide Program for International Students Assessment (PISA), which included representation from 79 countries and economies, found a positive school climate to be associated with academic resilience. School absenteeism

was significantly associated with the quality of student–teacher relationships, an aspect of school climate (Monseur & Baye, 2017; OECD, 2019). In another example, the Second Regional Comparative and Explanatory Study (SERCE for its name in Spanish) is a longitudinal, large-scale study focused on identifying school and societal factors associated with Latin American and Caribbean students’ educational outcomes (United Nations Educational, Scientific, and Cultural Organization, 2019). SERCE has been one of the largest education studies ever implemented in Latin America and the Caribbean, assessing learning and achievement across 16 countries and more than 195,000 students. One of the key takeaways from SERCE was the significance of a positive educational environment that promotes respect for students and learning. In fact, the authors assert that such environments can have an overshadowing effect on barriers related to social disparities, potentially reducing learning inequities among students (United Nations Educational, Scientific, and Cultural Organization, 2008).

Hatzichristou et al. (2018) explicitly examined the ways social, political, and economic factors related to student experiences of school climate and mental health in a sample of 746 middle school students. The authors situated their investigation in the ongoing economic recession in Greece to explore protective factors against adversity in the national financial crisis. Results indicated a significant relationship between the effects of the Greek economic recession, students’ subjective well-being, and school climate (Hatzichristou et al., 2018). Across contexts, school climate represents a shared and important construct; as such, this study sought to investigate cross-national similarities and differences in student perceptions and examine the degree to which aspects of school climate relate to student mental health across cultures.

Conceptual Foundations

The most commonly recognized areas of school climate include perceptions of physical and emotional safety, interpersonal relationships among peers and adults, and perceptions of the learning environment, including teachers’ expectations and material school resources (Thapa et al., 2013). Appropriating knowledge from the field of cultural psychology as a theoretical conceptualization for the purpose of the current study, the multinational study of students’ school climate perceptions does not “necessitate the blanket denial of universals because

[universals are] a form of pluralism and pluralism is a special form of universalism” (Shewder & Sullivan, 1993, p. 508). Shewder and Sullivan (1993) utilize the phrase “universalism without uniformity” (p. 508) to describe a concept and process of multicultural explorations that serve to identify divergences in experiences, as well as collective or universal experiences—in this case, perceptions of school climate among students across different countries.

Students are nested within schools that are nested within larger systems. Thus, school improvement efforts should include both large scale and localized, targeted strategies to foster school improvement. Here, we use the terms “context” and “contextually relevant” to refer to the physical and local context of each region within the study. While we have not expanded beyond the overarching regional context for the purpose of this initial study, we do recognize the significance of examining localized culturally specific variables per country (e.g., school size, school demographics, etc.) in future studies. We appreciate that a one-size-fits-all approach to school improvement fails to meet the differential needs of students across contexts. However, we intended to explore the group-level trends across educational settings using a multinational sample. Findings from the current study will inform large-scale practices for school improvement efforts that can be applied cross-nationally to improve student school climate.

Cross-National Examination of School Climate Perspectives

Previous studies have examined cross-cultural similarities and differences in the relationships between gender, age, culture, and school climate across settings. Jia et al. (2009) conducted a study of school climate perceptions among seventh-grade students from New York City and China. They found that the dimensions of school climate (e.g., teacher support) were significantly associated with outcomes for both groups. The effect of peer support on students’ psychological well-being, above and beyond that of parent or teacher support, was also evidenced (Jia et al., 2009). However, Chinese students reported significantly more positive perceptions of school climate than the U.S. sample. Situated within a cultural context, results may reflect differences in perceptions of teachers in China and the United States. In mainstream Chinese culture, for example, families emphasize education and hierarchical obedience, thus

encouraging children to readily embrace schooling and teacher authority (Yau et al., 2009). Additionally, students in the United States perceived more emotional support from their parents than Chinese students.

Samdal et al. (1998) found that, for students across Finland, Latvia, Norway, and Slovakia, the most significant predictors of school satisfaction were a sense of fairness, safety, and support. Khoury-Kassabri, Benbenishty and Astor (2005) explored how perceptions of school climate differentially related to peer victimization across 162 Jewish and Arab community schools in Israel. Though school climate was negatively associated with peer victimization for all secondary students ($N = 10,400$), school climate accounted for 27% of the variance in physical victimization in Jewish schools and only 16% of the variance in physical victimization in Arab schools. Researchers posited that cultural differences between Jewish and Arab students, particularly related to perceived social responsibility in school, might partially account for this disparity (Khoury-Kassabri et al., 2005).

The aforementioned studies demonstrate cross-national perspectives comparing psychological attitudes related to school climate but constituted as latent variables that cannot be measured directly. As such, school climate measures function as indicators of the latent construct. Van de Vijver and Leung (2000) assert that given that most cross-cultural research focuses on the comparisons of psychological constructs across cultural groups, employing statistical methodology establishing equivalence of measures is essential (Milfont & Fischer, 2010). To our knowledge, the current study is the first study of this scale that examined the factor structure of a school climate survey using a large cross-national sample and also conducted measurement invariance analyses at the subscale level. Measurement invariance assesses the psychometric equivalence of constructs across groups. Scalar invariance is one type of measurement invariance and is required to meaningfully compare latent variable means (i.e., school climate subscales). More specifically it must first be established that each observed indicator (i.e., subscale items) relates to the latent construct (i.e., school climate subscale) in the same way across groups (e.g., country). When scalar invariance is established, it is presumed that regardless of group membership (i.e., country) students who have the same subscale scores also have the same scores on the subscale items (Milfont & Fischer, 2010) and therefore, meaningful comparisons can be drawn.

School Climate and Mental Health

A sustained positive school climate supports students' social, emotional, and behavioral adjustment. This is perhaps particularly elucidated among adolescents since the transition to secondary school can be one of the most challenging times for students (Kuperminc et al., 1997). The change in school structure may result in feelings of isolation, loneliness, and victimization at a particularly vulnerable time for adolescents, who are at risk for onset of depressive or anxiety disorders (Lester et al., 2017). In a study of 3,459 adolescents in Western Australia, researchers examined the relationship between school climate and mental health as measured by the Depression Anxiety Stress Scale. Results indicated that during the first year of secondary school, negative perceptions of school connectedness were associated with increased feelings of depression and anxiety from the start to end of the year. Feelings of connectedness also declined over the course of the first year (Lester et al., 2013). In a subsequent study, Lester and Cross (2015) found school climate served as a protective factor against depression, with school connectedness and peer social support identified as the most important protective factors for first- and second-year students, respectively. Lester et al.'s study findings illustrate a bidirectional relationship between student well-being and perceived belonging and connectedness.

As a result of several studies establishing connections between school climate and student mental health outcomes (KhouryKassabri et al., 2005; Lester et al., 2017), there is a growing emphasis on data-driven school improvement efforts that facilitate a physically and emotionally safe and supportive learning environment for all students. The World Health Organization (WHO) conducted the Global Burden of Disease Study among 17 countries, and found evidence of these "enormous burdens worldwide, due to the combination of high prevalence and high disability" (Kessler et al., 2007, p. 168). With widespread efforts focused on creating safe and supportive learning environments for all students, we are admonished to increase our understanding of (a) the multinational aspects of the school environment that are most related to student perceptions of school climate and mental health, (b) the interrelationships among school climate and mental health, and (c) targeted strategies and interventions to improve outcomes given culture specific considerations.

Purpose

The purpose of the current study was to examine perceptions of school climate and mental health among adolescents across 14 countries or territories. Data from this study were collected as part of a multinational project initiated by members of the International School Psychology Association (ISPA) Research Committee. Findings from the study can guide universal as well as targeted, culturally relevant school improvement strategies to support positive school climate and mental health outcomes for adolescents. For school psychologists, understanding the relationship between mental health and various school climate factors can support more targeted advocacy, resources, and strategies to increase educational outcomes and mental well-being. The following research questions were examined:

1. Is there scalar measurement invariance for the school climate subscales across groups?
2. Are there mean differences in perceptions of school climate, as measured by eight collective subscales?
 - a. It was hypothesized that, among a multinational sample, there would not be significant differences in perceptions of overall school climate.
3. What is the relationship between perceptions of school climate and self-reported mental health problems?
 - a. It was hypothesized that, among a multinational sample, there would be a significant association between school climate and student mental health problems. Higher levels of mental health problems were expected to be related to more negative perceptions of school climate.

Methods Participants

The targeted developmental level of this study was early to late adolescence (e.g., age 11–17). The sample accounts for differences in the way that grade level is defined across groups. Specifically, in Germany, Latvia, and Russia, fifth grade is the equivalent of sixth grade in the remaining sample given student age and stage in the schooling trajectory. Participants included 34,923 fifth- through twelfth-grade secondary students from 298 schools across 14 countries,

regions, and territories: Belgium—French-speaking community (N = 339), Germany (N = 1,301), Greece (N = 390), Hungary (N = 342), Italy (N = 134), Jamaica (N = 1,705), Latvia—Latvian speaking community (N = 4,645), Latvia—Russian-speaking community (N = 1,173), Lithuania (N = 330), Malta (N = 304), Puerto Rico (N = 420), Russia (N = 6,439), Slovakia (N = 384), and the United States (N = 18,042). Participants were representative across gender categories for boys (N = 17,318, 48.2%) and girls (N = 18,401, 51.2%). Participant demographics are summarized in Table S1 (see supplemental materials).

Procedures Recruiting

This International School Climate Collaborative (ISCC) was initiated through conversations and communications among members of the Research Committee of the ISPA. Convenience sampling (Connelly, 2008) was used by recruiting international research collaborators through a listserv invitation sent to members and affiliates of the ISPA. Leadership was provided by the primary investigator and colleagues, and a country lead representing respective research teams was identified for each participating country. Country leads were responsible for recruiting schools via context specific professional education organizations, providing study information and parent opt-out forms, administering online or paper surveys, and monitoring data collection at school sites in their respective countries. All international collaborators completed human subjects research training online through the Collaborative Institutional Training Institute (CITI) or through a web-based training provided by the principal investigator to ensure consistency in ethical research standards and practices. In addition to the respective Institutional Review Boards (IRBs) internationally, all human subjects training and research study procedures were approved by the IRB at the University of Connecticut.

Survey Translation

Translation of study materials (i.e., consent, notification, and information forms) was completed for each site by a bilingual translator identified by the site's lead researcher. School climate surveys were translated using a staged process of translation, review, and back-translation recommended by Beaton et al. (2000) for adaptation of surveys for expanded cultural and linguistic settings (see Table S2 in supplemental materials). The comprehensive translation process emphasizes semantic and conceptual equivalence across survey adaptations,

rather than a literal translation that does not account for subtle differences in word connotations (see Beaton et al. for full review).

Each site determined the target language(s) of the translations based on the primary language(s) spoken in participating schools. Given that this study investigates multinational perceptions of school climate, Puerto Rico is referred to separately from the United States to highlight geographic, linguistic, and cultural distinctness. Similarly, surveys in Latvia were administered in both Latvian (Latvia-L) and Russian (Latvia-R); these translations are referred to separately to account for linguistic differences across the country. As an English-speaking country, Jamaica created adapted survey versions with minor changes (e.g., spelling) reviewed by the primary research team. Participants from Malta also opted to use an English version of the survey and underwent similar adaptation procedures as Jamaica.

Survey Administration

School climate surveys were available to participants through a secure online portal (Qualtrics) hosted by the PI's institution, and in paper format based on preference and to accommodate sites with limited access to technology (i.e., computers and internet). The country leads ensured that school personnel obtained parental consent for students to participate in the survey, as defined by each country's standards (e.g., signed parental consent process and parental opt-out form).

Students completed the surveys independently under the supervision of school personnel during school hours. School personnel were not permitted to view students' responses during or after the survey. No personal identifying data were collected. Students were notified that they could skip questions or discontinue the survey at any time. The survey took approximately 10–15 min to complete.

Measures School Climate

The Georgia School Climate Survey (GSCS) is a validated measure of middle and high school student perceptions of school climate within the eight dimensions of school connectedness, character, physical environment, adult social support, peer social support, cultural acceptance,

order and discipline, and safety (GSHS 2.0; Georgia Department of Education). Participants' responses were on a Likert scale with response options ranging from 1 (strongly disagree) to 4 (strongly agree), where higher scores represent more positive perceptions of school climate. The scale includes a higher-order school climate factor that explains the variance, in part, among eight lower-order factors that assess the aforementioned dimensions of school climate. The factor structure of this model has demonstrated good data fit with middle school respondents ($\chi^2(17) = 27,825.18, p < .001, CFI = .966, TLI = .944, RMSEA = .074, SRMR = .030, N = 301,520$) and high school respondents ($\chi^2(16) = 18,762.23, p < .001, CFI = .979, TLI = .963, RMSEA = .060, SRMR = .022, N = 327,864$).

Reliability analyses yielded a Cronbach's alpha of .92 for secondary students (La Salle, 2017).

Mental Health

The mental health scale, a component of the larger Georgia Student Health Survey 2.0, includes eight items assessing how often a student has experienced psychological and somatic symptoms within a 30-day period. More specifically, the items ask if in the past 30 days students have experienced symptoms of depression or emotional dysregulation. Students responded to these questions on a scale ranging from 1 = not at all to 7 = 30 days. Lower scores represent more positive mental health. Confirmatory factor analysis resulted in good data fit for the model in the present study ($\chi^2(20, N = 34,923) = 478.37, p < .001, CFI = .99, TLI = .99, RMSEA = .03, SRMR = .04$). Reliability analyses in previous studies resulted in a high scale reliability coefficient for the mental health scale (.86–.88) (Wang et al., 2019).

Demographics

Data on the following demographic variables were collected: Country, school, grade, and gender. However, participating countries or regions had the autonomy to modify the demographic questions to ensure that they represented the local context (e.g., salient racial, ethnic, and socioeconomic groups).

Data Analysis

Initial analyses were conducted in SPSS v.24 to evaluate the demographic characteristics of the sample. Mplus v. 7.3 (Muthén & Muthén, 1998–2015) was used to answer RQ1, RQ2, and RQ3.

Structural equation modeling procedures were utilized; specifically, multigroup confirmatory factor analysis (CFA) was used to establish measurement invariance across groups and examine mean differences in perceptions of school climate (RQ1 and RQ2). The country was the grouping command in the model to account for the nested nature of the data (e.g., students and schools nested within countries), using weighted least square parameter estimates with a diagonal weight matrix and standard errors with mean- and variance-adjusted chi-square test statistics (WLSMV estimator; Muthén & Muthén, 1998–2015) due to the categorical nature of the school climate data (4-point Likert scale). Theta parameterization was used to estimate models. Item and factor thresholds for categorical indicators were estimated rather than factor intercepts (used for continuous variables) for the measurement models.

Establishing measurement invariance (RQ1) was a necessary precursor to comparing means across groups (RQ2). Measurement invariance was conducted for the following factors: School Connectedness, Character, Environment, Adult Support, Peer Support, Cultural Acceptance, Order & Discipline, and Safety. First, individual confirmatory factor analyses were conducted for each group model of the proposed factor structure. Model fit indices were examined in cases of misspecification, and modifications were applied with caution only for cases consistent with the theoretical framework of the underlying model. Chi-square is sensitive to sample size, so the goodness of fit was assessed through three commonly used metrics including root-mean-square error of approximation ($RMSEA \leq .08$), comparative fit index (CFI) and Tucker–Lewis index (TLI) $\geq .90$, and standardized root-mean-square residual ($SRMR \leq .08$) (Hu & Bentler, 1999; Pendergast et al., 2017).

Following the identification of the model for each group, invariance across groups was assessed using the multigroup measurement invariance approach (Wu & Estabrook, 2016). Specifically, when analyzing ordered categorical variables, Wu and Estabrook (2016) advocate for a multigroup measurement invariance approach in which each of the invariance models (i.e., configural and scalar) is identified separately. Based on the recommendations for data with

more than two categories, the first model estimated was the configural model followed by the scalar model (Wu & Estabrook, 2016).

A goal of this study was to establish equality of thresholds (i.e., scalar invariance) so that average ratings could be meaningfully compared across groups (RQ1). Statistically, a model demonstrating threshold invariance (i.e., scalar model) is equivalent to a configural model. Conceptually, establishing threshold invariance assumes that people across multiple groups have an equal probability of shifting across response categories (or thresholds) on the latent construct (Pendergast et al., 2017). If threshold invariance is established, invariance across intercepts can be assumed, and support for the meaningful comparison of means across groups would be established (Pendergast et al., 2017). Authors in this study predetermined that if full invariance was not established, partial measurement invariance was examined and specified parameters were allowed to differ between groups based on modifications with the highest indices. Authors also predetermined that in order to establish partial invariance, at least five of the eight thresholds had to be invariant across groups (Bieda et al., 2017). According to Wu and Estabrook (2016), there are often identification issues among categorical variables that prevent the testing of loading invariance across groups, especially in the case of varying residual variances.

Finally, once full or partial scalar invariance was established, latent means were compared (RQ2). Given established research evidence of the factor structure of the English School Climate Survey, the U.S. sample was designated as the reference group for the models. The pooled standard deviation, a weighted average of standard deviation for two or more groups, was calculated using the weighted average of each group's standard deviation. This results in an averaged standard deviation with more weight given to larger sample sizes (Svetina et al., 2020; Wu & Estabrook, 2016). In Mplus, standard errors for the parameter estimates are computed using the observed information matrix to account for missing data (Muthén & Muthén, 1998–2015).

Linear regression analyses were used to examine the relationship between school climate and mental health ratings while controlling for grade and gender (RQ3). The present study investigated a regression model with the eight school climate subscales as predictors instead of the overall school climate factor. Thus, the variance explained by the regression model (R^2) and

model regression coefficients (β) for subscales were compared between the English and translated surveys.

Results

Research Question 1—Is there scalar measurement invariance for the school climate subscales across groups?

The fit indices and model specifications for each group are displayed in Table 1. The eight-factor model resulted in acceptable Table 1 CFI, TLI, SRMR, and RMSEA fit indices. Fit indices supported a good data model, $\chi^2(14,748, N = 34,923) = 80850.41, p < .001$, RMSEA = .042 (.042–.042), CFI = .96, TLI = .96) and SRMR = .05.

Confirmatory Factor Analysis Results for Translated Surveys

Survey version	Model fit indices				
	X2	df	CFI	TLI	RMSEA
The United States English	18185.74*	586	.96	.96	.04
Belgium French	1028.43*	586	.88	.87	.05
Germany German	1424.56*	586	.97	.96	.03
Greece Greek	792.98*	586	.91	.90	.03
Hungary Hungarian	914.72*	586	.96	.96	.04
Italy Italian	765.38*	586	.84	.83	.05
Jamaica English	956.44*	586	.95	.94	.02
Latvia Latvian	2332.06*	586	.92	.91	.03
Lithuania Lithuanian	1121.73*	586	.93	.92	.06
Malta Maltese	906.78*	586	.96	.96	.04
Puerto Rico Spanish	1018.80*	586	.99	.99	.04
Latvia Russian	984.75*	586	.97	.96	.02
Russia Russian	2557.54*	586	.91	.90	.02
Slovakia Slovakian	1792.11*	586	.84	.83	.07

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error approximation.

* $p < .001$.

Configural Invariance

Configural invariance was assessed across all groups and a good fit to the data was established: $\chi^2(7,452, N = 34,923) = 62278.8, p < .001$; RMSEA = .054 (.054–.06); CFI = .97, TLI = .97; SRMR = .05, supporting invariance across the underlying factor structure across all groups.

Scalar Invariance

To assess for equality of thresholds, partial scalar invariance was examined and the data were found to have acceptable fit to the model: $\chi^2(7,452, N = 34,923) = 62278.8, p < .001$; RMSEA = .054 (.054–.06); CFI = .97, TLI = .97; SRMR = .05, supporting equality of thresholds across groups. Though the overall model fit was good, we considered the model to be partially invariant because results indicated linear dependency among two or more variables or negative variance/residual variance, specifically in relation to the Culture and Peer Support subscales. Because of failure to establish threshold invariance across all groups for these subscales, Culture and Peer Support were not utilized in subsequent analyses.

Research Question 2—Are there mean differences in perceptions of school climate?

Table 2 contains the overall means, standard deviations, and correlations for student-level study variables; Table 3 contains the school climate and mental health means and standard deviations for each participating site. Table 4 displays differences in Adult Support ($M_{AS\Delta}$), Character ($M_{CA\Delta}$), School Connectedness ($M_{SC\Delta}$), Order and Discipline ($M_{OD\Delta}$), Physical Environment ($M_{PE\Delta}$), and School Safety ($M_{SS\Delta}$) between respective countries and territories. As mentioned, latent means for Culture and Peer Support were not compared across groups because preconditions were not met. The overall mean climate for the total sample was 3.01 (range = 2.77– 3.2). The group pooled standard deviation for the groups was .39. Mean comparisons to the reference group (English survey) yielded several significant findings. In the following section, we focus on reporting outcomes that meet the following two criteria: Have significant quotients and have an effect size of .95 or higher, representing a mean difference of at least one standard deviation.

Adult Support

Italy ($M_{AS\Delta} = .63$, $d = 1.62$), Latvia-L ($M_{AS\Delta} = .41$, $d = 1.05$), Puerto Rico ($M_{AS\Delta} = .84$, $d = 2.15$), Russia ($M_{AS\Delta} = .43$, $d = 1.10$), and Greece ($M_{AS\Delta} = .37$, $d = .95$) had mean scores at or above one standard deviation from the comparison mean.

Character

Significantly lower ratings were observed for Character in Belgium ($M_C\Delta = -.59$, $d = 1.51$), Lithuania ($M_C\Delta = -.41$, $d = 1.05$), and Slovakia ($M_C\Delta = -.39$, $d = 1.00$). Conversely, Malta ($M_C\Delta = .57$, $d = 1.46$) and Puerto Rico ($M_C\Delta = .46$, $d = 1.18$) had significantly higher ratings on the Character scale.

School Connectedness

Jamaica ($M_{SC\Delta} = 1.00$, $d = 2.56$) and Russia ($M_{SC\Delta} = .43$, $d = 1.10$) reported higher perceptions of School Connectedness, with Jamaica's mean being two and a half standard deviations above that of the reference mean. In contrast, Belgium ($M_{SC\Delta} = -.21$, $d = 1.49$) reported more negative perceptions of school connectedness than the comparison sample.

Table 2

Means, Standard Deviations, and Correlations among Study Variables

Variable	M (SD)	Correlation			
		1	2	2	4
1. Grade	9.10 (1.97)	—	.01*	-.10**	-.06**
2. Gender	—		—	-.11*	.12**
3. School climate	3.01 (.492)			—	-.29**
4. Mental health	1.75 (1.08)				—

Note. Gender: Boys = 1, Girls = 2 Grades: 5–12.

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

Table 3

Means and Standard Deviations of School Climate Subscale and Mental Health Ratings

Country	School climate subscale								Mental health
	Adult support	Character	Cultural acceptance	School connectedness	Order and discipline	Peer support	Physical environment	School Safety	
	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)
Full sample	2.94 (.81)	3.43 (.57)	2.74 (.78)	2.94 (.66)	3.01 (.70)	3.23 (.65)	2.80 (.76)	2.99 (.80)	1.75 (1.08)
Belgium	2.93 (.60)	3.08 (.54)	2.82 (.63)	2.71 (.63)	2.69 (.63)	3.29 (.60)	2.41 (.68)	2.72 (.69)	2.04 (1.19)
Germany	2.99 (.70)	3.48 (.46)	2.73 (.59)	2.97 (.60)	2.96 (.53)	3.38 (.49)	2.19 (.68)	3.15 (.76)	1.69 (.842)
Greece	2.67 (.76)	3.54 (.42)	2.65 (.67)	2.71 (.62)	2.69 (.63)	3.35 (.53)	2.61 (.69)	3.22 (.67)	1.77 (.76)
Hungary	2.89 (.77)	3.45 (.45)	2.80 (.67)	2.95 (.53)	3.16 (.50)	3.38 (.49)	2.85 (.66)	3.05 (.77)	1.74 (.77)
Italy	3.33 (.68)	3.54 (.44)	2.96 (.64)	2.97 (.53)	2.81 (.56)	3.42 (.51)	2.86 (.58)	3.38 (.63)	1.93 (1.01)

Jamaica	2.71 (.86)	3.48 (.54)	2.36 (.78)	3.23 (.66)	3.07 (.66)	3.05 (.75)	2.61 (.76)	2.52 (.84)	2.44 (1.40)
Latvia-	3.17 (.72)	3.35 (.56)	2.80 (.69)	2.91 (.60)	2.92 (.61)	3.31 (.63)	3.07 (.67)	2.90 (.79)	1.95
Latvian									(1.10)
Latvia-	2.95 (.78)	3.34 (.54)	2.86 (.68)	2.91 (.63)	2.90 (.64)	3.28 (.62)	2.99 (.67)	2.95 (.79)	2.25
Russian									(1.81)
Lithuania	2.85 (.60)	3.29 (.43)	2.93 (.55)	2.81 (.59)	2.78 (.47)	3.18 (.52)	2.84 (.58)	3.41 (.62)	2.22 (1.12)
Malta	3.07 (.83)	3.64 (.52)	2.92 (.74)	2.98 (.71)	3.19 (.61)	3.48 (.54)	2.89 (.70)	2.92 (.78)	2.17 (1.27)
Puerto Rico	3.34 (.73)	3.55 (.54)	2.75 (.82)	2.97 (.72)	2.91 (.79)	3.27 (.68)	2.77 (.78)	2.31 (.75)	1.56 (.94)
Russia	3.14 (.79)	3.39 (.61)	3.11 (.75)	3.10 (.71)	3.17 (.66)	3.36 (.68)	3.13 (.74)	3.13 (.83)	1.90 (1.11)
Slovakia	2.78 (.75)	3.20 (.64)	2.59 (.68)	2.78 (.59)	2.62 (.57)	3.09 (.69)	2.64 (.67)	2.81 (.83)	2.10 (1.17)
The United States	2.84 (.82)	3.47 (.57)	2.62 (.79)	2.89 (.66)	3.02 (.74)	3.17 (.65)	2.70 (.75)	3.01 (.77)	1.55 (.99)

Order and Discipline

In the area of Order and Discipline, Greece ($M_{OD}\Delta = -.39$, $d = 1$), and Slovakia ($M_{OD}\Delta = -.41$, $d = 1.05$) reported lower perceptions in comparison to the reference group.

Physical Environment

Germany reported lower perceptions of the physical environment ($M_{PE}\Delta = -.58$, $d = 1.49$), while Latvia-L ($M_{PE}\Delta = .5$, $d = 1.28$), Latvia-R ($M_{PE}\Delta = .39$, $d = 1$), and Russia reported more favorable perceptions ($M_{PE}\Delta = .67$, $d = 1.72$).

School Safety

Groups Jamaica ($M_{SS}\Delta = -.53$, $d = 1.36$) and Puerto Rico ($M_{SS}\Delta = -.79$, $d = 2.03$) reported feeling less safe than the reference group. In fact, the average rating for Puerto Rico was two standard deviations below the comparison mean. In contrast, Greece ($M_{SS}\Delta = .65$, $d = 1.67$), Italy ($M_{SS}\Delta = .74$, $d = 1.90$), Lithuania ($M_{SS}\Delta = .48$, $d = 1.23$), and Russia ($M_{SS}\Delta = .43$, $d = 1.10$) reported feeling safer than the reference group.

Research Question 3—What is the relationship between perceptions of school climate and self-reported mental health problems?

The regression model examined the extent to which the eight school climate subscales, combined, accounted for variance in student mental health. Regression analysis revealed that, controlling for the effects of gender and grade, the school climate subscales collectively accounted for a significant portion of the variance in mental health ratings for nine countries and territories: The United States, Belgium, Germany, Italy, Jamaica, Latvia-L, Latvia-R, Russia, and Slovakia (Table 5). The strongest association between school climate and mental health was observed for Italy ($r^2 = .59$, $p < .01$) and Belgium ($r^2 = .52$, $p < .01$), where ratings of school climate significantly accounted for 59% and 52% of the variance in mental health ratings, respectively.

For countries where school climate was significantly associated with mental health, regression coefficients were further examined to identify the subscales with the most significant connection to student mental health. In the reference sample (the United States), all subscales

were significantly associated with mental health ratings. School Connectedness was most frequently associated with mental health ratings across samples, with lower perceptions of School Connectedness being significantly associated with greater mental health problems in five additional cultures: Belgium, Germany, Jamaica, Latvia-L, and Russia (see Table S3 in supplemental materials). Similarly, lower ratings of perceived School Safety were significantly associated with more mental health problems in four additional cultures: Germany, Jamaica, Latvia-L, Russia, and the United States.

Discussion

The purpose of the current study was to examine school climate perceptions and the relationship between school climate and mental health among a cross-national sample with 14 participating countries or territories. The GSCS was adapted and administered to adolescents in secondary school to assess cross-cultural student perceptions of school climate and mental health, as well as the influence of school climate perceptions on student mental health. There were several key findings in the study. Partial scalar invariance was established for the translated surveys, supporting invariance among factor thresholds across groups in using a 4-point Likert response scale. Scalar invariance allows for the meaningful cross-national examination of mean differences across groups. Scalar invariance was not established for two of the eight subscales, Cultural Acceptance, and Peer Support, and as such those subscales were not included in subsequent analyses. We posit that invariance was not established for Cultural Acceptance for two reasons. First, the level of cultural diversity across the multinational study varies greatly, some being mostly homogenous (i.e., Russia) and others with large heterogeneity (i.e., the United States), so this latent construct is likely interpreted differently across groups. For example, the question “students at this school are treated fairly regardless of race, ethnicity, or culture” could result in significant variance in heterogeneous cultures, while in more homogenous cultures, distinguishing difference in treatment based on race is not as apparent. The Peer Support subscale has limited items ($N = 3$) and perhaps does not fully capture the construct on a multinational level. Findings from these analyses support the use of a six-factor School Climate Survey that can be used cross-nationally to examine student perceptions of school climate. The School Climate Survey, available in 10 languages (2 countries used English, 2 used Russian) contributes to the availability of use both intra- and internationally as

schools globally have become increasingly multilingual. The findings from the study also illustrate cross-national similarities and differences in student perceptions across several aspects of the school environment. On average, we observed that for any given school climate factor, approximately 30% of nations (Table 4) met the criteria of being both significantly different (in either a positive or negative direction) and having an effect size that was approaching or larger than 1 standard deviation from the reference mean. That is, students from different sites varied significantly in school climate perceptions across domains, but it is still evident that school climate is a cross-national construct. These data support a degree of universalism in both the underlying constructs of school climate and in student experiences at school, supporting cross-national collaboration that recognizes some of the shared global experiences of students, and uses such information to research and implement large-scale practices that can contribute to school improvement efforts. Globally, students spend approximately 1,000 hr (out of 6,000 waking hours) per year in school. Schools are the breeding grounds for developing environments where students are academically successful, engaged, and feel safe. These are universal goals, regardless of where in the world the school is. That is cause for creating educational environments that work for everyone, everywhere. For example, response styles differ based on cultural values and context, and this is crucial to acknowledge in cross-national survey administration and interpretation of results (Vieluf et al., 2019); some of the differences observed may be related to school norms and social expectations rather than vast differences in student experiences at school. To illustrate, general trends from the present study show more positive and statistically significant subscale ratings with large effect sizes for Southern region countries in Europe (Greece, Hungary, and Italy) more often than for countries in the northern region of Europe (Belgium, Slovakia, and Germany) (Table 4). These results are consistent with a previous study on rater acquiescence, or the tendency to select ratings on one side of a rating scale, in which Yang et al. (2012) found that in Western Europe, southern regions show greater positive acquiescence when compared to northern regions (Yang et al., 2012). Understanding cultural norms clarifies the intersection between school experiences and response style. In Italy, teachers place greater importance on interpersonal relationships than on rule-following and the physical environment. Thus, Italian students may both enjoy more positive relationships with others at school compared to students from other nations and be inclined toward agreeable responses on a measure administered in a school context. In another

example, for School Connectedness, two groups (i.e., Jamaica and Russia) reported significantly more positive perceptions while Belgium reported significantly more negative perceptions, and in 9 of the 11 remaining groups mean differences were significant with effect sizes ranging from .18 to 2.56. Findings within this domain highlight that efforts to promote the degree to which students feel connected to and a part of the school environment are fundamental in building the cornerstones for students to be able to grow academically, socially, and emotionally (Lester & Cross, 2015). School Safety also emerged as a common theme, with significant mean differences observed in 12 of the 14 groups and effect sizes ranging from .03 to 2.03. Students need to feel safe—both physically and emotionally—in order to learn and thrive. Recognizing this shared value among students allows for school psychologists and other educators to intently create school environments where students feel safe, secure, and connected. Recommendations for universal supports include establishing school-wide programs where students are able to connect with peers and adults; specifically, research has shown that if students are able to identify even one adult they can talk to if they need support, this can have lasting effects on long-term outcomes. Building a culture of trust and community increases school safety by reducing incidents of victimization and increasing bystander reporting.

Table 4

Comparisons of Mean School Climate Subscale Ratings by Country

Country	School climate subscale									
	Adult support		Character		School connectedness		Order and discipline		Physical environment	
	Effect		Effect		Effect		Effect		Effect	
	ΔM (σ^2)	size	ΔM (σ^2)	size	ΔM (σ^2)	size	ΔM (σ^2)	size	ΔM (σ^2)	size
							-.27**			
Belgium	.15** (.55)	.38	-.59** (.46)	1.51	-.21** (.58)	1.49	(.45)	.69	-.25** (.84)	
Germany	.14** (.51)	.36	-.00 (.45)	.00	.10** (.53)	.26	-.07**	.18	-.58** (.55)	1
							(.23)			
Greece	.37** (.59)	.95	.09* (.40)	.23	-.21** (.64)	.54	-.39**	1.00	-.08 (.59)	
							(.37)			
Hungary	.06 (.67)	.15	-.11* (.39)	.28	.11* (.50)	.28	.16**	.41	.19** (.46)	
							(.27)			
Italy	.63** (.75)	1.62	.14 (.47)	.36	.11 (.47)	.28	-.25**	.64	.21** (.39)	
							(.25)			
Jamaica	-.09**	.23	.34** (.93)	.87	1.00**	2.56	.26**	.67	-.07* (.90)	
	(1.00)				(1.72)		(.73)			

Latvia- Latvian	.41** (.72)	1.05	-.19** (.55)	.49	.02 (.50)	.05	-.11** (.33)	.28	.50** (.62)	1
Latvia- Russian	.16** (.75)	.41	-.20** (.52)	.51	.07* (.63)	.18	-.11** (.42)	.28	.39** (.57)	1
Lithuania	-.05 (.31)	.13	-.41** (.27)	1.05	-.13** (.48)	.33	-.33** (.13)	.85	.12** (.34)	
Malta	.32** (.99)	.82	.57** (1.16)	1.46	.18** (.96)	.46	.30** (.57)	.77	.24** (.61)	
Puerto Rico	.84** (1.20)	2.15	.46** (1.11)	1.18	.29** (1.12)	.74	.08 (1.19)	.21	.16** (.93)	
Russia	.43** (.98)	1.10	-.02 (.84)	.05	.43** (1.14)	1.10	.29** (.67)	.74	.67** (1.02)	1
Slovakia	-.08 (.57)	.21	-.39** (.60)	1.00	-.12** (.48)	.31	-.41** (.29)	1.05	-.12** (.49)	

Table 5

Regression: School Climate Subscales as Predictors of Mental Health

Country	Variance (R^2)	Standard error (SE)
Belgium	.52**	.15
Germany	.26**	.03
Greece	.31	.33
Hungary	.64	.35
Italy	.59**	.22
Jamaica	.24**	.03
Latvia-Latvian	.27**	.02
Latvia-Russian	.35**	.12
Lithuania	.36	.19
Malta	.29	.33
Puerto Rico	.18	.35
Russia	.41**	.03
Slovakia	.29**	.08
The United States	.15**	.00

** Significant at the .01 level.

Findings also supported a relationship between student-reported symptoms of mental health problems and perceptions of school climate in the majority of the investigated groups (the United States Belgium, Germany, Italy, Jamaica, Latvia-L, Latvia-R, Russia, and Slovakia). This is in accordance with conclusions from other studies emphasizing the universal importance of the environment in students' behavior and mental health (Weist et al., 2014). Consistent with findings from mean comparisons, school safety emerged as an important variable in student mental health for several groups, indicating that stakeholders may learn from one another through commonalities in the ways school safety affects their students, and also provide additional considerations for support by addressing unique regional circumstances and challenges. For example, in Jamaica, student reports of school safety were 1.36 standard deviations below the comparison mean, and school safety showed one of the strongest effects on student mental health, with students demonstrating nearly a half-point increase in ratings of

mental health problems for every point decrease in perceptions of school safety. In recent years, Jamaican researchers have drawn attention to limited progress in antibullying intervention and research compared to other nations, making it a priority in education legislation and school intervention (Elledge et al., 2019). Educators in the Jamaica setting may look to other countries that are struggling with antibullying measures to implement interventions that promote student well-being. Current findings make it possible to identify common educational issues like school safety, among others that cultures face, creating an opportunity for intellectual exchange that influences practice.

Even so, groups differed in terms of the extent to which areas of school climate were associated with mental health problems. Previous international studies have emphasized increasing connectedness and belonging as protective factors to promote student mental health and overall student outcomes (Lester & Cross, 2015; Riekke et al., 2017). Lower perceptions of school connectedness were associated with more mental health problems in several—but not all—groups, and effect sizes larger than one emerged for only 3 of the 13 reference groups. Though it is important to focus on issues of connectedness at school to improve student mental health universally, present findings also encourage the exploration of additional interventions that meet local needs to address student mental health specifically. Particularly highlighting the importance of local influences, school connectedness, and cultural acceptance were significant variables in Latvian-community schools in Latvia, but not in Russian-community schools in Latvia. Based on previous work and cultural relations within Latvia, this may be related to Russian speakers in Latvia already experiencing a degree of “Russian speaking nationality” that makes belongingness an inherent part of their school environment (Austers, 2002; Cheskin, 2013). In contrast, Latvian schools are less reliant on language as a cultural unifier, making students more aware of whether they feel accepted culturally and like a collective community at school. Results indicate the importance of whole-school or universal school improvement efforts that also recognize the influence of local norms and cultural influences, particularly to ensure effectiveness in efforts to maintain positive perceptions of school climate and reduce mental health problems.

Limitations and Future Directions

The current study contributes to cross-national efforts to advance understanding of school climate and symptoms of mental health problems. While there are several strengths, there are also notable limitations to the study. Although we had a robust international sample, convenience sampling limits the generalization of results beyond the cultural contexts explored. Further, data were collected cross-sectionally, so results summarizing the association between school climate and mental health should be interpreted with caution and without the assumption of causality. A future study may replicate these results with an expanded population in novel cultural settings.

Data collected for this study were obtained via self-report from participants; including additional measures of the school environment (e.g., observations, interviews, and school outcome data) can provide a more comprehensive understanding of universal as well as contextually specific needs. Multiple informants on perceptions of school climate, including school personnel and families, should also be considered alongside students to identify similarities and differences in educational perceptions and experiences. Such data can inform efforts supporting educational environments where teachers are able to teach, students are able to learn and develop, and families are able to meaningfully contribute to supporting student success.

As a preliminary investigation, the current study focused on examining perceptions of school climate and its subdomains, particularly as they relate to symptoms of mental health. The mental health survey was developed by the department of education responsible for administering the GSHS on an annual basis. The authors recognize the limitation of assessing mental health as a one-dimensional construct; as such, results related to reported symptoms of mental health should be interpreted with some caution because of the limitation of a one-dimensional measure of mental health limiting the ability to identify targeted supports and interventions to support struggling students. Future research studies should consider parsing out the dimensions of mental health (e.g., positive affect, life satisfaction, anxiety, and depression; Headey et al., 1993) and examining them in relation to perceptions of school climate. Future studies should also focus on the examination of universal and local social, political, and economic factors that may be more proximally related to students' school

experiences and well-being. Such analyses, examined from a universalism without uniformity lens (Shewder & Sullivan, 1993), will enhance broad strategies that relate to student experiences in consistent and predictable ways, as well as targeted strategies that address the nonuniform aspects that differentially affect students' experiences. To illustrate, in the present study, data collection for Puerto Rico took place in the aftermath of Hurricane Maria, an event that significantly disrupted and restructured schooling in subsequent months and years. Student-reported feelings of safety in this region were low, suggesting responses to trauma such as the increased perceived threat of risk to self and family (Orengo-Aguayo et al., 2019). Despite this, students reported more positive experiences of school climate in several areas when compared to the reference sample—especially in the domains of adult support, connectedness, and character. The paradox illuminates the capacity for students to have positive school experiences in spite of extenuating circumstances with the provision of educational supports. For example, Puerto Rican students have recognized increased community cohesion and solidarity in personal narratives about the hurricane (Munoz, 2007). Therefore, fostering a cohesive school culture with quality staff–student relationships is crucial in the aftermath of societal crises.

At the same time, not all regions can point to a significant cultural event that recently defined schooling experiences. Jamaican students in the present study reported feeling less safe than most other groups despite the absence of major sociopolitical changes. Students also felt the most connected at school in Jamaica, indicating that interventions to promote connectedness may not support feelings of safety in the same way that other international studies have demonstrated (Lester & Cross, 2015). Like several other samples in the present study, further investigation is warranted to identify factors affecting students' attitudes toward school climate to develop interventions. Beyond events out of our control, stakeholders must focus on malleable variables of interest to promote the capacity to modify and intervene. Targeted interventions may be better informed by how specific domains of school climate can be leveraged as a protective factor against negative outcomes for students.

Conclusion

Globally, promoting a positive school environment for all students is an increasing priority for educational stakeholders and leaders, as demonstrated by efforts to evaluate and promote school climate (United Nations Educational, Scientific, and Cultural Organization, 2019). In this changing educational landscape, the availability of tools that can be used to assess school climate cross nationally is central to widespread school improvement efforts. Cross-cultural adaptations of the GSCS facilitate the assessment of school climate across nations, as well as within nations that are educating increasingly diverse student populations.

Finally, cross-national adaptations of school climate measures facilitate the examination of school climate perceptions and additional variables across a range of cultures to inform universal and targeted intervention. School psychologists all over have long been held to the standard of supporting both teachers (as consultants) and students to enhance academic and social–emotional outcomes (Oakland & Cunningham, 1997). Yet, the practice has evolved to encourage a simultaneous understanding of variables at the systems level (e.g., national identities, norms, and values) and the individual level (intersectional identities of ethnicity, language, etc.) in this pursuit (Begeny, 2018). Cross-national resources support school psychologists to promote quality school environments by targeting universal variables of interest (e.g., school climate and subjective well-being) in a manner that meets context-specific school needs. Ultimately, safe and positive environments lead to thriving students and thriving adults—everywhere!

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FOURTH ARTICLE:

Deltour, C., Dachet, D., Monseur, C., & Baye, A. (in reviewing). Cultural Fit and the Effects of School-wide Positive Behavior Interventions and Supports in High-Need Schools: A Quasi-Experimental Study.

Cultural Fit and the Effects of School-wide Positive Behavior Interventions and Supports in High-Need Schools: A Quasi-Experimental Study

Abstract

School-Wide Positive Behavior Interventions and Supports is a framework that aims to improve school culture and climate, and students' behavior and attendance. As the program is largely spreading, no comparative study showing its efficacy on students outside the United States is available. In addition, there is limited work examining SWPBIS effects on school climate from all the stakeholders' point of view, especially students and parents. Moreover, no research used comprehensive questionnaires including the three main components of school climate: engagement, safety and environment. The purpose of this study is twofold: investigate the SWPBIS implementation feasibility in a French speaking European country and measure implementation effects on school climate and absenteeism. Using a quasi-experimental design, the current study investigates the impact of SWPBIS implementation in elementary and secondary high-need schools (n intervention schools = 4, n control schools = 5). Findings show positive effects for all stakeholders on different components of school climate. Effects on absenteeism are mixed. Implications and limitations are discussed.

Keywords: SWPBIS, quasi-experiment, school climate, absenteeism, high-need schools

Introduction

School-wide Positive Behavior Interventions and Supports (SWPBIS) have existed for over 20 years in the United States (Sugai & Horner, 2002). Now, the program is being disseminated in many other countries, including in Europe. To date, no deleterious effects have been published (Deltour et al, submitted). Instead, various positive effects have been reported, mostly on student suspensions and other disciplinary measures (Bradshaw et al., 2010, 2012, 2015; Caldarella et al., 2011; Flannery et al., 2014; Gage, Rose et al., 2019; Gage, Grasley-Boy et al., 2019; Lee et al., 2021; Pass et al., 2019; Ward & Gersten, 2013) but also on increased student attendance at school (Caldarella et al., 2011; Freeman et al., 2016; Pas et al., 2019), perceived school safety (Horner et al., 2009), increased instructional time (Lassen et al., 2006), and decreased problem behaviors (Gage, Rose et al., 2019; Sørli & Ogden, 2007, 2014, 2015) and bullying (Waasdorp et al., 2012; Gage, Rose et al., 2019; Ward & Gersten, 2013).

The Netherlands' successful implementation of SWPBIS for more than 10 years (Nelen, Blonk et al., 2019; Nelen, Willemse et al., 2019), its potential for cultural adaptation, and the encouraging effects observed in various contexts have inspired the idea to adapt SWPBIS for the French-speaking Belgian context. Indeed, as part of a reform of the education system, it was decided to foster evidence-based education (Baye & Bluge, 2016) and to offer underperforming schools incentives to use proven intervention programs (Fédération Wallonie-Bruxelles, 2017). Some of these schools had been experiencing a deteriorating school climate and numerous behavioral problems. In such cases, restoring the school climate is a prerequisite for providing all students with good learning opportunities. It is in this context that SWPBIS was implemented on a small scale. This evaluation of its effects using a quasi-experimental design aims to verify the value of continuing this project to address the challenges of schools facing difficulties and is a prerequisite to scaling up (Slavin, 2017).

SWPBIS is a school-wide program based on the Response to Intervention (RTI) model in which universal prevention is the primary focus (Fuchs et al., 2003). Universal prevention reorganizes the rules of a school around shared values that are translated into expected student behaviors in different areas of the school. The educational team teaches these expected behaviors actively and explicitly (via modelling, guided practice, autonomous practice). Positive reinforcement of

the expected behaviors and the application of logical and appropriate consequences for inappropriate behaviors increase the likelihood that the expected behaviors will appear and problem behaviors will subside.

The management of inappropriate behavior is reviewed considering the consistency and fairness of treatment that students expect from the educational team. It is especially important to consider the unequal treatment and unfairness felt by some students because of its direct link to dropping out (Monseur & Baye, 2017).

Another key aspect of SWPBIS is the decision-making process, which is driven by regular data collection. Data-driven choices are intended to make decisions more objective and easier to understand for all stakeholders (Schildkamp et al., 2013). This approach is relatively complex to implement in schools, where decisions made about students are sometimes based on feelings and on “labels” applied at a particular time that students may find difficult to shed (Schildkamp et al., 2014).

School climate

School climate refers to shared beliefs, values, and attitudes that shape interactions between students, teachers, and administrators. Together, these elements determine the parameters of acceptable behavior in the school setting (Kuperminc et al., 1997). For Haynes et al. (1997), school climate represents the quality and consistency of interpersonal relationships. The relational aspect that involves how people feel connected to each other at school is one of the fundamental dimensions of school climate (Bradshaw et al., 2014). For other authors, school climate refers to the quality and characteristics of school life (Cohen et al., 2009; Gage et al., 2016). More recently, the notion of school climate was expanded to include safety and the physical environment (Wilson, 2004; Zullig et al., 2010). Another definition builds on the idea that school climate is the “atmosphere for learning” (Suldo et al., 2013). This atmosphere arises from the feelings that people develop about their school and whether the school provides the conditions for learning to occur.

While all the factors determining school climate have not yet been clearly established, one important aspect seems to be the functioning of the school. This includes a focus on academic

achievement, friendly and collegial relationships among staff members, respect for all members of the school community, leadership and support from the principal, a consistent disciplinary policy, attention to safety issues, and engagement with families and the community (Hoy & Tarter, 1997, as cited in Bradshaw, Koth et al., 2008).

There is a consensus in the literature regarding the need to develop a healthy school climate (Berkowitz, 2017) since positive school climate is linked to several positive outcomes in behaviors, social skills, as well as attendance and academic achievement (Berkowitz, 2017; Booren et al., 2011; Gage et al., 2016; Gubbels et al., 2019). Students with a sense of belonging to their school community demonstrate greater regulation of classroom behaviors, whereas feeling insecure and outside of the school community represent elements that have been associated with deleterious outcomes (Gase, 2017; Goldweber et al., 2013; Wilson, 2004).

The quality and characteristics of school life (Cohen et al., 2009; Gage et al., 2016) therefore influence students' behaviors and social skills (Gottfredson et al., 2005; McIntosh et al., 2006; Gage et al., 2016). On the contrary, disorganized schools with high rates of conflict can specifically exacerbate the manifestation of problem behaviors and can contribute to academic failure and absenteeism (Goldweber et al., 2013; Hawkins et al., 1992).

According to Bradshaw et al. (2014), school climate is a significant predictor of dropping out, absenteeism, school exclusion, and aggressive and violent behavior. A positive school climate is associated with lower rates of absenteeism (Gubbels et al., 2019; Hendron & Kearney, 2016). Research on bullying has also highlighted that students who perceive their schools as unsafe and unsupportive are more likely to engage in bullying (Bradshaw, O'Brennan et al., 2008, Goldweber et al., 2013).

Effect of SWBIS on school climate

Successful support for students' positive behaviors has been linked to school environments and school climates that are effective, reassuring, preventive, and positive (Bradshaw, Koth et al., 2008; 2009; Gage et al., 2016; Horner et al., 2010).

In a recent meta-analysis on the effects of school-wide intervention programs on school climate, Charlton et al. (2021) concluded that SWPBIS is among the two types of interventions with the highest effect sizes.

In SWPBIS, improving school climate is a key element. By reducing inappropriate behaviors, the school becomes a more pleasant place to live (Caldarella et al., 2011). The data collected in numerous studies have shown a decrease in discipline problems in schools following the introduction of SWPBIS. Everyone in the school feels safer and relationships are more positive.

Horner et al. (2009) conducted a randomized, wait-list control trial in the United States on the effects of SWPBIS in 60 elementary schools. After implementation, the authors measured the various dimensions of school climate with the *School Safety Survey* (Sprague et al., 1996) including design of space, crowding, perceived caring, perceived sensitivity to cultural differences, students' bonding with school, quality of student-adult interactions, perceived fairness of school rules, and level of adult supervision. The effect size observed for staff members on the entire questionnaire was +0.32.

Bradshaw and colleagues (2008, 2009) also investigated the improvement in school climate through the implementation of SWPBIS as experienced by staff members in 37 Maryland elementary schools. This experimental study used the Organizational Health Inventory for Elementary Schools (Hoy & Fedman, 1987). The results show an overall positive effect of SWPBIS implementation on the overall OHI ($ES = +0.29$) and on the sub-dimensions measured ($ES = +0.24$ for staff affiliation, $ES = +0.22$ for academic emphasis, $ES = +0.21$ for resource influence, $ES = +0.20$ for collegial leadership, and $ES = +0.16$ for institutional integrity).

The quasi-experimental study conducted by Caldarella et al. (2011) to measure the effects of SWPBIS implementation on more than 3,000 teachers and more than 10,000 middle secondary students showed substantial improvement in school climate following the implementation of the program, throughout the sub-dimensions included in the *Indicators of School Quality* (Taylor et al, 2006): educational assistance: $ES = + 0.72$; school communication: $ES = + 1.24$ and student prosocial behavior: $ES = + 2.73$. According to the authors, this improvement had a positive impact on overall school quality and student achievement.

Ward & Gersten (2013) conducted an experimental wait-list study to evaluate the effects of implementing the Safe and Civil Schools model for PBIS in 22 elementary schools in the United States. They administered both the student and staff versions of the *California Healthy Kids Survey* (WestEd, 2013). First, the two authors noted that teachers reported improvement in several elements of school climate, namely a decrease in bullying ($ES = -0.24$), a decrease in classroom disorder ($ES = -0.67$) as well as a decrease in mistrust of adults ($ES = -0.15$). Second, more students reported never being hit or pushed at school ($ES = +0.12$). These results indicated a decrease in peer violence and an improvement in perceived safety at school. Smolkowski et al. (2016) repeated the investigation three years later and confirmed the initial results.

In Norway, Sørli and Ogden (2015) investigated the effect of the Norwegian version of the SWPBIS in their quasi-experiment. Teachers from 48 elementary schools were asked to complete the *Classroom Climate Scale* (Sørli and Nordahl, 1998). A student version was used to measure students' perceptions of prosocial learning in the classroom. Sørli and Ogden found a low effect size at baseline on the teacher questionnaires ($ES = +0.17$). In contrast, no effect was found in the data from the student questionnaires.

Most of the comparative studies were conducted in the United States and were primarily focused on only one category of individuals (school staff or students). None of the studies included school staff, parents, and students. In addition, the studies addressed only one or two dimensions of school climate (safety, engagement, and environment) but never all three. However, Gase et al. (2017) explained that when schools seek to “measure and implement interventions aimed at improving school climate, consideration should be given to grounding these efforts in a multidimensional conceptualization of climate that values student perspectives and includes elements of both engagement and safety” (p. 320). The authors demonstrated that school staff and administrative measures of school climate showed limited association with student outcomes, while student reports of engagement and safety showed strong associations with student outcomes.

Effects of SWPBIS on absenteeism

Since absenteeism is one of the observable and predictive symptoms of dropping out (Balfanz et al., 2007; Rumberger & Lim, 2008), it is important to test whether the implementation of SWPBIS increases student attendance in school, as research in other school systems has shown (Caldarella et al., 2011; Freeman et al., 2015, 2016; Molina et al., 2020; Pas et al., 2019; Smolkowski et al., 2016; Ward & Gersten, 2013).

Purpose

In some schools, especially high-needs schools, addressing the school climate issue is a prerequisite for learning to take place. SWPBIS is a framework that has demonstrated effects in the US, but only a limited number of studies have demonstrated the effects perceived by students themselves.

The first aim of this study was to test the feasibility of implementing SWPBIS in a Western European French-speaking educational system. In this context, positive feedback is rare, while negative feedback and sanctions are the norm (OECD, 2019). Furthermore, the behaviorist aspects of such a project typically meet resistance. Finally, data collection and analysis at the school level are not common practice (Soetewey & Crépin, 2014). This issue of feasibility and cultural fit was a prerequisite to collecting and analyzing data on the effectiveness of SWPBIS in our educational context. When a practice and its features do not correspond to identified needs and to the school environment, including its culture, implementation and efficacy can be put at risk (McIntosh et al., 2010). The barriers and enablers of the implementation of SWPBIS in a French-speaking context will be discussed elsewhere (Deltour et al, submitted). In this study, we will address this first issue through an analysis of the fidelity of the program's implementation, which will give an indication of the feasibility of implementing SWPBIS in our context. In our opinion, if the program can be implemented with fidelity, it will mean that the intervention features correspond to the school environment and needs, thus representing a cultural fit.

The second purpose of this study is to measure the effects of the implementation of SWPBIS in four experimental schools (three elementary schools and one middle school) compared to

control schools. The effects will encompass all the dimensions of school climate and all the stakeholders. Our study adds to the existing body of knowledge as it includes all the stakeholders (i.e., students, educational team, and parents), in both elementary and middle schools, and addresses all three dimensions of school climate (safety, engagement, and environment).

Research questions

Research Question 1: To what extent is it feasible to implement SWPBIS with fidelity in a Western French-speaking country?

Research Question 2: Do the students, school staff, and parents in the SWPBIS experimental schools feel that their school climate is improving to a larger extent than those in the control schools?

Research Question 3: Is student absenteeism lower in SWPBIS experimental schools?

Materials and Methods

Participants

In 2017–2018, four schools (three elementary schools and one middle school) began the implementation project. School officials helped the research team find comparable control schools based on school size, geographical situation, particular features (such as bilingual schools), school type, and socio-economic status. Table 1 describes the characteristics of the experimental and control schools. In a small education system, it is a challenge to find comparable schools on all the defined criteria. The selected experimental and control schools are fairly comparable, even if Control School 1 is somewhat more advantaged and larger in size than the corresponding experimental school.

Table 1: Characteristics of participating schools

School	Education level^a	No. students	School particularity	School SES^b	Geographical characteristic	School type^c
Experimental 1	Elementary	84		4	Suburban	Public (state level)
Control 1	Elementary	149		7	Suburban	Public (state level)
Experimental 2	Elementary	127	Bilingual (French-German)	5	Suburban	Public (state level)
Control 2	Elementary	204	Bilingual (French-English)	4	Suburban	Public (state level)
Experimental 3	Elementary	208	Bilingual	19	Rural	Public (municipality)
Control 3	Elementary	149	Bilingual	18	Rural	Public (municipality)
Experimental 4	Middle school	160	Grades 7 & 8 only	2	Urban	Private (but mainly state-funded)
Control 4	Middle school	180	Grades 7 & 8 only	3a	Urban	Private (but mainly state-funded)
Control 4'	Middle school	115	Grades 7 & 8 only	1	Urban	Private (but mainly state-funded)

Notes:

- Education level: Elementary schools go from kindergarten to grade 6.
- School SES is defined each year by the Ministry of Education according to the socio-economic status of the students in each school. The rating ranges from 1 to 20, with 1 designating the most disadvantaged schools.
- School type: Schools relate on three main networks: public at the state level, public at the local level, and private (mainly catholic schools funded at the state level; private schools may therefore welcome very poor students, like in Experimental and Control 4 schools).

By Ministry decision, the project was proposed exclusively to “high-need schools.” This status is given to schools facing specific difficulties and therefore in need of specific support. The schools that receive this status and support are the furthest from the average of the group they are comparable to according to a composite indicator combining information on student SES, turnover and achievement; school failure; staff turnover; and school climate. The participating schools are mostly situated in quite poor neighborhoods and enroll students from disadvantaged to very disadvantaged backgrounds, as shown in Table 1, except for Experimental School 3 where underperformance was due to staff members and staff turnover. SWPBIS was first introduced at an assembly of school directors. For those who showed interest, a further on-site presentation for all the staff was organized. This detailed presentation was followed by a question and answer session. At the end, the entire school staff voted anonymously on the project. We were expecting an 80% buy-in (Slavin, 2004) to start the project in a particular school.

As soon as staff buy-in was obtained, a training schedule was proposed. A small SWPBIS team was created on a voluntary basis. The advice was to build a diverse team to be representative of the entire school staff. This SWPBIS team was responsible for preparing, implementing, and monitoring the project. For the first four participating schools, we followed the implementation method used in the Netherlands: preparation and implementation “area by area.” Thus, the university coaches and the SWPBIS team prepared the implementation of SWPBIS for the playground, then the project was implemented in this location, and then a new area, e.g., the cafeteria, was added, and so on.

Measures

School climate

The *Georgia School Climate Survey Suite* (La Salle et al., 2021) was chosen because it covers all the categories of people we wanted to survey and includes all the important constructs of school climate described in the school climate literature, both in English (Booren et al., 2011; Bradshaw et al., 2009, 2014; Cohen et al., 2009; Koth et al., 2008; Kuperminc et al., 1997; Modin & Ostberg, 2009; Suldo et al., 2013; Thapa et al., 2013; Van Houtte, 2005) and in French (Debarbieux, 2013, 2015; Janosz et al., 1998; Poulin et al., 2015).

The survey was validated cross-culturally with middle and high school students within the eight dimensions of school connectedness, character, physical environment, adult support, peer support, cultural acceptance, order and discipline, and safety (La Salle et al., 2021). The scale includes a higher-order school climate factor that explains the variance, in part, among eight lower-order factors that assess the aforementioned dimensions of school climate. The elementary questionnaire was validated in the US. The confirmatory factor analysis results indicated a good model fit and an internal consistency of the scale of .80 (La Salle et al., 2016).

We translated and adapted the Suite using double translation followed by reconciliation and validation by an expert (Grisay, 2003; Harkness, 2002). After a trial of the different versions of the questionnaire with approximately 20 participants per questionnaire (volunteer teachers, students, and parents), four people were contacted again to carry out a cog lab to ensure the quality of the translation. The research team wanted to ensure that the different concepts in French were understood in the same way as in the original version of the measurement tool. Participants answered using a Likert scale with response options ranging from 1 (strongly disagree) to 4 (strongly agree), with higher scores representing more positive perceptions of school climate. Below, Cronbach' alphas at pre-test are presented after each dimension.

Each questionnaire covers several school climate constructs:

- Georgia School Personnel Survey (31 items): staff connectedness (.80), structure for learning (.84), physical environment (.74), peer and adult relations (.88), parent involvement (.83), school safety (removed because of a lack of internal consistency)
- Georgia School Student Elementary Survey (15 items): school climate (.71), peer victimization (.79)
- Georgia School Student Secondary Survey (67 items): school connectedness (.68), physical environment (.68), adult support (.85), peer support (.67), cultural acceptance (.71), order and discipline (.64), school safety (.46), parent involvement (removed because of a lack of internal consistency), peer victimization (.83), character (.80)
- Georgia Parent School Climate Survey (24 items): Teaching and learning (.70), school safety (.80), interpersonal relationships (.85), institutional environment (.65), parent involvement (.47)

Two sub-scales were added from the PISA 2015 student questionnaire.

Disciplinary climate (.77): five items (4-point Likert scale) measuring disciplinary climate in the classroom.

Teacher unfairness (.82): six items (4-point Likert scale) concerning the perception of fair treatment from teachers were added to the questionnaire.

Absenteeism

Given the difficulty in obtaining administrative data on the topic due to the general data protection regulation (GDPR, 2016), self-reported PISA items on falling behind in school and absenteeism were used. Only middle school students responded to these items. We included three items from PISA 2015 on absenteeism. These self-reported measures asked the students whether they had “skipped a whole school day,” “skipped some classes,” or “arrived late for school” during the last two full weeks of school. Students answered on a four-point Likert scale (“never,” “one or two times,” “three or four times,” “five or more times”).

Implementation fidelity

Implementation fidelity, also called treatment integrity, is defined according to Blakely et al (1987, cited by Mowbray et al., 2003) as the proportion of a program's components that are implemented and the way they are implemented with respect to the original protocol (Orwin, 2000, cited by Mowbray et al., 2003).

According to Carroll et al. (2007), implementation fidelity partly determines the effectiveness of the intervention. According to Keller-Margulis (2012), this is especially true for measures based on the Response to Intervention model (Fuchs et al., 2003), as in the case of SWPBIS. The objective of assessing fidelity is to understand whether the SWPBIS is implemented in a way that maintains its quality and achieves its intended goals (Dusenbry et al., 2003).

We used two instruments to assess implementation fidelity: one external (the School-wide Evaluation Tool, SET) and one internal (the Tiered Fidelity Inventory, TFI). The SET (Horner et al., 2004) is a 28-item direct observation and survey instrument that assesses the extent to which schools are implementing the SWPBIS universal prevention practices. It takes

approximately two hours per school for an external trained evaluator to collect the data, review the permanent products, and interview students, administrators, teachers, and other staff members. SET generates a “total” score ranging from 0 to 100%. A school is considered to have achieved fidelity when its total score reaches or exceeds 80%. The internal consistency of the SET has been documented with an alpha of .96, while test-retest reliability is .97 and inter-rater agreement is .99 (Horner et al., 2004). The SET uses a mixed method of fidelity assessment and helps create an overview of the school by combining different types of interviews, observations, and a review of materials (Mowbray et al., 2003). This evaluation tool has been recognized as the most objective and direct fidelity assessment (Bruhn et al., 2015).

The Tiered Fidelity Inventory (TFI) (Algozzine et al., 2014) assesses the fidelity of each of the three tiers of PBIS in a single instrument through a scale of scores for each tier listed separately or through an overall score. This is a self-reporting measurement tool, intended to be completed by the SWPBIS team members with the coach as facilitator. Tier 1 consists of 15 items. The internal consistency of the Tier 1 measure is documented by an alpha of .87. Several studies have demonstrated evidence of its content validity, factor structure, as well as reliability: with a Cronbach's alpha of .96, and of .87 for Tier 1; inter-rater and 2-week test-retest intra-class correlations of .99 (Massar et al., 2017; McIntosh et al., 2017). Schools achieving a TFI score of 70% or higher are considered to be implementing Tier 1 adequately.

Data collection

Baseline data were collected before any component of the intervention was discussed with the educational team. Thereafter, data collection occurred at the same time of the school year each year.

Table 2: Data collection

Instruments	Time of year
School climate questionnaire, in student, staff, and parent versions, including items on attendance and school absenteeism	Autumn, before implementation preparation (pre-test)
	Autumn, after 6 months of implementation (post-test 1)
	Autumn, after 18 months of implementation (post-test 2)
Internal and external assessment of implementation fidelity ¹	Winter and spring, beginning of implementation
	Winter and spring, after 1 year of implementation
	Winter and spring, after 2 years of implementation ²

Notes: 1. Only in the experimental group.

2. Due to COVID-19, the external assessment of implementation fidelity planned for June 2020 was cancelled.

Interventions

Tier 1 interventions

Tier 1 intervention involves defining, teaching, monitoring, and positively reinforcing a small number of values expressed through expected behaviors. It concerns all students, both inside and outside the classroom. In addition to the positive reinforcement that forms the core of the program, Tier 1 also requires careful consideration of the school's policy for managing problem behaviors, to standardize the consequences that follow students' inappropriate behaviors.

For this first level of intervention, it is important to clearly, explicitly, and consistently define both the expected behaviors in each area of the school and the associated reward system, as well as the consequences for inappropriate behavior. The school must also become accustomed to collecting and using data to make decisions.

The goals of this first phase of the program are to establish a school culture that allows students to know what behaviors are expected and valued, to create a sense of predictability and safety, and to maximize the time spent learning. Students need to be able to see that school expectations are predictable, consistent, safe, and positive. As in other examples of the Response to Intervention model (Fuchs & Fuchs, 2006), SWPBIS anticipates that an active investment in the prevention of inappropriate behaviors partially prevents problems from occurring through the ongoing assessment system, and prevents the escalation of problems through consistent, logical, and immediate interventions.

Tier 2 interventions: More intensive interventions for small, targeted groups of students

Once Tier 1 is implemented with fidelity, schools can move on to implement tiers 2 and 3. At these levels, moderate or intensive monitoring for students who do not “respond sufficiently to Tier 1 intervention” is arranged. Tier 2 interventions are designed for students whose behavior problems do not pose a serious risk to others or to themselves (Anderson & Borgmeier, 2010; Hawken et al., 2009). The goals of this level of intervention are to reduce the frequency of student behavior problems and prevent their escalation (Peshak-George et al., 2009).

There are different types of Tier 2 interventions. Check-In/Check-Out (Hawken et al., 2009) is, however, the most frequently used program at this level and rigorous scientific evaluations have demonstrated its effectiveness (McIntosh et al., 2009; Simonsen et al., 2010). These encouraging results prompted us to make it a priority. In concrete terms, more attentive support is offered to groups of students who are having difficulty adopting the expected behaviors, most often in the classroom.

Tier 3 interventions: Higher-intensity individual interventions for fewer students

Tier 3 interventions are highly individualized and based on a functional behavior assessment. A specially trained individual follows a process to understand the underlying needs spurring the student's recurrent problem behavior. Assessing the purpose fulfilled by the repetitive problem (according to the student), makes it possible to create a behavioral intervention plan, which can last between three and eight months. The plan guides the student towards preferable replacement behaviors when faced with the same kind of situations.

Some members of the SWPBIS teams were trained in this process.

Data and analysis

Response rate

Table 3 presents the number of questionnaires administered and returned, as well as the response rates for the teacher and student samples. The response rates for elementary and middle school students were satisfactory, although there was a differential in favor of the experimental group. The participation rate of parents exceeded the expected rate, which indicates the benefit of asking them about this dimension. Here again, the response rate was higher in the experimental schools. The teachers' response rate was lower than expected in both groups. The relatively low response rate is likely because the questionnaires were distributed to all the school staff members, including the maintenance staff, cooks, etc. However, some of these staff members and some teachers only come to the schools for a few hours and so did not participate in the study. Surveying only the regular teachers would have improved the response rate, but we wanted to consider all adults who interact with students as part of the staff.

Table 3: Questionnaires and response rates

Pre-test		Post-test 1		Post-test 2		
	Exp. G	Cont. G	Exp. G	Cont. G	Exp. G	Cont. G
Q distributed	T ^a = 110	T = 148	T = 119	T = 156	T = 119	T = 149
	EP ^b = 120	EP = 122	EP = 116	EP = 153	EP = v.a. ^c . 71/v.b. ^f . 71	EP = v.a. 85/v.b. 86
	SS ^c = 168	SS = 281	SS = 167	SS = 288	SS = 145	SS = 307
	P ^d = 545	P = 694	P = 585	P = 770	P = 564	P = 809
Q received	T = 72	T = 63	T = 69	T = 85	T = 58	T = 51
	EP = 106	EP = 94	EP = 107	EP = 131	EP = v.a. 57/v.b. 64	EP = v.a. 59/v.b. 66
	SS = 130	SS = 205	SS = 130	SS = 192	SS = 126	SS = 246
	P = 327	P = 320	P = 365	P = 340	P = 338	P = 414
Response rate	T = 65.5%	T = 42.4%	T = 58%	T = 55.5%	T = 49%	T = 34%
	EP = 88%	EP = 77%	EP = 92%	EP = 85.5%	EP = v.a. 80%/v.b. 90%	EP = v.a. 69%/v.b. 76%
	SS = 77%	SS = 73%	SS = 78%	SS = 67%	SS = 87%	SS = 80%
	P = 60%	P = 46%	P = 62%	P = 44%	P = 60 %	P = 51%

Notes: a/ T = teachers; b/ EP = elementary pupils from grades 4 to 6; c/ SS = secondary students; d/ P = parents; e/ v.a. = original version of the elementary questionnaire; f/ v.b. = second version of the elementary questionnaire: reversed Likert scale

Missing data

Data collected via Likert scales were scaled using the one-parameter item response logistic model generalized to polytomous items, specifically the so-called partial credit model. Analyses were performed with Conquest (Wu et al., 1997) software and estimates for individuals were made using the weighted likelihood estimate (Warm, 1985). Among the clear advantages of these IRT models is their ability to scale data from an incomplete evaluation design to a single scale. With this property, respondents with missing data can be given a score that is perfectly comparable to the scores of respondents without missing data.

Effect size

The effect sizes were calculated using Morris's formula (2003). Using this formula is valuable because it takes into account the difference between the sample sizes and also uses a polarized standard deviation. Finally, the process capability index (Cpk) allowed us to avoid the bias of overestimating the effect sizes (Morris, 2008).

There is no universal guideline for interpreting the significance of a standardized effect size estimate for an intervention (Hill et al., 2008). The rules of thumb suggested by Cohen (1988) have been used extensively. According to those guidelines, effect size of about .20 is considered “small,” about .50 is considered “medium” and about .80 is considered “large.”

However, Hill et al (2008) showed that the gain in effect size varies substantially depending on the nature of the intervention, the population, and the outcome measures. The authors therefore recommend that effect sizes be interpreted by comparing them to effects observed for similar interventions in similar settings. This means that for a school-wide program, an effect size of around .20 is still quite significant (Borman et al., 2002; Lipsey, 1998).

Results

Baseline Equivalence

Table 4 presents the comparison between the experimental and control groups on all dimensions measured at pre-test. Using a criterion of no more than .25 SD difference at pre-test (Baye et al., 2019), the experimental and control groups were comparable on all but three of the constructs measured. Taking a slightly looser criterion of .50 SD difference at pre-test (Slavin, 2008), the groups were comparable on all dimensions.

Table 4: Baseline equivalence between experimental and control group

Questionnaire version	Sub-scale	Experimental group		Control group		Effect size (Cohen δ)
		μ	σ	μ	σ	
Elementary	Order and discipline	3.81	1.23	4.13	1.44	0.24
Elementary	School safety	4.47	1.63	4.71	1.64	0.15
Elementary	School connectedness	10.89	2.14	11.01	2.10	0.06
Elementary	Peer victimization	7.74	3.44	6.84	3.15	-0.27
Secondary	School connectedness	13.45	3.22	13.62	3.09	0.05
Secondary	Peer support	15.62	2.97	15.84	3.04	0.07
Secondary	Adult support	12.07	2.99	12.21	2.81	0.04
Secondary	Cultural acceptance	11.42	3.35	12.68	5.24	-0.27
Secondary	Character	24.94	4.97	25.14	4.13	-0.08
Secondary	Physical environment	11.37	2.71	11.44	2.20	-0.10
Secondary	School safety	17.87	3.94	16.85	3.68	-0.26
Secondary	Order and discipline	19.87	3.96	20.36	3.82	0.12
Secondary	Peer victimization	10.28	4.48	9.38	3.63	0.22
Secondary	Disciplinary climate	14.90	3.79	14.46	3.33	-0.12
Secondary	Teacher unfairness	9.38	4.31	9.04	4.26	-0.08
Personnel	Staff connectedness	19.78	2.44	20.11	2.54	0.13
Personnel	Structure for learning	17.71	2.77	18.89	3.51	0.38
Personnel	Physical environment	11.75	1.96	11.77	2.30	0.02

Personnel	Peer and adult relations	17.42	3.02	19.27	4.41	0.50
Personnel	Parent involvement	6.98	2.10	7.85	1.81	0.44
Parent	Teaching and learning	12.53	1.67	12.22	2.12	-0.16
Parent	School safety	15.81	2.53	15.68	2.73	-0.05
Parent	Interpersonal relationship	26.15	3.33	25.42	4.35	-0.19
Parent	Institutional environment	9.62	1.41	9.51	1.45	0.08
Parent	Parent involvement	11.26	2.27	10.98	2.37	0.12

Cultural fit of the intervention

Table 5 shows the overall results of the implementation fidelity tests conducted each year, both internally (TFI) and by an external evaluator (SET).

Table 5: Fidelity scores

	SET year 1	TFI year 1	SET year 2	TFI year 2	SET year 3	TFI year 3
Experimental School 1	a	a	54.8%	53.3%	b	70%
Experimental School 2	a	a	73%	83%	b	73%
Experimental School 3	77.4%	56.6%	59.88%	80%	b	70%
Experimental School 4	72.5%	53.5%	77%	70%	b	73.5%

Notes: a = not administered (too early since the beginning of the implementation), b = not administered (COVID)

The TFI results for Year 3 show that all four intervention group schools were implementing Tier 1 universal prevention with sufficient fidelity to achieve the expected results of SWPBIS implementation. Three experimental schools were already meeting implementation fidelity in Year 2.

The difference in fidelity test scores for Experimental School 3 at the end of the second year of implementation is explained, in this case, by the absence of the principal during Year 2 of

implementation. Since the SET results are calculated based on the correspondence between the answers given by staff members and those given by the principal, they were strongly influenced by the principal's absence in Year 2. The TFI administered by the coach with the SWPBIS team shows that fidelity was met in Year 2.

Not all the implementation fidelity assessments scheduled for the 2019–2020 school year could be administered due to the COVID crisis and the extended school closure in FWB.

In conclusion, it appears that when the implementation fidelity results are examined as a whole, it can be inferred that the adaptation of the SWPBIS to the educational context of French-speaking Belgium was successful and working well, according to both internal and external fidelity indices.

Effects of Intervention

School climate

Table 6 presents the effect sizes after two years of SWPBIS implementation for pupils in the last three grades of elementary education since pupils in grades 1 to 3 are too young to be surveyed this way.

The effect for school connectedness was +0.45. This dimension comprises five items that cover various aspects: whether the child likes going to school and has the impression that he/she is performing well, whether the behavior of other pupils allows the teacher to carry out lessons, the quality of relations between pupils, and the possibility of finding help at school if the child needs it.

The effect size of the SWPBIS implementation on peer victimization was also higher in the experimental group as the scale was reversed ($ES = -0.23$). This points to the value of active supervision during recess, another component of the SWPBIS. The adults pay greater attention to the children and their experiences during recess supervision, and this logically prevents certain problematic situations from developing or escalating.

Unexpectedly, the results obtained on order and discipline show an effect size that was unfavorable to the experimental schools ($ES = -0.25$). The last dimension, school safety, comprising four items, shows a negative effect size close to zero ($ES = -0.09$). An examination of the averages demonstrated that the intervention did not have any detrimental effects, but it did not allow the experimental schools to progress more than the control schools.

Table 6: Effect sizes after two years of implementation - Elementary pupils (grades 4 to 6)

School connectedness (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.20	0.01	0.03	0.11		0.10	-0.16	
σ	1.04	1.02	0.91	0.92	+0.13	1.07	1.18	+0.45
n	108	94	108	131		56	59	
Order and discipline (environment)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.31	0.29	0.19	0.34		0.56	0.72	
σ	0.73	0.72	0.71	0.76	-0.23	0.75	0.74	-0.25
n	108	94	108	131		56	59	
School safety (safety)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.28	0.09	-0.02	0.14		0.46	0.35	
σ	0.87	0.96	0.80	0.79	-0.38	1.11	0.83	-0.09
n	108	94	108	131		56	59	

Peer victimization - reversed scale (safety)		T0		T1		ES	T2		ES
		SCP	Control	SCP	Control	(Morris δ)	SCP	Control	(Morris δ)
	μ	0.18	-0.21	0.06	0.20		0.40	0.31	
	σ	1.27	1.28	1.24	1.31	-0.41	1.43	1.30	-0.23
	n	108	94	108	131		56	59	

Eleven dimensions of school life were surveyed among middle school students (Table 7) before the program implementation, and during two consecutive years of the program.

Tableau 7: Effect sizes after two years of implementation - Secondary students

School connectedness (engagement)		T0		T1		ES	T2		ES
		SCP	Control	SCP	Control	(Morris δ)	SCP	Control	(Morris δ)
	μ	-0.09	-0.07	-0.09	0.06		0.40	-0.13	
	σ	1.08	1.06	1.68	0.86	-0.12	0.91	0.85	+0.51
	n	130	205	131	192		123	245	

Peer support (engagement)		T0		T1		ES	T2		ES
		SCP	Contrôle	SCP	Control	(Morris δ)	SCP	Contrôle	(Morris δ)
	μ	-0.24	0.01	-0.16	0.02		0.26	0.07	
	σ	1.09	1.22	1.20	1.19	+0.06	1.25	1.20	+0.37
	n	130	205	130	192		123	245	

Adult support (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.12	-0.10	-0.03	-0.01		0.55	-0.64	
σ	2.28	2.20	2.45	2.19	0.00	1.85	2.21	+0.54
n	129	205	128	192		123	245	
Cultural acceptance (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.53	-0.09	-0.01	0.10		0.26	0.16	
σ	1.50	1.48	1.66	1.49	+0.22	1.47	1.69	+0.37
n	129	205	128	192		123	244	
Character (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.06	-0.01	-0.05	0.18		0.14	-0.13	
σ	1.39	1.16	1.33	1.24	-0.14	1.02	1.18	+0.25
n	127	205	130	192		123	244	
Physical environment (environment)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.09	0.01	-0.17	0.24		-0.04	-0.05	
σ	1.29	1.14	1.26	1.13	-0.26	1.09	1.18	+0.09
n	127	205	129	192		123	244	

School safety -reversed scale (safety)		T0		T1		ES (Morris δ)	T2		ES (Morris δ)
		SCP	Control	SCP	Control		SCP	Control	
	μ	0.11	-0.02	-0.03	-0.08		0.01	0.03	
	σ	0.47	0.44	0.63	0.63	-0.18	0.59	0.61	-0.34
	n	126	205	129	192		123	244	
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Peer victimization -reversed scale (safety)		T0		T1		ES (Morris δ)	T2		ES (Morris δ)
		SCP	Control	SCP	Control		SCP	Control	
	μ	0.86	0.65	0.62	0.39		0.45	0.59	
	σ	1.37	1.28	1.44	1.23	+0.02	1.23	1.32	-0.27
	n	124	205	128	190		123	244	
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Order and discipline (environment)		T0		T1		ES (Morris δ)	T2		ES (Morris δ)
		SCP	Control	SCP	Control		SCP	Control	
	μ	-0.06	0.07	0.04	0.01		0.18	-0.08	
	σ	0.80	0.83	1.02	0.76	+0.20	0.79	0.86	+0.48
	n	123	204	128	192		123	242	
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Disciplinary climate - reversed scale (environment)		T0		T1		ES (Morris δ)	T2		ES (Morris δ)
		SCP	Control	SCP	Control		SCP	Control	
	μ	0.18	0.10	0.08	-0.15		-0.39	0.06	
	σ	1.53	1.33	1.67	1.37	+0.11	1.55	1.47	-0.37
	n	122	204	128	192		123	242	

Teacher unfairness - reversed scale (safety)		T0		T1		ES (Morris δ)	T2		ES (Morris δ)
		SCP	Contrôle	SCP	Control		SCP	Contrôle	
	μ	0.60	0.48	0.56	0.40		0.33	0.58	-0.34
	σ	1.07	1.07	1.14	0.92	+0.04	0.91	1.00	
	n	121	202	124	187		120	236	

For each of the dimensions considered, effect sizes in favor of students in the experimental groups were observed, albeit with variations. Effect sizes of about half a standard deviation were observed for the dimensions adult support (ES = +0.54), school connectedness (ES = +0.51) and order and discipline (ES = +0.48). We also observe positive results for peer support (ES = +0.37), cultural acceptance (ES = +0.37), discipline (ES = +0.37), school safety (ES = +0.34), but also peer victimization (ES = +0.27), as well as all the dimensions measured by our survey, except for the physical environment. Also of note is the ES in favor of the experimental group regarding the feeling of being treated fairly by teachers (ES = +0.34), a construct added because of its link to dropping out.

Students' parents were not particularly involved in the project during the early years of implementation, yet they were still surveyed. The results can be found in Table 8.

Table 8: Effect sizes after two years of implementation - Parents

Teaching and learning (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.12	-0.32	0.09	-0.27		0.35	-0.13	
σ	1.72	2.01	1.68	1.70	+0.09	1.80	1.76	+0.15
n	322	315	361	337		300	410	
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School safety (safety)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.24	-0.35	0.19	-0.12		0.11	-0.11	
σ	1.98	2.01	1.84	1.91	+0.10	1.87	1.87	+0.06
n	322	320	361	340		299	412	
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Interpersonal relationship (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.01	-0.23	0.23	-0.12		0.26	-0.31	
σ	1.70	1.94	1.84	1.79	+0.06	1.82	1.70	+0.18
n	321	319	361	338		300	414	
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Institutional environment (environment)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.01	-0.15	-0.22	-0.33	-	0.17	-0.63	
σ	2.25	2.28	2.38	2.24	-0.02	2.47	2.39	+0.13
n	316	317	360	337		298	413	
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Parent involvement (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.03	-0.11	0.01	0.13		0.11	-0.13	
σ	1.43	1.45	1.46	1.50	-0.18	1.56	1.41	+0.07
n	319	316	361	335		297	409	

The effect sizes were small but all positive. This is quite logical since there were relatively few actions targeting parents during the first two years of the project. These results mean that the more remote players, not directly involved in the project, noted improvements in the dimension relating to the quality of relations between all the stakeholders in the school (students, teachers, but also parents) and in the dimension relating to the environment the students experience at school.

For school staff (Table 9), there was a significant effect of the intervention on school climate dimensions on structure for learning ($ES = +0.60$), parent involvement ($ES = +0.58$), and peer and adult relations ($ES = +0.38$). There was no detectable impact on physical environment ($ES = -0.01$) and a negative effect on staff connectedness. The strongest effects were observed on the dimensions that showed the largest differences at pre-test, with the experimental group starting out from lower levels at pre-test on these dimensions.

It needs to be noted that the experimental schools all experienced a change in leadership. During these “downs,” the coaches observed that the most convinced teachers continued their efforts, while the others slackened off in the absence of a leader at the school, which could have weakened team cohesion and led to the result observed on this dimension.

Table 9: Effect sizes after two years of implementation – School staff members

Staff connectedness (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.13	0.37	-0.29	0.18		-0.81	-0.10	
σ	2.05	2.11	2.54	2.04	-0.11	2.51	2.27	-0.23
n	74	65	69	84		56	52	
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Structure for learning (environment)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	- 0.64	0.40	0.15	-0.06		0.15	-0.09	
σ	1.84	2.42	1.89	1.92	+0.58	2.17	1.99	+0.60
n	74	65	69	84		56	52	
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Physical environment (environment)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	0.32	0.31	0.03	-0.44		- 0.14	-0.14	
σ	1.76	1.86	1.31	1.45	+0.25	1.37	1.33	-0.01
n	74	65	69	84		56	52	
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Peer and adult relations (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	- 1.19	0.12	0.44	-0.23		0.32	0.59	
σ	2.23	3.20	2.02	2.48	+0.72	2.14	2.24	+0.38
n	73	65	69	84		56	52	

Parent involvement (engagement)	T0		T1		ES (Morris δ)	T2		ES (Morris δ)
	SCP	Control	SCP	Control		SCP	Control	
μ	-0.66	0.62	0.50	-0.71		0.36	0.11	
σ	2.77	2.43	2.42	2.37	+0.95	2.25	2.19	+0.58
n	73	62	65	80		56	49	

Absenteeism

The implementation of SWPBIS did not have a visible impact on student-reported absenteeism from class (Table 10). It did, however, have an effect on students arriving late for class.

Being on time for school and classes is an expected behavior emphasized in SWPBIS and is explicitly and actively taught in the program. In the study, punctuality was reinforced, while tardiness led to consequences (most often the recovery of lost time).

Table 10: Effect sizes after two years of implementation on truancy and tardiness declared by middle school students

Middle school students (n = 361 – 3 schools)	ES
I skipped a whole school day	+0.50
I skipped some classes	+0.04
I arrived late for school	- 0.65

Discussion

School climate may be a challenge in high-need schools. SWPBIS, as a complete framework, has existed for over 20 years in the United States (Sugai & Horner, 2002) as a program to improve student and teacher relationships and students' behavior through positive support. In the US context, a few positive results have been found concerning the effect of SWPBIS on school climate among teachers (Bradshaw, Koth et al., 2008, 2009; Caldarella et al., 2011; Horner et al., 2009; Smolkowski et al., 2016; Ward & Gersten, 2013) and students' attendance at school (Caldarella et al., 2011; Freeman et al., 2015, 2016; Molina et al., 2020; Pas et al., 2019; Smolkowski et al., 2016; Ward & Gersten, 2013). Unfortunately, no study has taken a comprehensive measurement of climate from students themselves. The purpose of this study was to measure the effects of SWPBIS in high-need schools on all stakeholders, including those primarily concerned—the students, using a comprehensive measure of school climate. In addition, this study wanted to test the feasibility of the project in a cultural context outside the United States. A small-scale feasibility study was a prerequisite for the wider extension of the project in an evidence-based education perspective (Slavin, 2017).

The feasibility of its implementation in the context of a French-speaking Western European country was not easy, due to a negative opinion about the behaviorist paradigm and a school culture massively oriented towards assessment-sanction and negative feedback, where students perceive little support from their teachers (OECD, 2019). Furthermore, the intervention was only offered to high-need schools where the school climate was particularly deteriorated.

Fidelity measures, which show if a practice and all its features correspond to a school culture, environment, and needs (McIntosh et al., 2010), were used to determine whether SWPBIS implementation culturally and contextually fit our school system. An examination of the internal implementation fidelity measures showed that three of the four pilot schools were able to reach the expected internal fidelity threshold of 70% in Year 2 of implementation and all four schools had reached fidelity after three years of implementation. This result could be expected in relation to the average time needed to implement universal prevention with fidelity (Nese et al., 2019), but it was not obvious to achieve it in a French-speaking context (Deltour et al., submitted). Regarding the external fidelity measure (SET), after two years, the fidelity

threshold of 80% (Horner et al., 2004) had not yet been reached. In particular, the schools were not meeting the SET criterion on data-based decision making. Data-based decision making in education (Schildkamp, et al., 2013, 2014) is not very present in our educational system, at least at the time the SETs were given. Yet, as McIntosh et al. (2018) have shown, the data use dimension is a significant predictor of program sustainability over time.

The second purpose of the study was to measure the effects of the program on the three dimensions of school climate (engagement, safety, and environment) and on absenteeism using a quasi-experimental design.

In this quasi-experimental study, we evaluated school climate outcomes for four schools implementing SWPBIS compared with five control schools that had not been trained in SWPBIS. Across the 25 school climate outcomes, the results indicated that 15 outcomes (60%) showed a $d > 0.25$ in favor of the experimental group.

We simultaneously surveyed students, parents, and educational teams. The results indicated that all stakeholders perceived benefits of the project. To date, we have found no other studies on the effects of SWPBIS on school climate dimensions conducted with high school students or parents. Our project contributes to the body of scientific knowledge because it provides results for both populations.

According to school climate literature and previous research (e.g., Cohen et al., 2009; O'Brennan & Bradshaw, 2013; Thapa et al., 2013), there are different ways of improving school climate such as implementing programs targeting social and emotional learning, bullying prevention, risk prevention, (mental) health promotion, or supporting positive behavior. SWPBIS is thus one of these approaches. Indeed, working on the quality of the relationships which are the “glue that binds together an effective school climate” (Payne, 2018, p.8) plays a role in the effort to enhance school climate. Therefore, it is not surprising to find positive impacts of SWPBIS implementation on the three dimensions of school climate.

Regarding middle school students, the overall results obtained for the different sub-dimensions of climate were positive. As far as we know, this is the first comparative study showing positive outcomes on a comprehensive measure of school climate for secondary students. With the

exception of the physical environment subscale, the effect sizes (d Morris) were systematically greater than .25.

Regarding parents, we observed positive effects on the three main dimensions of school climate. Admittedly, the effects on school safety and institutional environment were weak. The effects on interpersonal relations and teaching and learning were more interesting. These kinds of results could not be found elsewhere and thus cannot be compared to others.

Very little work to date has measured the effects of the program on elementary school students in terms of school climate, and the majority has focused on bullying. Ward and Gersten (2013) observed an effect of -0.24 on bullying, while Gage, Rose et al. (2019) found none. We observed nearly the same effect as Ward and Gersten (2013) on bullying. Nelson et al. (2002) found an effect on the feeling of safety, which we did not observe. We also noted a negative effect on the subscale order and discipline, a dimension that has not been evaluated by other research. That said, the effect is not detrimental (both groups progressed), but it should be noted that the control group has probably implemented more effective practices on this dimension. Unfortunately, we did not carry out more detailed observations of the control groups to better understand this type of phenomenon. For elementary students, the subscale school connectedness ($ES = +0.45$) saw the greatest increase. We find no such result in the scientific literature, with the only other “engagement” measures taken by Sørli & Ogden in Norway (2007, 2014, 2015) being slightly negative or zero. To date, our study is the first to document positive effects simultaneously on two of the three major dimensions of school climate.

Regarding teachers, we found particularly positive effects on the subscales of structure for learning ($ES = +0.60$), peer and adult relations ($ES = +0.38$), and parent involvement ($ES = +0.58$). These results echo those of Bradshaw, Koth et al. (2008), who also found positive results on two of the three main components of school climate, namely engagement (everything related to the relational quality between people) and environment (quality of resources and disciplinary policy).

In our opinion, the most notable result was the improvement on dimensions related to interpersonal relationships, which is convergent with Payne’s work (2018) and the importance of relationships in creating an effective school climate. The dimensions linked to relations are

found in various forms in each version of the questionnaire. In the personnel questionnaire, the subscales are peer and adult relations and structure for learning. The effects on these dimensions were respectively +0.38 and +0.60. In the questionnaire for primary school students, peer relationships are included in school connectedness, for which an effect of +0.45 was observed, and in peer victimization (ES = +0.23). For secondary school students, relationships with adults in the school and with peers are included in adult support (ES = +0.54: this is the largest increase of all the subscales in the questionnaire), peer support (ES = +0.37), cultural acceptance (ES = +0.37), teacher unfairness (ES = +0.34) and peer victimization (ES = +0.27).

We believe that the profound paradigm shift of rewarding students in a cultural context where such reinforcement is rarely used explains the positive results obtained in terms of improved student-teacher relations. Moreover, rewarding students, in parallel with maintaining consistent rules and sanctions, explains, in our opinion, the increase in the feeling of justice and the calmer relations between students.

Another explanation to such positive results can be found in Borman and colleagues' meta-analysis on comprehensive school reforms (2003), also known as whole-school reforms. To implement changes on a whole-school basis, specific ingredients need to be present: staff buy-in, professional development and training, quality external support and assistance. The same ingredients are also cited in Durlak and DuPre's review of the literature regarding the influence of implementation on program outcomes (2008). In the case of SWPBIS implementation in our educational context, staff buy-in was a prerequisite to joining the project, professional development and support were frequently provided, and assistance was ongoing.

Regarding absenteeism, we hypothesized a decrease in absenteeism reported by students attending SWPBIS schools. This dimension was measured only at the middle school level, where the problem is most prominent. Five studies have measured the effect of SWPBIS on full-day absenteeism among middle and high school students using administrative data (Caldarella et al., 2011; Freeman et al., 2015, 2016; Molina et al., 2020; Pas et al., 2019). Unlike these studies, we used a self-reported measure. Four of the previous studies found positive effects. Like Molina, our study, on the other hand, showed a negative effect on full-day

absenteeism. However, we obtained a positive effect of 0.65 on the self-reported measure of tardiness. This finding is consistent with the expected behavior articulated in all SWPBIS schools that all students must arrive on time to all classes.

Limitations and directions for future research

At the conclusion of this study, it is important to mention three essential limitations in order to avoid overgeneralizations.

First, school climate is a major component of school culture and has multiple implications. It is generally measured through questionnaires and therefore reflects the feelings of the respondents. However, these self-reported measures must be interpreted with some caution.

Second, the sample size and the “pilot” nature of the project were undoubtedly a limitation of this study. For example, while the results for elementary education were based on three experimental schools, the results for middle school education were based on only one school. Thus, there was a risk of confusing the effect of the program with the middle school implementing it. In addition, the absence of random components in the construction of the sample and its small size made it impossible to use inferential statistical tools. Furthermore, the experimental design adopted did not allow for guaranteed causality of the intervention on the observed effects. Thus, investigating the organizational health of the schools in the control group would add value to any future research, to ensure that the implementation of SWPBIS is indeed the cause of the improvement in school climate and not of the particular events experienced in the control schools, which would explain a decrease in the feeling of school climate.

Finally, the schools in the experimental group enroll students from mostly disadvantaged to very disadvantaged backgrounds. Future research could implement SWPBIS in schools with students from different socio-economic backgrounds to compare the effects of these demographic characteristics on implementation and to verify that school climate can improve through SWPBIS regardless of the setting. Indeed, school climate quality does not depend solely on the social and academic characteristics of the students.

Implications

In a school, a visitor can perceive a positive climate “within minutes” (DeWitt, 2016). In contrast, a deteriorated climate can take months or years to restore. In the high-need schools we worked with, improving climate and regaining control over student behavior management were significant challenges. To meet these challenges, the teams chose to set up a school-wide project, which also implied a “cultural revolution,” as positive feedback is not very common in our educational system.

The pilot experience showed that the significant investment made by the educational teams paid off and contributed to improving school climate and decreasing bullying, by enhancing the quality of peer relations as well as student-teacher relations. However, the project did not improve all aspects of absenteeism in secondary school. Overall, these results are likely to support the educational teams in their choices and help them overcome certain difficulties related to the implementation of the systems. The next challenge for SWPBIS coaches and teams is to achieve sustainability and for researchers to analyze what will contribute to maintaining the effects over time.

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FIFTH ARTICLE:

Deltour, C., Dachet, D., Monseur, C., & Baye, A. (2021). Does SWPBIS increase teachers' collective efficacy? Evidence from a quasi-experiment, *Frontiers*, 6, 720065.

Does SWPBIS increase teachers' collective efficacy? Evidence from a quasi-experiment

Abstract

Teachers' collective efficacy is predictive of students' success. School-Wide Positive Behavior Interventions and Supports implementation requires the whole team to set itself common goals regarding behavior management. The main purpose of this study was to investigate the medium-term effects of a SWPBIS intervention on teachers' collective efficacy. Nine schools and 139 teachers and staff members (n intervention = 74, n control = 65) took part in the study. The study shows that SWPBIS implementation has a positive effect on teachers' collective efficacy both for primary and secondary schools at post-test 1 ($ES = +0.80$) and 2 ($ES = +0.71$). Differences are observed at baseline and at posttests according to the educational level. The link between subscales of a school climate instrument and teachers' collective efficacy is also investigated. The "structure for learning" subscale explains the greatest variance in collective efficacy.

Keywords: teachers' collective efficacy, school-wide positive behavior interventions and supports, school climate, quasi-experiment, stepwise

Collective teacher efficacy is one of the most impressive predictors of student achievement, but the remaining question is how to improve it.

According to several authors (Donohoo, 2018; Donohoo et al., 2018; Eells, 2011; Sun et al.; 2017), collective teacher efficacy can counteract the negative impact of socioeconomic conditions on student learning. Hope therefore exists for principals of schools that enroll many students from minority, disadvantaged backgrounds.

We posit that a school-wide program working on school culture and common goals can improve teachers' collective effectiveness. Research by Sørli and Torsheim (2011) has demonstrated this previously. We intend to do so in turn, but in a different context. The novelties brought by our research are the validation of a measure of teachers' collective efficacy, in a French-speaking primary and secondary education context, and to examine the effects of the implementation of SCP (the French name of SWPBIS) in a quasi-experimental and longitudinal design including two post-tests.

The aim of this paper is to measure the evolution of collective efficacy in four schools where SCP was implemented, and to contrast it with the evolution of collective efficacy in five control schools.

Background

What is teachers' collective efficacy?

Collective efficacy is defined as teachers' beliefs about the educational team's ability to educate students. These beliefs constitute a norm that influences the actions and outcomes of schools. This definition comes from Bandura's own original research on this topic in 1993. According to Bandura, teachers operate collectively rather than as isolated individuals within an interactive social system. As such, the author notes that principal leadership contributes significantly to the development and maintenance of effective schools through their ability to bring their teams to work together by understanding the value of collaboration and believing in their ability to overcome obstacles as a team on the road to student success. The belief system of the educational team therefore creates a school culture that can have either vitalizing or

demoralizing effects on the way schools function as a social system: vitalizing if the team believes itself to be collectively capable of promoting the academic success of its students, otherwise demoralizing. Bandura (1993) therefore postulates a link between collective effectiveness and academic success. The other definitions found in the literature are all congruent with Bandura's definition.

For example, Goddard et al. (2000; 2001; 2004a, b) define collective teacher efficacy as the judgment of teachers in a school about the ability of the educational team to organize and execute the courses of action required to have a positive impact on students. Tschannen-Moran and Barr (2004) define collective teacher efficacy as the collective perception that teachers in each school have of themselves as making an educational difference for their students, beyond the educational impact of their families and communities. Skaalvik and Skaalvik (2007) define collective efficacy as teachers' beliefs in the ability of the educational team to implement strategies that will enable students to succeed. According to Skaalvik and Skaalvik (2007), schools with high perceived collective efficacy set ambitious goals and demonstrate persistence in their efforts to achieve those goals. These ambitious goals create normative pressure that encourages all teachers in the school to do everything they can to excel and discourages them from giving up when faced with difficult situations.

What is known about the sources and shaping of collective teacher efficacy?

According to the first research conducted on this subject by Bandura (1993), it seems that the collective efficacy perceived by teachers evolves according to the level at which they teach. Fairly low when children enter school, then increasing once children are more acclimated to school routines; when the complexity of academic demands increases in the senior years and some gaps are not filled, teachers perceive the decline of their school in terms of teaching effectiveness. This is even more true in schools attended by a disadvantaged audience. According to Bandura's (1993) research, students' unfavorable socioeconomic conditions affect their academic performance more because of the deleterious effect they have on the educational team's beliefs in its ability to motivate and educate students than because of direct links between these unfavorable conditions and academic performance. But the reverse is also true. With educational teams that strongly believe that, through their efforts, students can be motivated

and learn regardless of their social background, schools attended by minority and disadvantaged student populations can achieve high scores on standardized tests in reading and mathematics.

Goddard et al (2000) developed a model and a measure of collective teacher effectiveness. The foundations of their model are based on the concept of self-efficacy formulated by Bandura in 1993 and on the model of teacher effectiveness developed by Tschannen-Moran et al. in 1998. The sources of teachers' collective efficacy are, according to the authors who draw on Bandura (1993), the same as those of self-efficacy and are equally fundamental to the development of this collective belief: mastery experience, vicarious experience, social persuasion, and affective states (Goddard et al., 2000; 2004a, b). While the four sources of information are central to the shaping of collective efficacy, the cognitive processes of analyzing and interpreting information are also crucial. Consistent with the model of teacher efficacy described by Tschannen-Moran and colleagues (1998), Goddard and colleagues posit that there are two key elements in the development of teachers' collective efficacy: analysis of the teaching task and assessment of teaching skills. Teachers feel effective in teaching certain subjects to certain students in specific situations. They may feel more or less effective when circumstances differ. The authors therefore hypothesize that the development of perceptions of the group's ability to educate students successfully occurs when teachers consider the level of difficulty of the teaching task in relation to their perceptions of group competence. And, although the analysis of the teaching task and perceptions of group competence could be considered separately, perceptions of collective efficacy are formed only after teachers weigh the two elements presented above in relation to each other (Goddard et al., 2000). For the authors, perceived collective efficacy influences both individual and team behaviors.

Like Bandura (1993) before them, Goddard et al. (2000) believe that there is reason to believe that although collective efficacy is a relatively stable property, once it is developed, it can grow. According to the authors, this potential growth is consistent with the natural cycle of efficiency induced by reciprocal causality. For example, if gains in collective efficiency generate benefits, reciprocal causality suggests that these benefits can, in turn, enhance collective efficiency. However, this change in collective efficacy requires substantial effort.

In their 2011 systematic review on teacher efficacy, Klassen et al. note, however, that more research is needed to further investigate the sources and shaping of collective efficacy. As the link between teachers' collective efficacy and students' success has been highlighted by research and specifically in two meta-analyses (Eells, 2011; Sun et al., 2017), some authors have examined possible ways to increase it. School leadership appears to play a role in improving teachers' collective efficacy (Goddard et al., 2000; 2001; 2004a, b; Leithwood et al., 2020, Sun & Leithwood, 2017; Tschannen-Moran & Barr, 2004).

What has already been shown about collective teacher efficacy?

A first wave of research on collective teacher efficacy aims to shed light on the predictive link between collective teacher efficacy and student achievement in a school. Like Bandura in his 1993 study, Goddard et al (2000; 2004b) postulate a link between teachers' collective efficacy and students' academic success, mainly via the behaviors that this perception of efficacy induces. To this extent, they believe that there is much to be gained by leading schools along a path that will systematically develop the collective efficacy of educational teams. The authors postulate that the consequences of a high level of collective efficacy will be the acceptance of ambitious goals, great organizational efforts and persistence that will lead to better performance. But the opposite is, therefore, also true. Low collective efficacy will lead to less effort, a propensity to give up, and lower performance.

Goddard et al (2000; 2004b) developed a questionnaire based on their model and tested and validated it in a first study they did on a sample of 452 teachers from 47 elementary schools in the Midwestern United States. In their study, the authors hypothesized that collective teacher efficacy would be positively associated with school differences in student achievement, based on the theory that collective teacher efficacy can positively influence many teacher behaviors that would tend to improve student achievement. The results of the study show that collective teacher efficacy is a significant predictor of student achievement in both math and reading. The effect of collective teacher efficacy is larger in magnitude than any other demographic on both reading and math achievement. For math, the score on the collective efficacy measure is associated with an average gain of 8.62 points (out of 100). For reading, the average gain associated with the score on the collective efficacy measure is 8.49. Put another way, a one-

unit increase in teacher collective efficacy is associated with a more than 40% standard deviation increase in student achievement. These results are consistent with Bandura's 1993 research and posit perceived teacher collective efficacy as predictive of student achievement. The authors (Goddard et al., 2004b) replicated their first study in High schools and the results suggest the same tendency: for a 1 standard-deviation increase in collective efficacy a gain of 0.25 standard deviation is associated in terms of number of students who pass high-stakes assessments in 12th grade. The paper published by Donohoo et al. (2018) says no different and brings to the forefront the reciprocal causality between collective teacher efficacy and student progress ratings, already pointed out by Bandura in the first place (1993).

The results detailed above are confirmed by two meta-analyses. First, that of Eells (2011) who investigated the content of 26 studies on the effects of collective teacher efficacy on student achievement, and second, that of Sun and colleagues (2017) who, in turn, examined 11 studies on the effects of collective teacher efficacy and student academic outcomes. In both meta-analyses, on average, a strong positive correlation exists between collective teacher efficacy and student academic achievement. The conclusion that can be drawn from these meta-analyses is that collective teacher efficacy is a strong predictor of student achievement.

A second wave of research investigates the links between collective efficacy and other variables either at the teacher level or at the school level. Two Finnish researchers have investigated the extent to which teacher self-efficacy and collective efficacy mediate the effect of perceived school climate on teacher job satisfaction and burnout. Malinen and Savolainen (2016) investigated the issue through large scale longitudinal follow-up. The structural equation modeling indicates that perceived school climate is a significant predictor of teacher self-efficacy ($\beta = .26$) and collective efficacy ($\beta = .51$). According to Malinen and Savolainen (2016), this relationship indicates that collective efficacy shares elements with the constructs listed above: school climate and self-efficacy. The results of the study also highlight that self-efficacy correlates with teachers' collective efficacy ($r = +0.46$), as other researchers had demonstrated before them, for example: Goddard et al. in their 2000 study and, after them, Skaalvik & Skaalvik in 2007. In this study, however, collective efficacy did not show any mediating effect on job satisfaction or burnout.

Skaalvik & Skaalvik (2007), two Norwegian researchers, investigated the links between teachers perceived collective efficacy and their self-efficacy. The authors postulate that collective efficacy is predictive of self-efficacy. To explore this question, Skaalvik and Skaalvik (2007) developed a measure of teacher self-efficacy and a measure of collective efficacy. They used both measures in a study of a sample of 244 teachers from 12 primary and middle schools. Their results indicate that self-efficacy is strongly related to collective efficacy ($r = +0.64$), according to the structural equation modeling. Collective efficacy is not directly related to burnout, but the authors nevertheless found a moderate indirect link between collective efficacy and burnout, with this relationship being mediated by self-efficacy ($r = -0.49$). The authors, consistent with previous research, indicate that self-efficacy and collective efficacy are two different constructs and should be measured as such, that the relationship between the two is strong, positive, and reciprocal or bidirectional.

It should be noted, however, that the fit between the concept of collective teacher efficacy itself and the measurement tools used in the research conducted on the subject is not always present (Klassen et al., 2011). According to the authors, only two measures of collective teacher efficacy fit the conceptual definition: Skaalvik and Skaalvik (2007), and Tschannen-Moran and Barr (2004).

School-Wide Positive Behavior Interventions and Supports

School-Wide Positive Behavior Interventions and Support is a systemic approach - the term systemic is used here in the sense of "present at all levels" and implemented by all educational stakeholders - designed to establish support for both the social culture and individual behaviors, both of which are necessary for a school to be a safe and effective learning environment for all students (Sugai & Horner, 2009).

Universal prevention tools are introduced to all students: (a) to support prosocial behaviors, (b) to maximize educational opportunities and academic success, and (c) to prevent the onset of behavior problems (Sugai & Horner, 2009).

SWPBIS organizes a dual three-tiered system of support increasing in intensity according to students' needs and operating in parallel to address both behavioral and learning issues. The

system is built around a primary intervention, known as universal prevention, targeting all students in the school. Secondary interventions are designed to reduce or eliminate risk factors for certain students (+/- 15% to 20% of students) by providing them with “protective” factors. Tertiary interventions are aimed at reducing the complexity, intensity, and severity of behavioral problems in students with identified risk factors (+/-5% of students). This latter type of intervention is most often multidisciplinary and various experts are brought in. These interventions are always highly individualized to match students’ needs most closely (Sugai & Horner, 2002, 2006, 2009; Sugai & Simonsen, 2012).

SWPBIS, or SCP in its French version, is therefore a flexible, contextually, and culturally appropriate system for the school in which it is implemented, with the goal of creating a positive, safe, and effective learning environment by preventing and reducing behavioral problems through the development of values from which behavioral expectations are derived. These expectations must be clearly written in positive terms and observable by the educational team. They are then explicitly taught, displayed, and supported by a system of verbal and/or tangible feedback to build a positive school culture that reinforces students’ positive behaviors. Another key element of the system is the collection and use of data to guide the implementation and regulation of interventions in terms of both behavior and learning (Sugai & Horner, 2009).

SWPBIS and teachers’ sense of efficacy

The topic has been little investigated. Only one longitudinal study conducted by Sørli and Torsheim in Norway in 2011 examined the relationship between collective efficacy and the management of inappropriate student behavior. The purpose of Sørli and Torsheim (2011) was to conduct a multilevel analysis of the relationship between teachers' collective efficacy and behavior problems at school. The authors conducted this study as part of longitudinal research to question the effectiveness of the implementation of the Norwegian version of SWPBIS known as PALS. More than 1,000 teachers and principals from 48 Norwegian elementary school of different sizes participated in the study, which was conducted in two waves: the first in the spring of the 2006-2007 school year (Time 1) and the second, 6 months later, at the beginning of the following school year, 2007-2008 (Time 2). Of the 48 schools that

participated in the study, 28 were experimental schools and benefited from the implementation of the PALS program, while 20 schools formed the control group.

The authors used the Collective Efficacy Scale (CES; Goddard, 2001). This 12-item scale assesses the extent to which an educational team believes in its collective ability to positively influence student learning. To measure the amount of problem behavior, present in schools, Sørli and Torsheim (2011) used two measures based on teacher observations called Problem Behaviour in the School Environment Last Week and Problem Behaviour in the Classroom Last Week, developed by Grey and Sime (1989) and translated into Norwegian by Ogden in 1998. The measures consist of 15 and 20 items respectively.

At the school level, collective efficacy and behavior problems showed strong associations as indicated by correlations ranging from 0.70 to 0.78 ($+0.70 < r < +0.78$). Schools with high collective efficacy reported lower levels of behavior problems. At the school level, the correlation between collective efficacy and observed behavior problems in the classroom exceeded 0.90 ($r = +0.90$) and was 0.87 ($r = +0.87$) for behavior problems in common areas. These differences were stable over time.

The data presented in Sørli and Torsheim's (2011) longitudinal study confirm that collective efficacy is a significant variable at the school level and likely a stable feature of a school's culture. Sørli and Torsheim's (2011) findings are consistent with the assumptions made by Goddard and colleagues (2000; 2004b) when they established through their empirical research that collective efficacy is a stable school contextual variable that requires substantial effort to change.

That said, intervention programs such as SWPBIS (PALS in Norway) could change this. For example, Sørli and Torsheim (2011) found that in schools where collective efficacy increased from T1 to T2, teachers consistently reported a lower prevalence of behavior problems over time. In schools with a negative change in collective efficacy beliefs, teachers reported higher rates of behavior problems at T2 compared to T1. However, the authors state that they also found the opposite connection: the increase in the prevalence of behavior problems at the school over time is related to a decrease in perceived collective efficacy. Thus, according to the

authors' empirical research, there is a strong bidirectional predictive relationship between collective efficacy and behavior problems.

Sørli and Torsheim (2011) conclude that teachers from schools with high collective efficacy implement more consistent positive behavior support practices than teachers from schools with lower collective efficacy. Teachers in more collectively effective schools are also more likely to persist in their efforts to regulate behavior problems and to propose and reinforce a more common set of rules. The reverse is also true: if strong pressure is placed on positive student behavior and consistent responses to rule infractions, as in the implementation of SWPBIS, collective team efficacy may subsequently increase.

Teachers' collective efficacy contributes decreasing inequalities and is a strong predictor of students' achievement. Yet little is known – if anything – about how to improve it. SWPBIS, which has demonstrated its effectiveness at improving school climate and decreasing students' problem behavior, was identified as having the potential to improve teachers' collective efficacy to a large extent. However, to date, no comparative study has investigated the effectiveness of a program, or of SWPBIS in particular, in improving collective efficacy.

Research questions and hypotheses

First research question: Does the implementation of the French version of School-Wide Positive Behavior Interventions and Supports influence the collective efficacy perceived by the members of the educational teams?

It is hypothesized that perceived collective efficacy will increase more in schools where SCP is implemented compared to control schools.

Second research Question: Is teachers perceived collective efficacy related to aspects of school climate?

The hypothesis that perceived collective efficacy is related to school climate is formulated.

Third research Question: To what specific aspects of school climate is perceived collective efficacy related?

Previous research (e.g.: Malinen & Savolainen, 2016) highlights a link between school climate and collective efficacy. A predictive link between collective efficacy and student achievement has also been demonstrated by different authors (Bandura, 1993; Donohoo, 2018; Eells, 2014; Goddard et al., 2000; 2004; Sun et al., 2017). The hypothesis that is therefore posited is that the aspects of school climate that affect student success will be those highlighted by the results of the analyses.

Method and measurement

Participants

As this is a quasi-experimental research design, each of the four schools in the intervention group is matched with one or two control school(s) selected according to the following criteria: socio-economic status, size, location, educational network where possible, and the options offered (e.g.: language immersion).

It should be noted that three of the four schools in which School-Wide Positive Behavior Interventions and Supports is implemented are schools attended by students from low to very low socioeconomic backgrounds.

The sample is composed of staff members from the four pilot schools in which SCP is implemented. There are three elementary schools and one middle school. In all, this represents an $n = 74$ at pretest for the intervention schools. The other part of the sample consists of the teachers of the five control schools in which the research team did not intervene at all, apart from the times of data collection (passing questionnaires). This represents an $n = 65$ at pretest. One hundred and thirty-nine staff members answered the questions in this scale three times: 101 were teachers (73%), 110 were women (78%), 68 were elementary school teachers (49%), and 86 had been teaching for more than 11 years (62%).

The following table details the demographic characteristics of staff members at the participating schools.

Table 1: demographic characteristics at baseline

	Total number of team members	
	Intervention schools (n = 74)	Control schools (n = 65)
Characteristics		
Gender		
Male	17	11
Female	55	54
Missing	2	0
Position		
Teacher	48	53
Educator	6	2
Director	3	4
Administrative staff	0	1
Other (e.g.: supervisory staff, cleaning or kitchen staff)	17	4
Missing	0	1
Level		
Pre-K	10	9
Primary	19	20
Secondary	17	22
Missing	28	14
Years of experience		
0-5 years	11	16
6-10 years	15	9
11-15 years	10	12
More than 15 years	36	28
Missing	2	0

The following table presents the characteristics of the schools participating in the study.

Table 2: characteristics of participating schools

School	Education level^a	N Students	School particularity	School SES^b	Geographical characteristic	School type^c
Experimental 1	Elementary	84		4	Sub-urban	Public (state level)
Control 1	Elementary	149		7	Sub-urban	Public (state level)
Experimental 2	Elementary	127	Bilingual (French-German)	5	Sub-urban	Public (state level)
Control 2	Elementary	204	Bilingual (French-English)	4	Sub-urban	Public (state level)
Experimental 3	Elementary	208	Bilingual	19	Rural	Public (municipality)
Control 3	Elementary	149	Bilingual	18	Rural	Public (municipality)
Experimental 4	Middle school	160	Grades 7 & 8 only	2	Urban	Private (but mainly state funded)
Control 4	Middle school	180	Grades 7 & 8 only	3a	Urban	Private (but mainly state funded)
Control 4'	Middle school	115	Grades 7 & 8 only	1	Urban	Private (but mainly state funded)

Notes:

- d. Education level: Elementary schools goes from kindergarten to grade 6
- e. School SES: is defined each year by the Ministry of education according to socioeconomic status of the students for each school. It may range from 1 to 20, 1 being reserved to the most disadvantaged schools.
- f. School type: schools relate on 3 main networks: public at the state level, public at the local level, and private (mainly catholic schools funded at the state level; private schools may therefore welcome very poor students, like in experimental and control schools 4.

Instruments

Perceived Collective Teacher Efficacy Scale

The Skaalvik and Skaalvik (2007) scale was selected and translated. It consists of seven items (five points Likert scale) that reflect the ease with which the school educational team carries out its behavioral and cognitive tasks.

Here are the items in their original version, then in their French version.

Perceived Collective Teacher Efficacy Scale

- | | |
|--|--|
| 1. As teachers of this school, we can get even the most difficult pupils engaged in their school-work. | 1. En tant qu'équipe éducative de cette école, nous arrivons à ce que même les élèves les plus difficiles s'engagent dans leur travail scolaire. |
| 2. Teachers in this school prevent mobbing effectively. | 2. L'équipe éducative de cette école prévient efficacement le harcèlement moral. |
| 3. As teachers of this school, we handle conflicts constructively because we work as a team. | 3. En tant qu'équipe éducative de cette école, nous réglons les conflits de façon constructive parce que nous travaillons en équipe. |
| 4. At this school, we have a common set of rules and regulations that enables us to handle disciplinary problems successfully. | 4. Dans cette école, nous avons un ensemble de règles communes qui nous permettent de traiter avec succès les problèmes disciplinaires. |
| 5. Teachers in this school successfully address individual pupils' needs. | 5. L'équipe éducative de cette école répond avec succès aux besoins individuels des élèves. |
| 6. At this school, we are able to create a safe and inclusive atmosphere even in the most difficult classes. | 6. Dans cette école, nous sommes capables de créer une atmosphère sécurisante et où chacun a sa place même pour les classes les plus difficiles. |
| 7. Teachers at this school succeed in teaching math language skills even to low-ability pupils. | 7. L'équipe éducative de cette école réussit à enseigner les maths et les compétences linguistiques même aux élèves ayant de faibles capacités. |
- (1) false, (2) mostly false, (3) sometimes false/sometimes true, (4) mostly true, (5) true.

Modalités de réponse : (1) faux, (2) faux la plupart du temps, (3) parfois faux/parfois vrai, (4) vrai la plupart du temps, (5) vrai.

We translated and adapted the Suite using double translation followed by reconciliation and validation by an expert (Grisay, 2003; Harkness, 2002).

After a field test of the scale with about 20 volunteer teachers, four people were contacted again to conduct a cognitive laboratory to ensure the quality of the translation. The research team wanted to verify that the understanding of the concept in French had the same meaning as in the original version of the measure.

Internal consistency analysis of the scale conducted on SAS 9.4. indicated a Cronbach's alpha of 0.86 on pretest data. Exploratory factor analysis was conducted on MPlus (Muthén & Muthén, 1998-2011) to compute McDonald's hierarchical omega (Béland et al., 2017; Deng & Chang, 2017; Peters, 2014), with the following formula:

$$\omega = \frac{(\sum_{j=1}^J \lambda_j)^2}{(\sum_{j=1}^J \lambda_j)^2 + \sum_{j=1}^J \psi_j^2}$$

The result obtained is: = +0.84. According to McDonald (1999), this is a good index.

The measures of internal consistency of the perceived collective efficacy scale attests to the internal consistency and reliability of the instrument as used in French speaking Belgium. The scale was added to the end of the school climate questionnaire given annually to members of the educational teams in both the experimental and control schools. This choice was made by the researchers not to multiply the number of questionnaires to be completed by the teams.

To ensure the validity of the pre-test measure, the first administration of the scale took place before any detailed presentation of SCP was made, i.e., at the very beginning of the full team training day devoted to the selection and definition of values. The questionnaire was offered at the same time of year (between the third week of November and the winter break) for the next two years.

School climate questionnaire

The Georgia School Climate Survey Suite (Anonymous, 2021), in its "staff member" version (31 items, four points Likert scale), was translated and adapted using the following method: double translation, reconciliation, and expert validation.

The protocol described for the Perceived Collective Teacher Efficacy scale (field test, cognitive laboratory), was applied to the Climate questionnaire.

The sub-dimensions of the climate questionnaire are staff connectedness: staff perceptions of the degree to which they feel they fit in and are a part of their school ($\alpha = .80$); structure for learning: staff perceptions of the degree to which they feel their colleagues treat students fairly, have high expectations, and set clear rules ($\alpha = .84$); physical environment: staff perceptions of maintenance of school grounds and resources ($\alpha = .74$); peer/adult relations: staff perceptions of how students interact with peers and adults in their school ($\alpha = .88$); and parental involvement: staff perceptions of the degree to which parents are involved in their student's education ($\alpha = .83$) and school safety: staff perceptions of their own safety at school (removed due to a lack of internal consistency).

Baseline comparison

Besides school's characteristics comparability (Table 2), baseline comparability between the intervention and control groups was verified for all sub-dimensions of the school climate questionnaire, as this was the main outcome of the study. The difference between groups at pretest is less than half a standard deviation (Slavin, 2008) for each of the sub-dimensions of the climate questionnaire, with a minimal difference at pretest of $ES = +0.02$ and a maximal difference of $ES = +0.44$.

Baseline difference between groups with respect to perceived collective efficacy was greater than half a standard deviation on the total sample of teachers (Hedges $g = -0.67$). When computed by education level according to What Works Clearinghouse standards (2020), analysis shows that intervention and control groups are highly contrasted in primary education (Hedges $g = -1.19$) and comparable at secondary level (Hedges $g = -0.08$).

Data collection and software

Data collection to verify the effects of SCP implementation was conducted as follows: the pre-test questionnaire was administrated before starting SCP preparation. The first post-test questionnaire was administrated at the same period one year later, which means six months after the start of the implementation. The second post-test was administrated at the same period two years later or eighteen months after the implementation started. Timeline for data collection can be found in Table 3.

Table 3: data collection

Instruments	Time of year
School climate questionnaire + collective efficacy scale	Autumn before preparation with PBIS team (pre-test)
School climate questionnaire + collective efficacy scale	Autumn after 6 months of tier one implementation (post-test 1)
School climate questionnaire + collective efficacy scale	Autumn after 1 year and a half of tier one implementation (post-test 2)

To answer research questions 1, 2, and 3, SAS 9.4 software was used: to calculate effect sizes, first; to perform a Stepwise regression analysis, second; and to allow the software to test for a link between the climate questionnaire and perceived collective efficacy.

Results

Question 1: Influence of SCP on teachers' collective efficacy

The magnitudes of the effect of SCP implementation on perceived collective efficacy calculated first at post-test 1, then at post-test 2, for all staff members across all levels of education are quite large: $ES = +0.80$ at post-test 1 and $ES = +0.71$ at post-test 2. The detailed results are shown in Table 4.

Table 4: teachers' collective efficacy comparison between baseline, post-test 1 and post-test 2 (all educational levels)

Intervention group			Control group			Between group difference			
	Pre	Post1	Post2	Pre	Post1	Post2	Pre	Post1	Post2
Mean	23.75	26.94	27.90	27.02	26.33	27.71	***	ns	ns
SD	4.26	3.97	4.12	5.43	4.92	3.53	g = -	g	g
N	65	53	50	53	75	41	0.67	=+0.13	=+0.05
Effect sizes	Post-test 1 Morris $\delta = +0.80$			Post-test 2 Morris $\delta = +0.71$					

Notes: between group differences are reported for each time: significance of differences is computed by Student's T analysis for independent samples: ns not significant; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; the magnitude of the between group differences have been computed using Hedges g . Effect sizes of the intervention are computed with Morris' δ .

Since comparability was not ensured at pretest between intervention and control groups across all educational levels – there is comparability among secondary staff in terms of sense of collective efficacy, whereas this is not the case in elementary schools – effect sizes were computed separately for elementary and secondary schools. They are presented in Tables 5 and 6.

Table 5: teachers' collective efficacy comparison between baseline, post-test 1 and post-test 2 (at the primary level)

Intervention group			Control group			Between group difference			
	Pre	Post1	Post2	Pre	Post1	Post2	Pre	Post1	Post2
Mean	24.18	27.47	28.46	29.77	28.84	29.26	***	ns	ns
SD	4.72	3.82	4.00	4.58	4.78	3.53	g = -	g = -	g = -
N	39	34	37	30	32	19	1.19	0.31	0.21
Effect sizes	Post-test 1			Post-test 2					
	Morris $\delta = +0.90$			Morris $\delta = +1.02$					

Notes: between group differences are reported for each time: significance of differences is computed by Student's T analysis for independent samples: ns not significant; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; the magnitude of the between group differences have been computed using Hedges g . Effect sizes of the intervention are computed with Morris' δ .

Table 6: teachers' collective efficacy comparison between baseline, post-test 1 and post-test 2 (at the secondary level)

	Intervention group			Control group			Between group difference		
	Pre	Post1	Post2	Pre	Post1	Post2	Pre	Post1	Post2
Mean	23.12	26.00	26.31	23.43	24.47	26.36	ns	ns	ns
SD	3.44	4.15	4.21	4.27	4.18	3.00	$g = -$	g	$g = -$
N	26	19	13	23	43	22	0.08	$=+0.36$	0.01
Effect sizes	Post-test 1 Morris $\delta = +0.47$			Post-test 2 Morris $\delta = +0.07$					

Notes: between group differences are reported for each time: significance of differences is computed by Student's T analysis for independent samples: ns not significant; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; the magnitude of the between group differences have been computed using Hedges g . Effect sizes of the intervention are computed with Morris' δ .

The collective efficacy mean score increased at both time in intervention group, while it remained stable in the control group, being already higher at baseline. At the same time, the difference between intervention and control groups at pretest measured by Student's T became not significant at posttests 1 and 2. The effect sizes of SCP implementation on teachers perceived collective efficacy were +0.90 at post-test 1 and +1.02 at post-test 2 for educational teams in elementary schools. These results must be interpreted with caution considering that the experimental group was less confident in its collective efficacy at baseline.

The situation was different for educational teams in secondary schools. Intervention and control groups were comparable at baseline on demographic and on climate and collective efficacy scales. The effect size of SCP implementation on teachers perceived collective efficacy was positive and in favor of the intervention group at post-test 1 ($ES = +0.47$) and marginal at posttest 2 ($ES = +0.07$). In intervention group, mean results increased after 6 months of implementation, and then remained stable. In control group, there was a slight increase at posttest 1, and another one at posttest 2, with a decrease of the standard deviation.

When mean results are examined, there was an increase in perceived collective efficacy between baseline and post-test 1 at both educational levels. This improvement was maintained

at post-test 2, eighteen months after the start of the implementation, for secondary staff. Improvement went further at post-test 2 for primary staff.

Questions 2 and 3: Link between collective efficacy and school climate

Following the example of Malinen & Savolainen (2016), the researchers wanted to investigate the possible links between the sense of collective efficacy and school climate. The results of the Stepwise regression analysis performed on SAS 9.4. can be found in Table 7. Model 5 was selected because it has the lowest Mallows relevance index ($C(p) = 3.3751$) and the highest percentage of variance explained (73.57% of variance explained). Stepwise regression results show that 73.57% of the variance is explained by the variables group (intervention vs. control), gender, structure for learning, physical environment, and peer and adult relationships.

Table 7: Stepwise regression analysis results

Synthesis of the Stepwise selection								
Step	Variable Entered	Variable Removed	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	Structure for learning		1	0.64	0.64	21.82	137.35	<.0001
2	Group		2	0.05	0.69	9.68	13.00	0.0005
3	Physical environment		3	0.03	0.72	4.72	6.90	0.0104
4	Sex		4	0.01	0.73	3.69	3.08	0.0835
5	Peer adult relationship		5	0.01	0.74	3.38	2.40	0.1255

Note: The subscale “structure for learning” explains 63.78% of variance in the Stepwise model.

The dimension of the climate questionnaire administered to teachers in the intervention and control groups that explained the greatest percentage of variance in teachers perceived

collective efficacy was the dimension “structures for learning”. It explained 63.78% of variance in collective efficacy.

Other elements intervened in the explanation of the variance and notably that of belonging to the intervention group. Membership of the intervention or control group explained 5.23% of the variance.

Discussion

Considering the mean improvement of perceived collective efficacy in the intervention schools, we observe an improvement at both education levels at post-test 1 and post-test 2. Considering the improvement due to the intervention, the extent to which this perception has improved varies depending on the level of education and on the sharpness with which these results are analyzed. As we consider that comparability between groups on all independent (demographic) and dependent (climate and perceived collective efficacy) variables must be present at baseline, then this study concludes that, after the SCP implementation, the secondary school staff perceives an increase in collective efficacy. If some consider that comparability on the independent variables (demographics) and on the main dependent variable (school climate) is an indicator of groups’ comparability at baseline, then both primary and secondary teams in schools implementing SCP perceive an improvement in collective efficacy.

As Kelm and McIntosh (2012) and Sørli and Torsheim (2011) have demonstrated in their studies, the explanation for these effect sizes of SCP implementation on perceived collective efficacy is the decrease in behavioral problems and time spent on them. Indeed, the harmonization of common practices of positive and coherent discipline management within schools implementing SCP, thanks to all the components of the system, allows educational teams to see a decrease in problematic behaviors and the time spent on them. Through the implementation of SCP components, educational team members perceive greater collective effectiveness.

Based on the results of research conducted by Ross et al. in 2012, the researchers also postulate that the sense of collective efficacy of the educational teams in the four pilot schools where

SCP is implemented has increased well because teachers working in low socioeconomic status schools benefit from SCP first, which is the case for the pilot schools our country.

The improvement is maintained at post-test 2, although the changes in leadership in all the intervention schools happened shortly before taking the “climate and collective efficacy of teachers” questionnaires at post-test 2 and may have put the educational teams in significant difficulties in terms of the functioning of the schools. Indeed, these changes in terms of leadership and operational difficulties may have affected the teams' sense of collective efficacy, since previous research found a link between executive leadership, institutional functioning, and sense of collective efficacy (Goddard et al., 2000; 2001; 2004a, b; Leithwood et al., 2020, Sun & Leithwood, 2017; Tschannen-Moran & Barr, 2004).

As hypothesized in the second research question and as Malinen and Savolainen (2016) demonstrated in previous research, perceived collective efficacy is related to school climate. Stepwise regression analysis linking items from both climate and perceived collective efficacy instruments demonstrates this. Linking sub-dimensions of school climate to perceived collective efficacy explains up greatest variance in perceived collective efficacy. To the extent that school climate and perceived collective efficacy are part of a school's culture, the link between the two is not surprising. The concept of school climate refers to the quality and characteristics of school life (Cohen et al., 2009; Gage et al., 2016). School climate influences student outcomes in behavior and social skills (Gottfredson et al., 2005; McIntosh et al., 2006; Gage et al., 2016). The Stepwise regression analysis highlighted the subscale “structures for learning” as the part of the climate questionnaire that explained the most variance in collective efficacy. The items constituting this sub-dimension relate to what teachers put in place to support student success (e.g.: “my school promotes success for all students” or “teachers in my school work hard to ensure that all students do well”). The content of these items relates to the efforts made by the educational team to support students' academic success. To the extent that collective efficacy is defined as teachers' beliefs about the ability of the entire educational team to positively influence students and their success (see above) and to the extent that academic success is discussed as both a predictor of and an outcome of perceived collective efficacy (Bandura, 1993; Donohoo, 2018; Donohoo et al., 2018; Eells, 2011; Goddard et al, 2000, 2004b; Sun et al., 2017), it is not surprising to find a link here too between collective efficacy

and the elements put in place to promote student success and perceived collective efficacy. This dimension “structures for learning” alone explains for the greatest variance in the sense of collective efficacy in the Stepwise model.

This study is subject to a few *limitations*. *Firstly*, at the beginning of the research, the questioning of the collective effectiveness of the educational teams with which the researchers would work to implement SCP indicated a deficit of collective effectiveness. Some of the educational teams were dysfunctional. It is worth noting that the research project on the effects of SCP implementation focused on schools in “adjustment mode”. These “underachieving” schools were audited based on a few criteria, one of which concerned the (dys)functioning of the educational team. In other words, it was difficult for the research team to find comparison schools on that criterion. SCP implementation is not intended to solve team cohesion issues. However, thanks to the efforts made by the educational teams to harmonize their practices for the joint management of the various aspects of school discipline – prevention and correction – the collective effectiveness perceived by the teams themselves evolved positively, much more positively than the initial situation would have suggested.

Secondly, the size of the sample on which the research was conducted, and the “pilot” nature of the project do not allow for the generalization of the results observed. If SCP was implemented on a larger scale and the research replicated on a larger sample, the differences observed at baseline between the groups would be reduced. Furthermore, the absence of random components in the construction of the sample and its small size make it impossible to use inferential statistical tools.

Thirdly, the research team did not have access to information from the control schools, apart from that collected through the various questionnaires. It cannot be ruled out that specific situations or elements may have a link with the decrease in collective effectiveness perceived in these educational teams. Investigating the functioning of the schools in the control group would represent an added value for future research to ensure that it is indeed SCP implementation that improves the perceived collective effectiveness and not particular events experienced in the schools in the control group that explain the decrease in this same feeling within these schools.

Our findings give *directions for future research*. *Firstly*, schools in the intervention group enroll students from disadvantaged to very disadvantaged backgrounds and are therefore more likely to benefit from SCP implementation. Future research should implement SCP in schools with students from different socioeconomic backgrounds to compare the effects of these demographic characteristics on implementation and to verify that perceived collective efficacy increases more quickly and more in schools with more disadvantaged students.

Secondly, as the Stepwise regression, used to investigate whether a link between collective efficacy and school climate exists, does not allow to analyze mediating variables, SEM analyses could be conducted in future research.

Our findings also has some *implications for practice*. While the extent to which the perceived improvement in collective efficacy varies, the reasons for this improvement are the same: first, the set of components of SCP and the efforts required from the educational teams to implement them, and second, the socio-economic level of the schools in which SCP has been implemented. Harmonizing practices requires considerable effort, especially considering the pedagogical freedom usually granted to teachers in French speaking Belgium. Getting all members of an educational team to agree on common values, on expected behaviors, on an explicit and active way of teaching them, on a system of reinforcement as well as on a common policy for dealing with inappropriate behaviors is not an easy task, especially since it is not enough to agree in theory, but to apply them in a common and consistent way. Getting all staff members to agree on this common discipline and on its application by all requires considerable effort, which may well correspond to that mentioned by Bandura in his study (1993), and which can lead to a change in perceived collective effectiveness. Changing elements of a school's culture such as perceived collective efficacy requires significant change and effort.

As Sørli and Torsheim (2011) have previously demonstrated, by jointly and consistently implementing SCP components, such as expected, and commonly known behaviors taught explicitly, reinforcement of appropriate behaviors, and a common policy for managing inappropriate behaviors applied consistently, the educational team acts on their students' behavioral issues and time. By aligning behavior management practices to reduce the

occurrence of problem behaviors, the school team's collective effectiveness also increases, if all the key elements of SCP are implemented with fidelity.

It should also be noted that changes in school leadership can have an impact on perceived collective efficacy insofar as the leadership of school principals contributes significantly to the development and maintenance of effective schools through their ability to get their teams to work together by understanding the value of this collaboration and by believing in their ability to overcome, as a team, the obstacles on the way to their students' success (Bandura, 1993; Goddard et al., 2000; 2001; 2004a, b; Leithwood et al., 2020, Sun & Leithwood, 2017; Tschannen-Moran & Barr, 2004).

Overall, the main purpose of this study was to investigate the issue of perceived collective efficacy improvement through SCP implementation in a quasi-experimental research design. Using the scale translated from Skaalvik and Skaalvik (2007), the research team was able to observe the effect of SCP implementation on perceived collective efficacy in the pilot schools. Using measures collected in the control schools, the researchers found that the implementation of the key elements of SCP improved the collective efficacy perceived by the educational team. Regardless of the issue of group comparability at baseline that has been discussed in this article, the implementation of the various components of the SCP has effects on the perceived collective efficacy of educational team members in the intervention group schools.

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**“Education is the most powerful weapon which you
can use to change the world”**

Nelson Mandela

Discussion

First, we will briefly revisit our baseline hypotheses to assess whether they were validated through the five studies conducted. We will then discuss the implementation and effectiveness of SWPBIS in our specific educational system.

Baseline hypotheses and summary of the findings

1. The body of existing research on SWPBIS implementation and outcomes will be robust and empirically supported.

To investigate the expected outcomes from SWPBIS implementation, we conducted a systematic and critical review of the literature. Ultimately, 39 studies presenting student and teacher outcomes due to SWPBIS implementation were included in our review. As we also aimed to examine the methodological qualities of the included studies, we noted that the criteria related to sample sizes, duration of the investigations, and quality of the measurement tools were easily met, whereas criteria related to the baseline comparability between groups, either on sociodemographic or dependent variables, and RCT design were harder to meet. Only eight of the 39 studies were randomized controlled trials that met all the quality criteria. In conclusion, our study shows that there is a large body of existing research concerning SWPBIS and its numerous outcomes, but its robustness would be improved in future studies by accounting for methodological qualities. An example would be to choose (quasi)-experimental designs.

2. SWPBIS implementation in the context of French-speaking schools in Belgium will be quite similar to implementation in comparable contexts: barriers and enablers will be common.

The exploratory work accomplished with our colleagues from Quebec and France illustrated commonalities between the ways SWPBIS implementation is conducted in our three educational contexts. First, because of the difference in years of implementation and the staff members' common vision of the teaching profession, we observed similarities in the contexts of France and FWB. Further, because implementation in FWB is linked to a research project

led by the university and supported by professional coaches, we shared similarities with Quebec regarding the implementation. Yet local differences and adaptations arose in our comparison such as Quebec's inclusion of a leadership measurement in the staff buy-in. But this work's major contribution to the field relates to the unavoidable facilitating factors that should be present whenever a new SWPBIS implementation is about to start. These three factors are the presence of school leadership and their dedication to supporting SWPBIS implementation; available resources, preferably in the form of quality time to prepare, set up, and monitor the system; and quality support at all implementation stages through regular professional coaching and ongoing access to technical assistance. If one of these three factors is lacking, then implementation quality and sustainability may be jeopardized, and outcomes may not be obtained.

3. SWPBIS implementation is feasible in the school context of French-speaking Belgium and fidelity will be achieved.

We hypothesized that implementing SWPBIS in French-speaking Belgium would not be easy as reservations exist concerning the behaviorist paradigm in the schools that plays out as a reinforcement system. Giving positive feedback to students is not common in our school culture, which is massively oriented towards assessment-sanction systems and negative feedback (OECD, 2019). Nevertheless, some staff members in the pilot schools were already convinced of the power of positive reinforcement. Other staff members experienced that positive power through the project and started changing their practice. These practice changes, however, were not always sufficient to achieve implementation fidelity. After three years of implementation, all four pilot schools achieved internal fidelity. External fidelity has not yet been achieved because data collection and use are still not fully part of the school culture, as seen in the results from the School-Wide Evaluation Tool (SET).

4. Compared to the control schools, school climate will improve for all stakeholders (staff members, students, and parents) in the experimental schools.

School climate refers to the quality and characteristics of school life as well as the quality and consistency of interpersonal relationships at school. A positive school climate is associated with several positive outcomes in behaviors, social skills, attendance, and academic

achievement. SWPBIS implementation has already been shown to improve numerous dimensions of school climate. As we implemented SWPBIS in French-speaking Belgium, we wanted to measure the implementation effects on all three dimensions of school climate (engagement, safety, and environment). Our study adds to the existing body of knowledge as it included all three dimensions of school climate, surveyed all the stakeholders (i.e., students, staff members, and parents) and took place at both the elementary and high school levels. Out of the 25 school climate outcomes measured by a comprehensive questionnaire, 15 of them were in favor of the experimental group with a $d > 0.25$. Results indicate that all stakeholders perceived school climate improvement as a consequence of SWPBIS implementation. Furthermore, our study appears to be the first on the effects of SWPBIS on school climate dimensions conducted with all stakeholders.

The positive results found in categories such as “Peer support,” “Adult support,” “Peer and adult relations,” and “Interpersonal relationship” can all be grouped under the umbrella of relationship quality. This means that all stakeholders noted an improvement in the quality of their interpersonal relationships. Specifically, this refers to the quality of the student-teacher relationship, which is underscored by those results. But there were also positive outcomes in the dimensions of “Teacher unfairness” and “Peer victimization.” We believe that SWPBIS implementation and the profound paradigm shift of rewarding students in a cultural context where such reinforcement is not very present explains the positive results obtained in terms of improved student-teacher relations. Moreover, rewarding students, in parallel with the consistent application of rules and sanctions, explains, in our opinion, the increased feeling of justice and the calmer relations between students.

5. Compared to the control schools, student absenteeism and lateness will decrease in the experimental schools.

Unlike some studies, we found no positive effects of SWPBIS implementation on absenteeism. We used self-reporting tools to collect these data. Students also provided self-reported feedback on tardiness. For the latter, they reported being more on time after two years of SWPBIS implementation than at the baseline measurement. In contrast with the result on absenteeism, the effect of SWPBIS implementation on tardiness is positive and quite impressive, even

though this result should be confirmed by collecting data. In accordance with other research findings, we postulate that this result is directly linked to the improved quality of student-teacher relationships.

6. Compared to the control schools, teachers' collective efficacy will improve in the experimental schools.

Teachers' collective efficacy is one of the most impressive predictors of student achievement as it can counteract the negative effect of students' SES on their learning. In our view, implementing whole-school, universal prevention interventions such as SWPBIS can help enhance teachers' sense of collective efficacy. Therefore, we included a measurement of teachers' collective efficacy in the school climate questionnaire to investigate our hypothesis. The mean results indicated an improvement of perceived collective efficacy at both educational levels in the experimental group. Yet these results cannot be confirmed in terms of effect size for all educational levels since a baseline comparison of the dependent variable was not available for elementary school staff members. For middle school staff members, the situation was different. Baseline data were comparable for both the intervention and control groups. In the intervention group, improvement was observed after six months of implementation and remained stable afterwards, while results improved in the control group at both post-tests. The results revealed a clear link between teachers' collective efficacy and the school climate questionnaire, particularly its "Structure for learning" subscale.

Discussion

To a large extent, our baseline hypotheses were confirmed through the studies we conducted. Yet, some additional arguments should be considered while questioning and assessing SWPBIS implementation, effectiveness, and its relevance to our educational context. The elements that enrich the discussion are mainly linked to the sustainability of the system and its outcomes.

First, we will discuss the school-wide characteristic of the program and the consequences arising from it. Then, we will examine the fidelity of the implementation, which plays an important role in achieving outcomes when implementing SWPBIS. Next, we will consider what data collection and data-based decision-making (DBDM)—two key-components of the SWPBIS system—imply and in what way this new way of functioning can represent a barrier

to implementation fidelity and intervention sustainability. We will also investigate the difference between DBDM at tiers 1 and 2. Lastly, we will look at the role SWPBIS implementation can play in reducing the impact of students' SES background on learning.

The school-wide characteristic of SWPBIS and its consequences

We are interested in exploring an important aspect of SWPBIS implementation: the collective dimension of the intervention, embodied by the school-wide aspect of the proposed changes. Indeed, we consider that implementing SWPBIS in French-speaking Belgium is, in many ways, comparable to implementing a comprehensive school reform. According to Borman et al. (2002), comprehensive school reform (CSR) “focuses on reorganizing and revitalizing entire schools, rather than on implementing a number of specialized, and potentially uncoordinated, school improvement initiatives” (p. 2). In this view, SWPBIS implementation in the pilot schools in our context can be seen as a comprehensive or whole-school reform to manage interpersonal relationships, discipline, and behaviors. In fact, SWPBIS implementation requires all staff members to agree on the shared value with which the expected behaviors will be aligned. Afterwards, the entire staff must validate the revised discipline management method and use it in a standardized manner so that students will feel they are being treated fairly and equally by any and all staff members.

Various elements from the Borman et al. (2002) meta-analysis on the achievement effects of comprehensive reforms are useful in understanding and evaluating our work. The first element is that schools that implemented CSR for five years or more showed the strongest effects. “The number of years of model implementation has very important implications for understanding CSR effects on student achievement. The strong effects of CSR beginning after the fifth year of implementation may be explained in two ways: a potential cumulative impact of CSR or a self-selection artifact” (Borman et al., 2002, p. 38). As SWPBIS is a whole-school approach whose aim is to create a safe, supportive, positive, and predictable environment for students to learn, the impact of the intervention's duration on the magnitude of the effects is a very interesting observation. Our research project lasted four years including an interruption due to Covid-19. The data we used for our analyses were collected only after 18 months of

implementation and there is therefore no evidence that the effects will be maintained in the long run.

To ensure the sustainability of the system for as long as possible, we first tried to slow the pace of the university support and, at the same time, organize in-house coaching. While it would have been best to implement official, institutionalized coaching for the long term, the different school networks in our educational system did not comply. Moreover, in the pilot schools, further professional development will likely focus on other areas than SWPBIS. In fact, because of the seven objectives from the Pact for Excellence in Education presented in the introduction, schools have many areas they need to improve and therefore to focus on in terms of professional development. Concretely, micro-piloting at the school level is demanding. To achieve the various objectives schools set for themselves in relation to the Pact, knowledge and skills must first be developed through professional training for staff members. Consequently, not much time will be left to devote to other goals and activities. Thus, it is possible that SWPBIS will not remain a first-line objective in the pilot schools. In our article comparing SWPBIS implementation in three French-speaking contexts, we highlighted the importance of factors like professional support, training, and ongoing technical assistance. Borman et al. (2002) also pointed out that the presence of these three factors is a major condition for program maintenance. So, even if the university continues supporting SWPBIS implementation in the pilot schools four times a year, the long-term sustainability of the project is uncertain. We think organized, more official, ongoing support would be appropriate and should be put in place for the schools that started the journey with us and committed to a whole-school project. Finally, as the outcomes were examined after only 18 months of implementation, a delayed post-test after more than five years of SWPBIS implementation should help verify whether a whole-school behavioral intervention such as SWPBIS follows the same pattern Borman and his colleagues (2003) observed in their meta-analysis of CSR.

A second element pointed out by Borman et al. (2002) is that “all schools, regardless of poverty level, appear to benefit from CSR and most subject areas tested reveal similar reform impacts” (p. 38). This finding is interesting as most CSR funding targets high-poverty schools. Our SWPBIS research project was mainly implemented in underperforming schools, which also appeared to be high-need schools. The difference between CSR, within the scope of Borman’s

meaning, and SWPBIS is of course the primary goal: academic achievement for CSR as selected by Borman et al. (2002) and school climate and problem behavior for SWPBIS. The commonality between the two is the way changes are implemented while reorganizing and revitalizing an entire school. Staff members working together, pursuing common goals, and implementing standard practices is key when attempting to improve academic success or school climate. But, at the same time, this is probably the most difficult part of the change process. In his book *Peut-on reformer l'école*, Dupriez (2015) explained how difficult it can be to reform an educational system as pedagogical practices are directly linked to class organization, teaching and learning situations, and relationships that every single teacher initiates and which are shaped by nature. The author also identified organizational paradox in our system. To be reformed, the system needs to make teaching practices evolve, but the way the system itself is organized prevents the authorities from having a hold on these practices. Indeed, the legal framework of the educational system states that the different school networks are free to choose the pedagogical methods they want to use in their schools and that parents are free to choose the school they want to send their children to. Concretely, this freedom to choose the pedagogical methods in the different networks gives teachers great autonomy to use some practices rather than others. Therefore, implementing SWPBIS, or any whole-school intervention or reform, in a top-down manner can be deleterious. Including local stakeholders and partners in the reform process is a must. Teachers must also be included because they have to legitimize the changes if the changes are to be effective. Even though staff buy-in is recognized as a facilitating factor when implementing CSR reform (Borman et al., 2002; Slavin, 2004), achieving 80% of staff buy-in at baseline when presenting a program or an intervention does not mean that every single teacher will agree to follow the practice changes every step of the way. This is even more true for schools assessed as underperforming that are being urged to change their situation. Nonetheless, to achieve a whole-school reorganization and revitalization, staff members must be on the same page and accept to implement, follow up on, and assess new practices together, as a team. As Levin and Fullam (2008) emphasized: working as a team supposes a shared vision of the teaching profession, which is not always the case for teachers. While autonomy is a major characteristic of the teaching profession in French-

speaking Belgium,⁷ sharing a common vision of the profession and working as a team with one's colleagues is not necessarily easy. In our opinion, these elements underline the importance of improving teachers' collective efficacy through SWPBIS implementation.

Given our interest in CSR, we also read the work of the RAND Corporation (Vernez et al., 2006), which evaluated comprehensive school reform at scale. Another element linked to system and outcome sustainability noted in that work is the extent to which schools have implemented the CSR model they had chosen. Or, stated in other words, the implementation fidelity. For CSR models, including SWPBIS, implementation fidelity matters, and we therefore thought it valuable to investigate what implementation fidelity is, how it can be measured, and what it is useful for.

SWPBIS and implementation fidelity

According to Mowbray et al. (2003), implementation fidelity, also called program integrity, is defined as the proportion of a program's components that are implemented and how closely they follow the protocol originally developed. According to Carroll et al. (2007), it is important to assess implementation fidelity because it plays a role in the relationship between an intervention and its results. It also avoids drawing hasty conclusions about the effectiveness of an intervention.

In their article entitled "Fidelity Criteria: Development, Measurement, and Validation," Mowbray et al. (2003) presented the two components of fidelity: structure fidelity, which refers to the framework in which the program is implemented, and process fidelity, which refers to the way the program is implemented. There are two main types of methods for assessing fidelity: (1) expert evaluation based on project documentation, on-site observations, interviews, and/or videotaped sessions and (2) surveys or interviews of individuals implementing or benefiting from the program. The value of implementation fidelity is that faster, better, or

⁷ According to the TALIS 2018 results, only 24% of teachers in our educational context stated they collaborate actively with their colleagues, for example by co-teaching in the same class, whereas 43% of teachers exchange pedagogical material and consider it a collaborative practice. These results are lower than the OECD average (Quittre & Dupont, 2019).

greater results are achieved if the program is implemented with fidelity. Mowbray et al. (2003) therefore argue for a mixed method in assessing fidelity.

This is especially true for RTI-based interventions such as SWPBIS. Keller-Margulis (2012) reminded us that, according to Perepletchikova & Kazdin (2005), generally an intervention achieving 80% in its fidelity assessment is considered to be implemented with fidelity. Fifty percent is considered a low implementation fidelity level. Keller-Margulis (2012) emphasized that in implementing RTI models, there must be (a) integrity in assessing students to determine the level of intervention they will receive, (b) integrity in the intervention to ensure that all students can progress, and (c) integrity in the procedures that move students from one level to the next. Keller-Margulis (2012) also stressed the value of using mixed assessment methods.

In their systematic review of the treatment integrity of universal school-based prevention programs, Bruhn et al. (2015) also noted that research had demonstrated the value of a mixed-method approach to measuring fidelity when using both expert evaluation and interviews with implementers and beneficiaries. This approach, however, requires training and expertise in the area targeted by the program or intervention. This literature review is a fitting example of how the *Journal of Positive Behavior Interventions* regularly publishes articles that examine implementation fidelity in order to inform research findings.

To be more concrete and relate the theory to this study, out of the 39 references selected in our systematic and critical review (first article), 26 reported data collection on implementation fidelity. Only six of these references reported analyses that quantified the impact of an increase in implementation fidelity on the intervention outcomes. But when fidelity and expected effects on the dependent variables were measured in parallel, in the same study, and fidelity was achieved, progress was also most often present for the dependent variables (Flannery et al., 2014; Gage et al., 2018; Houchens et al., 2017; LaFrance et al., 2011; Sørli & Ogden, 2007, 2015). Considering fidelity is therefore a key element in the initial SWPBIS implementation as well as throughout all the implementation stages.

Among the existing fidelity measures, the most used tools in the studies presented above were the SET (Horner, Todd, Lewis-Palmer, Irvin, Sugai, & Boland, 2004) and the BOQ (Cohen, Kincaid, & Childs, 2007). All the instruments used to assess SWPBIS implementation fidelity

have themselves been the subject of various research studies, and some have been empirically validated. Furthermore, most of the existing tools for assessing SWPBIS fidelity fall under the principal-component model-based fidelity analysis described by Blase and Fixsen in 2013.

It is important to add to this section on implementation fidelity the results of the recent study conducted by Pas and colleagues (2019). In that paper, the authors (Pas et al., 2019) examined the fidelity thresholds in the SET that indicate achievement of the expected outcomes from SWPBIS implementation. It turned out that fidelity thresholds for achievement varied by educational level (70% in elementary school, 90% in middle schools and 70–80% in high schools). The analyses also showed that specific scores obtained on certain sub-dimensions of the SET pointed directly to the achievement of results: achieving fidelity on the sub-dimensions related to expected behaviors and on the total score are both linked to improved behavior. Whereas achieving fidelity on the sub-dimension dealing with responses to inappropriate behaviors is related to improved academic performance.

By assessing fidelity, it is possible to understand how SWPBIS should be implemented to maintain quality and to arrive at the desired outcomes (Dusenbry et al., 2003). Therefore, measuring fidelity may be one solution for schools to sustain the outcomes over time. SWPBIS teams in pilot schools were trained to use an internal measurement tool called the Tiered Fidelity Inventory, or TFI (Algozzine, Barrett, Eber, George, Horner, Lewis, ... & Sugai, 2014). But, as with other instruments, filling out the TFI and ensuring follow-up imply data collection and analysis, which we have found to be the most significant barrier in SWPBIS implementation.

The role and importance of data in SWPBIS implementation

Since data collection and analysis represented a real novelty and challenge during the implementation process, we decided to examine the subject in more depth. Data have become increasingly more important since the era of accountability began in most school systems. The main objective of accountability is to empower schools and their leadership. Therefore, many benchmarks and standardized tests were created and are used to regulate school systems (Dupriez, 2015). Still this management style is not prevalent across continental Europe. In these school systems, teachers are seen as reflexive actors able to question their own actions and to

develop their practices on their own. Data are, in these school systems, mainly aimed at helping analyze practices (Dupriez, 2015). In other European school systems (Schildkamp et al., 2014), data are used to make decisions and improve student achievement. In this view, it seems that a good deal of data is collected in many school systems, but according to Schildkamp et al. (2013), the collected data are sometimes not needed, and sometimes the needed data are not available.

But what exactly is data? Schildkamp and his colleagues (2013) broadened the definition by stating that data are “information collected and organized to represent some aspect of schools” (p. 10). This definition is intentionally large as its goal is to include any relevant information about students, parents, schools, and teachers. These data can be obtained and analyzed in different ways, in connection with either a qualitative or quantitative methodology. It is a misconception to perceive data as equal to test results (Mandinach & Schildkamp, 2021). Data are more than test results: they should “be diverse and both quantitative and qualitative, including socio-emotional, attitudes, behavior, and more” (Mandinach & Schildkamp, 2021, p. 5). There are different kinds of data: input data, outcome data, process data, and context data. They come from multiple sources, and they can help teachers and school leaders make wise decisions, mainly on the best methods to improve student learning (Schildkamp et al., 2014). But after collecting the right data, it is not always easy for staff members to know how to use them. Analyses must be conducted and then the results interpreted. Therefore, there needs to be a clear purpose as to which data must be collected and why. Without a clear objective in mind, data are not always useful for decision-making. Thus, data-based decision-making is a process, and this process needs to be learned (Schildkamp et al., 2019). The figure below presents the DBDM process visually.

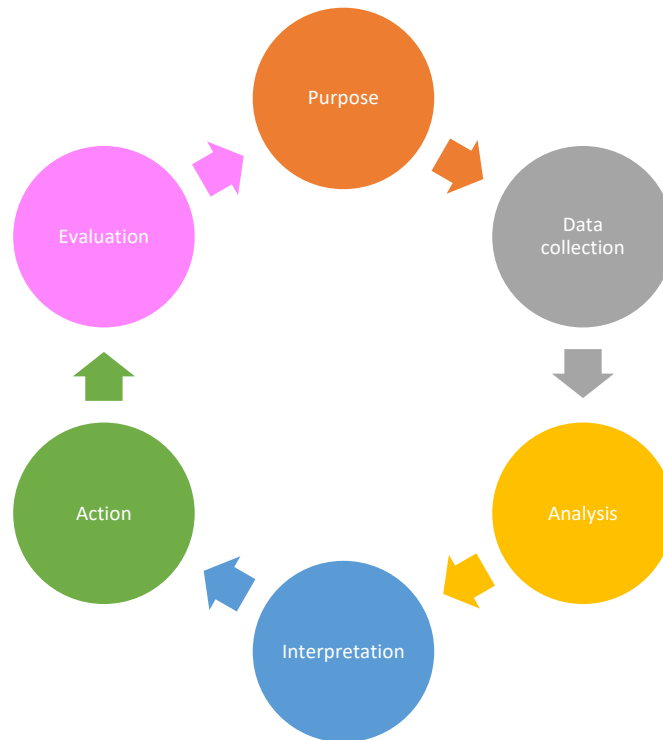


Figure 1: stages to use DBDM while implementing SWPBIS, inspired by the eight steps of the data team intervention (Schildkamp et al., 2013, pp. 56-57)

Once the purpose is clear, it is easier to know which data to collect from a wide variety of possible sources. The following step, analyzing data, means “contextualizing, categorizing, calculating, connecting, and/or summarizing the data in a way that meets the purpose” (Schildkamp et al., 2013, p. 17). Next comes interpreting the data, which consists of a sense-making process that enables people to understand the meaning of the data and “their implications for future action” (Schildkamp et al., 2013, p. 17). Sometimes this step reveals that the available data are not sufficient to understand a situation and that other data need to be collected. Only once the data are understood and interpreted can appropriate action based on these data be undertaken. Using data in this way is called an instrumental use of data or a problem-solving use of data, and this is what Schildkamp and her colleagues (2013) advocate for. The instrumental use of data is also required for SWPBIS monitoring. However, Schildkamp et al. (2013) focused on the fact that this kind of data use is often difficult to achieve, and may need or take time. The authors added that data are usually typically used conceptually first. The conceptual use of data consists of “a more indirect type of data use

where data are analyzed and interpreted but do not directly lead to action” (Schildkamp, 2013, p. 19).

The evolution Schildkamp et al. (2013) described from the conceptual use of data to the instrumental use of data is what we experienced in implementing SWPBIS. While implementing Tier 1, DBDM needed to be taught and learned, yet collecting and using data was unusual for the SWPBIS team members. For teachers who were not part of the team, it was difficult to even understand the need to collect data and to base decisions on their analysis. According to Bruhn et al. (2020), in Tier 1, data should be collected school-wide, meaning “on every student in the building” (p. 120). These data normally include attendance, suspensions, or expulsions and help monitor Tier 1 implementation as well as identify students who need Tier 2 or Tier 3 support because they do not respond to the universal prevention put in place. We organized a system to collect data on behavior incidents to monitor Tier 1 implementation, but teachers found it difficult to collect the day-to-day data. Some data were collected, but not always enough to get a complete picture of the situation and to guide decision-making. Teachers saw data collection as time consuming (they had to fill out an incident report for specific inappropriate behavior while actively supervising the students or while in the classroom during lessons). It may also have been experienced as intrusive because when an incident occurred in the classroom, the teacher had to fill out an incident report. This information provides insight into how teachers were managing their group of students, which teachers may have interpreted as a loss of autonomy. As the data were collected by everyone but only analyzed by the SWPBIS team members, there may also have been a question of trust.

When implementing Tier 2, the situation was different. In Tier 2, students are identified for further support either by the data collected at Tier 1, through incident reports mostly for externalized behaviors, or by teachers referring their students for demonstrating very shy behaviors, avoiding contact with others, sleeping on their desk, etc. These are known as internalized behaviors (McIntosh et al., 2014). As Tier 2 often is a supplementary layer of support tied to the Tier 1 universal prevention and designed for approximately 15% of students, additional resources are needed to implement these targeted interventions. Therefore, it is necessary to monitor students’ progress more closely and base decisions on these data to adapt the intervention. In this particular situation, collecting and analyzing data was not seen in the

same way DBDM was at Tier 1. First, these data were collected for fewer students and only concerned the teachers of the students involved in Tier 2 interventions. That means fewer people were expected to collect data. Second, the data collected at Tier 2 mainly concerned the student, as the daily report card was filled out based on the student's behavior. The individual students were responsible for their own daily report card. And even though the feedback teachers gave students about their behavior was of the greatest importance, it may not have appeared as intrusive as the information about classroom management on the incident report. Third, the SWPBIS team members were aware that there was a timeline to respect for implementing Tier 2 interventions (i.e., CICO lasts for a maximum of 10 weeks) and that the underlying idea was for the students to experience success. Thus, they understood the importance of monitoring the students' progress.

As we believe DBDM is important at both tiers, we wanted to investigate what the literature divulged that would explain this difference between DBDM at Tier 1 and Tier 2. We also aimed to pinpoint the elements that can be identified as barriers or facilitators in implementing DBDM in general.

In a study conducted across five different European school contexts, Schildkamp et al. (2014) investigated data-use practices in order to identify enablers and barriers to data use in education. Their conclusion is very important: all respondents, throughout the five studied contexts, acknowledged the importance of data use, but also noted the common problems experienced in their schools on this issue: difficulty accessing data and often inappropriate data systems and tools, a lack of knowledge and skills in using data (and related to this a lack of professional development), and a lack of training in data use. Only UK respondents indicated they were trained in the use of (achievement) data.

In another paper, Hoogland et al. (2016) investigated the prerequisites for DBDM. Among the elements listed by the authors that are needed to successfully implement DBDM, there are some that are absent from either the pilot schools or the system itself: a DBDM leadership, a DBDM culture in the school, facilitation through time and resources, teacher knowledge and skills, professional development, and data-use attitude. DBDM leadership is in fact the focus of another paper (Schildkamp, Poortman et al., 2019) examining how school leaders can either

build effective data teams or enable or hinder data use in a school willing to implement DBDM. This, once again, points to the crucial role of the leadership in implementing SWPBIS practices or in implementing effective DBDM, which in the case of French-speaking Belgium are intertwined.

Professional development has also been investigated in different papers: one in particular was written by Schildkamp, Smit et al. (2019) in their replication of a study previously done in the Netherlands. The paper underscored the influence of school organizational characteristics, data characteristics, and team and user characteristics in the use of data. All the factors influencing data use can either become facilitators or barriers depending on the situation (e.g., availability of data vs lack of data; positive attitude towards data vs negative attitude; clear goals vs lack of clear goals, etc.). But we were mostly interested in the practical implications the authors provided. Schildkamp, Smit et al. (2019) highlighted the importance of having a data coach to steer the process and support the team in their data collection and analysis during the first two years of DBDM. If we honestly reflect on the coaching activities we had in the pilot schools, we must admit we did not devote every coaching session to DBDM during the three years of support. This is especially true for the first year during which we had to focus on many different SWPBIS practices. It would be helpful to devote more time and training for DBDM so it can become part of the SWPBIS routines.

The second article investigating professional development written by Ebbeler et al. (2016) focused on the effects of data-use intervention on educators' satisfaction and data literacy. The results showed that data literacy knowledge increases throughout the intervention, but that the effect is small to medium and could increase more if the training period was extended, the support and material were improved, and more explicit principles and examples were used to develop educators' data literacy skills. These conclusions align with what we experienced during SWPBIS implementation and are a possible explanation for the difference between DBDM at Tier 1 and Tier 2.

Other findings from the previously cited studies also correspond to the situation in our school context. Regarding teachers, data collection and use are not part of the compulsory teaching curriculum: neither in the initial training, nor later in professional development. Regarding the

educational system, each school network can develop its own data system and tools, meaning that there wasn't necessarily anything established at all educational levels. Some elementary schools still work on paper to collect input data, such as absenteeism, and not every teacher has access to a computer at school if they do not buy their own. Thus, data collection and access to data can be challenging. This probably explains why it was so complicated and perceived as time-consuming for teachers in the pilot schools to collect data and use them to guide decision-making regarding SWPBIS monitoring and fidelity. Although we proposed using a specific tool to gather behavioral data and guide decisions about additional support for students and we organized training sessions for staff members, even then, data collection and data-based decision-making did not become a common, logical, and regular practice. Once more, as for CSR, it takes time to change practices and see the resulting effects. We think it would be highly beneficial to conduct a delayed data-driven post-test on fidelity and decision-making.

Another element pointed out by Schildkamp and her colleagues (2013) is that, in school contexts where data use is effective and efficient, the opportunity and time to use it is provided. But not only is time provided, training in data literacy and use for planning and evidence-based practice is mandatory (Schildkamp et al., 2013). We were able to verify this assumption in the field. Indeed, using data for decision-making remained complicated during Tier 1 implementation. But when Tier 2 was about to start, a major part of the time used to support the team was devoted to data use and analysis to guide decisions for implementing Tier 2 interventions. We noticed a change in the teachers' view as well as in their motivation to collect and use data. In our opinion, it seemed more purposeful and accurate to collect and analyze data for Tier 2. Monitoring student response to CICO is necessary to assess whether the supplementary resources are successful or whether another intervention may be more suitable for a particular case. Since evaluating Tier 2 interventions enabled the team to clearly see the results of what they were doing and to understand the necessity of using data for decision-making, they started reacting differently when they were reminded that data were also necessary to assess Tier 1 interventions.

Time, professional development, and support once again emerge as required resources to implement quality intervention and practices, as highlighted in our second article about SWPBIS implementation in three French-speaking school contexts. However, we can conclude

from the existing literature and our own experience that DBDM is in fact a school-wide intervention that demands time, attention, and specific support. Knowing the importance of DBDM in SWPBIS, we organized it, taught it, supported it the best we could, but we may have underestimated the time required to fully and effectively implement DBDM.

SWPBIS and equity

The last element we want to address in this discussion is the impact SWPBIS can have when trying to reduce inequities. Many preconditions were not met when SWPBIS implementation started in the pilot schools in our educational context. The pilot schools, SWPBIS teams, and coaches faced difficulties and yet positive outcomes were still demonstrated. At a time when inequity is widespread and must therefore be dealt with, we want to point out these encouraging results. Indeed, the positive outcomes related to school climate and collective efficacy, which previous research showed can minimize and counteract the impact of students' SES background on their learning (Berkowitz et al., 2017; Donohoo, 2018; Donohoo et al., 2018; Eells, 2011; Sun et al.; 2017), are therefore of great interest to educational systems working to reduce inequities. According to the results of international surveys, inequality is a major issue in many school systems (Monseur & Lafontaine, 2012), including in French-speaking Belgium (Lafontaine et al., 2012; Bricteux & Quittre, 2019). Our educational context is referred to as a quasi-market (Dupriez, 2015; Felouzis & Perroton, 2007) because of its public funding and families' freedom in selecting a school. This situation of course leads to competition between schools. The most advantaged students generally go to the best schools, whereas the most disadvantaged students enroll in the most disadvantaged schools, where the school climate is often not ideal for learning (Monseur & Lafontaine, 2012; OECD, 2019). Changing the system and the way it functions as a whole must be an objective to tackle inequity at the systemic level, but changes can and should also occur at the school level. We already mentioned in the introduction that the index of disciplinary climate between schools showed a variation of 8.8%. The pilot schools we worked with were mostly high-need schools, and still the research project shows that SWPBIS implementation can lead to changes at the school-level and therefore could help reduce inequities. Implementing SWPBIS could help counteract the impact of student SES background on learning by improving school climate and increasing teachers' collective efficacy. SWPBIS practices could therefore be implemented at a larger scale to help reduce

inequality at the school level, specifically in high-need schools, or at least in schools where the climate is less than ideal.

A final question remains: In an educational context providing all the necessary conditions to implement SWPBIS with fidelity and success, what would be the implementation quality and fidelity? And what would be the outcomes? In the case of French-speaking schools in Belgium, knowing that the barriers faced during the implementation process are still present, with reduced ongoing professional support and almost no (or little) official and formal meeting times for the SWPBIS team, we think it would be difficult to ensure fidelity, sustainability, and outcomes over time. Furthermore, we cannot ignore the recent paper published by our Norwegian colleagues (Borgen et al., 2021) questioning the long-term impacts of SWPBIS on academic and behavioral outcomes as well as on criminal activity. Using population-wide longitudinal register data, including all Norwegian students exposed to SWPBIS, Borgen et al. (2021) investigated the effects on short- and long-term academic outcomes, long-term school behavior, and youth crime. The authors found no indications that the Norwegian version of SWPBIS affected any of the examined outcomes, both when considering all students and only at-risk students. Borgen and his colleagues (2021) proposed different explanations for this result. First, they pointed out the difference found between the results from a study under near-optimal delivery and real-world conditions, which was the case in their study, but not in the previous ones on SWPBIS in Norway. Second, the authors (Borgen et al., 2021) observed that even when fidelity is achieved during trial conditions, it is often jeopardized when scaled up. In Norway, more than 10% of elementary schools are currently implementing SWPBIS and only 18% of those schools have reported achieving fidelity. This highlights that the ability to effectively implement prevention programs in real-world settings is an essential factor to consider when thinking of large-scale implementation. Although the findings from this study need to be replicated in other educational contexts, in light of this recent, high-quality paper, the short- and long-term cost-benefit ratio of SWPBIS implementation should be closely examined before scaling up.

Before closing the discussion, it is important to come back to the stages recommended to implement evidence-based practices (Slavin, 2008, 2015) presented in the general introduction. Normally, the last step is disseminating and extending evidence-based practices and

interventions. As mentioned earlier, scaling up first needs careful consideration for the short- and long-term cost-benefit ratio and, to our knowledge, this stage has not yet been met for SWPBIS. If this ratio is positive enough, another thing to be considered when scaling up is how an educational system operates. In the case of French-speaking Belgium, after the pilot project, the school networks become responsible for supporting the dissemination process. The idea was that the university in charge of the pilot project would act as the school networks' partner to organize an effective transfer of skills. The explicit instruction model would be used as well as a mentoring process to train the new coaches. While this may appear easy, in reality, it was not. On the one hand, two of the three school networks may be interested in disseminating SWPBIS, but no other schools in these networks have requested it yet. If there is no demand, it is not meaningful to start disseminating. On the other hand, many schools from the third and largest network have requested SWPBIS implementation, because they have heard many positive things about the project and its outcomes. But in this case, the network itself is not interested in supporting the implementation and there is clear opposition to some of the key components of SWPBIS. Therefore, we fear this final stage of dissemination may never occur in our educational context, in the near future at least.

From four years of field experience, we may conclude that the readiness conditions were probably not sufficiently present in our school context to start implementing whole-school behavioral interventions and to ensure their sustainability and outcomes over time. We still think this experience was a positive first step that will help in other attempts to implement effective whole-school interventions.

Limitations

This research project and the results from the different studies are subject to limitations.

First, the pilot nature of the project and the sample size do not allow for the generalization of the findings. SWPBIS needs to be implemented on a larger scale and the studies replicated on larger samples using, for example, a wait list control group design to get more precise as well as more representative results. In such case, the differences observed between the intervention and control groups would probably decrease. Nevertheless, because our educational system is

quite small, this kind of design is not easy to organize here. Furthermore, the absence of random components in the sample make-up and its small size make it impossible to use inferential statistical tools.

Second, to ensure the outcomes are maintained over time and are not due to the research project but to the intervention itself, delayed post-tests should take place after a minimum of five years of implementation, as suggested in Borman and his colleagues' work on CSR (2002).

Third, we did not have access to information about the control schools beyond the answers to the various questionnaires we used. But events linked to school life (leadership change, staff turnover, and so on) can explain changes in the results. Future research designs would need to include an investigation of the functioning of control schools to ensure that the results are due to SWPBIS implementation in the pilot schools rather than to difficulties faced by the control schools.

Fourth, regarding implementation comparison in three French-speaking school contexts, extending that comparison to other European and non-European countries would provide researchers or anyone interested in SWPBIS a broader picture of the barriers and enablers for a quality implementation.

Fifth, a major bias in this research is the fact that we were directly supporting the daily implementation in schools and were responsible for assessing the project's effectiveness. Our double role may have led to interpretation bias while analyzing the findings, even though we were aware of this uncomfortable situation and its possible consequences. Our enthusiasm towards the potential changes SWPBIS could generate helped us face the barriers encountered during the research, but it also may have accounted for occasional shortsightedness in analyzing and interpreting the collected data.

Directions for the future

Implications for the research

Research on SWPBIS

Because of the pilot nature of this project, future research should replicate this design to investigate whether the results can be confirmed in ecological conditions, in different sorts of schools (not only high-need schools or underperforming schools), and at a larger scale.

Due to a lack of existing data, decreased problem behavior was not investigated yet and needs to be, as research about SWPBIS and behavior problem is the most extensively developed on an international scale. Tier 2 and Tier 3 implementation and effectiveness in our educational system should also be investigated in depth.

With easier access to academic results, studies investigating the link between SWPBIS implementation and student performance could present another possibility for new research projects.

From our systematic and critical review of the literature, we can conclude that some effects of SWPBIS on students are well documented (i.e., ODRs, suspensions and exclusions), whereas others are not sufficiently documented and require further investigation. This is the case for the effects of SWPBIS on school climate and on classroom climate. The same is true for the effects of SWPBIS on tardiness and dropping out as well as on bullying. The effects of SWPBIS on teachers also needs further examination as most studies focus solely on student outcomes.

Considering the recent paper from our Norwegian colleagues (Borgen et al., 2021) questioning the long-term effects of SWPBIS implementation in elementary schools in their educational system, a study should be conducted in our educational system to further examine the long-term impacts of SWPBIS.

Qualitative methods could also be used to better understand the barriers faced at the school level when implementing the different interventions and their components at each of the three SWPBIS tiers.

Research on applying CSR to academics

Having observed staff members from Quebec using the three-tiered model to improve academics after seeing it work for behavior, another possible focus for research could be to investigate whether implementing a CSR targeting behavior could then lead to establishing a CSR to improve cognitive skills.

Research to further investigate topics addressed in our work

Reflecting on the different subjects investigated in the various sections of this work led us to other fields that could be explored through future research. School climate needs to be investigated further and more deeply. Indeed, some important dimensions of school climate have not been examined in most existing studies. Usually out of the three major dimensions (i.e., engagement, safety, and environment), only one and sometimes two appear on school climate questionnaires. Further, in the literature, it is not possible to find studies collecting data on school climate from all school stakeholders (i.e., students, staff, and parents), except for our article on the impact of SWPBIS implementation on school climate. Lastly, most of the studies are conducted in the United States. It would be very interesting to expand the field internationally, following the path we initiated.

The literature review we conducted for the article on the potential increase in teachers' collective efficacy through SWPBIS implementation reminds us that the link between teachers' collective efficacy and student achievement should be investigated in educational contexts outside the USA. Research into teachers' collective efficacy could be conducted in European school contexts, either regarding its link to student achievement or on the increase in collective efficacy through other CSRs, like the first step we proposed with our work.

Data-based decision-making and its importance while implementing CSR is also a possibility to explore as studies on DBDM mostly take place either in the Netherlands or in the English-speaking world. Because DBDM is directly related to the implementation of the Pact for Excellence in Education, currently there is, in our opinion, a real opportunity to lead research on this subject in French-speaking Belgium.

Finally, when considering the role SWPBIS implementation can play in reducing inequality at the school level, conducting research aimed at examining this finding is unavoidable in our view.

Implications for practice

If SWPBIS is to be implemented on a more widespread basis, implementers, researchers, and schools need to pay close attention to the readiness conditions and capacity building to ensure that the implementation can be carried out without too many barriers. The key elements to success are ensuring lasting resources, mainly as formal and official quality time for the SWPBIS team to meet and monitor the system, and professional support as well as ongoing access to technical assistance (e.g., data collection tool).

When a first tier has been implemented, assessing fidelity can help determine the right time to start implementing the next tier. Monitoring implementation by measuring fidelity can indicate what part of the process needs to be revised or what key component should be improved to achieve the goals set by the SWPBIS team.

To organize the last stage in implementing evidence-based practices—scaling up and extending practices and interventions—the university researchers should transfer their expertise to the field professionals specifically trained to support SWPBIS implementation. A basic curriculum to train SWPBIS coaches and a mentor system between experienced and new coaches should be arranged. Partnerships between the university and the different school networks need therefore to be established. Collaboration with external partners and other universities should be maintained to continuously develop SWPBIS experience and expertise.

Implications for policies

When considering the implementation of evidence-based practices, even on a small scale, community readiness should be examined in depth and capacity building should be a prerequisite. This means that all the necessary resources, training, professional development, support, and ongoing assistance must be available and easily accessible to those working in the field.

Research results and program evaluation must also be made available to all the stakeholders in a user-friendly way.

Conclusion

This research project took a first step towards implementing evidence-based practices. It was a challenging endeavor to implement SWPBIS and evaluate its effectiveness. We had to learn and master the new tasks of supporting staff members and organizing the different parts of a research project. As a teacher, the mission was to help and support students in achieving the best they could, even when they thought it was not possible. As a researcher, the goals were to improve the functioning of the system, at least at the school level, and to offer better chances of success to a larger majority of students, especially those from disadvantaged backgrounds. We hope these findings will help clarify the potential steps needed to bring change, specifically to improve school climate for the benefit of all stakeholders and to increase collective efficacy.

Implementing SWPBIS interventions can help schools counteract the impact of students' SES background on their academic success. We hope these findings advocate for scaling up SWPBIS implementation.

The chance to demonstrate that a better school climate and increased collective efficacy can counteract the impact of students' SES background on their learning and academic success was enough for us to conclude that this project was well worth the experience and effort. While the experienced opened a new chapter of our working/teaching life, we hope it also opened a new path towards implementing evidence-based practices to ensure student success.

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