



Teacher Perceptions of Implementation Climate Related to Feasibility of Implementing Schoolwide Positive Behavior Supports and Interventions

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Abstract

For Schoolwide Positive Behavior Interventions and Supports (SWPBIS) to be effective, educators must use the practices as intended. Whether a teacher uses a practice as intended can depend, in part, on how feasible the practice is perceived to be. Identifying malleable factors associated with teachers' perceptions of SWPBIS feasibility can help schools identify targeted supports to improve feasibility. Implementation climate, or the shared perception among implementers that their school supports implementation efforts, is known to promote high quality implementation. However, little is known about how individuals' perceptions of their school's implementation climate may influence their perceptions of feasibility. The lack of empirical evidence points to a need to explore whether educators' shared and individual perceptions of implementation climate influence feasibility of implementing SWPBIS. Therefore, this study examines the link between teachers' individual and shared perceptions of implementation climate related to the feasibility of implementing SWPBIS in a sample of 348 K-5 general education teachers across 39 elementary schools in the pacific northwestern United States. Results indicate that teachers who experience their schools' implementation climate as positive are more likely to report SWPBIS as feasible, controlling for teachers' shared perceptions of implementation climate. Implications for schools aiming to improve their implementation of SWPBIS, including the development of individualized implementation supports (e.g., tailoring implementation strategies to support each and every teacher), are discussed.

Keywords Schoolwide Positive Behavior Interventions and Supports · Feasibility · Implementation climate · Elementary

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Introduction

As a primary service setting to address and prevent children's mental health challenges in the United States of America (Duong et al., 2021), schools remain critical for students' social, emotional, and behavioral (SEB) skill-building. Schoolwide Positive Behavior Interventions and Supports (SWPBIS) is an effective approach for children with a variety of SEB strengths and needs to experience improved social, behavioral, and academic functioning (Blair et al., 2021; Lee & Gage, 2020). However, the effectiveness of SWPBIS hinges on the fidelity with which it is implemented (Gage et al., 2018), which is known to vary across schools (Schaper et al., 2016). Understanding and leveraging malleable factors at the educator and school levels can help to improve fidelity. One important factor to high fidelity implementation at the individual level is how feasible (i.e., the extent to which an evidence-based practice (EBP) can be used within a given setting; Proctor et al., 2011) teachers perceive SWPBIS practices to be. Likewise, emerging theory and research point to a school-level factor that can facilitate implementation—implementation climate (i.e., the shared perception among implementers that the climate supports implementation efforts; Ehrhart et al., 2014; Weiner et al., 2011). While implementation climate may set the stage for successful use of a practice, teachers' individual perceptions of that climate likely reflect their personal experience of it and may be more strongly linked with perceptions of EBP feasibility. A focus on both individual educators who use SWPBIS practices and the overall implementation context of the school in which they are expected to implement could help realize the promise of SWPBIS to improve student outcomes.

Theoretical Framing

Implementation science researchers and practitioners use frameworks that help to understand and intervene upon the implementation process to support improved use of evidence-based interventions and resulting student outcomes. One widely considered framework is the Exploration, Adoption/Preparation, Implementation, and Sustainment (EPIS) model (Aarons et al., 2011). EPIS systematically outlines inner setting (e.g., school, educator) factors likely associated with effective implementation across implementation phases (exploration, adoption/preparation, implementation, sustainment) and levels of influence (i.e., organizational or individual as opposed to policy-level). In addition to focusing on student outcomes targeted by interventions like SWPBIS, EPIS and other frameworks

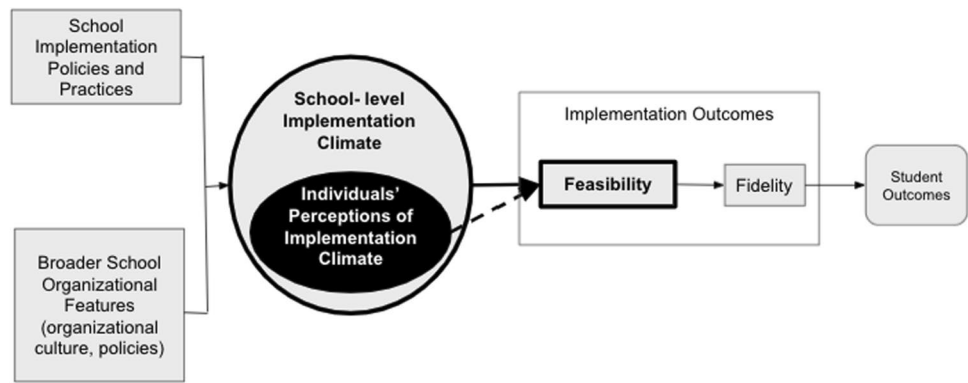
identify *implementation outcomes* such as feasibility, which can be targeted by implementation or professional development supports via improvement in *implementation determinants* such as implementation climate. Using EPIS as our guiding framework, we will first describe the current state of SWPBIS implementation in schools. Next, we will explicate the potential implementation outcomes (e.g., feasibility) and determinants (e.g., implementation climate) that characterize schools (e.g., the inner setting; Damschroder et al., 2009). We then assert that individual educators may differently experience implementation climate in ways that could influence their perceived feasibility of implementing SWPBIS.

Implementation of Schoolwide Positive Behavior Interventions and Supports (SWPBIS)

SWPBIS is a universal (e.g., Tier 1, delivered to all students) strategy that aims to prevent challenging student behaviors while promoting prosocial ones (Sugai & Horner, 2006). These goals are achieved by reforming systems (e.g., discipline), using data to identify needs and monitor progress, and employing evidence-based practices aligned with student need (Sugai & Horner, 2009). Implementation of SWPBIS has been shown to positively influence student behavior (Bradshaw et al., 2012), particularly among students who have the most room to develop their SEB skills (Bradshaw et al., 2014). Further, SWPBIS has consistently been shown to decrease exclusionary discipline (e.g., Bradshaw et al., 2012; Childs et al., 2016; Noltemeyer et al., 2019) and may positively influence students' academic achievement over time (Angus & Nelson, 2021). There has been widespread adoption of SWPBIS across schools in the United States (Horner et al., 2014), meaning that the positive impacts associated with SWPBIS have the potential to reach students across thousands of schools. However, these benefits have not materialized for all students, at least in part, because the implementation of SWPBIS with fidelity is stilted (Gage et al., 2018; Kim et al., 2018; Schaper et al., 2016). Understanding the factors that can lead to variation in implementation can illuminate how to improve SWPBIS implementation, ultimately benefiting students.

Teachers' ability to easily use SWPBIS practices in their school context is a necessary condition to achieving high quality implementation (Neugebauer et al., 2016; Proctor et al., 2011). As such, identification of malleable factors influencing teachers' perceptions of SWPBIS feasibility could open the door to tailored implementation or professional development supports that might bolster its use. The implementation climate, including both teachers' shared and individual climate perceptions, may be one such factor. We focus on two critical implementation outcomes from the EPIS model: the multilevel implementation context of

Fig. 1 Conceptual model grounded in EPIS and based on Weiner et al., (2011). Proposed relations between multilevel implementation climate, implementation outcomes, and student outcomes. Constructs with thick bordering and text indicate the focal constructs, and bold, black arrows indicate relations tested in this study



schools and how it relates to implementation outcomes. Figure 1 describes our conceptual model, which posits that school implementation policies and procedures and broader organizational culture and policies (not of primary interest in this study) shape both teachers' shared and individual perceptions of implementation climate, influencing perceptions of feasibility with cascading effects to fidelity and ultimately student outcomes.

Role of Feasibility in Achieving High Quality Implementation of SWPBIS

There are several implementation outcomes (e.g., fidelity, feasibility) that relate to high quality implementation (Damschroder et al., 2009). SWPBIS fidelity (i.e., the degree to which SWPBIS is implemented as prescribed) is widely examined (Lee & Gage, 2020), with studies showing that increased adherence to SWPBIS is associated with desirable SEB and academic outcomes for students (Angus & Nelson, 2021; Childs et al., 2016; Freeman et al., 2016; Gage et al., 2017; James et al., 2019; Noltemeyer et al., 2019; Simonsen et al., 2012; for exceptions see Heidelberg et al., 2022 and Kim et al., 2018). Though there are no empirical studies that we know of linking feasibility to fidelity, there are reasons to think that variation in SWPBIS fidelity may be partially due to teachers' perceptions of how feasible SWPBIS practices are. An EBP is feasible when it can be used with relative ease given available resources (e.g., effort) and circumstances (e.g., political will; Weiner et al., 2017). Teachers who feel they do not have the time or effort required to use SWPBIS practices (e.g., data review, consistently using reinforcement) may be less likely to implement them with fidelity, constraining the positive impact SWPBIS might otherwise have for students. Indeed, educators commonly cite lack of time as a key barrier to successfully implementing components of SWPBIS across various phases of implementation (Fox et al., 2021; McIntosh et al., 2014; Pinkelman et al., 2015).

Research most frequently considers feasibility in pilot studies of school-based interventions (Bergen-Cico et al.,

2015; Daunic et al., 2013; Klatt et al., 2013). Researchers tend to rely on feasibility reports to inform whether intervention adaptations are necessary prior to assessing intervention effectiveness in large-scale evaluations. As implementers of SWPBIS, teachers' perceptions about the feasibility of SWPBIS may be an indicator of whether or to what extent they are likely to use it (Brann et al., 2022), making feasibility informative not just during a pilot to forecast innovation adoption, but also during active implementation (Neugebauer et al., 2016). Feasibility data may be useful in identifying educators who are struggling to use SWPBIS practices and informing which implementation supports might increase the feasibility of those practices (for example of how feasibility is implicated in intervention adaptation, see Miller et al., 2020). Despite the potential influence educators' perceptions of feasibility may have on their SWPBIS fidelity, very little attention has been dedicated to understanding it or its link to other implementation outcomes. To be useful for schools and educators implementing SWPBIS, we must first identify malleable factors associated with teachers' perceptions of SWPBIS feasibility.

School Implementation Climate is a Key Driver of Successful Implementation

Theory and empirical research point to implementation climate as an important contextual factor that promotes successful implementation (Aarons et al., 2011; Ehrhart et al., 2014; Weiner et al., 2011). *School implementation climate* describes teachers' shared perception that school policies and practices signal the importance of EBP implementation and directly support it (Ehrhart et al., 2014; Lyon et al., 2018). At the school-level, implementation climate represents a composite of educators' perceptions of their schools' overall implementation climate (Weiner et al., 2011). Teachers may perceive their school's implementation climate positively when, for example, the school has clearly communicated implementation of SWPBIS as a top priority, SWPBIS trainings and materials are made available, and teachers who use SWPBIS are seen as experts and recognized within the

school (Lyon et al., 2018; Thayer et al., under review). Though work examining implementation climate in schools is nascent, one study found that special education teachers and support staff in classrooms with positive implementation climate and high fidelity supported student outcomes more effectively than those in classrooms with less positive implementation climate and low fidelity (Kratz et al., 2019). Outside of education, several studies have demonstrated positive implementation climate to be significantly associated with effective implementation of EBPs (Klein et al., 2001; Osei-Bryson et al., 2008; Williams et al., 2018; Williams et al., 2020). Implementation climate may also support teachers' perceptions of SWPBIS feasibility. Schools that leverage shared time to resolve issues implementing SWPBIS, promote attendance at SWPBIS conferences, and integrate SWPBIS with other priorities (e.g., academic instruction) are actively supporting implementation in ways that could directly influence perceptions of feasibility (e.g., SWPBIS may seem more feasible to teachers when seamlessly integrated with classroom instruction).

In addition to teachers' shared perceptions, *individual perceptions of implementation climate* may be important to consider, though research in this area is nascent. Research from outside the education sector provides evidence that individual perceptions of implementation climate can vary based on characteristics of the individual (Beus et al., 2010; Engell et al., 2020; Roberson, 2006). It could be that teachers perceive the strategic supports that characterize positive implementation climate differently from one another, such as their perception of what is rewarding or preference for public or private recognition (Locke et al., 2019). Within school buildings, there are also differences in teachers' attitudes and beliefs about practices (Larson et al., 2021; Locke et al., 2019) that could influence how teachers perceive their implementation climate as it relates to a specific EBP. Given that implementation of SWPBIS practices can differ among individual teachers (Reinke et al., 2013), knowing if teachers' individual perceptions of implementation climate are related to practice feasibility is crucial. Varied perceptions of implementation climate (e.g., rewards, EBP integration) might inform tailored implementation supports for individual teachers intended to increase the school-level implementation climate thought to be necessary for SWPBIS to be maximally effective for students' SEB functioning and development (Bradshaw et al., 2012).

Purpose

The purpose of this study was to test one piece of our model describing teachers' individual and shared perceptions of school implementation climate and their effects on teachers' feasibility for SWPBIS implementation. In this study, we examine two primary questions:

1. Are individual teacher perceptions of implementation climate associated with teacher-reported feasibility of SWPBIS controlling for school-level implementation climate?

Hypothesis 1 More positive individual perceptions of implementation climate will relate to higher levels of feasibility of implementing SWPBIS, controlling for school-level implementation climate.

2. What amount of variance in teacher-reported feasibility of implementing SWPBIS is explained by individual and school-level implementation climate?

Hypothesis 2 Teachers' individual perceptions of implementation climate will explain more variance in feasibility than teachers' shared perceptions of implementation climate.

Method

Data and Participants

Data for this study come from a large-scale measurement adaptation and development project with the goal of creating tools for organizational implementation context constructs (e.g., implementation climate) tailored for use in schools. Schools were recruited and eligible to participate if they implemented one of two evidence-based universal prevention programs: SWPBIS ($n=39$) or Promoting Alternative Thinking Strategies (PATHS; $n=13$). PATHS is a curriculum-based social-emotional intervention intended to promote students' social competence and reduce challenging behaviors (Domitrovich et al., 2007; Kusché & Greenberg, 2005). Though these are multitiered interventions, the project was interested in Tier 1 (universal, administered to all students) implementation. Because teachers' perceptions of feasibility and the implementation context may vary depending on the program being implemented, the present study was restricted to only those schools implementing SWPBIS.

The analytic sample included 348 general education teachers in 39 elementary schools across four districts in one state in the northwestern United States. Thirty-five percent of students in participating schools were Black, Indigenous, Person of Color (BIPOC); 15% Asian, 11% Mixed Race, 7% Black/African American, 1% Pacific Islander, and 1% Native), and 20% were English Language Learners (ELL; see Table 1). Approximately nine teachers were recruited from each school. Fifty-nine percent of teachers taught grades 3–5, with the remaining

Table 1 Sample demographics

	Mean	SD	Min	Max
Teacher Female	0.89		0.00	1.00
Teacher BIPOC	0.13		0.00	1.00
Teacher Years of Exp	10.83	6.75	1.00	20.00
Survey Type	0.50		0.00	1.00
School Size	549.46	158.30	281.00	976.00
Pct. BIPOC St	0.35	0.15	0.13	0.82
Pct. St. ELL	0.20	0.12	0.03	0.48
Pct. BIPOC Tch	0.13	0.12	0.00	0.50

SD, standard deviation; Min, minimum; Max, maximum; Exp, Experience; Pct, percent; BIPOC, Black, Indigenous, Person of Color; St, student; Tch, teacher; ELL, English language learner

serving students in grades K-2. Teachers were majority female (89%), White (87%), and reported an average of 11 years of teaching experience (range = 1–20).

Procedure

Adaptations to the Implementation Climate Scale (ICS; Ehrhart et al., 2014) were guided by input from research and practice experts and focus groups with education stakeholders (Locke et al., 2019; for a full description of adaptations made to the School Implementation Climate Scale (SICS), see Thayer et al., under review).

Human subjects approval was obtained from the University of Washington Human Subject's IRB and from partnering school districts when necessary. Central administrators supported school recruitment. Additionally, an expert intermediary organization (e.g., SWPBIS organization that disseminates information and promotes adoption of the program; Proctor et al., 2019) aided in school recruitment. School administrators then recruited 4–12 general education teachers to participate in data collection. Teachers' contact information was shared with the research team to communicate and send survey links.

Data were collected via a web-based survey during the fall of the 2017–2018 academic year. Teachers received an initial email in November, which (1) provided them with project information, (2) supplied a link to provide informed consent, and (3) provided a link to the web-based survey. SWPBIS fidelity data (see Measures) were collected once for each school during the second semester by the expert intermediary that supported project recruitment. All schools were afforded a one-month window to complete the survey. Eighty-eight percent of consented teachers completed the online survey.

Measures

Feasibility of Intervention Measure (FIM)

Teachers reported on their perceptions of the feasibility of SWPBIS using the short, 4-item version of the FIM (Weiner et al., 2017). Teachers used a 5-point Likert scale (1 = *completely* disagree to 5 = *completely* agree) to respond to the following items: “SWPBIS seems implementable,” “SWPBIS seems possible,” “SWPBIS seems doable,” and “SWPBIS seems easy to use.” These items operationalize the extent to which teachers feel they are able to use SWPBIS within their school's context (Proctor et al., 2011; Weiner et al., 2017). The FIM has shown evidence of construct, convergent, and divergent validity (Weiner et al., 2017). Internal consistency in the current sample was acceptable ($\alpha=0.93$).

School Implementation Climate Scale (SICS)

The SICS is a 21-item measure adapted from the original implementation climate scale (ICS; Ehrhart et al., 2014) for use in schools (Lyon et al., 2018; Thayer et al., under review). The SICS employs seven three-item subscales (Focus on EBP, Educational Support for EBP, Recognition for EBP, Rewards for EBP, Use of Data to Support EBP, Existing Supports to Deliver EBP, and Integration of EBP) to measure aspects of a school's implementation climate necessary for the integration of EBPs into routine practice (see Table 2 for definition and example item for each subscale). Teachers responded to items using a 5-point Likert scale (0 = *not at all* to 4 = *very great extent*). Evidence from the larger study from which these data were collected supports SICS as a unitary construct with convergent and divergent validity (Thayer et al., under review). It is important to note that two versions of the SICS were used: one was EBP-agnostic (e.g., “Teachers/school staff who use EBPs are seen as experts”) and one was EBP-specific (e.g., “Teachers/school staff who use SWPBIS are seen as experts”). The surveys were evenly distributed such that 50% of teachers received the EBP-agnostic version and 50% received the EBP-specific version. Multigroup modeling showed evidence of invariance across survey type (Thayer et al., under review). However, as a conservative approach, the present study includes survey type as a covariate in predictive models (see Analytic Plan). All teacher-reported SICS items were aggregated to the school-level to operationalize school-level implementation climate. Aggregating individual SICS scores to the organization-level is a common approach to operationalizing implementation climate (Ehrhart et al., 2014; Weiner et al., 2011). In the current sample, SICS showed acceptable internal consistency ($\alpha=0.94$). The ICC(1) indicated that approximately 11% of the variance in teacher-reported SICS existed between schools.

Table 2 Description and example item for each of the seven School Implementation Climate subscales

School Implementation Climate Subscale	Description	Example Item
Focus on EBP	The extent to which schools prioritize EBP implementation and practice goals	"People in this school believe that implementation of evidence-based practice is important."
Educational Support for EBP	The extent to which educational opportunities are supported and/or provided by the school	"This school supports attendance at conferences, workshops, or seminars focusing on evidence-based practice."
Recognition for EBP	The extent to which a school shows appreciation for teacher/staff EBP use	"Teachers/school staff who use evidence-based practice are held in high esteem in this school."
Rewards for EBP	The extent to which schools incentivize teacher/staff EBP use	"The teachers/staff who are better at using EBP are more likely to get additional resources to support their work."
Use of Data to Support EBP	The extent to which schools incorporate data-based decision-making processes and tools to create accountability and encourage school staff to implement an EBP	"This school collects data about how well evidence-based practices are being implemented (e.g., fidelity assessments)."
Existing Supports to Deliver EBP	The extent to which schools leverage existing structures (e.g., professional development, coaching) to help them learn about and apply EBP	"The school uses professional development time to support staff to use evidence-based practice over time."
Integration of EBP	The extent to which EBP is integrated with other school system processes (e.g., improvement plans, ongoing work)	"This school integrates (i.e., braids) the implementation of evidence-based practice with other ongoing work."

Tiered Fidelity Inventory

Fidelity of implementing SWPBIS was captured using the Tiered Fidelity Inventory (TFI; Algozzine et al., 2014). The TFI includes a list of SWPBIS components that implementation teams rate as either not implemented, partially implemented, or fully implemented. TFI data were collected only once. Scores were averaged across components of SWPBIS to generate percent fidelity with higher percentages indicating greater adherence to SWPBIS at that single time point. The TFI has been shown to be valid and have strong test–retest reliability (McIntosh et al., 2017). Though fidelity of SWPBIS is not a primary interest in this study, descriptive information is provided to contextualize the implementation of SWPBIS across schools in this sample.

Teacher and School Demographics

Teachers reported their demographic information (race/ethnicity, gender, years of experience) via survey. School demographic information (school size, percent White students, percent ELL students) was compiled from district websites.

Data Analytic Approach

These data represent teachers nested within schools. Results from an unconditional two-level model showed 6% of the variance in teacher-reported feasibility attributable to between school factors. While below the more traditional 15% threshold (Raudenbush & Bryk, 2002), given the strong theoretical link of school implementation climate to implementation outcomes (Aarons et al., 2011; Weiner et al., 2011), we proceeded with a two-level model. This approach allowed us to test a proof of concept – that both teacher- and school-level SICS will be associated with separate levels of variance in a key perceptual implementation outcome.

One two-level random intercept model was examined with teacher-reported SICS included at level-1 and school-level SICS at level-2. At level-1 (teacher-level), the outcome is teacher-reported feasibility of implementing SWPBIS. The level-1 intercept (mean feasibility for a given school) becomes the level-2 (school-level) outcome. As such, level-2 variables including school-level implementation climate are associated with school-level mean feasibility whereas level-1 variables are associated with teacher-reported feasibility. Based on prior research and theory (Engell et al., 2020; Kratz et al., 2019; Weiner et al., 2011), several covariates were included at level-1 (teacher sex, teacher race (BIPOC), teachers' years of experience, survey type) and level-2 (school size, percent White students, percent ELL students, percent BIPOC teachers). Teacher-level SICS was group mean-centered and school-level SICS was grand mean-centered. Therefore, the intercept is interpreted as the predicted

mean feasibility score for a teacher reporting average SICS in a school of average SICS, adjusted for covariates.

All models were run in Mplus version 8 using full information maximum likelihood to account for missing data (Enders, 2001), the rate of which was extremely low (~1%) across all study constructs. Unstandardized estimates are presented. Several additional pieces of information were examined to contextualize the results. First, the R^2_1 was calculated to determine the amount of variance explained by all variables in the predictive model (Snijders & Bosker, 2012). Second, the percent change in variance (PCV; Merlo et al., 2005) was calculated to determine the amount of variance explained by individual variables at each level of analysis (e.g., the percentage of teacher-level (level-1) variance in feasibility explained by individual teachers' reports of implementation climate). Finally, local effect sizes were calculated using Cohen's f^2 (Cohen, 1988; Selya et al., 2012); values of 0.02, 0.15, and 0.35 correspond to a small, medium, and large effect, respectively. A post hoc power analysis indicated that this study's sample ($N = 348$) and analytic model including nine covariates is able to detect with 83% power effect sizes (f^2) of 0.02 and higher.

Results

Table 3 presents univariate statistics for teacher-reported SWPBIS feasibility and teacher- and school-level implementation climate. Table 4 presents bivariate correlations among all study variables. On average, teachers reported high levels of feasibility of implementing SWPBIS ($M = 4.21$, $SD = 0.65$) and moderately favorable school implementation climate ($M = 2.08$, $SD = 0.70$). The average school-level implementation climate mirrored that of individual teachers ($M = 2.08$, $SD = 0.31$). However, the smaller standard deviation and restricted range (see Table 2) indicates less school-level variability compared to individual teacher reports. Bivariate correlations showed teacher- and school-level implementation climate to be moderately positively correlated, and both were positively correlated with teacher-reported feasibility of implementing SWPBIS. On average, schools implemented SWPBIS with 78% fidelity ($SD = 0.15$; range = 30%–97%).

Teacher- and School-Level Implementation Climate

Results revealed teacher-level SICS to be significantly positively associated with teacher-reported feasibility ($b = 0.23$, $p \leq 0.001$, $f^2 = .06$; see Table 5 for all results). This indicates that a one-point increase in teacher-reported SICS is associated with an average point increase of 0.23 in teacher-reported feasibility relative to other teachers at that school. Additionally, teacher-level SICS explained 5%

Table 3 Univariate statistics for school implementation climate and teachers' perceptions of SWPBIS feasibility

	Mean	SD	Min	Max	Scale Anchor for Mean
Feasibility	4.21	0.65	1.00	5.00	4—Agree
Teacher SIC	2.08	0.70	0.19	4.00	2—Moderate Extent
Focus	2.88	0.75	0.33	4.00	3—Great Extent
Ed. Support	2.45	0.88	0.00	4.00	2—Moderate Extent
Recognition	2.08	0.94	0.00	4.00	2—Moderate Extent
Rewards	0.77	0.86	0.00	4.00	1—Slight Extent
Data Use	2.06	0.96	0.00	4.00	2—Moderate Extent
Existing Support	2.12	0.96	0.00	4.00	2—Moderate Extent
Integration	2.21	0.88	0.00	4.00	2—Moderate Extent
School SIC	2.08	0.31	1.28	2.67	2—Moderate Extent
Focus	2.88	0.37	2.11	3.67	3—Great Extent
Ed. Support	2.44	0.37	1.62	3.02	2—Moderate Extent
Recognition	2.06	0.42	1.27	2.81	2—Moderate Extent
Rewards	0.76	0.33	0.22	1.85	1—Slight Extent
Data Use	2.05	0.46	1.07	3.27	2—Moderate Extent
Existing Support	2.10	0.36	1.27	2.61	2—Moderate Extent
Integration	2.19	0.36	1.37	2.92	2—Moderate Extent

$N_{teachers} = 348$, $N_{schools} = 39$. SD, standard deviation; Min, minimum; Max, maximum; SIC, school implementation climate; Focus, focus on EBP; Ed Support, educational support for EBP; Recognition, recognition for EBP; Rewards, reward for EBP; Data Use, use of data (to support EBP); Existing Support, existing supports to deliver EBPs; Integration, EBP integration; EBP, evidence-based practice

of the 94% between teacher variance in teachers' feasibility (i.e., 4.7% of the total variance in feasibility). Results also revealed school-level SICS to be significantly positively associated with school-level mean feasibility ($b = 0.39$, $p \leq 0.001$, $f^2 = .04$). This means that a one-point increase in a school's average SICS score is associated with a 0.39-point increase in school-level mean feasibility relative to other schools in this sample. School-level SICS explained 24% of the 6% between school variance (i.e., 1.44% of the total variance). Though not of primary interest, two covariates also emerged as significantly associated with teacher-reported feasibility. BIPOC teachers reported lower SICS ($b = -0.23$, $p \leq .05$) compared to White teachers and teachers in schools with higher proportions of ELL students reported lower feasibility ($b = -0.01$, $p \leq .001$).

Discussion

This study examined if teachers' individual and shared perceptions of implementation climate were uniquely associated with teacher-reported feasibility of implementing SWPBIS. Results indicated that both school- and teacher-level implementation climate were positively

Table 4 Bivariate correlations for all study variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Feasibility	1											
2. Tch. SICS	.28***	1										
3. Sch. SICS	.22***	.45***	1									
4. Fidelity	-.01	.16**	.34***	1								
5. Tch. Female	.14**	.03	.10	.06	1							
6. Tch. BIPOC	-.13*	.06	-.05	-.02	-.11*	1						
7. Survey Type	.01	-.13*	-.03	-.03	.06	-.01	1					
8. Tch. Years Exp	-.01	-.06	.01	.01	.09	-.08	-.04	1				
9. Sch. Size	.07	-.05	-.12*	-.10	.06	-.03	-.01	-.07	1			
10. Pct. St. White	.07	.00	.01	-.16**	.01	-.11*	-.03	.23***	-.14*	1		
11. Pct. St. ELL	-.13*	-.04	-.10	.25***	-.06	.05	.02	-.19***	.05	-.84***	1	
12. Pct. Tch. NW	-.13*	-.05	-.12*	-.04	-.04	.35***	.02	-.04	-.10	-.32***	.15**	1

Tch, teacher; Sch, school; SICS, School Implementation Climate Scale; BIPOC, Black, Indigenous, Person of Color; Exp, Experience; Pct, percent; St, student; ELL, English language learner

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 5 Results from a multilevel model examining teacher- and school-level implementation climate related to teacher-reported feasibility of implementing SWPBIS

	Estimate (S.E.)	PCV L1	PCV L2	f^2
Teacher-Level				
SICS	0.23*** (.07)	5%		.06
Female	0.16 (.09)			
Tch. Years of Exp	0.00 (.01)			
Non-White	-0.23* (.11)			
Survey Type	0.04 (.07)			
School-Level				
SICS	0.39*** (.08)		24%	.04
School Size	0.00 (.00)			
Pct. St. White	-0.01 (.00)			
Pct. St. ELL	-0.01*** (.01)			
Pct. Tch. Non-White	-0.42 (.30)			
R^2	15%			

Unstandardized estimates are presented with standard errors in parentheses

PCV, percent change in variance; L1, level 1; L2, level 2; SICS, School Implementation Climate Scale; Tch, teacher; Exp, experience; Pct, percent; St, student; ELL, English language learner

associated with teacher-reported feasibility. Teachers' individual-level perceptions of implementation climate explained more of the total variance in feasibility of SWPBIS and had a larger effect size than school-level implementation climate. These findings provide preliminary evidence that individuals' perception of implementation

climate may be a malleable factor influencing SWPBIS implementation. Following, we discuss the implication of these findings for research and practice, emphasizing the importance of continued work to better understand how teacher perceptions of organizational factors can be leveraged to improve teachers' implementation of SWPBIS.

Individual Perceptions of Implementation Climate Predict Feasibility of Implementing SWPBIS

Supporting our hypothesis and conceptual model, teachers' individual perceptions of implementation climate were positively associated with their feasibility reports, controlling for teachers' shared perceptions of their school's implementation climate. This finding also aligns with the EPIS model, which suggests that characteristics of an organization (e.g., school implementation climate) influences the adoption and implementation of EBPs (Aarons et al., 2011). To our knowledge, this is the first study to examine individual implementer's perceptions of implementation climate related to an implementation outcome. That an individual teacher's perception of school implementation climate was more strongly associated with SWPBIS feasibility reports provides valuable insight to how school implementation climate functions. Implementation climate was moderate with room for growth at both the teacher- and school-levels (see Table 3), which aligns with levels reported in other studies (Ehrhart et al., 2014; Lyon et al., 2018). Improving upon these moderate levels of implementation climate might facilitate various aspects of implementation, including feasibility, which could potentially increase the quality of SWPBIS implementation writ large (Aarons et al., 2014; Weiner et al., 2011; Williams

et al., 2020). This is an empirical question that is ripe for investigation in schools or classrooms implementing EBPs.

Additionally, this study found that teachers in schools with more positive implementation climate reported SWPBIS to be more feasible. This finding aligns investigations from outside the education sector showing that implementers in organizations with higher average implementation climate tend to use EBPs with more frequency (Williams et al., 2018; Williams et al., 2020). Feasibility is an indicator of EBP use (Briesch et al., 2013) and EBPs must be used before they are able to exert influence on students. Because school-level implementation climate is a function of teachers' perception of their school's implementation climate, improving teachers' perceptions will necessarily improve school-level implementation climate. Confirming that teachers' perceptions of implementation climate are positively associated with SWPBIS feasibility opens possibilities to attend to both levels of implementation climate to support SWPBIS implementation (for example of organization-level intervention to improve implementation climate see Aarons et al., 2015).

Potential Implications for Schools Implementing SWPBIS

Having identified teachers' perceptions of implementation climate as a malleable factor influencing teachers' experience of SWPBIS feasibility opens doors to improve feasibility, which may ultimately increase students SEB functioning (Neugebauer et al., 2016). Identifying ways to influence implementation climate at the individual-level might support individual teachers with low perceptions of climate to have higher perceptions of climate and thus increased perceptions of feasibility. One approach to this may be using tailoring methods that attend to various stakeholders when matching implementation supports to specific barriers (i.e., low perceived climate, or low perceived feasibility of a practice; Lewis et al., 2018; Powell et al., 2017). Schools might encourage their implementation teams to gather a group diverse in their school role and perceptions of implementation climate. This group could engage in the methods suggested by Powell et al. (2017) to offer the individualized supports that would enhance the implementation climate experienced by all educators (e.g., conjoint analysis). A more applied approach could be to examine teachers' perceptions of implementation climate to help identify ways practices could be changed specific to an individual. For a teacher reporting low recognition for SWPBIS use, for example, a school leader might individualize how that educator is recognized (e.g., private vs. public praise). Average ratings of school implementation climate may also be informative when considering how leaders can create positive implementation climate at the individual level. In our sample, teachers' average ratings of rewards for SWPBIS use were very low

($M=0.77$) indicating that this component of their school's implementation climate as in need of improvement. Faced with these data, schools might work to bolster this aspect of implementation climate by finding ways to provide small perks for teachers' use of SWPBIS. In this way, teachers' perceptions of implementation climate may be a useful tool for monitoring the progress of and being responsive to active implementation efforts. Please note that these findings are preliminary, and these suggestions are intended to bring the potential importance of these findings to life. While we view these findings as promising, we urge caution in immediately applying them to school-based practices.

Limitations

These findings must be understood in light of several limitations. For example, we relied solely on teacher reports of key constructs. Relying on a single reporter increases the potential influence of common method variance (Tehseen et al., 2017). The feasibility measure we used was designed to be a pragmatic scale (Glasgow & Riley, 2013), the brevity of which may not have captured all aspects of feasibility. No data were collected on teachers' role within SWPBIS. As such, we do not know if teachers responded to feasibility and implementation climate items with individual or teaming practice in mind, which may have influenced ratings. Similarly, data were not collected regarding each school's SWPBIS implementation phase (e.g., implementation, sustainment). Theory suggests different implementation outcomes are relevant at different stages of implementation and as such, future studies should prioritize collecting these data. TFI data, usually collected at multiple points across the school year, were only collected once as part of the larger study. Using a mean from multiple time points would have more accurately captured how SWPBIS was implemented, on average, in this sample of schools. Additionally, school leaders recruited teachers in their school to participate and may have selected for teachers that view their school in a favorable light, potentially inflating ratings of school implementation climate. Two versions of the School Implementation Climate Scale were used (EBP agnostic, EBP specific) that may have influenced results, though there is evidence of invariance across survey type and survey type did not significantly predict feasibility in these data. This study relied on concurrent data, and as such, the findings presented do not provide evidence of directionality of association among constructs examined. Indeed, the proposed associations may operate bidirectionally—teachers who perceive a practice to be infeasible may be frustrated and, therefore, more likely to perceive a negative implementation climate. Theoretical frameworks (e.g., Aarons et al., 2011) support the proposed directionality, though future investigations with temporally separated constructs will be imperative for continued theory

building (see Williams et al., 2020, for example outside of the education sector). This sample reflects elementary schools and teachers in a particular region of the northwestern United States implementing Tier 1 SWPBIS. The results of this study cannot be assumed to generalize to different populations of schools implementing interventions other than SWPBIS at Tier 1. Finally, the effect sizes observed were small. Research shows that small effect sizes are more likely to be spurious and less likely to replicate (Ioannidis, 2005). For these reasons, replication of this proof of concept is crucial to building this emergent evidence base.

Future Directions

As mentioned, feasibility is a key perceptual implementation outcome that supports intervention fidelity and ultimately effectiveness (Proctor et al., 2011). While the present study focused narrowly on examining one path in our theory of change (see Fig. 1), others are ripe for investigation. For example, examination of hypothesized mediating pathways (e.g., implementation climate influencing fidelity through feasibility) will be crucial for understanding the implementation processes that unfolds in schools leading to desirable student outcomes. Relatedly, our conceptual model will require refinement in light of new evidence. The paths tested in this study seem well reflected in the conceptual model, though there are almost certainly missing components to consider. For example, EBP use (Briesch et al., 2013) may sit to the right of feasibility with fidelity moderating the association between EBP use and student outcomes (i.e., feasible EBPs are more likely to be used, which leads to improved student outcomes depending on fidelity of EBP implementation). The distinction between fidelity as a mediator and moderator is important because the former suggests improvement in EBP feasibility will lead to improvements in fidelity of implementing an EBP, whereas the latter suggests implementation fidelity is an independent implementation factor that influences the magnitude of feasibility's effect on student outcomes. Bringing clarity to our conceptual model in light of new findings will help the research community support high quality implementation of EBPs in schools.

A recent systematic review of SEB assessments in schools found that most studies did not examine aspects of intervention usability, inclusive of feasibility, and called for future work to shed light on this important aspect of implementation (Brann et al., 2022). Our model explained more school- than teacher-level variance in the feasibility of implementing SWPBIS, and the vast majority of variance existed at the teacher-level. This begs the question: What other teacher-level factors contribute to teachers' perceptions of feasibility? These data included a rich set of demographic characteristics, and only teacher BIPOC and percent of ELL students in the school were significantly

associated with feasibility (see Table 5). Evidence shows that teachers' attitudes and beliefs about practices and programs vary considerably (Domitrovich et al., 2019; Locke et al., 2019). Given that teachers' demographic characteristics were not found to substantially influence their reported feasibility, investigating attitudes and beliefs may illuminate other malleable factors that might be leveraged to improve teachers' perceptions of SWPBIS feasibility. Ideally, future efforts intentionally select for schools at different stages of SWPBIS implementation and use repeated measures design to examine if feasibility varies more depending on time of year and to identify factors (e.g., perceptions of implementation climate) associated with feasibility at different points throughout the school year.

There is much to be learned about teacher's perceptions implementation climate in schools as well. For example, in a sample of Norwegian child welfare service workers, Engell et al. (2020) demonstrated that job satisfaction positively influenced individual perceptions of implementation climate, whereas years of experience was negatively associated. If this holds true in the education sector, integrating implementation supports targeted to more experienced teachers may result in strengthening individual and school-level implementation climate. Identifying ways to improve individual teacher's experience of their school's implementation climate necessarily means improvements to the school's overall implementation climate, effectively amplifying the positive influence on feasibility. Further, BIPOC teachers and teachers in schools with higher proportions of ELL students reported lower levels of feasibility. While not malleable, identifying processes that undergird these findings may indicate other ways to enhance implementation climate. Additionally, gathering and understanding individual perceptions of implementation climate may be a more practical approach to understanding the differing implementation contexts and responsibilities of teachers as users of SWPBIS and other EBPs. Schools include educators who serve in various roles with unique responsibilities, some of whom are the only one or one of a few serving in that role (e.g., school psychologists, special educators, paraeducators) and their responsibilities may differentially impact their feasibility and resulting implementation of SWPBIS. Attending to these individuals' or subgroups' need for a positive implementation climate could ensure that all members of a school have a climate that supports them in their SWPBIS implementation efforts.

Conclusion

SWPBIS has the potential to positively impact the SEB functioning of students across the United States of America (Horner et al., 2014). To realize the promise of SWPBIS,

however, it must be implemented with quality and studies show fidelity of implementation to vary substantially (Schaper et al., 2016). Though less studied, feasibility of SWPBIS is related to EBP use (Briesch et al., 2013). Lack of EBP use would be captured as “not implemented” on the TFI (Algozzine et al., 2014). Pairing this information with feasibility reports can provide insight to why a teacher may not be using an EBP. Identifying factors that influence SWPBIS feasibility may reveal ways to increase EBP use and adherence, functionally creating the conditions necessary for students to reap the benefits SWPBIS has to offer. This study found teachers’ perceptions of their school’s implementation climate to be one such malleable factor. Implementation climate has the potential to be a particularly powerful factor because improving teachers’ perceptions necessarily improves the overall implementation climate, which might facilitate various aspects of SWPBIS implementation (Aarons et al., 2011; Williams et al., 2020). Our hope is that this study spurs replication and extensions which could include linking teacher- and school-level implementation climate and/or feasibility to other implementation outcomes. Building this evidence base would provide schools with valuable knowledge to develop the positive implementation climate necessary for interventions like SWPBIS to be maximally effective.

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Declarations

Conflicts of interest None.

Ethics Approval All procedures were approved by the University of Washington IRB (Study No. 52311).

Informed Consent Electronic consent was obtained from all participants.

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