

EXPLORING SUSTAINABILITY, FIDELITY, AND INDICATORS OF DATA USE
BY SCHOOLS IMPLEMENTING POSITIVE BEHAVIORAL INTERVENTIONS
AND SUPPORTS

by

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DISSERTATION ABSTRACT

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Title: Exploring Sustainability, Fidelity, and Indicators of Data Use by Schools
Implementing Positive Behavioral Interventions and Supports

Analysis of the variables that affect use of evidence-based and promising innovations in education has led to an emerging literature base addressing sustainability or the potential for sustained implementation over time. Examining the experiences of schools actively engaged in implementing evidence-based innovations holds promise for identifying factors that predict effective data use, high procedural fidelity, and sustained implementation needed to produce substantive school improvement. This study examined three constructs (sustainability, fidelity, and data use) related to implementation of Positive Behavioral Interventions and Supports (PBIS). PBIS is an evidence-based framework that specifically addresses school climate and student social, emotional, and behavioral needs.

The purpose of this exploratory study was to examine sustainability of PBIS over time through relations with several simple measures of (a) data use by PBIS school teams, (b) PBIS fidelity, and (c) factors linked to and across tiers of support within the framework. Extant data were collected from a sample of 656 U.S. schools implementing the PBIS framework over three consecutive years. Results of this study indicate statistically significant relations between fidelity and factors of sustainability across PBIS tiers but indicate that more sophisticated measures of school team data use across tiers are

needed. Implications of these findings, limitations, and suggestions for practitioners and future research are discussed.

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CHAPTER I
INTRODUCTION

Statement of Purpose

Efforts to understand school improvement have expanded from the traditional (and critical) focus on outcomes produced by specific educational practices to include larger implementation concerns across multiple related practices (Bryk, 2020; Slocum et al., 2014). This expanded view of school improvement attempts to understand the inner workings of (a) adopting effective practices that meet specific improvement needs and implementing each with high procedural fidelity (Forman et al., 2013), (b) sustaining the core elements of adopted practices over long time periods (Bradshaw & Pas, 2011; Hall, 2015), and (c) collecting and using data to guide both implementation and adaptation of effective practices to maximize effectiveness (Breiter & Light, 2006). This study examines the intersection of these three areas of implementation to identify how educators may better plan, monitor and guide school improvement.

Examining the experiences of schools actively engaged in implementing school improvement holds promise for identifying which factors best support and predict the high procedural fidelity, sustained implementation, and effective data use needed for substantive student gains. The unifying lens for this analysis is the use of data by schools to understand implementation efforts and outcomes. Schools have become increasingly intentional in efforts to collect and use data to drive and sustain school improvement efforts. Iterative and collaborative use of data for decision-making to improve academic, social, emotional, and behavioral outcomes in schools has become a standard component in school routines both for internal decision making about implementation efforts and external (e.g., district, state)

accountability (Boudett et al., 2013; Horner et al., 2001; Koczwara et al., 2018; Lewis, 2015). Data-driven school improvement efforts may include the selection of specific practices or interventions to support student outcomes (e.g., academic performance, social behavior, attendance), systems to support staff implementation of one or more practices (e.g., professional development, incentives, materials), or broader conceptual models and frameworks (e.g., multi-tiered systems of support, explicit instruction) that have external data or evidence of effectiveness to address specific gaps or challenges at scales that are meaningful to the community (Fixsen et al., 2005; Flay et al., 2005; Horner et al., 2017).

There are an increasing number of improvement innovations (e.g., practices, interventions, frameworks) considered to be evidence-based or promising (i.e., with emerging evidence) to improve school outcomes (Fixsen et al., 2019; Flay et al., 2005). One example of an evidence-based school innovation is teacher use of behavior specific praise statements to positively reinforce desired social behavior (Ennis et al., 2020; Markelz et al., 2019). Another example is incorporating supplemental reading interventions in small group instruction for students struggling to meet grade-level reading benchmarks (Coyne et al., 2018). In recent years, researchers and practitioners have recognized the importance of acknowledging the array of variables that affect the selection, adoption, implementation, and sustained use of best and promising practices in schools (Adelman & Taylor, 2007; Auld & Morris, 2016; Hawkins & James, 2017).

Selection and adoption decisions about school improvement efforts range from classroom-level practices for individual or small group instruction (Park et al., 2017; Stevenson & Mussalow, 2019) to broad systemic policies and procedures that impact every member of the school community such as staff, students, and family/guardians/caretakers

(Antoniou & Kyriakides, 2013; Bradshaw et al., 2012). The use of a formal or informal measure of readiness for a specific improvement area is often used to guide the analysis of existing student and teacher data or to collect additional data that will support informed decisions about whether an intervention meets the intended need and is feasible to implement.

Decisions about implementation and sustained use of an adopted improvement innovation also include ongoing assessment and evaluation of core components to determine whether the improvement efforts (e.g., core elements of the innovation) have been maintained over time as agreed on and the extent that the improvement goal(s) have been reached. Data may indicate that improvement efforts are effective with no change or that changes may be necessary to improve implementation or effectiveness. Intentional implementation using internal or external measures of readiness for specific innovations (Fixsen et al., 2019).

Monitoring and addressing gaps in student performance or outcomes also reach beyond academic competence to assessment of the social, emotional, and behavioral development of students. One evidence-based framework for addressing these social, emotional, and behavioral needs is positive behavioral interventions and supports (PBIS; Bradshaw & Pas, 2011; Horner et al., 2017; Horner et al., 2009). The PBIS framework guides school personnel to strategically organize research-driven or promising practices that provide universal preventative supports to all students, as well as identify and intervene when groups or individuals need additional tiers of social, emotional, and behavioral support. Deeply embedded in the PBIS literature is an emphasis on data-driven decision making. Creating progress monitoring procedures and iterative review cycles that allows

the school implementation team to address needs efficiently and effectively or improve implementation across tiers of support (Bruhn et al., 2019; Irvin et al., 2006; Sugai & Horner, 2006). Recent research on PBIS reinforces this emphasis on use of data, suggesting that iterative cycles of using data to monitor progress is key to sustained, high-fidelity implementation of PBIS over time (McIntosh et al., 2013; McIntosh, Mercer, Nese, et al., 2018).

While use of data has been identified as a predictor of sustainability, little is known about the specific procedures of data use (e.g., collection, organization, analysis, sharing) by PBIS implementation teams. This study builds upon the sciences of improvement and implementation, the PBIS framework, and existing models for data-based decision making to examine measures of sustainability, fidelity, and use of data across tiers of support in PBIS schools. Additionally, the study examined access of standardized reports in pre-packaged progress monitoring systems as indirect measures of data-based decision making by PBIS implementation teams. This study informs future research of the role that data and decision systems impact sustainable and high-fidelity implementation of the PBIS framework in schools.

Literature Review

This study examined three constructs (sustainability, fidelity, data use) related to improvement of schools through implementation of Positive Behavioral Interventions and Supports (PBIS), an evidence-based framework that specifically addresses school climate and student social, emotional, and behavioral needs. Abandonment of evidence-based innovations has led to an emerging literature base to address the factors of sustainability or the potential for sustained implementation over time. Sustainability is often inclusive of the

construct of fidelity or acceptable quality of implementation. There is a broad literature base that generally supports the use of data to drive improvement and implementation decisions in schools as well as emerging research supporting use of data as a predictor of sustained, high-fidelity implementation of the PBIS framework. The following sections will highlight the role of data in improvement science, implementation science, and the PBIS framework and introduce the specific theoretical models that will guide this study in the examination of sustainability, fidelity, and school use of data.

Improvement Science

Schools are not alone in their focus on improving core outcomes. Across many fields of industry and research in the U.S. there is an ever-increasing attention to improvement. Improvement efforts span across healthcare, social climate, education, economy, and environment (Marshall et al., 2013; Neely, 1999). This widespread attention to improvement, driven by competition or dissatisfaction with current outcomes, has prompted the emergence of new fields of research dedicated to examining successes and barriers that are shared across fields. One of these new fields is Improvement Science, designed to address improvement for dynamic and complex organizational structures (e.g., schools, hospitals, businesses) through intentional and systematic decisions about change (Langley et al., 2009; Lewis, 2015; Mason, 2008). Improvement science emphasizes the need for both disciplinary and profound knowledge to enact improvement as well as cyclical routines for continued adaptation and improvement over time. Bryk (2020) identifies six principles of improvement science:

1. Make the work problem-specific and user-centered.
2. Variation in performance is the core problem to address.

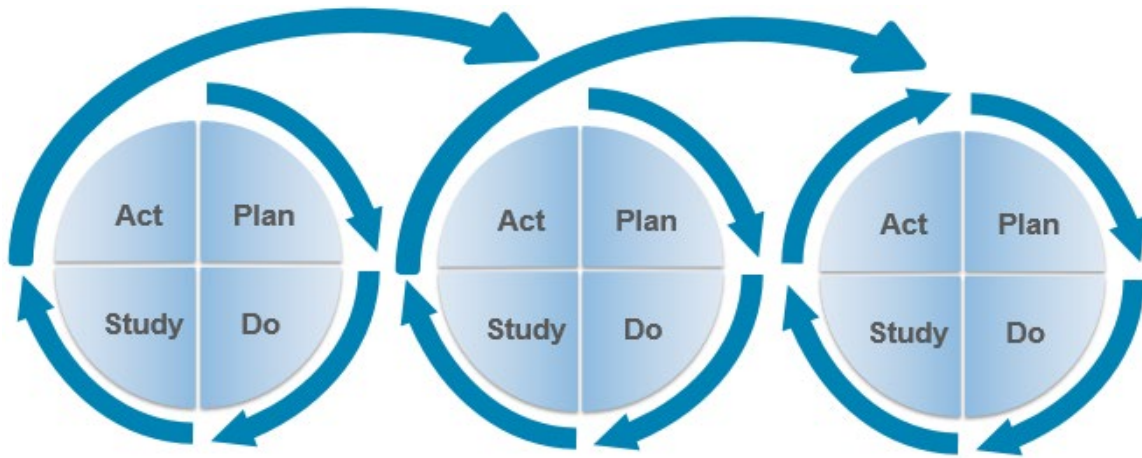
3. See the system that produces the current outcomes.
4. We cannot improve at scale what we cannot measure.
5. Anchor practice improvement in disciplined inquiry.
6. Accelerate improvements through networked communities.

Principles four, five, and six collectively identify the intentional (disciplined and structured) collection and collaborative use of data to drive improvement decisions. Schools may use these improvement principles to guide many areas of improvements but will require comprehensive data systems as well as training and coaching, to develop and maintain data-driven instructional systems that are effective (Halverson et al., 2015; Vanlommel & Schildkamp, 2019).

At the heart of improvement science is the use of iterative improvement cycles, typically based on the Plan-Do-Study-Act Cycle model (PDSA-C; McNicholas et al., 2019; Taylor et al., 2014), a process for building rapid cycles of implementing a practice or improvement and studying (and using) the implementation and outcome data to improve the practice for the next iteration (Figure 1). Data measuring implementation efforts includes valid and reliable indicators about the extent that the “do” phase was carried out as anticipated and any adaptations (e.g., modification, supplementary actions) that may have impacted the results or outcomes... Data on outcomes includes valid and reliable indicators about the impact that the ‘doing’ of the plan had on stakeholders and community members (e.g., students, families, staff), especially on the target area of improvement.

Figure 1

Improvement Science: Plan-Do-Study-Act Cycles (PDSA-C) model



Note. This figure from the National Implementation Research Network demonstrates the iterative nature of the Plan-Do-Study-Act Cycles within improvement science. From right to left, three four-step PDSA cycles are lined up with arrows showing movement between steps within a single cycle and then leading into the next cycle.

Implementation Science

Growing up alongside Improvement Science is Implementation Science. The two fields are closely intertwined and share many common features. Implementation science builds from the use of iterative improvement cycles and expands on features that impact the successful adoption of existing improvement practices into organizations that are likely to benefit (Fixsen et al., 2009; Fixsen et al., 2019; Fixsen et al., 2005). The National Implementation Research Network (NIRN) provides one framework referred to as the Active Implementation Framework for understanding and applying principles of implementation science. The Active Implementation Framework identifies four stages that an organization typically moves between as they implement and sustain a specific

innovation as well as the drivers that influence the quality and speed of implementation.

Implementation Drivers

Organizations using the Active Implementation Framework, or similar models of implementation, attend to several factors that drive implementation (Figure 2) toward strong fidelity, consistent use, and finally improved outcomes (Blase, Van Dyke, et al., 2013; Fullan, 2011; Lindland et al., 2015). These factors or Implementation Drivers are organized into three categories including leadership, competency, and organization. First are Competency Drivers which include the selection, training, and coaching (e.g., prompting, performance feedback) of any mechanisms identified to develop, improve, and sustain implementer capacity to deliver the improvement practice or intervention (Atkins et al., 2017; Bethune & Wood, 2013).

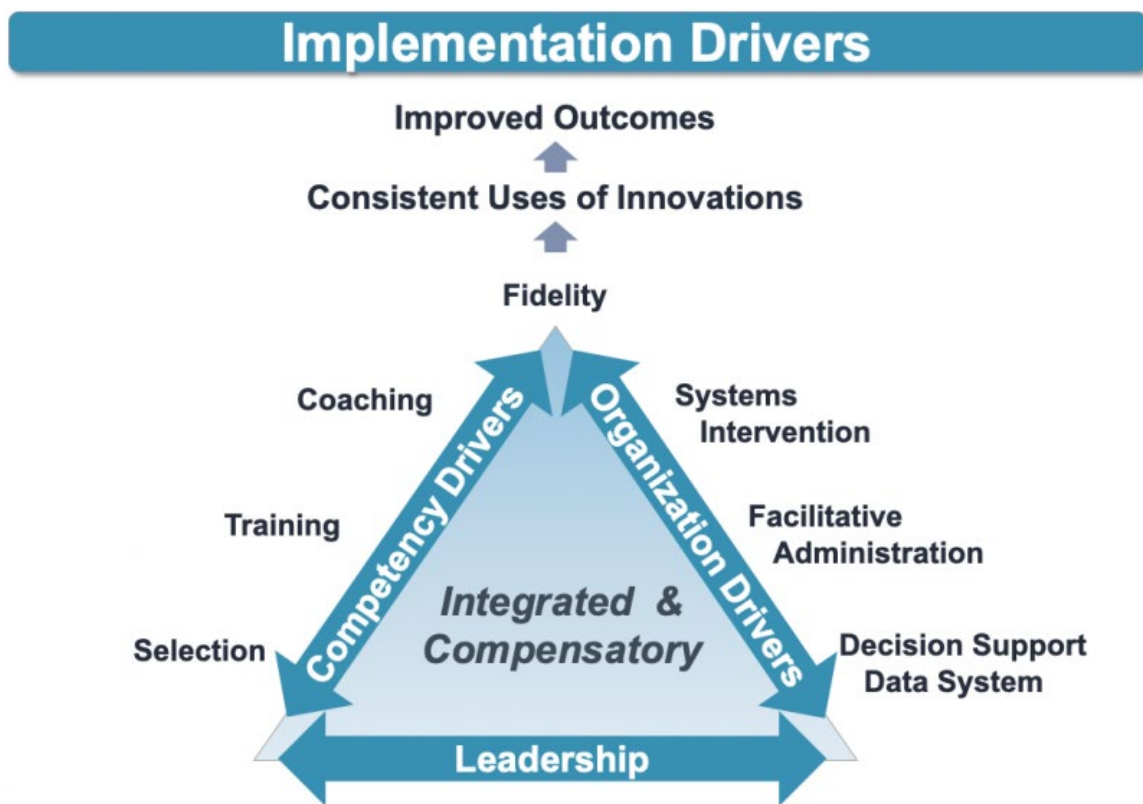
Leadership Drivers represent decisions made by stakeholders who are uniquely positioned with authority to allocate resources or influence with other stakeholders to enact change (Atkins et al., 2008). Leadership may need to adapt to improve capacity for the innovation or to better meet the needs of other stakeholders in their implementation efforts. For more complex improvement efforts, an organization may create a new leadership committee or team to focus solely on the implementation of one innovation or a similar set of innovations (e.g., school climate innovations).

Organization Drivers include system interventions, facilitative administration, and a data-driven decision system to support decisions related to the mechanisms needed to prepare an organization to effectively embed the practice or intervention into the environment (Hagger & Luszczynska, 2014). Data-driven decision systems are inclusive of the systems of data collection and organization needed to inform decisions as well as

the procedures for extracting information from those data and translating them into actionable decisions that will improve implementation fidelity and organizational outcomes, capacity, or sustainability.

Figure 2

Implementation Science: NIRN Active Implementation Framework Drivers



Note. From the National Implementation Research Network. At the bottom is a triangle with arrows showing the integrated and compensatory relation between three implementation drivers. From the top of the triangle, arrows show the relation between the implementation drivers and fidelity, between fidelity and consistent use of innovations, and finally between consistent use and improved outcomes.

Stages of Implementation

There are four stages (Figure 3) within the Active Implementation Framework that an organization moves between: Exploration, Installation, Initial Implementation, and Full Implementation. The first stage of the Active Implementation Framework is Exploration. During Exploration, decision makers of an organization move to (a) identify local performance strengths and gaps (Gilbert, 1978), (b) identify effective and promising practices that will logically improve performance gaps (Blase, Kiser, et al., 2013; Merrell & Buchanan, 2006), and (c) systematically prepare the organization (e.g., personnel, budget) for the installation stage. During Exploration, organizational leaders and stakeholders collaboratively collect and use data to drive decisions, determining when the organization decision-makers and its members agree about the innovation and establish the foundation to move into the Installation stage.

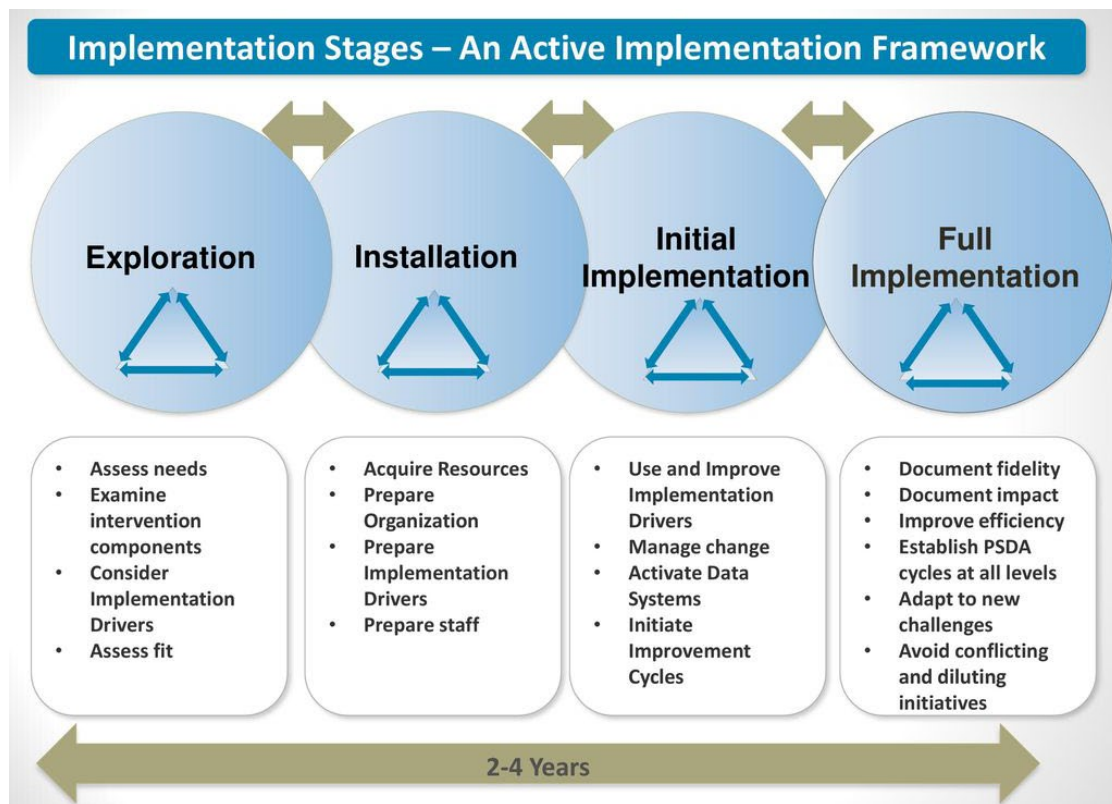
During Installation, the organization acquires resources necessary to move forward with implementation and establish each of the drivers to ensure strong and sustainable leadership, competency, and organization as it pertains to implementing the innovation. During the Installation stage the organization leaders begin to resolve challenges and adapt their capacity as well as organization policies and procedures to best support implementation. Personnel may be asked to change their role, engage in training and coaching opportunities, and provide input in aligning the innovation to the local context.

The first attempt to implement an innovation with recipients (e.g., students) occurs during Initial Implementation. In this stage, a small number of personnel and recipients are chosen to pilot the innovation to establish competence, and organization supports as well as identify potential barriers to enable effective and efficient diffusion to other personnel.

Once at least 50% of the practitioners are implementing with fidelity (based on valid and reliable measures aligned to the innovation) then the organization is ready for the Full Implementation stage.

Figure 3

Implementation Science: NIRN Active Implementation Framework Stages



Note. From the National Implementation Research Network. At the top of the image are four circles that represent the four stages of implementation with bidirectional arrows between stages. Within each stage is a triangle to represent the implementation drivers. Below each stage is a list of potential activities associated with each stage. At the bottom of the graphic is a bidirectional arrow that spans across stages and indicates that it takes 2-4 years to reach full implementation for an innovation.

The Full Implementation stage may take 2-4 years to attain, possibly moving back and forth between stages to address barriers or identify contextual adaptations necessary to fit the innovation to the local needs and values. During this stage there is an effort to establish data systems that document fidelity to the innovation and improvement outcomes. These data form the foundation of the PDSA Cycles and improve sustainability of the innovation. Sustainability may be defined as the potential to sustain the innovation so that it can withstand the many challenges (e.g., new initiatives, personnel turn-over) that may threaten implementation efforts over time. Sustainability is often achieved by embedding the core elements deeply into the policies and routines of the organization to become integral in the identity and core values of the organization.

Since movement between stages is not often linear, it should be based on specific indicators of readiness, capacity, fidelity, and outcomes. Data-based decision making protects the organization leaders and stakeholders from moving too quickly toward a stage that it is unready for or too slowly and losing support or momentum. For example, an organization in the Initial Implementation stage may pilot a math curriculum with two groups of students until a specific number of lessons have been tested and assessment data have been compared to data from the current curriculum before training all practitioners. Alternately, an organization may achieve Full Implementation criteria but later determine that staff commitment or fidelity has waned, indicating that the organization should move back to Initial Implementation or even Installation.

To confidently make decisions about readiness, capacity, fidelity, or outcomes of educational innovations, school decision makers must be able to rely on their collective data sources to meet certain assumptions (Breiter & Light, 2006; Horner, Sugai, & Todd,

2001). The first assumption is that the data collected meets an ongoing information (decision-making) need in the school. Given the emphasis on iterative decision making in both improvement and implementation sciences, most data should be sensitive to changes, but not all changes are equally relevant to decision makers. Collection and presentation of excessive or irrelevant data to decision makers is likely to impact the efficiency of decision making just as the lack of useful data is likely to impact its effectiveness.

A second assumption is that the data will be simple and efficient in both content and delivery. Implementation science relies on shared commitment from stakeholders to meet a common need using a promising or evidence-based innovation. To maintain this shared commitment, the content and presentation (e.g., charts, graphs) of the data should simply and directly connect to the commitments and goals identified by leaders and stakeholders. Given the natural adaptations that occur throughout the implementation stages, data sources, collection procedures, and presentation methods may also require adaptation over time to maintain simplicity and efficiency for decision makers.

The third assumption that decision makers must rely on is accessibility of data to the team for both scheduled review cycles (e.g., team meetings) and unscheduled decision events (e.g., unexpected problem, external request). Accessibility does not inherently imply direct and unlimited access by all stakeholders. Direct access to data may at times be limited to small numbers of personnel to maintain confidentiality or reduce the need for wide-scale training on data systems. Instead, accessibility of data refers to maintaining an appropriate number of personnel with training, direct access, and time allotted in their schedules to provide data to decision makers before (or during) decision events, scheduled or unscheduled.

Positive Behavioral Interventions and Supports (PBIS)

The innovation of interest for this study is the positive behavioral interventions and supports (PBIS) framework. PBIS is an evidence-based, multi-tiered approach to improvement of social, emotional, and behavioral outcomes across all students (Bradshaw & Pas, 2011; Horner et al, 2009). More than 29,000 schools in the U.S. currently implement the PBIS framework (Center on Positive Behavioral Interventions and Supports, 2021). According to the Handbook of PBIS (Dunlap, Sailor, et al., 2009) and its predecessors (Effective Behavior Support, Positive Behavioral Supports) the PBIS framework was built on four tenets:

1. “application of research-validated behavioral science”,
2. “Integration of multiple intervention elements to provide ecologically valid, practical support”,
3. “Commitment to substantive, durable lifestyle outcomes”, and
4. “Implementation of support within organizational systems that facilitate sustained effects”.

During the 1960s, 1970s, and 1980s social justice movements received historically high levels of attention in the U.S. Social justice efforts included increased supports and rights for members of racial and ethnic minorities and individuals with a wide range of exceptionalities and documented disabilities. These movements included access to free, appropriate public education, which required schools to meet minimum standards of accessibility to academic and eventually social-behavioral supports for all students (Zettel & Ballard, 1979). During this same time, the technology of applied behavior analysis

(ABA) emerged, which quickly demonstrated effectiveness in improvement outcomes for individuals with severe emotional and behavioral disorders. During the 1990s and early 2000s, the principles of ABA were combined with a popular model of tiered public health supports to systematically assess and address social, emotional, and behavioral needs of students. This model evolved into the comprehensive framework of PBIS.

Implementation of PBIS has been linked to several areas of school improvement of outcomes in schools (Horner et al., 2017), including increased perceptions of school safety (Horner et al., 2009), decreased incidents of student problem behavior such as office discipline referrals and suspensions (Barrett et al., 2008; Taylor-Greene et al., 1997), as well as improvements in student academic achievement (Bradshaw et al., 2010; Bradshaw et al., 2012). Practices and interventions implemented within the framework to support targeted or individualized behavioral needs have also demonstrated effectiveness. For example, Check-In Check-Out (CICO; Hawken et al., 2021) is an intervention commonly embedded within the PBIS framework for students who need just a small increase in dosage of social skills instruction, adult interaction, positive reinforcement, and performance feedback. This intervention has been primarily studied within the context of PBIS implementation and has been linked to decreased problem behavior and increased academic engagement (Hawken et al., 2014; Hawken et al., 2011; Maggin et al., 2015).

The PBIS Approach

There are four fundamental areas of improvement that schools must address to effectively implement PBIS, shared outcomes, core practices, organization systems, and use of data to drive decisions (Sugai & Horner, 2006). First, schools implementing PBIS identify a set of goals outcomes related to school climate as well as social, emotional, and

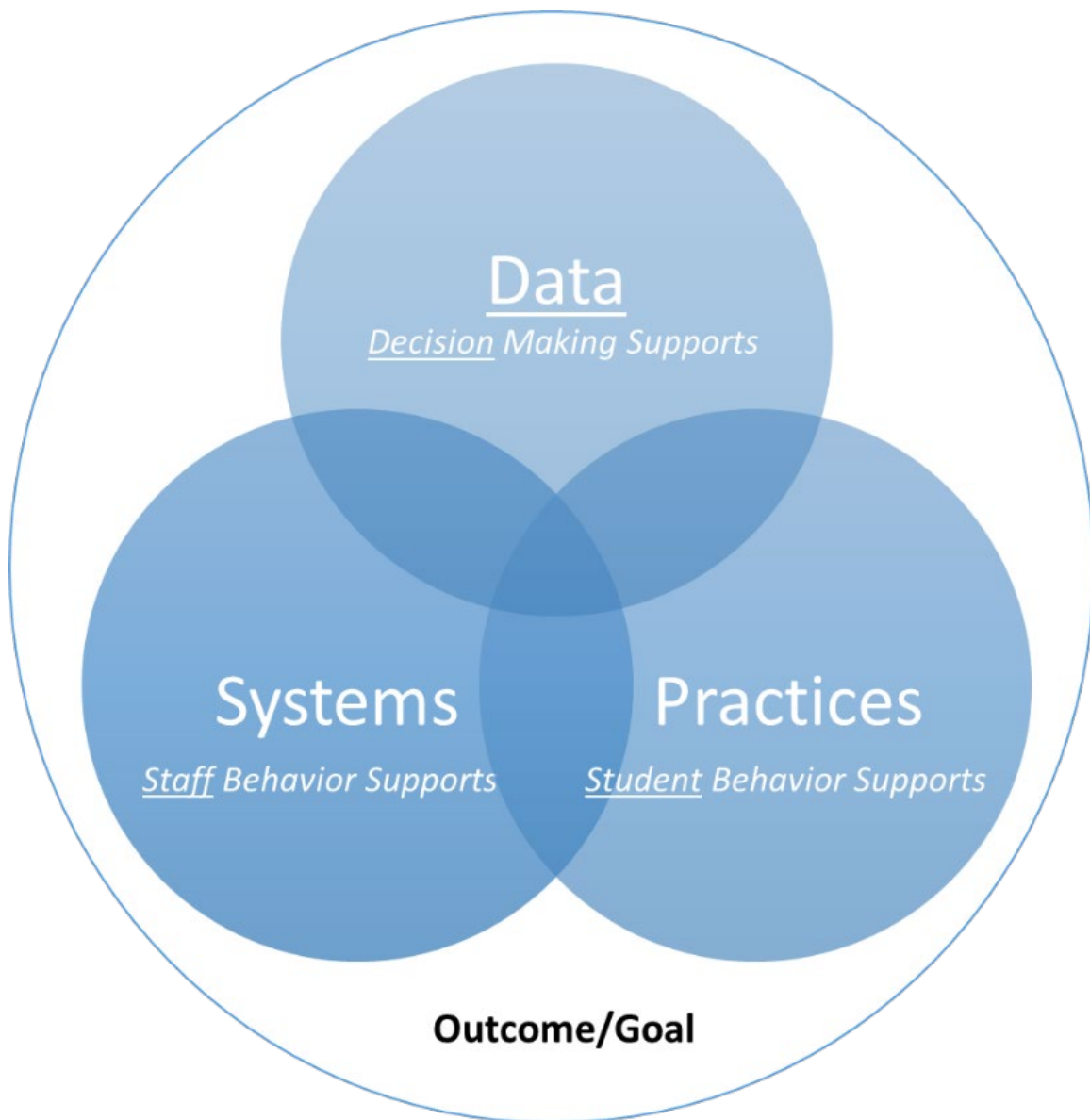
behavioral capabilities for students. These outcomes are developed collaboratively and must align with the core values across the stakeholders or members of the school community. The shared outcomes are used to guide in the selection and adoption of practices (e.g., expectations, social skills curriculum, interventions) embedded within PBIS tiers to address specific student performance gaps or needs. Schools are encouraged to choose the fewest possible student practices to reduce overlap and maximize resources while comprehensively meeting needs. Just as with the outcomes, the practices must be selected collaboratively so that all stakeholders are invested in implementing with fidelity.

Implementing practices with fidelity requires attention to organizational systems (or the Organization Drivers). Systems are established to enable staff to implement the broader PBIS framework (e.g., consistent response procedures to expected and problem behavior) and any selected practices within the framework (e.g., social skills curriculum, targeted interventions) with fidelity over time. The systems are essentially the supports provided to adults as they fulfill their assigned role within the school.

Finally, data systems are established to guide improvement decisions across practices, systems, and outcomes within PBIS. Valid and reliable measures of fidelity to core elements of PBIS and individual practices as well student outcomes make up the core of the PBIS data system. The PBIS data system is embedded within a collaborative data-based decision-making model to support iterative cycles of improvement. Together, these goals, practices, organizational systems, and information systems form the foundation of PBIS (Figure 4).

Figure 4

Diagram of PBIS Approach to School Improvement



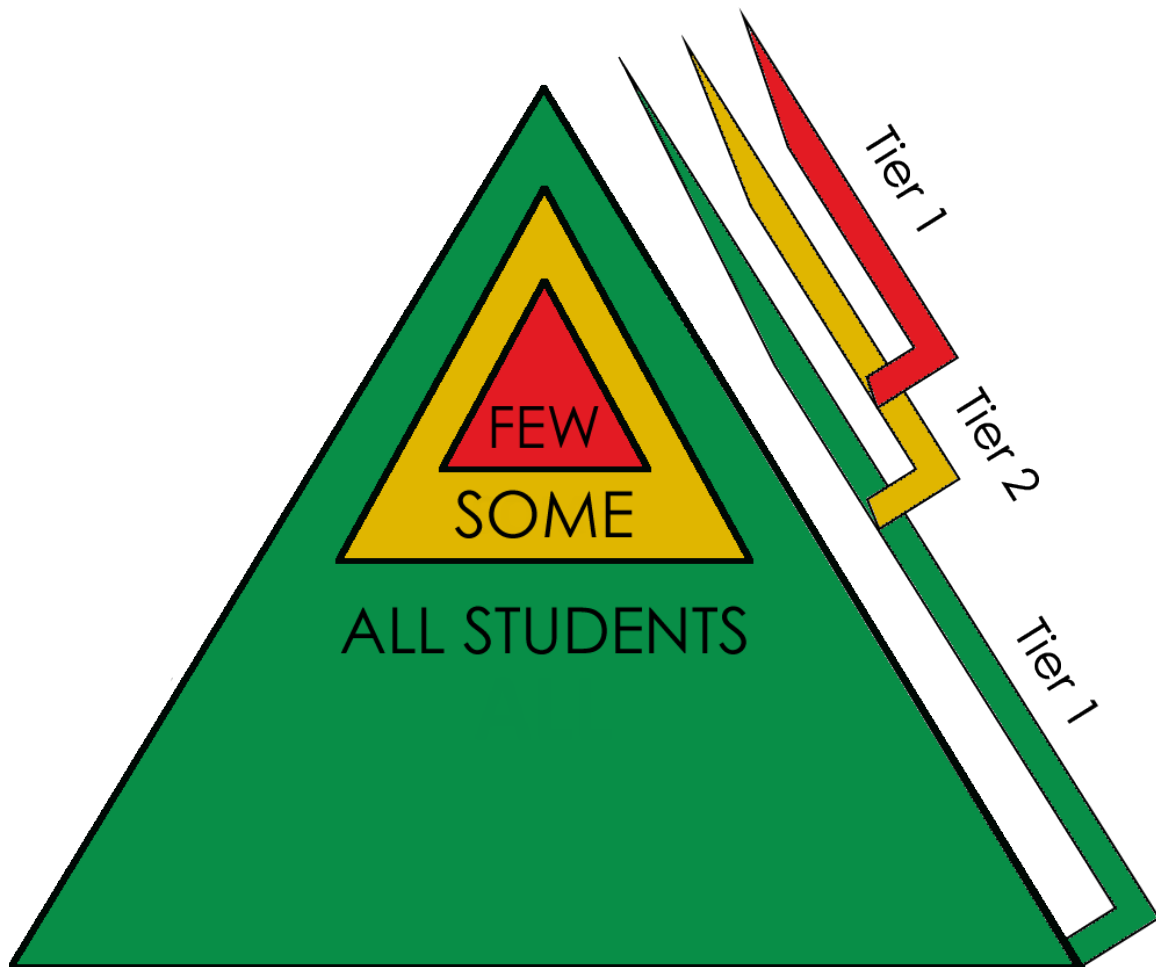
Note. From the Center on PBIS website. A Venn diagram shows three overlapping circles labeled practices, systems, and data. A larger outer circle is labeled outcome/goal to indicate that all practices, systems, and data should align or match to specific school improvement goals.

Tiers of Support in PBIS

Identifying shared outcomes, core practices, organization systems, and use of data to drive decisions occurs within tiers of support intensity. The tiers within PBIS are intended to maximize resources and effort by layering the practices, systems, and data on a continuum that matches support intensity to the specific needs of students. Tier 1 is the most recognizable of these layers because it forms the universal prevention practices targeting for all members of the organization in all places at all times of day. Advanced tiers of support build upon the foundational practices, increasing the intensity and complexity of supports as needed for students. Tier 2 provide a modest and highly efficient boost in student supports through standardized interventions and practices, often in targeted routines or locations (e.g., cafeteria, small group reading) where challenging behavior is more likely to occur. Tier 3 is the most intensive and resource-intensive supports that are individualized based on behavioral assessments and the recommendations of a uniquely formed team that understands the student and family needs as well as the context and function of the student's unique social, emotional, and behavioral challenges. Systems of advanced tiers of support in PBIS are usually adopted and implemented more slowly and preferably after Tier 1 is firmly in place and effectively supporting at least 80% of students (Kittelman et al., 2021). This allows the school to accurately identify student needs that cannot be met by universal supports. The tiers of support are most often represented in terms of a triangle that shows the proportion of student who receive one, two, or all layers of support (Figure 5).

Figure 5

Positive Behavioral Interventions and Supports (PBIS) Tiers of Supports



Note. From the Center on PBIS website. Image shows a large green triangle labeled Tier 1 to represent all students. Within the green triangle is a smaller yellow triangle near the top labeled Tier 2 for some students who need a modest boost in behavioral supports. Finally, the smallest, red triangle is embedded within the yellow triangle and is labeled Tier 3 for a few students who require more individualized or intensive behavioral supports. This and similar graphics are often used to represent the tiered approach to behavioral supports in PBIS and other MTSS frameworks.

Tier 1. Tier 1 PBIS supports form the foundation of the PBIS framework and include the practices, systems, and data representative of all members of the community (often in terms of students). Tier 1 is often referred to as universal prevention or the green portion of the triangle, representing all students. It has sometimes been associated with 80%, not because it is delivered to 80% but because effective Tier 1 supports at least 80% of enrolled students without a need for additional behavioral tiers. A Tier 1 PBIS school leadership team is made up of representatives across stakeholder groups (e.g., administration, teachers, paraprofessionals, students, family members) who meet at least monthly to evaluate and make implementation decisions at the school or system level.

Tier 1 practices and systems. Examples of PBIS practices adopted at Tier 1 include: 3-5 school-wide behavioral expectations, a school-wide social skills curriculum, standard procedures for reinforcing student behavior that aligns with school-wide expectations, and standard procedures for correcting and documenting student behavior that does not align with school-wide expectations. To support staff in implementing these practices competently, the Tier 1 leadership team establishes Tier 1 systems to ensure all Tier 1 practices are delivered with adequate fidelity. For example, staff training and coaching needed to implement each individual practice or and maintaining materials needed to teach the school-wide expectations (Figure 6; Sugai, 2008) or deliver social skills lessons within the adopted curriculum. Tier 1 systems may also include prompting procedures for staff like putting a certain number of reinforcement tokens or coupons into mailboxes at the beginning of each week as a reminder to acknowledge and reinforce desired behaviors.

Figure 6

Positive Behavioral Interventions and Supports (PBIS) Teaching Matrix Example

PBIS TEACHING MATRIX: EXAMPLE

		SETTING						
		All Settings	Hallways	Playgrounds	Cafeteria	Library/ Computer Lab	Assembly	Bus
EXPECTATION	Respect Ourselves	Be on task. Give your best effort. Be prepared.	Walk.	Have a plan.	Eat all your food. Select healthy foods.	Study, read, compute.	Sit in one spot.	Watch for your stop.
	Respect Others	Be kind. Hands/feet to self. Help/share with others.	Use normal voice volume. Walk to right.	Play safe. Include others. Share equipment.	Practice good table manners	Whisper. Return books.	Listen/watch. Use appropriate applause.	Use a quiet voice. Stay in your seat.
	Respect Property	Recycle. Clean up after self.	Pick up litter. Maintain physical space.	Use equipment properly. Put litter in garbage can.	Replace trays & utensils. Clean up eating area.	Push in chairs. Treat books carefully.	Pick up. Treat chairs appropriately.	Wipe your feet. Sit appropriately.

Note. From the Center on PBIS website. This sample PBIS teaching matrix identifies school-wide behavioral expectations and how they are applied or interpreted in specific school settings. For example, Respect Ourselves in the Hallway setting means to walk and Respect Property on the Bus means wiping your feet and sitting appropriately.

Tier 1 teaming and data use. To support Tier 1 leadership to make decisions, evaluation data are needed to measure fidelity of implementation and outcomes related to Tier 1 supports. Fidelity measures indicate overall Tier 1 PBIS framework across implementers and leaders, like the PBIS Tiered Fidelity Inventory (TFI-Tier 1; Algozzine et al., 2014), or specific Tier 1 practices like the Classroom Management Self-Assessment (Simonsen et al., 2006) and the self-reported counts of delivering positive reinforcement tokens. Tier 1 outcome data should represent patterns across all students, or at least

represent all student subgroups (e.g., gender, disability, grade level, ethnicity/race) across enrolled students. Examples may include a school climate survey (Bear et al., 2011; La Salle et al., 2018), attendance records, and universal screening measures like the Student Risk Screening Scale (SRSS; Drummond, 1994; Lane et al., 2012) to determine whether the Tier 1 supports are effective for most students (e.g., 80% or more) and identify any students that are not responding to their current level of support. One common source of Tier 1 student outcome data are discipline referrals, sometimes called office discipline referrals that collect details of an incident that involved one or more student engaging in problem behavior that violated the school-wide expectations or code of conduct. Discipline referral forms collect details such as student information, location, time of day, problem behavior, staff action taken, and the perceived motivation of the behavior (e.g., avoid task, get attention). Figure 7 provides an example of a discipline referral form.

Tier 1 PBIS evaluation data (e.g., fidelity, outcomes) collectively inform the Tier 1 PBIS school team about the current implementation efforts across Tier 1 practices and systems and their effectiveness in improving the school behavioral patterns. The team primarily uses this information internally during iterative review cycles (e.g., monthly team meetings) to identify, prioritize, and solve problems but also shares the information with other stakeholder groups to celebrate improvements, recruit feedback on problems and priorities, and maintain general communications about PBIS implementation efforts. To maximize the use of data collected (e.g., discipline referrals), the team adopts a formal or informal data system to store and organize data so that it is accessible and formatted to clearly identify patterns, trends, and peaks that are useful for decision making (Horner et al., 2001).

Figure 7

(Tier 1) Discipline Referral Form

SHOW RESPECT MAKE GOOD DECISIONS SOLVE PROBLEMS	SWIS Demo School Referral form Descriptions Minor vs. Major Behavior Clarifications	REFERRAL FORM EXAMPLE 2
--	---	--

Date: _____ Time: _____ Referring Staff: _____

Student: _____ IEP 504 Class: _____ Grade: _____

Location:

<input type="checkbox"/> Classroom	<input type="checkbox"/> Gym	<input type="checkbox"/> Music Room	<input type="checkbox"/> Special Event/ Assembly/ Field Trip
<input type="checkbox"/> Hallway/Breezeway	<input type="checkbox"/> Office	<input type="checkbox"/> Off-Campus	<input type="checkbox"/> Parking Lot
<input type="checkbox"/> Playground	<input type="checkbox"/> Bathroom/Restroom	<input type="checkbox"/> Art Room	<input type="checkbox"/> Locker Room
<input type="checkbox"/> Cafeteria	<input type="checkbox"/> Common Area _____	<input type="checkbox"/> Bus Loading Zone	<input type="checkbox"/> Vocational Room
<input type="checkbox"/> Bus	<input type="checkbox"/> Library	<input type="checkbox"/> Computer Lab	<input type="checkbox"/> Other: _____

Notes: _____

Problem Behaviors (check the most intrusive):

Minors (Teacher Managed):	Major (Office Managed):
<input type="checkbox"/> Disrespect	<input type="checkbox"/> Disrespect (Blatant or Excessive, Defiance, Leaving Assigned Area, Forgery, Ongoing Pattern)
<input type="checkbox"/> Disruption	<input type="checkbox"/> Disruption (Yelling excessively, Pattern of Teacher not being able to teach or children learn, excessive tardy)
<input type="checkbox"/> Dress Code	<input type="checkbox"/> Dress Code (Ongoing Pattern, Gang Related)
<input type="checkbox"/> Inappropriate Language	<input type="checkbox"/> Inappropriate Language (Blatant or Excessive, Severe Bullying – Verbal, Harassment, Intimidation)
<input type="checkbox"/> Property Damage/Misuse	<input type="checkbox"/> Property Damage/Misuse (Excessive, Permanent, Vandalism)
<input type="checkbox"/> Physical Contact	<input type="checkbox"/> Physical Contact (Fighting/Repeated Physical Aggression, Loss of Control Out of Anger, Intent to Harm)
<input type="checkbox"/> Technology Violation	<input type="checkbox"/> Technology Violation (Accessing “off limit”, inappropriate websites, bullying/harassment on school equipment)
<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____

Notes: _____

Possible Motivation:

<input type="checkbox"/> Avoid Adult(s)	Teacher or Staff Member Follow-Up Decisions (check the most serious):
<input type="checkbox"/> Avoid Peer(s)	<input type="checkbox"/> Time Out (Give a break, Sensory Accommodation)
<input type="checkbox"/> Avoid Task(s)/Activities/Sensory	<input type="checkbox"/> Conference with Student (Problem-Solving, Class Meeting, Mediated Student Conversation)
<input type="checkbox"/> Obtain Adult(s)	<input type="checkbox"/> Instruction (Teach Correct Behavior, Reteach, Behavior Plan Implemented w/ Fidelity)
<input type="checkbox"/> Obtain Peer(s)	<input type="checkbox"/> Parent (Contact, Conference)
<input type="checkbox"/> Obtain Task(s)/Activities/Sensory	<input type="checkbox"/> Other (RESET Opportunity, Modify Environment/Expectations)
	<input type="checkbox"/> Other: _____

Others Directly Involved:

None Unknown Peer(s) Substitute: _____ Staff Member: _____

Administrative Decision (if referred to Dean’s office):

<input type="checkbox"/> Time Out (Detention, Time in Office)	<input type="checkbox"/> Loss of Privilege(s) _____
<input type="checkbox"/> Conference with Student (Problem-Solving, Mediation)	<input type="checkbox"/> In-School Suspension: _____
<input type="checkbox"/> Restitution (Apology, Community Service)	<input type="checkbox"/> Out of School Suspension: _____
<input type="checkbox"/> Parent (Contact, Conference)	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Instruction (Teach Correct Behavior, Reteach, Restorative Solution)	_____

Notes: _____

WHITE COPY: To the Office YELLOW COPY: To Homeroom Teacher

Note. A sample discipline referral form from the PBISApps website showing the demographic and incident information (e.g., name, behavior, motivation) collected when a behavioral incident occurs.

Advanced Tiers. Advanced tiers of Support in PBIS describe the additional layers of practices, systems, and data that are available for up to 20% of students who are not responsive to Tier 1 supports alone or meet criteria for risk of school failure due to social behaviors. There are most often externalizing problem behaviors but may also be internalizing behaviors that interfere with the student's social-emotional development (Hunter et al., 2013). Advanced tiers of support typically include Tier 2 and Tier 3 supports, although some models include four or more tiers to further identify the level of support individualization or intensity provided. Given the complexity of implementing advanced tiers, the Center on Positive Behavioral Interventions and Supports (PBIS) recommends that schools fully implement Tier 1 prior to introducing advanced tiers of support. Recently Kittelman et al. (2021) reported that staggering or lagging implementation as well as higher level of fidelity predicted higher initial fidelity when introducing advanced tiers. For example, researchers found that schools with a 2- or 3-year lag between initial Tier 1 launch predicted higher initial (year 1) fidelity of Tier 2.

Tier 2. Targeted or Tier 2 support refers to one or more standardized interventions that large groups of students can simultaneously access when there is indication of mild-to-moderate risk of school failure. Tier 2 interventions are group-based and standardized to provide a highly efficient, low-cost, low-effort boost of supports that address the function and context of commonly identified social, emotional, or behavioral needs. Within the tiered logic of PBIS, a school organizes Tier 2 procedures and interventions around widely shared behavioral needs across students (e.g., attention-maintained classroom disruption, general social skill deficits, work-avoidance tardiness) and maintains the capacity (e.g., materials, implementers) to support 10-15% of students across the school year (Hawken et

al., 2009). A school's PBIS leadership team (e.g., Tier 2 team, advanced tier PBIS team) will meet more frequently than Tier 1 teams (e.g., biweekly) to evaluate and make decisions about the Tier 2 practices and systems across the school. This team also monitors or appoints a subcommittee to monitor individual student outcomes to ensure that supports are matched appropriately and faded as soon as the student had demonstrated sufficient self-management skills. Data systems to support team decisions are adopted or developed based on specific intervention data and coordination needs across interventions.

The most implemented Tier 2 practice is the Check-In Check-Out or CICO intervention, which consists of inviting students to meet with an adult mentor or facilitator at the beginning and end of each day as well as interacting with staff members periodically (e.g., 5-10 times) across the day to recruit and receive performance feedback on following school-wide expectations (Bruhn et al., 2013; Hawken et al., 2021). Performance feedback is collected using a daily progress report such as the one provided in Figure 8, and students receive reinforcement when their daily goal (e.g., earned 80% of points) is met. The CICO intervention has demonstrated effectiveness in improvement of academic engagement and decreases in problem behaviors (Maggin et al., 2015; Sullivan, 2015; Todd et al., 2008). Systems that support CICO implementation include a committee or team that manages intervention activities, training for all school staff on providing performance feedback, screening tools and criteria for identifying and matching students to CICO, and a private location for mentors to meet with students. Data-based decision making within CICO often includes the use of student point data to monitor outcomes (Scott et al., 2010) and measures of overall and implementer-specific fidelity to monitor whether the core elements of CICO (Algozzine et al., 2014; Sullivan, 2015) are maintained at acceptable levels.

Figure 8

(Tier 2) CICO Daily Progress Report

School Name
Check-In Check-Out Point Card

Student name: _____ CICO mentor: _____ Date: _____

	Expectation #1	Expectation #2	Expectation #3	Total Points	Teacher Initials
Period 1	0 1 2	0 1 2	0 1 2		
Period 2	0 1 2	0 1 2	0 1 2		
Period 3	0 1 2	0 1 2	0 1 2		
Period 4	0 1 2	0 1 2	0 1 2		
Period 5	0 1 2	0 1 2	0 1 2		
Period 6	0 1 2	0 1 2	0 1 2		
Period 7	0 1 2	0 1 2	0 1 2		
Period 8	0 1 2	0 1 2	0 1 2		

Key:

2 points	Behavior was appropriate; student managed his/her own behavior.
1 point	Behavior was somewhat appropriate; student needed one reminder.
0 points	Behavior was inappropriate; student continued problem behavior after reminder(s).

Note. Sample CICO daily progress report or point card from the PBISApps website. This form includes placeholders for the school-wide expectations and generic time periods across a school day. Based on demonstrated behavior during eight brief (30-60 minute) periods, the student receives 0, 1, or 2 points for each school-wide expectation and can earn up to 48 points for a full school day. The total percent of points earned by the student is typically used to determine whether the student has met their daily goal, usually associated with receiving a pre-determined daily reinforcer (e.g., school behavior ticket, tangible item, activity). Over time, the percent of points earned is also used to determine whether modifications, fading, or graduation from CICO is appropriate.

Tier 3. Tier 3 refers to supports that are individualized, comprehensive, and designed to address a unique or intensive gap in social, emotional, or behavioral performance. Tier 3 supports often require the highest effort and cost and is the final layer of support provided when Tier 1 and Tier 2 supports have proved ineffective in addressing student needs (Bambara et al., 2012; Strickland-Cohen et al., 2018). When Tier 1 and Tier 2 supports are effective and proportional to the total school enrollment, Tier 3 supports should be required for 5% or less of the population. At this layer of PBIS there is increased attention to identifying the unique context and function of the behavior so that an intervention plan can be tailored to meet those unique needs. The progress monitoring system and implementation team are also individualized to match the uniqueness and intensity of the intervention plan. Given the individualized nature of Tier 3 supports, schools may include a wide and diverse range of practices, systems, and data within this tier. For example, a student whose behavior does not respond to a standardized Tier 2 (e.g., CICO) but does respond to a modified and individualized version of that intervention may be included in Tier 3 supports. However, another student who receives Tier 3 supports might receive wraparound supports that comprehensively and uniquely address home, school, and community needs (Eber et al., 2011).

A PBIS school leadership team (e.g., Tier 3 team, advanced tier PBIS team) will meet regularly (e.g., twice monthly) to evaluate and make decisions about the Tier 3 practices and systems across the school. This team also appoints and supports student-centered subcommittees (e.g., student support team) to monitor individual student outcomes to ensure that supports are matched appropriately and faded as soon as the student has met a set of individualized goals and is likely to respond to Tier 2 supports (or

lower-intensity Tier 3 supports).

Tier 3 practices that a student may receive often include the use of a model or procedural checklist for (a) completing a functional behavior assessment to identify individual student strengths and needs, (b) appointing a student-centered support team, (c) developing a behavior support plan to identify strategies to meet those needs, and (d) using an evaluation system to monitor the fidelity and outcomes of the behavior support plan (Alberto & Troutman, 2008; Umbreit & Ferro, 2015). Two examples of models for organizing Tier 3 supports and progress monitoring are the Basic FBA to BIP (Borgmeier et al., 2017; Strickland-Cohen & Horner, 2015) and the Prevent, Teach, Reinforce or PTR model (Barnes et al., 2020; Dunlap, Iovannone, et al., 2009). These models are structured or semi-structured procedures for conducting functional behavior assessments and developing the behavior support plans and progress monitoring procedures to meet an individual student's needs.

Tier 3 systems may include training and coaching for staff directly involved in implementing a behavior support plan and procedures for adjusting staff schedules and responsibilities to allow for conducting observations (to collect data) during routines when the student is most likely to exhibit the problem behavior. Tier 3 systems may also include training all staff in general principles of Tier 3 and procedures for nominating students who may benefit from advanced tiers of support. According to one measure of PBIS fidelity, the Tiered Fidelity Inventory (TFI; Algozzine et al., 2014), data-based decision making at Tier 3 includes both (a) student-level and (b) system-level decisions.

Student-level decision teams are uniquely formed around a student and use individualized indicators of behavior support plan implementation and student

responsiveness or outcomes. Like the Tier 2 CICO intervention, daily progress reports or similar behavior rating scales are often incorporated into Tier 3 student progress monitoring procedures but are often individualized to address target behaviors rather than the school-wide expectations. Use of an individualized daily progress report increases structure and performance feedback on the student's behavior in a way that is consistent with procedures for CICO (an intervention all school staff are trained to implement) as well as provide intermittent data to drive decisions that are tailored to the student. Additional data may also be collected to monitor detail about specific target (desired or problem) behaviors. Figure 9 provides examples of individualized data fidelity and outcome collection tools for a student who receives Tier 3 supports that includes both a daily progress report and frequency data for specific student behaviors. Given the individualized nature of interventions and systems to individual student needs, adopting procedures or standardized data systems to summarize Tier 3 data at the student- and school-wide levels present many challenges to student support teams as well as the school Tier 3 leadership teams.

System-level decision making for Tier 3 is managed by a broader school-wide team that collects broader indicators of fidelity to the Tier 3 systems across staff delivering and general outcomes across students receiving Tier 3 supports within the school. For example, student support teams that manage individual behavior support plans may be required to report average fidelity scores, percent of days when fidelity was acceptable, and the status of meeting behavior support plan goals (e.g., progressing, not progressing, fading procedures implemented). These broad indicators can then be summarized across student support teams for an overall indicator that Tier 3 supports are being implemented with fidelity and are generally effective in meeting student needs.

Figure 9

(Tier 3) Individualized Progress Monitoring Forms

My Name: _____
 Long Date: _____ Short Date: _____
 My Goal Today: _____% Working for: _____

Picture Schedule & Behavior Card

Time	Activity	Picture	Speak Clearly	Stay On-Task	Use Strategies	Points Earned	Teacher Initials
8:20 am	1. Get off the bus					=	
8:30 am	2. Rm 8 Teacher check in					=	
8:40 am	3. Rm 8 Circle Time					=	
9:00 am	4. Rm 8 Small Groups AM					=	
10:25 am	5. Rm 12 Math Whole Group					=	
10:45 am	6. Rm 12 Math Small Group					=	
11:00 am	7. Rm 12 Special: _____	?				=	
11:30 am	8. Lunch					=	
11:50 am	9. Recess					=	
12:30 pm	10. Rm 8 Small Groups PM					=	
1:30 pm	11. Rm 8 Special: _____	?				=	
2:45 pm	12. Get on the bus					=	
0 = Try again 1 = Okay 2 = Good work!			Total	=	=	=	/ (24) = %

Teacher Tally Marks for Behavior

Strategies Used	Prob. Behavior Events	Instructional hours
Ask for Tx attn:	Off-Task:	<input type="checkbox"/> Regular Schedule (5 hrs)
Ask for Px attn:	Unclear communication:	<input type="checkbox"/> Low instruction (3 hrs)
Ask for Help:	Disruption:	<input type="checkbox"/> Extra instruction (6 hrs)
Other _____:	Other _____:	<input type="checkbox"/> Other: _____

Note: _____
 Plan Change: _____

Quick Implementer Checklist (Rating per plan component)

After working with Carly, quickly review and enter your fidelity rating per component. Leave components blank if it is not your responsibility. Enter lowest rating into I-SWIS.

Student Initials: Today's Date: _____

Item	Plan Component	AS	BB	AA	Final	Notes/Tasks
1	Teacher morning check-in					
2	Picture Schedule/ Behavior Card					
3	Reinforce attempts/positive behaviors with attention					
4	Ignore low-intensity problems					
5	Quick, neutral reteach for high-intensity behaviors					

April: Morning check in, small group rotations
 Bert: 8:20am – 11:50am (rotate during small groups)
 Amy: 11:45am – 12:00am (rotate during small groups)

1 = Low accuracy or consistency
 2 = Minimal accuracy or consistency
 3 = Acceptable accuracy & consistency
 4 = High accuracy & consistency

Room 12 Self-Monitoring

Student Initials: Teacher Initials: _____ Today's Date: _____
 What is my goal? **Stay on task in room 12.** I'm trying to get: _____ stamps
 Working for: _____

Instructions:
 a. Use your recorder and earbuds.
 b. Keep the volume on low and push play.
 c. When you hear the beep think about your behavior. **Did you stay on task?**
 • Yes – good work, add 1 stamp
 • No – no stamp, try again
 d. When you reach the hand picture, raise your hand to ask your teacher for a thumbs-up or high-five.

Whole Group Math	Small Group Math	Specials

Note. Sample Tier 3 progress monitoring forms from the PBISApps website. Top left shows an individualized daily progress report with a student-specific written and picture schedule, behavioral goals, and points earned. Bottom left provides teachers space to tally their own fidelity ratings along with occurrence of target problem behaviors and total instructional hours in the student’s day. Top right shows an implementation checklist with a list of behavior plan strategies (e.g., prompt use of picture schedule) for implementers to self-rate fidelity on a Likert-type scale of 1-4. Bottom right shows a student self-monitoring form to track individualized behavior goals (e.g., stay on task) with an interval prompting device.

Fidelity, Sustainability, and Data Use in PBIS

This study examines three constructs shared across improvement science, implementation science, and the PBIS framework: fidelity of implementation, sustainability of implementation, and the use of data to drive improvement and implementation decisions.

PBIS Fidelity

Fidelity or integrity of implementation has been widely used within research to link innovations of interest with the results or outcomes observed (Ledford & Gast, 2014; Peterson et al., 1982). More recently there have been efforts to expand the measurement of fidelity to practitioners as a standard assessment procedure to maintain implementation standards over time, especially while making cultural adaptations to fit local values or needs (Castro-Olivo et al., 2018; Evanovich & Kern, 2018; Harn et al., 2013). PBIS has maintained a high emphasis on monitoring fidelity within schools. As outlined in the PBIS Evaluation Blueprint (2020), fidelity of implementation within PBIS most often refers to the standardized measures of school fidelity to core components of the framework such as appointing school leadership team(s) and subcommittees across tiers, establishing tiered practices and systems within each tier of support, adopting evaluation measures and procedures to guide decision-making, and protecting resources required to implement practices and systems with fidelity.

Over the last 20 years, PBIS implementers have sought to develop valid and reliable measures of PBIS fidelity to inform both researchers and practitioners about the extent that core components of PBIS are embedded into school routines. Several different PBIS fidelity tools have been developed to-date, each attempting to serve a specific set of evaluation needs. For example, the School-Wide Evaluation Tool (SET; Horner et al.,

2004) was designed to evaluate PBIS fidelity for research purposes and ensure that outcomes can confidently be associated with core components of the framework. The Benchmarks of Quality (BoQ; Kincaid et al., 2005) was developed to support school Tier 1 leadership teams and district coaches in self-monitoring a comprehensive set of Tier 1 core components. Most recently, the Tiered Fidelity Inventory (TFI; Algozzine et al., 2014), was developed to support school leadership team(s) and district coaches across tiers in more efficiently self-monitoring a set of high-priority core components of PBIS across tiers. Companion guides to the TFI have also been developed for schools that have successfully established strong PBIS implementation over time to evaluate more advanced initiatives such as cultural responsiveness and mental health supports within the PBIS framework (Barrett et al., 2016; Levenson et al., 2021). Additional practice- or intervention-specific fidelity measures are administered as appropriate. For example, Simonsen et al. (2006) identified several classroom practices related to PBIS that teachers can self-assess (or a coach can observe and provide external feedback) including the ratio of positive-to-negative statements, opportunities to respond per minute, and arranging the room to minimize crowding and distraction.

Measurement of fidelity is often viewed as simply a tool of external accountability or establishing a standard of quality that yields desired outcomes (Childs et al., 2016) but within the PBIS framework, the use of fidelity focuses on internal use of the data provided to PBIS implementers. During early stages of implementation, fidelity measures support school teams to identify features in place, partially in place, or not in place and to determine where to focus implementation efforts. During later stages of implementation, regularly monitoring fidelity to the PBIS framework over time supports decisions about

sustained implementation of core features especially as schools engage in programmatic or individual (teacher or student) adaptations made to core elements and may be shared with staff to encourage shared commitment to PBIS over time.

PBIS Sustainability

Maintaining core elements of PBIS is only useful if those features can be scaled to produce meaningful student outcomes that can be sustained over time. Recent efforts are underway to measure and examine the potential for sustained implementation over time or the sustainability of PBIS core elements separately from fidelity of implementation of those same features (McIntosh, Horner, et al., 2009). While fidelity measures provide a snapshot of whether core elements of the innovation are being implemented and are closely related to the continued use of those features (Yeung et al., 2016), the emphasis is on keeping basic features in place. Sustainability expands beyond simple maintenance and includes the examination of separate enablers and barriers that may impact the likelihood, speed, or quality of implementing the core elements in the future. Additionally, sustainability directly addresses the need for continuous regeneration or adaptations to the core elements to maximize resources and improve the relevance of those features to ever-changing local needs (McIntosh, Horner, et al., 2009).

The need for research on sustainability is rooted in the same issue that sparked improvement and implementation science, and abandonment of evidence-based practices. McIntosh et al. (2016) analyzed fidelity of PBIS implementation data from 5,331 schools over a five-year period. The patterns of fidelity were grouped into four categories, including Sustainers, Slow Starters, Late Abandoners, and Rapid Abandoners. Sustainers were identified as schools that met recommended fidelity criterion across all five years.

About 29% of schools fit into the Sustainer category. Slow Starters were those that showed inconsistent patterns of reaching fidelity criterion across the first three years but increased and met criterion in the final two years. About 13% of participating schools fit in the Slow Starters category. Late Abandoners were identified as schools that reached fidelity criterion within the first three years but dropped off or were unlikely to reach criterion in the fourth and fifth year. About 24% of schools fell into the Late Abandoners category. Finally, Rapid Abandoners were schools that reported reaching fidelity criterion in the first year but abandoned or reported low fidelity in the remaining years. About 34% of schools fell into the Rapid Abandoners category.

Research on enablers and barriers of PBIS adoption and sustainability (Hieneman & Dunlap, 2000, 2001; Kincaid et al., 2007) have evolved into a list of indicators or factors for PBIS schools and researchers to attend to as they attempt to create robust implementation procedures that will withstand a wide range of potential barriers that may be encountered (Bambara et al., 2009; Robertson et al., 2020; Turri et al., 2016). At Tier 1, both school- and district-level variables have been identified as influencers over PBIS sustainability (McIntosh, Horner, et al., 2009; McIntosh, Mercer, et al., 2018). Several of these indicators are measured in a survey of Tier 1 PBIS sustainability called the School-Wide Universal Behavior Sustainability Index: School Teams (SUBSIST; McIntosh, Doolittle, et al., 2009). Most recently, variables have been identified that collectively or separately influence sustainability of advanced tiers of PBIS (Tier 2, Tier 3). These variables were used to develop a new measure of advanced tier PBIS sustainability called the Advanced Level Tier Interventions Treatment Utilization and Durability Evaluation (ALTITUDE; McIntosh, Kittelman, et al., 2018).

A more recent study by Kittelman et al. (2020) followed up with personnel from 30 schools that abandoned and later readopted the PBIS framework. The study identified the perceived reasons for abandonment included lack of staff buy-in/commitment/enthusiasm, lack of school administrative support, lack of staff consistency, and low fidelity of implementation. The most frequently identified reason for re-adoption was new school administrator with additional responses relating to district support, observing success in neighboring schools that implemented, and additional funding.

Initial efforts to understand the role and factors of adoption, abandonment, and sustainability all share the goal of developing a technology for PBIS sustainability that can be applied to school improvement and PBIS implementation efforts. Moving from theoretical models and measures of sustainability toward an applied technology will improve the ability of implementers to address issues of sustainability in the early stages of implementation and with greater precision. While this long-term goal has not yet been reached progress has been made toward predicting sustained implementation with adequate fidelity at Tier 1, the tier most likely to be implemented first within the framework.

Tier 1 PBIS Sustainability. Because of the time required to reach full implementation of universal supports and the complexity of implementing advanced tiers, research on PBIS sustainability has primarily focused on universal or Tier 1 systems of support. School-level and district-level factors have been identified as predictors of sustained implementation over multiple years. Several school-level factors that have been found to significantly predict PBIS Tier 1 sustainability, including acknowledgement systems (e.g., token economy), matching instruction to student ability (e.g., age-appropriate social skills curriculum), self-reported Tier 1 implementation fidelity, and team actions

such as use and sharing of data (Mathews et al., 2014; McIntosh, Mercer, et al., 2018b). District-level capacity building has also been identified as a predictor of sustained PBIS implementation (Kittelman, McIntosh, et al., 2019). George et al. (2018) identified several additional themes that district staff perceived important to district-level capacity including coordination capacity, coaching, teaming, and a data infrastructure.

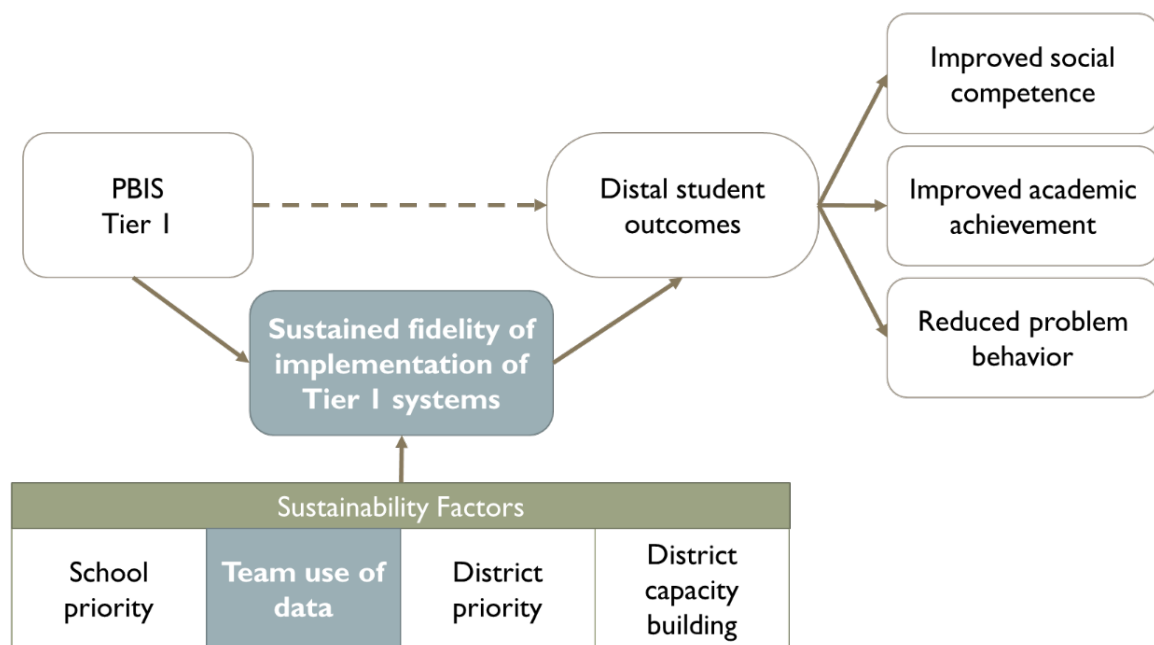
In one study, McIntosh et al. (2013) identified Team Use of Data and District Capacity Building as two significant predictors of sustained Tier 1 PBIS implementation with fidelity at or above criterion. As a follow-up to these results, McIntosh et al. (2015) examined a larger sample of schools, including a set of three additional questions related to school team actions. The first school team action question asked respondents to identify frequency of PBIS team meetings on a 5-point Likert-type scale from every other month to weekly. Second, respondents were asked the frequency that teams shared data with the whole school staff on a 10-point Likert-type scale from less than once per year to weekly. Finally, respondents were asked to identify the hours of PBIS coaching received by the school team on a 7-point Likert-type scale from none to more than 5 hours per week. Results of latent regression analyses of variables predicting individual factors of Tier 1 sustainability indicated that frequency of team meetings was a significant predictor for School Team Use of Data, District Priority, and District Capacity building factors of Tier 1 PBIS sustainability. Frequency of sharing data with staff was a significant predictor of School Priority and school Team Use of Data. Access to coaching was only a significant predictor of District Capacity Building.

The theoretical model for PBIS sustainability at Tier 1 (McIntosh, Doolittle, et al., 2009; McIntosh et al., 2011) is presented in Figure 10. The model identifies sustained

fidelity of core elements of Tier 1 PBIS as a mediator of the universal distal student outcomes targeted by the framework including (a) improved social competency, (b) improved academic achievement, and (c) reduced problem behavior (e.g., discipline referral rates, suspension). Sustained fidelity of implementation is a direct result of the four factors of PBIS Tier 1 sustainability (School Priority, Team Use of Data, District Priority, Capacity Building).

Figure 10

Theoretical Model for Tier 1 PBIS Sustainability



Note. Adapted from McIntosh, Doolittle, et al. (2009) and McIntosh et al. (2011).

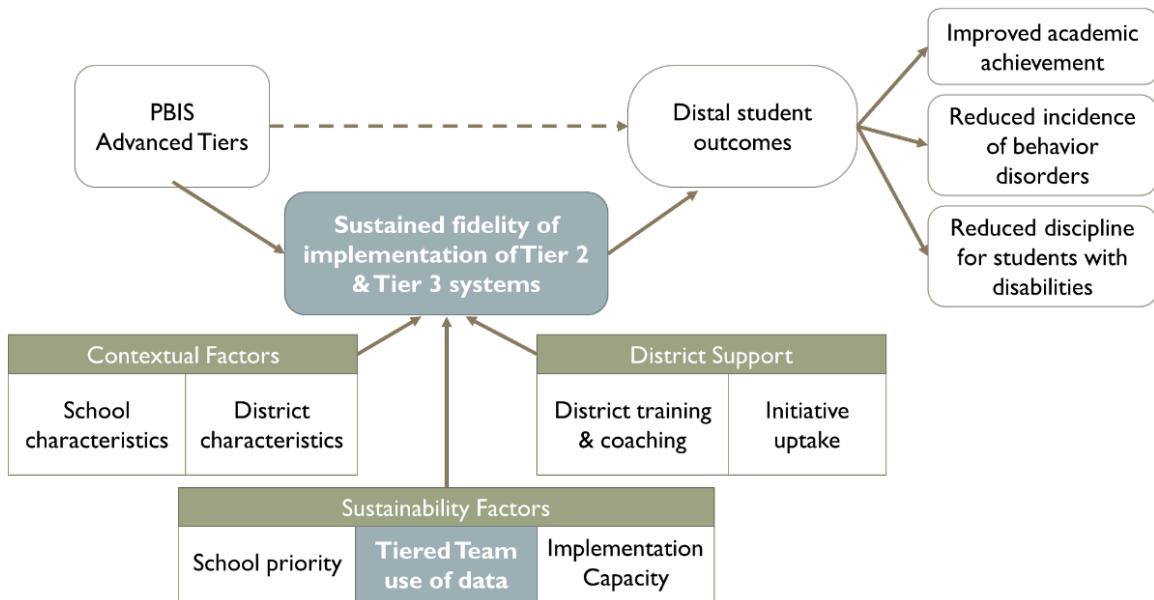
Theoretical model for Tier 1 PBIS sustainability. This model identifies four factors of sustainability that impact sustained fidelity of Tier 1 PBIS systems which in turn impact distal student outcomes of implementing PBIS at Tier 1 (improved social competence, improved academic achievement, reduced problem behavior).

Advanced Tier PBIS Sustainability. Very recently, interest in PBIS sustainability has turned to factors that would predict the implementation of PBIS at advanced tiers of support (Tier 2 and Tier 3), separately from the factors that would predict general PBIS implementation and Tier 1 specifically. The more complicated and nuanced nature of targeted (Tier 2) and individualized (Tier 3) supports will conceptually present challenges that differ from adopting universal (Tier 1) prevention systems and practices intended to be implemented by all staff members for all students. These predictors of advanced tier PBIS sustainability have been slower to emerge given that fewer schools report measures of implementation (e.g., fidelity, outcomes) of advanced tiers, possibly indicating slower adoption rates of Tier 2 and Tier 3 systems of support (Debnam et al., 2012; Kittelman et al., 2018).

Potential factors related to sustainability of advanced PBIS tiers have been identified for a small number of specific Tier 2 interventions (Loman et al., 2010) as well as general models and procedures for Tier 3 supports (Bambara et al., 2009; Bambara et al., 2012). Figure 11 provides the theoretical model for PBIS sustainability at advanced tiers (Tier 2, Tier 3) of support (McIntosh, Kittelman, et al., 2018; McIntosh, Mercer, Horner, et al., 2018). Like the theoretical model for Tier 1 PBIS sustainability, this theoretical model identifies sustained fidelity of core elements of advanced tiers of PBIS as a mediator of three advanced tier distal student outcomes targeted by the framework, including (a) improved academic achievement, (b) reduced incidence of students identified with a behavior disorder, and (c) reduced discipline data for students identified with one or more disability.

Figure 11

Theoretical Model for Advanced Tier PBIS Sustainability



Note. Adapted from McIntosh, Mercer, Horner, et al. (2018) and McIntosh, Kittelman, et al. (2018). This model identifies several factors of sustainability, context, and district support that impact sustained fidelity of advanced tier PBIS systems, which in turn impact distal student outcomes of implementing PBIS at advanced tiers (improved academic achievement, reduced incidence of behavior disorders, reduced discipline for students with disabilities).

Given the complexity of advanced tiers, sustained fidelity of implementation for advanced tiers is impacted by a combination of school and district contextual factors, district supports available (e.g., training, coaching), and sustainability factors. The general factors of sustainability are identified as School Priority, Tiered Team Use of Data, and Implementation Capacity. Some features of advanced tier PBIS sustainability are

theoretically shared across Tier 2 and Tier 3 supports (e.g., administrative support, strong home partnerships), while others are distinct to Tier 2 (e.g., school personnel knowledgeable about Tier 2 logic and interventions, Tier 2 or group-based behavior data system) or Tier 3 (team with knowledge about Tier 3 supports, individualized behavior data system). By attending to the factors of sustainability shared across tiers and for specific tiers of support, school leadership teams may be better equipped to (a) identify when the school is ready to begin exploration and installation of the next tier of support without abandonment of previous tier(s) and (b) consider factors of sustainability while planning implementation activities at each stage.

PBIS Data Use

Use of data and data-based decision making in PBIS is a challenging construct given the wide range of data systems that schools may choose to collect and use as indicators of implementation fidelity and student outcomes across practices and systems. Newton et al. (2012) developed a model called Team Initiated Problem Solving (TIPS) for Tier 1 PBIS teams to use as they meet to analyze and translate data collected into useful information for decision making. During initial research on TIPS, the primary source of outcome data used were office discipline referrals collected within an online data system, the School-Wide Information System or SWIS (May et al., 1998) to review patterns of inappropriate behaviors and make decisions about school climate and system-level problems. Within the model, the team appoints a data analyst to generate reports prior to team meetings and present precise problem statements with supporting graphs to the team before or at the beginning of the meeting. The team then prioritizes one or two problems, and the remainder of the meeting is used to identify solutions and create an action plan to

address and monitor the problem (Newton et al., 2009; Todd et al., 2012). Another TIPS study examined contents of the Decision Observation, Recording, and Analysis (DORA) tool, a research tool developed and validated to capture observations of team meetings for PBIS teams that adopted the TIPS model. By analyzing 44 problem statements discussed across 18 meetings in 10 elementary schools documented by trained DORA evaluators, Algozzine et al. (2016) were able to examine specific teaming and decision procedures by PBIS teams that involved the use of data as well and compare them to student outcome data collected about discipline referral patterns in SWIS. Results indicated that team engagement in problem-solving and use of quantitative data recorded on the DORA were associated with positive changes in student outcomes (reduced discipline referrals in general or specific contexts). The most recent randomized waitlist-controlled study on implementing TIPS (Horner et al., 2018) collected team meeting observations and indicated that teams implementing the model were more likely to identify problems with adequate precision to develop actionable solutions, implement those solutions with fidelity, and document improved student outcomes (reduced rates of discipline referrals and out of school suspensions per 100 students).

Discipline Referral Data. Within PBIS research, discipline referral patterns have been examined not only as a dependent variable or outcome of PBIS implementation (Lewis et al., 1998; Scott & Barrett, 2004), but also as a source of evaluation data within the framework. For example, Sugai et al. (2000) analyzed patterns of discipline referral rates as early indicators of problem behaviors that may lead to school violence. Understanding patterns of referral data, especially in the context of developmental level allows schools to target response and improvement efforts to specific needs. (Kaufman et

al., 2010) analyzed different ways to disaggregate discipline referral patterns that would be useful to schools as they make programmatic or system-level decisions or plan for specific practices and interventions within the PBIS framework. They determined that grade (developmental level), gender, and racial and ethnic contextual factors were all important considerations for the school to account for in driving decisions. Alternately, other studies have found that discipline referral is not appropriate or rather insufficient for making all decisions within PBIS. Skiba et al. (1997) cautioned that the seriousness of the problem behavior and the severity of the consequence were often disproportionate across the referral patterns. This finding pointed to the need for staff to build shared procedures for addressing and documenting problem behavior.

One attempt to address this disproportionality in discipline practices was the development of a comprehensive decision system and web-based application for tracking discipline referrals. The School-Wide Information System or SWIS (May et al., 2013) was developed as part of an early PBIS grant in the 1990s (then called Effective Behavior Support or EBS) to provide pilot schools with effective tools for identifying patterns of discipline and engaging in problem-solving. Once the grant ended, school leaders and PBIS implementers expressed interest in maintaining SWIS for ongoing PBIS implementation efforts. Currently over 8,000 schools have adopted SWIS (PBISApps.org), working closely with a local SWIS facilitator who receives training on use of the SWIS application as well as coaching on procedures for installation and maintenance of school requirements.

Schools and SWIS facilitators work to meet a set of fidelity or readiness requirements and agree to maintain those standards over time. The full SWIS Readiness Requirements are provided in Appendix A. Examples of SWIS readiness requirements

include the following:

1. administrative support for use of SWIS,
2. aligning the school referral form to SWIS requirements (Appendix B),
3. maintaining a leadership team that regularly meets to analyze and use SWIS data,
4. documenting school procedures for addressing and documenting problem behaviors, and
5. ongoing training, coaching, and readiness “check-ups” from the local SWIS facilitator.

Within the PBIS literature, referral patterns in SWIS have been used in elementary and middle schools to examine individual student trajectories and identified as one source of data for identifying a student in need of additional tiers of support, often referred to as universal screening (McIntosh et al., 2010; Predy et al., 2014). Recently, Kittelman et al. (2019) analyzed the count of months when a SWIS user for the school generated one or more report as an indirect measure of intention to “use” discipline referral data for decision making and analyzed relation with the SUBSIST measure for Tier 1 PBIS sustainability. The results indicated that generation of discipline referral reports in SWIS was modestly and statistically significantly correlated with SUBSIST Team Use of Data factor scores across implementation groups.

SWIS Reports. The use of discipline referral data is useful for decisions across tiers of PBIS but is commonly associated with Tier 1 or universal prevention systems. SWIS was designed around the principles of Tier 1 and the standardized or core reporting options within the application are tailored to identify system-level patterns across all enrolled

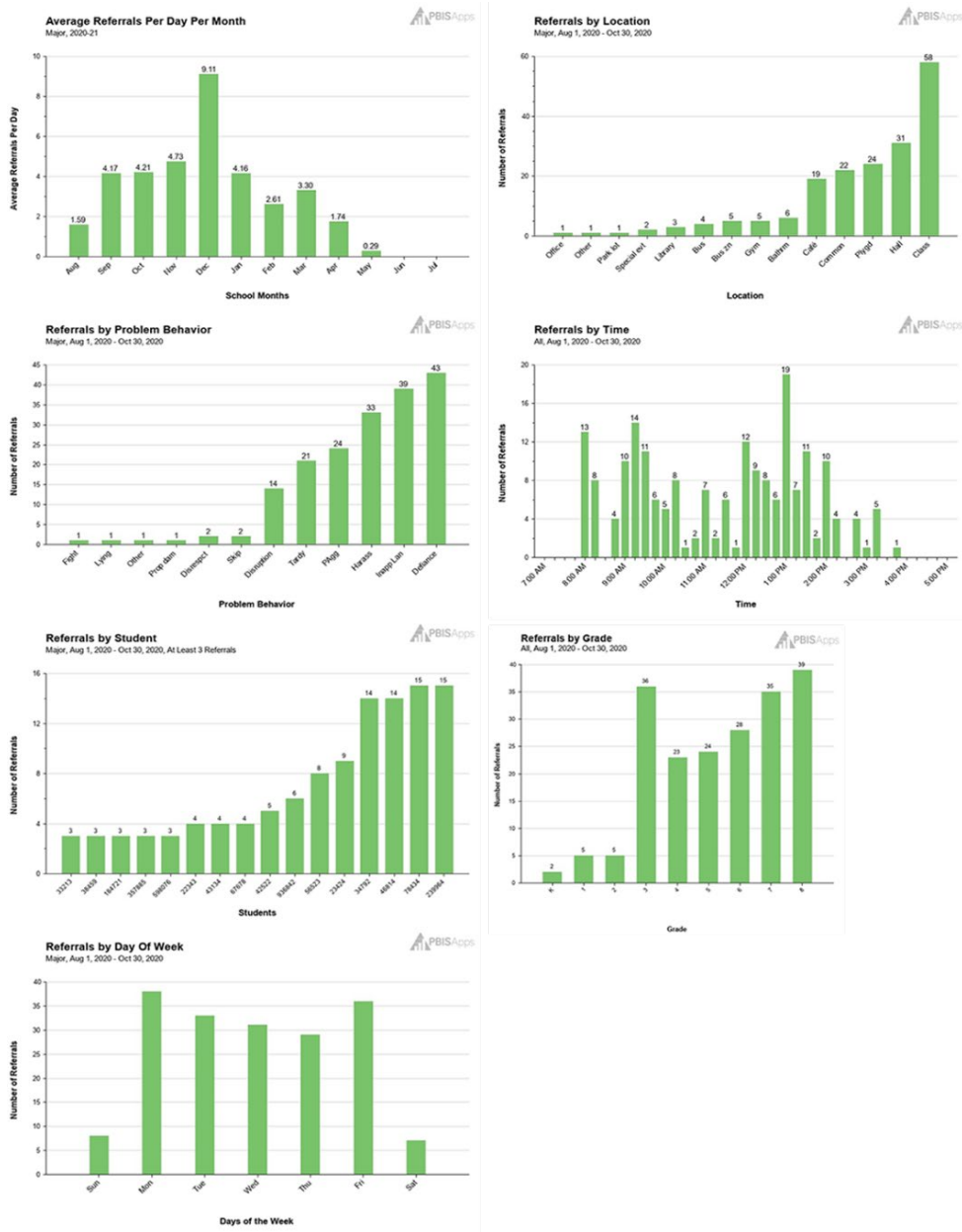
students. There are seven core SWIS reports (Figure 12) that are designed to use during monthly PBIS leadership meetings and shared out regularly with members of the school community (e.g., students, staff, families). Core SWIS reports include:

1. Average Referrals Per Day Per Month
2. Referrals by Location
3. Referrals by Problem Behavior
4. Referrals by Time of Day
5. Referrals by Student
6. Referrals by Day of Week
7. Referrals by Grade

Additional customized reports of discipline referral patterns may be manually created in SWIS using a tool called “Drill Down” that allows for specific filters to be applied to limit the reports to patterns within a specific context, behavior, or sub-group of students (e.g., grade, gender, ethnic/racial group, intervention participants). For example, if core SWIS reports indicate high levels of referrals in the cafeteria, the Drill Down tool can be used to show the specific problem behaviors that have been referred in the cafeteria for a specified date range (e.g., the month of October, the last six weeks). The Drill Down tool often requires additional training but improves the precision and efficiency of decision making at Tier 1 or serves as supplemental data about advanced tiers of support. Figure 13 provides a snapshot of the SWIS Drill Down tool with filters for a specific date range (i.e., 9/1/20 to 10/30/20) and one type of behavior (i.e., Harassment) of interest.

Figure 12

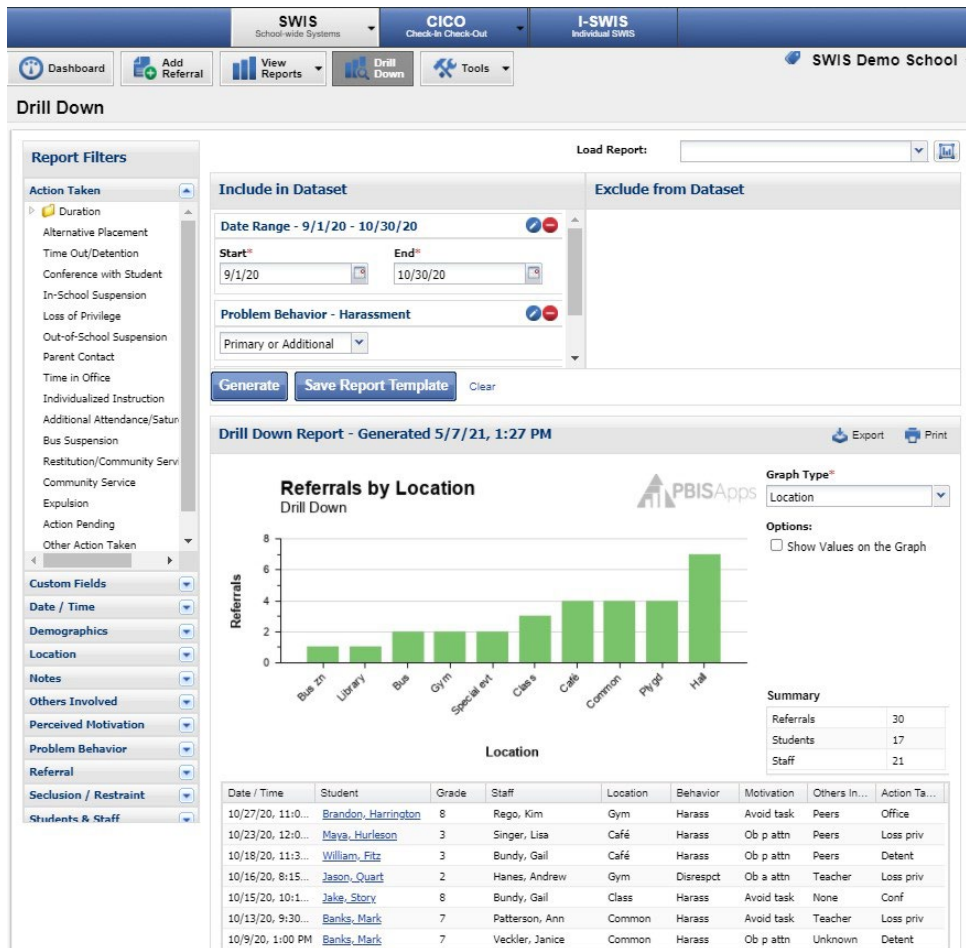
School-Wide Information System (SWIS) Core Reports



Note. From the PBISApps demonstration website for SWIS. This image includes seven examples of core reports in SWIS including average referrals per day per month, by location, by problem behavior, by time, by student, by grade, and by day of week. All reports are bar charts to allow for simple comparison across categories (or students).

Figure 13

School-Wide Information System (SWIS) Drill Down



Note. From the PBISApps demonstration website for SWIS. This image demonstrates the functionality available in the SWIS Drill Down tool. At the left are data filters (e.g., problem behaviors, location) to choose from. At the top of the Drill Down tool are two boxes where filters can be added to either Include or Exclude in the dataset. At the bottom right is the report section showing results of the filtered dataset. A drop-down menu allows the dataset to be formatted in specific bar charts by type (location, problem behavior, gender). A summary table shows the number of referrals, number of students, and number of referring staff represented in the current dataset. At the bottom is a large table of individual referral information from the dataset.

Student Intervention Data. Currently there is no published research on the use of TIPS for teams that monitor advanced tiers of PBIS and limited guidance on procedures for using data at advanced tiers to make system-level PBIS decisions across interventions. However, the handbook for the Tier 2 Check-In Check-Out intervention (CICO; Hawken et al., 2021) identifies student point data from the daily progress report as a key source of data to monitor intervention outcomes. Many Tier 2 and Tier 3 interventions include the use of daily progress reports and similar direct behavior rating scales that may be used for progress monitoring of individual interventions (Daniels et al., 2017; Fabiano et al., 2017). Given the popularity of the CICO intervention, the developers of the SWIS application created a separate decision system and online web application to monitor student outcomes on this and similar interventions that are based on a standardized daily progress report. The Check-In Check-Out School-Wide Information System (CICO-SWIS; May et al., 2008) monitors the daily progress report (point card) data using a 3-point (0-2) Likert-type scale across 5-10 periods of a day. Report available in CICO-SWIS include graphs and tables that support decisions about the intervention systems as well as individual students. These CICO-SWIS graphs are used during twice monthly reviews by the team or coordinator and present patterns of student intervention data including:

1. Number of days that students participated (i.e., received points),
2. Number of days when the daily point goal (e.g., 75%) was met by one or all students, and
3. Average daily points earned across students or days or specific periods of a day.

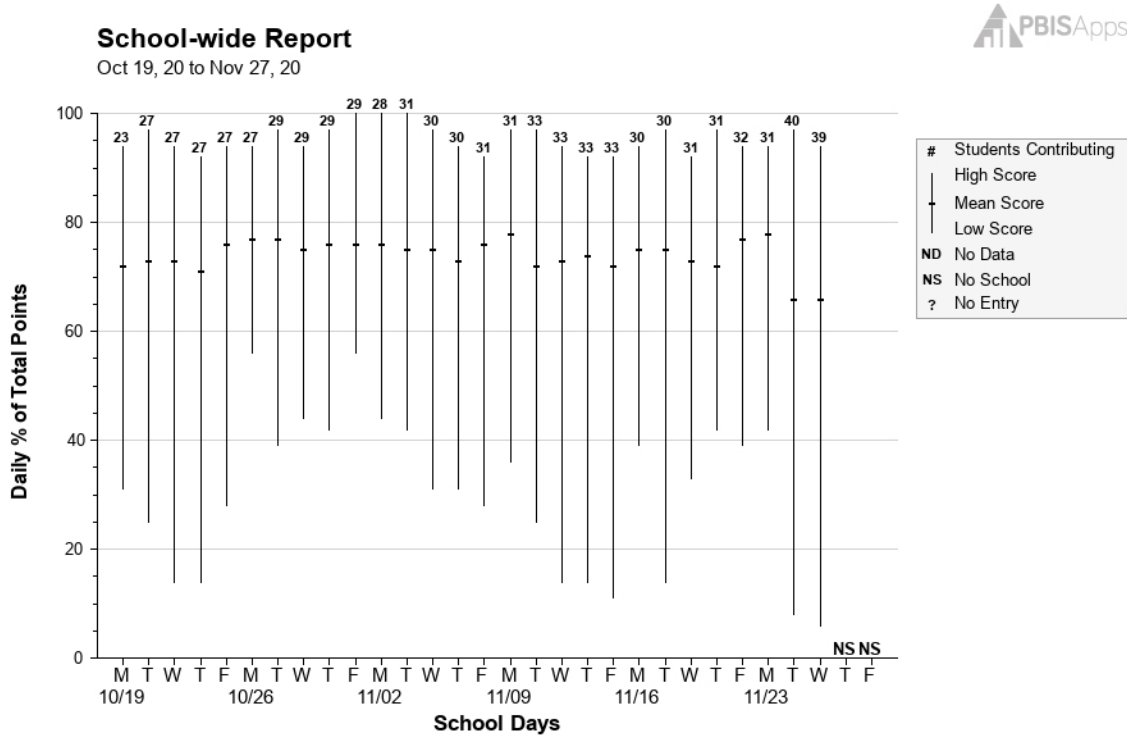
CICO-SWIS Reports. Figure 14 provides an example of a CICO-SWIS school-wide report that organizes student point data across students into a daily whisker graph. The vertical line represents a range of the proportion of points that all participating students earned. The small horizontal dash or line represents the average score across students. Finally, the number at the top of the vertical line indicates the number of participating students for the given date.

School decision-making teams use this report to determine the extent that students identified to participate are consistently using the daily progress report and the overall patterns of points received across students over time. Figure 15 provides another example that provides an average of points earned by all students who participated in the intervention over a specified date range (e.g., Nov. 30, 2020 – Dec. 18, 2020). This provides another representation of patterns of points earned across students and identifies whether individuals or groups of students were more or less likely to the school-wide goal (e.g., 80%) consistently for that date range. Three additional student-level CICO-SWIS reporting options are available to analyze:

1. day-by-day participation and percent of overall points earned across periods and behavioral expectations,
2. average percent of points earned by period of the day over a specified date range, and
3. day-by-day participation and percent of points earned across behavioral expectations for a specified period of the day.

Figure 14

Check-In Check-Out School-Wide Information System (CICO-SWIS) School-Wide Report

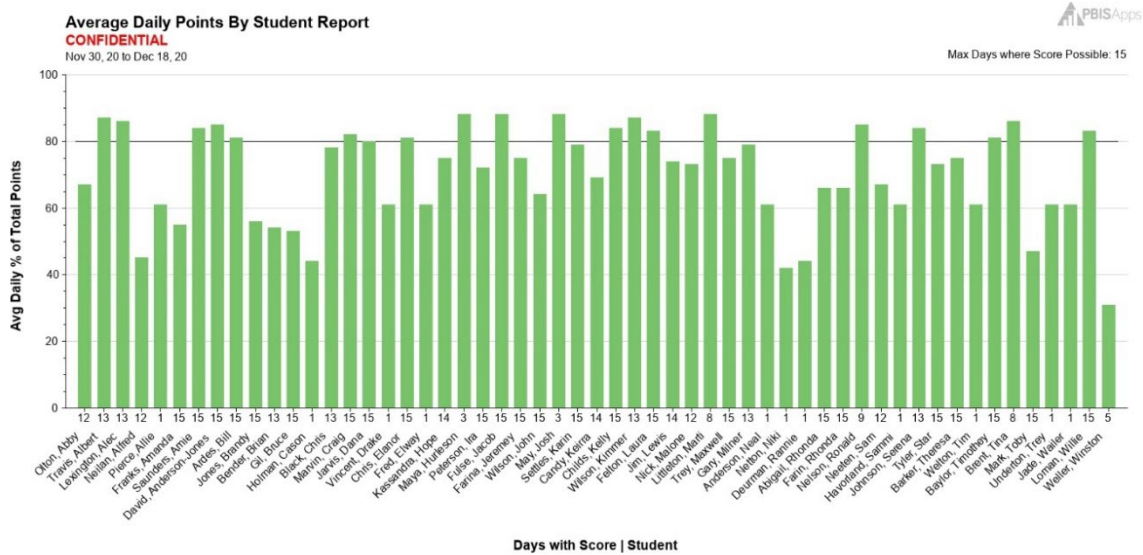


Note. From the PBISApps demonstration website for CICO-SWIS. This image provides a sample School-Wide Report. This whisker graph shows day-by-day the number of contributing students for a given date along with the range of daily percent of points earned across students and the average score across all participating students for the day. The graph shows up to 30 days and indicates days where no data were entered (e.g., no school, no entry). This School-Wide report indicates that from October 19, 2020 to November 27, 2020 between 23 and 40 students participated in the intervention each day with high variability in the range of daily percent of points earned. Average daily scores across participating students ranging from 60% to 80% of points. Decision makers may want to further investigate the variability in both participation and points earned across students.

Figure 15

Check-In Check-Out School-Wide Information System (CICO-SWIS) Average Daily

Points by Student Report



Note. From the PBISApps demonstration website for CICO-SWIS. This image provides a sample Average Daily Points by Student Report. This bar graph shows the average scores for each participating student in a specified date range (Nov 20 to Dec 18). For each student, the average score and number of participating days (i.e., days that points were entered into CICO-SWIS) are provided to monitor both student participation and responsiveness to the intervention.

Adoption of CICO-SWIS mimics that of the original SWIS component with a local, certified facilitator trained in the functionality and procedures for CICO-SWIS (and often the CICO intervention as well). The school and CICO-SWIS facilitator collaborate to meet a set of readiness requirements that highlight indicators of fidelity to Tier 2 systems of support and then the facilitator completes the licensing and subscription procedures to set

up the CICO-SWIS application for the school. Appendix C provides the list of readiness requirements that schools/facilitators agree to meet and maintain as part of implementing the data system. These requirements include similar items to the SWIS requirements related to administrative support, teaming, and documented procedures that personnel will follow in implementing both Tier 2 interventions (usually CICO) and the CICO-SWIS application.

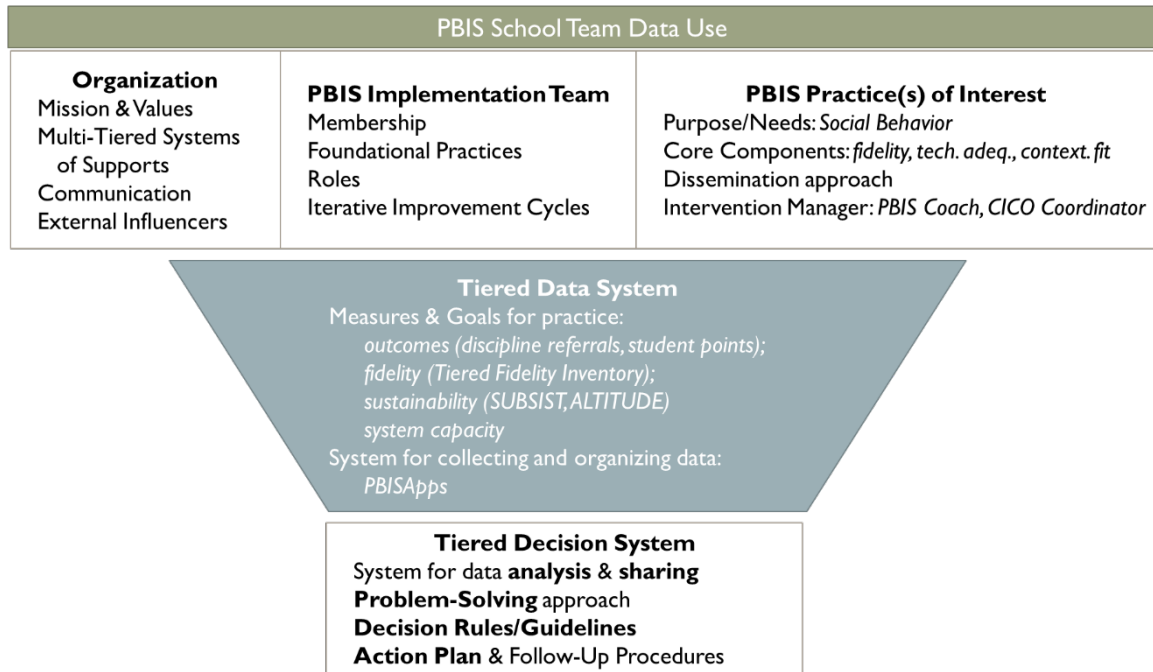
Theory of Data Use

Based on the improvement, implementation and PBIS literature, a separate theoretical model was developed on team use of data across tiers within PBIS implementation teams (Figure 16). The model was developed to guide the present set of analyses and starts by identifying three factors that impact team use of data by PBIS implementation teams. Organization factors or drivers specific to PBIS implementation team use of data include the mission and values of the school including the multi-tiered systems approach to academic and behavioral supports, the communication procedures, and external (e.g., community, district) influencers to resource allocation and decision making. At the top center is teaming, the specific foundations and procedures adopted by the PBIS Implementation Team including membership (i.e., stakeholder representation), foundational practices (e.g., minute taking, time allocation), roles (e.g., facilitator, data analyst), and specifically the model used for iterative improvement cycles. PBIS Implementation Team(s) and sub-committees in the school often focus on a specific tier or even specific practices. These specific target practice(s) within the purview of the team will also impact the use of data for example the alignment of the practice to the needs off the school, the fidelity and contextual fit of the core elements for the practice, the school's approach to dissemination (implementation phases), and the manager(s) that coordinate the

target practice(s) for example the PBIS Coach or the Check-In Check-Out (CICO) Coordinator.

Figure 16

Theoretical Model of PBIS Implementation Team Data Use



Note. Theoretical model for PBIS School Team Data use. This model identifies five factors that impact the effectiveness of school teams in using data for decision making. At the top are three factors that influence teaming procedures including organizational factors (e.g., school mission and values), PBIS implementation team (e.g., membership, roles), and PBIS Practice(s) of Interest (e.g., purpose, core components). At the center is the availability and use of a Tiered Data System or the measures and systems adopted to collect and organize PBIS data. At the bottom is the final factor, a Tiered Decision System that includes the systems and procedures for analyzing, sharing, problem-solving, making decisions, and action planning.

Tiered Data System

Given the influence of organizational, team, and practice factors, the theoretical model divides use of data into two components: a tiered data system, and a tiered decision system. A tiered data system describes the organization of evaluation measures and related procedures that are adopted by the team to monitor (a) outcomes for example discipline referrals or student point data (e.g., CICO points), (b) fidelity such as the School-Wide Evaluation Tool or Tiered Fidelity Inventory. Additional measures of sustainability and capacity may also be used by the team, for example the SUBSIST and ALTITUDE to measure PBIS sustainability across tiers or indicators that the school has the system capacity to support the intended number of students. Just as with practices, each measure should serve a specific purpose and provide valid and reliable information to the team about overall PBIS implementation or specific tiers and practices within the PBIS framework. Adopting separate measures for each tier is important but insufficient to meet this goal, the team also needs a strong system for collecting and organizing data. Pre-packaged data systems such as the those offered by PBISApps (e.g., SWIS, CICO-SWIS) provide not only the technology to store and organize data but also recommended procedures for staff procedures that will maintain the integrity of the data from start to finish. Other data systems may use simpler technologies such as spreadsheets, but local procedures must be established to ensure data integrity.

Tiered Decision System.

With the data systems firmly in place, the final component is to build a system of decision routines and procedures to support team use of the data collected. These guidelines establish specific procedures for using the collection of outcome, fidelity, sustainability,

and capacity data to drive improvement and implementation decisions, especially those tied to resources such as staff time and effort or financial costs. Decision rules describe a set of pre-determined indicators used by the team for analyzing and sharing data with stakeholders in the organization. For example, schools often identify several potential indicators that despite high fidelity of current supports, an individual student may need additional behavioral intervention(s) including discipline referrals (e.g., 2+ referrals in a 6-week period), attendance (3+ unexcused absences in a single quarter), or intervention-specific data (e.g., below CICO point goal 8 out of 10 days). The TIPS model encourages each team to identify a data analyst who takes the lead in managing these tasks and becoming the local expert on the data system(s) and decision guidelines used by the team. This data analyst often follows a schedule for sharing a set number of reports that are routinely (e.g., monthly, quarterly, annually) used by the team but also uses their knowledge of the data to look for additional reports and information that may be timely to share with the team. Sharing of data outside the team is also an important procedure to build so that all stakeholders have access to the information relevant to their role within the organization and can build a shared understanding of PBIS or specific practices. When useful information has been shared with the team, the next focus is on systematically using it to identify and solve problems related to fidelity, outcomes, sustainability, or capacity and to maintain a set of decision rules that will allow the team to efficiently identify the direction of problem-solving (e.g., staff training, identify adaptations to the practice). The final element of the decision rules used by teams is building an action plan that translates solutions and decisions into actionable steps with procedures to follow up on the fidelity and outcomes of those decisions as they relate to the original problem, the practice of

interest, the PBIS framework, and the school as a whole organization.

Summary

Across the literature for improvement science, implementation science, and the Positive Behavioral Interventions and Supports framework, the systematic and iterative use of data is identified as an important feature that links initial and sustained fidelity to core elements of an innovation. Research on school team use of data within PBIS implementation is limited and lacking in detail that would allow for the quality or frequency of data use to be evaluated at large scales. One potential indicator of school data use at Tier 1 is the frequency that reports about discipline patterns are generated. While indirect, discipline referral patterns have been cited as one outcome of implementing the PBIS framework and examined as a source of data available to school teams for monitoring school climate and student behavioral patterns. Initial efforts to use access or generation of reports in SWIS resulted in a modest but statistically significant relation to PBIS Tier 1 sustainability, specifically the Team Use of Data factor on the SUBSIST measure.

Indicators of data use at advanced tiers at the school level are nearly nonexistent within the existing PBIS literature. Given the use of student daily progress reports or point data earned within many Tier 2 interventions, use of student point data and generation of reports about student point data are a measure worth exploring further. The generation of reports about student outcomes (discipline patterns, student points) is not likely to capture the full construct of data-based decision making with sufficient sensitivity but adopting a data system and accessing reports may sufficiently capture intention to use data by school teams and leaders. This may serve as a small step toward identifying simple, indirect indicators of data use that are efficient for researchers and district or state leadership teams

to examine across many schools in the effort to monitor and study data use.

Study Purpose and Research Questions

This study proposed to expand the current body of evidence related to sustainability of PBIS in schools by analyzing sustainability scores, fidelity scores, and direct measures of data use patterns across tiers. The results of this study may contribute to improved understanding of overall sustainability of PBIS at each tier and the relation between sustainability, fidelity, and use of data for decision making. Studying two specific examples of data used by implementation teams may improve understanding of how data are used by schools to improve implementation and adaptation of the core elements of the PBIS framework as well as specific social, emotional, and behavioral practices. The hope is that this information will prompt further attention to improvement of data systems that inform implementation and outcomes of evidence-based practices in schools. Additionally, the study targets contribute to validation of two measures of PBIS sustainability (SUBSIST, ALTITUDE). Five research questions were considered:

1. To what extent is PBIS Tier 1 fidelity related to factors predicting sustainability of PBIS at Tier 1 (as measured by the SUBSIST)?

RQ1 Hypothesis: There will be a positive relation between Tier 1 fidelity across three years and Tier 1 sustainability scores in year 3.

2. To what extent is PBIS Tier 1, Tier 2 and Tier 3 fidelity related to factors predicting sustainability of PBIS at advanced tiers (as measured by the ALTITUDE)?

RQ2 Hypothesis: There will be a positive relation between Tier 2 and Tier 3 fidelity across three years and advanced tier sustainability scores in year 3.

3. To what extent are factors of sustainability of PBIS at Tier 1 (as measured by the

SUBSIST) related to factors of sustainability of PBIS at advanced tiers (as measured by the ALTITUDE)?

RQ3 Hypothesis: There will be a positive relation between factors of Tier 1 sustainability and factors of advanced tier sustainability in year 3.

4. To what extent is access of progress monitoring data about Tier 1 student behavior patterns related to (a) fidelity of PBIS at Tier 1 and (b) sustainability of PBIS at Tier 1 (as measured by the SUBSIST)?

RQ4 Hypothesis: There will be modest positive relations between the use of Tier 1 data related to student behavior patterns and both Tier 1 fidelity and Tier 1 sustainability, especially for the factor related to data use.

5. To what extent is access to student behavior data about advanced tier interventions related to (a) fidelity of PBIS at Tiers 2 and 3 and (b) sustainability of PBIS at advanced tiers (as measured by the ALTITUDE)?

RQ5 Hypothesis: There will be modest positive relations between the use of advanced tier data related to student intervention scores and both fidelity and sustainability of advanced tiers, especially sustainability at Tier 2.

CHAPTER II

METHODS

Settings and Participants

This study examined extant data from a sample of 656 U.S. schools implementing the PBIS framework over three consecutive years (Year 1, 2016-17; Year 2, 2017-18; Year 3, 2018-19), based on an existing sample of schools from a separate study. Data sets provided self-reported metrics of fidelity, factors predicting sustainability, and use of a data system designed to support PBIS implementation. During the 2018-2019 school year, one participant from each school (e.g., internal PBIS leader, external PBIS coach) was invited to participate in a separate longitudinal study relating to sustainability of PBIS across tiers of support by completing one or more surveys of PBIS sustainability. Completion of this survey became Year 1 of the longitudinal study and Year 3 for the present study. Most respondents were PBIS team leaders, facilitators, or internal coaches ($n = 337, 51\%$), followed by school administrators ($n = 168, 26\%$), school faculty or staff members ($n = 81, 12\%$), and external, district, or regional coaches ($n = 56, 9\%$). Additional respondent roles included PBIS team members and “other roles” ($n = 14, 2\%$). Proportions of school representatives were similar across school types (elementary, secondary, other).

Demographic data for each school were obtained from the National Center for Educational Statistics (NCES) databased. The data were collected by NCES in year 1 of the study (2016-2017) and were collected by the investigators managing the separate, longitudinal study during the 2018-2019 school year. The 645 schools were from 23 U.S. states across the Midwest ($n = 262, 40\%$), West ($n = 182, 28\%$), South ($n = 149, 23\%$), and Northeast ($n = 63, 10\%$) regions. Over half of the schools were elementary ($n = 394,$

60%), and most were located in suburbs ($n = 234$, 36%) or cities ($n = 222$, 34%).

Additional NCES demographic information is provided in Table 2.1.

Of the 656 schools in the sample, 634 (97%) reported at least one year of PBIS implementation fidelity data in the PBIS Assessment data system (Bragg et al., 2015). Using the first year that PBIS fidelity data were reported, we can estimate the school's earliest history of PBIS implementation efforts. Across the sample, 487 schools (74%) reported implementing PBIS features prior to the first year of the study (2016-2017). Of these, 115 schools (18%) had first reported PBIS implementation in 2008-2009. There were 147 schools (22%) that first reported PBIS implementation during one of the three years included in the study with 32 schools (5% of schools) first reporting PBIS implementation in the final year of the study (2018-2019). The mean number of years since first reporting PBIS implementation fidelity was 5.89 ($SD = 4.14$).

Measures

Data from several instruments were collected and analyzed to explore the constructs of sustainability, fidelity, and use of data by schools implementing the PBIS framework during the 2016-2017, 2017-2018, and 2018-2019 school years. A total of five measures were used to examine these constructs. One measure of fidelity of PBIS implementation across tiers was collected per school per year (consolidation of scores from the School-Wide Evaluation Tool, Tiered Fidelity Inventory, or Benchmarks of Quality); two measures of sustainability factors (SUBSIST and ALTITUDE) were collected only in year 3; and two measures of data use (Schoolwide Information System: SWIS; and Check-in Check-out SWIS) were collected per school per year.

Table 2.1*School Demographics*

Characteristics	Elementary	Secondary	Other	Total
Number (%) of schools	394 (60)	154 (24)	106 (16)	656
Number of U.S. states	21	18	13	23
Number of districts/regions/counties	191	103	69	262
Student enrollment, <i>M (SD)</i>	504 (197)	925 (516)	565 (364)	612 (369)
% Non-white students, <i>M (SD)</i>	50 (29)	48 (28)	62 (33)	51 (30)
% Students receiving FARMs, <i>M (SD)</i>	61 (26)	52 (25)	69 (27)	60 (26)
School region				
% Northeast	9	8	16	10
% Midwest	41	36	43	40
% South	23	24	20	23
% West	28	32	21	28
School locale				
% Schools in cities	33	28	45	34
% Schools in suburbs	38	42	17	36
% Schools in towns	11	14	11	12
% Schools in rural areas	16	11	17	15

Note. Schools were included if they met inclusion for one or more research question.

FARMs = free and reduced-price meals. Missing data for School Locale variable was between 2% to 9% across sub-samples.

PBIS Fidelity

Self-reporting PBIS fidelity at the tiers being implemented is a common practice among PBIS schools, primarily for monitoring and planning of implementation activities. Given the evolution of PBIS fidelity measures over the past 20 years, schools may select from several Tier 1 measures and a small number of advanced tier measures of fidelity. To examine the extent that schools implemented core elements of the PBIS framework with fidelity, fidelity scores across tiers for the three years of the study were analyzed using the three measures most frequently reported, the School-Wide Evaluation Tool (SET; Sugai et al., 2005), the Tiered Fidelity Inventory (TFI-Tier 1, TFI-Tier 2, and TFI-Tier 3; Algozzine et al., 2014), and the Benchmarks of Quality (BoQ; Kincaid et al., 2005). Fidelity scores were obtained from the free, online data system called PBIS Assessment (Bragg et al., 2015) that is offered through an organization called PBISApps that is based at the University of Oregon and provides both free and subscription-based data systems related to PBIS implementation. Several valid and reliable measures of PBIS fidelity, especially for Tier 1 PBIS are offered through PBIS Assessment, and schools may choose to complete one or more measures that aligns with the specific needs of the school's PBIS implementation team. Some schools are required by district leadership, policies, or grant-funding agencies to report specific fidelity measures.

Given the complexity of decisions about which fidelity tier to administer, the three measures most reported across the sample were analyzed. These measures included Tier 1 PBIS fidelity items and one measure included separate components or subscales for each of the three PBIS tiers. Table 2.2 presents the descriptive statistics for schools in the sample that reported PBIS fidelity for one or more tiers.

Table 2.2*Descriptive Statistics for PBIS Fidelity Across Tiers for Three Years for All School Types*

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
Year 3 (2018-2019)			
Tier 1 Fidelity	553	.84	.17
Tier 2 Fidelity	452	.77	.23
Tier 3 Fidelity	292	.68	.28
Year 2 (2017-2018) ^a			
Tier 1 Fidelity	394	.81	.21
Tier 2 Fidelity	252	.75	.25
Tier 3 Fidelity	125	.63	.31
Year 1 (2016-2017) ^b			
Tier 1 Fidelity	316	.80	.22
Tier 2 Fidelity	149	.77	.26
Tier 3 Fidelity	72	.67	.30

Note. Fidelity scores range from .00 to 1.00. Schools were included if they met inclusion for one or more research question. ^a Year 2 fidelity scores for schools that reported PBIS Tier 1 fidelity Year 2 and Year 3. ^b Year 1 fidelity scores for schools that reported PBIS Tier 1 fidelity for all three years of the study.

School-Wide Evaluation Tool (SET)

The School-wide Evaluation Tool (SET; Sugai et al., 2005) was used as the primary measure of fidelity to Tier 1 of the PBIS framework by 54 schools (8%) in year 3 of the

study (2018-2019). The SET is a research tool, designed to be conducted by a trained external reviewer to objectively evaluate fidelity to core features of the PBIS framework at Tier 1 based on observations during a school visit and interviews with administrators, staff, and students in the building. The evaluator or any individual in the district or school with permission to access the school's PBIS Assessment account may be assigned to submit the final SET scores or generate reports to share with school stakeholders (e.g., PBIS team, all staff). The SET is one of the earliest measures of PBIS implementation fidelity at Tier 1 that was originally developed as a research tool but is also used in some regions as the primary Tier 1 annual evaluation.

The SET has strong psychometric properties (Horner et al., 2004), including internal consistency (.96), interrater reliability (98.4% - 100%), test-retest reliability (89.9% – 100%). The 28 survey items of the SET are provided in Appendix D. The items are organized into seven subscales that correspond with core elements of PBIS implementation including having School-Wide expectations defined for staff and students (2 items, $\alpha = .64$), expectations taught explicitly to staff and students (5 items, $\alpha = .92$), a reward system in place to reinforce expectations (3 items, $\alpha = .78$), a violations system in place to redirect and correct problem behavior (3 items, $\alpha = .63$), a monitoring and evaluation system to drive decisions (4 items, $\alpha = .85$), a management system to coordinate PBIS efforts across the school (8 items, $\alpha = .91$), and support from the district in terms of policies, training, and data collection (2 items, $\alpha = .56$). Each SET item includes an evaluation question is rated on a three-point Likert-type scale (0-2) with specific criterion and data sources (e.g., permanent product, interview question) used to rate each item. The proposed and widely adopted fidelity criterion for adequate implementation using the SET is 80% overall score

and 80% score on school-wide expectations taught.

Tiered Fidelity Inventory (TFI)

The second measure of Tier 1 fidelity, and the only measure of advanced tiers of PBIS fidelity, was the *Tiered Fidelity Inventory* (TFI; Algozzine et al., 2014). The TFI is a self-assessment measure for each of the PBIS tiers (Tier 1, Tier 2, Tier 3). School PBIS leadership teams are encouraged to meet with an external (e.g., district) PBIS coach to collaboratively discuss and agree upon final scores for individual items, although the team may choose to conduct the TFI internally without a coach. Any individual in the district or school with permission to access the school's PBIS Assessment account may be assigned to submit the final TFI scores or generate reports to share with school stakeholders (e.g., PBIS team, all staff). The TFI (Appendix E) has strong psychometric properties for content validity including 91% - 93% reliability agreement, 96% for item validity, 95% for factor structure, and 89% for item scoring. The TFI also has strong internal consistency across tiers ($\alpha = .87$ to $.98$) and overall (.96), test-retest reliability ($r = .99$), interrater reliability ($r = .99$ across raters, tiers, and items), and factor structure (Massar et al., 2017; McIntosh et al., 2017).

TFI-Tier 1. The tier section of the TFI (TFI-Tier 1) scale consists of 15 items and three subscales (school teams, implementation, evaluation) with a recommended fidelity criterion of 70%. For purposes of this study, the school's last TFI Tier 1 scale submission of the year that was completed with the guidance of an external PBIS coach were analyzed. If there was not a submission that was completed with a coach, the final submission of the year was analyzed. The TFI-Tier 1 was the reported Tier 1 fidelity measure for 232 schools (35%) in year 3 of the study (2018-2019)

TFI-Tier 2. The Tier 2 section of the TFI (TFI-Tier 2) were analyzed to measure fidelity of PBIS at Tier 2. With a structure and procedures identical to the TFI-Tier 1, the Tier 2 scale consists of 13 items and three subscales (teams, interventions, evaluation) with a recommended fidelity criterion of 70%. For purposes of this study, the school's last TFI Tier 2 scale submission of the year that was completed with the guidance of an external PBIS coach were analyzed. If there was not a submission that was completed with a coach, the final submission of the year was analyzed.

TFI-Tier 3. The Tier 3 section of the Tiered Fidelity Inventory (TFI-Tier 3) were analyzed to measure fidelity of PBIS at Tier 3. With a structure and procedures identical to the TFI-Tier 1 and TFI-Tier 2, the Tier 3 scale consists of 17 items and four subscales (teams, resources, support plans, evaluation) with a recommended fidelity criterion of 70%. For purposes of this study, the school's last TFI Tier 3 scale submission of the year that was completed with the guidance of an external PBIS coach were analyzed. If there was not a submission that was completed with a coach, the final submission of the year was analyzed.

Benchmarks of Quality (BoQ)

For schools that did not submit either the SET or a TFI, Benchmarks of Quality (BoQ; Kincaid et al., 2005) scores were analyzed. The BoQ was the reported measure of Tier 1 PBIS fidelity for 74 schools (11%) in year 3 of the study (2018-2019). School PBIS leadership teams are encouraged to meet with an external (e.g., district) PBIS coach to collaboratively discuss and agree upon final scores for individual items, although the team may choose to conduct the BoQ internally without a coach. Any individual in the district or school with permission to access the school's PBIS Assessment account may be assigned

to submit the final BoQ scores or generate reports to share with school stakeholders (e.g., PBIS team, all staff). The BoQ (Appendix F) has strong internal consistency ($\alpha = .96$), test-retest reliability ($r = .94$), interrater reliability ($r = .97$), and concurrent validity ($r = .51$) with the SET (Childs et al., 2016; Cohen et al., 2007). The BoQ is a 53-item measure with 10 subscales including PBIS Team (4 items, $\alpha = .43$), Faculty Commitment (4 items, $\alpha = .75$), Discipline Procedures (3 items, $\alpha = .81$), Data Analysis (5 items, $\alpha = .74$), Expectations Developed (5 items, $\alpha = .76$), Rewards Program (8 items, $\alpha = .87$), Lesson Plans (6 items, $\alpha = .87$), Implementation Plan (7 items, $\alpha = .79$), Crisis Plan (3 items, $\alpha = .83$), and Evaluation (5 items, $\alpha = .83$).

PBIS Fidelity Across Tiers

The raw scores across the SET, TFI, and BoQ measures were converted to implementation percentage scores (0 to 1.00) using a total ratio of ratings divided by total possible score and were collapsed into a single score for each tier of PBIS. For Tier 1 PBIS fidelity, this required the use of a cascading logic model that prioritized measures in terms of participation from an external evaluator or coach. For Tier 2 and Tier 3, only the TFI scores were analyzed (McIntosh et al., 2013; Nese et al., 2016). To examine the history of PBIS implementation, PBIS fidelity scores at each tier for three years were collected and analyzed (e.g., Tier 1 PBIS fidelity in year 2, Tier 3 PBIS fidelity in year 3). A total of 316 schools reported Tier 1 PBIS fidelity across all three years, and the average score in year 3 was .84 ($SD = .17$), 149 schools in the sample reported Tier 2 fidelity for all three years and the average score in year 3 was .77 ($SD = .23$), and 72 schools in the sample reported Tier 3 fidelity for all years and reported an average score of .68 ($SD = .28$). Scores for all tiers across the three years of the study were near or above than average fidelity scores reported

by Kittelman et al (2018) in an evaluation brief that analyzed a national sample of school PBIS fidelity scores on the TFI during the 2016-2017 school year.

PBIS Sustainability

Tier 1 PBIS Sustainability (SUBSIST)

To measure the factors of PBIS sustainability at Tier 1, the School-Wide Universal Behavior Sustainability Index: School Teams (SUBSIST; McIntosh, Doolittle, et al., 2013) overall score and four individual factor scores were analyzed. The SUBSIST (Appendix G) was developed as a research instrument and consists of 39 self-administered items that correspond to two school-level factors and two district-level factors. The School Priority factor includes 20 items, School Team Use of Data includes 11 items, District Priority includes five items, and finally the District Capacity Building factor includes three items.

To complete the SUBSIST, a representative of the school (e.g., administrator, PBIS leader) responded via electronic survey using a sliding Likert-type scale with four response anchors including 1 = Not True, 2 = Partially True, 3 = Mostly True, and 4 = Very True. Respondents were also provided with a separate item of “Don’t Know/NA” which were treated as missing data in the analyses. Scores were then computed to provide an overall total ratio score using the sum of total ratings divided by the total possible so that scores range from 0 to 1.0. Factor-level scores were computed using the same procedures for total ratio score of items within specific factors (School Priority, School Team Use of Data, District Priority, District Capacity Building) divided by the total possible score for that factor.

The psychometric properties of the SUBSIST have been validated and display strong content validity (.95), interrater reliability (.95), and test-retest reliability (.96). In

addition, the SUBSIST overall score strongly predicts PBIS fidelity at Tier 1 with $r = .45$ to $.68$ (McIntosh et al., 2011; McIntosh, Mercer, et al., 2013; Mercer et al., 2014). The School Priority factor includes 20 items ($\alpha = .94$), School Team Use of Data includes 11 items ($\alpha = .94$), District Priority includes five items ($\alpha = .71$), and District Capacity Building includes three items ($\alpha = .74$).

Descriptive statistics for the overall and four individual factors of SUBSIST are presented in Table 2.3. A total of 615 school respondents completed at least one item on the SUBSIST measure, but two school respondents completed only items in the school-level factors. The average overall SUBSIST score across the sample was $.78$ ($SD = .19$). The average scores for the four factors ranged from $.74$ to $.81$ (School Priority ($M = .79$, $SD = .19$), School Team Use of Data ($M = .81$, $SD = .20$), District Priority ($M = .74$, $SD = .22$), and District Capacity Building ($M = .77$, $SD = .24$).

Table 2.3

Descriptive Statistics for Tier 1 PBIS Sustainability (SUBSIST) in Year 3 (2018-2019) for All School Types

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
Tier 1 Sust. Overall	615	.78	.19
Tier 1 Sust. Sch. Priority Factor	615	.79	.19
Tier 1 Sust. Sch. Team Use of Data Factor	615	.81	.20
Tier 1 Sust. Dist. Priority Factor	613	.74	.22
Tier 1 Sust. Dist. Capacity Factor	613	.77	.24

Advanced Tier PBIS Sustainability (ALTITUDE)

The Advanced Level Tier Interventions Treatment Utilization and Durability Evaluation (ALTITUDE; McIntosh, Kittelman, et al., 2018) overall and individual factor scores were analyzed as measures of potential for PBIS advanced tier sustainability. The ALTITUDE (Appendix H) was first introduced in 2018 and consists of 32 items organized into three factors, Tier 2 and Tier 3 General, Tier 2 Specific, and Tier 3 Specific.

Like the SUBSIST measure, a representative of the school responds to each item via electronic survey using a sliding Likert-type scale with four response anchors, including 1 = Not True, 2 = Partially True, 3 = Mostly True, and 4 = Very True. Respondents were also provided with a separate item of “Don’t Know/NA” which were treated as missing data in the analyses. Scores are computed to provide an overall total ratio score using the sum of total ratings divided by the total possible so that raw scores were converted to implementation percentage scores from 0 to 1.0 or 0% to 100%. Factor scores were computed using the same procedures for specific survey items within the Tier 2 and Tier 3 General, Tier 2 Specific, and Tier 3 Specific factors.

Validation efforts for the ALTITUDE are in early stages compared to the SUBSIST but are promising. Kittelman, Mercer, McIntosh and Nese (2021) analyzed reliability and relations to PBIS fidelity measures. Internal reliability was found to be strong for each of the three factors: Tier 2 and Tier 3 General (14 items, $\alpha = .95$), Tier 2 Specific (9 items, $\alpha = .95$), and Tier 3 Specific (9 items, $\alpha = .97$). Test-retest reliability was also strong across factors: Tier 2 and Tier 3 General ($r = .89, p < .001$), the Tier 2 Specific ($r = .90, p < .001$), and the Tier 3 Specific ($r = .95, p < .001$). The ALTITUDE was also found to correlate with PBIS fidelity across all three PBIS tiers, correlations between the three

ALTITUDE factors and Tier 1 fidelity ranged from $r = .27$ to $r = .46$ ($p < .001$).

Correlations between the ALTITUDE factors and Tier 2 fidelity included: Tier 2 and Tier 3 General ($r = .43, p < .001$), Tier 2 Specific ($r = .48, p < .001$), and Tier 3 Specific ($r = .38, p < .001$). Correlations between the ALTITUDE factors and Tier 3 fidelity included: Tier 2 and Tier 3 General ($r = .34, p < .001$), Tier 2 Specific ($r = .24, p < .001$), and Tier 3 Specific ($r = .41, p < .001$).

Descriptive statistics for the overall and three individual factors of the ALTITUDE are presented in Table 2.4. A total of 631 schools completed at least one item on the Advanced Tier General factor while 618 schools completed one or more item on the Tier 2 Specific factor and only 542 schools completed at least one item on the Tier 3 Specific factor. The average overall ALTITUDE score across the sample was $.61$ ($SD = .21$), while average scores varied for the Advanced Tier General ($M = .62, SD = .20$), Tier 2 Specific ($M = .65, SD = .22$), and Tier 3 Specific ($M = .54, SD = .27$) factors.

Table 2.4

Descriptive Statistics for Advanced Tier PBIS Sustainability (ALTITUDE) in Year 3 (2018-2019) for All School Types

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
AdvTier Sust. Overall	631	.61	.21
Adv Tier Sust. Tier 2/3 General Factor	631	.62	.20
Adv Tier Sust. Tier 2 Specific Factor	618	.65	.22
Adv Tier Sust. Tier 3 Specific Factor	542	.54	.27

PBIS Data Use

To explore simple indicators of the extent that schools used student outcome data for decision making, measures were analyzed from two online data system that monitor student social behavior (e.g., discipline referrals, daily point card data), offered through PBISApps, the same organization that offers PBIS Assessment. PBISApps records each instance of school user generation of reports within the data system and these instances of report generation were analyzed.

School-Wide Information System (SWIS)

To explore potential indirect and simple measures of school team data use at Tier 1, school user access to reports about student discipline referrals in the School-Wide Information System (SWIS; May et al., 2013) were analyzed. In year 1 of the study, 180 schools entered referral data into SWIS and agreed to share their data for research and evaluation purposes, there was an average of 1.08 referrals per 100 students per day ($SD = 1.86$), In year 2, 205 schools entered referral data into SWIS and reported an average of 1.25 referrals per 100 students per day ($SD = 2.24$), Finally, in year 3 of the study, 220 schools entered referral data into SWIS and reported an average of 1.29 referrals per 100 students per day ($SD = 2.59$). As of March 2021, the PBISApps organization reported that over 9,000 schools subscribed to SWIS in the U.S. and abroad. Two groups or types of reporting options were selected as potential indirect measures of Tier 1 data use.

Core reports disaggregate referral data for a specified date range across a set of seven features (i.e., average referrals per day per month, referrals by time, referrals by location, referrals by day of week, referrals by problem behavior, referrals by grade, and referrals by student). These collectively provide an overall indicator of social climate in the

school as well as potential contexts or behaviors that may be negatively impacting the social climate and learning. Schools that subscribe to SWIS commit to maintaining a PBIS leadership team that will analyze SWIS reports at least monthly. The core reports are the most likely to be generated, analyzed, and shared during monthly meetings and were analyzed as an indirect measure of data use at Tier 1.

Drill down reports are intended to allow users to customize the data filters (e.g., cafeteria referrals only, only referrals for classroom defiance from male students) and disaggregate (e.g., show referrals by time of day, show referrals by perceived motivation) referral data to a level of precision that would allow for problem-solving. Drill down reports are most frequently used to (a) determine whether a potential problem identified in the core and additional reports meet the school's criteria as a problem, (b) precisely identify the problem at a level of precision that the team can efficiently and effectively solve, and (c) assess a previously identified problem or potential problem to determine effectiveness of previous decisions. The generation, analysis, and sharing of drill down reports may vary month-by-month, but each change in filters and type of disaggregation are counted as one event of access. School generation of drill-down reports in SWIS were also analyzed as an indirect measure of data use at Tier 1.

¹ While not analyzed for this study, several additional reports in SWIS provide disaggregation of referral data in a variety of ways that contribute to understanding the core reports and overall health of PBIS and the social climate. These additional reports (e.g., multi-year, staff, racial/ethnic equity, year-end) are often less sensitive to monthly changes and are therefore recommended/likely to be generated, analyzed, and shared less frequently or with only specific audiences.

Given the limited research on using generation of reports as an indicator of data use, four metrics were developed and applied first to core SWIS reports and then to drill down reports across the three years of the study. First, the count of months (range 0-12) that the school generated at least one SWIS (core, drill down) report was developed as an indicator of consistent use of data with minimal criteria. Second, the median number of SWIS (11 core, 9.5 drill down) reports was identified and a subsample of schools was developed to include only months when at least the median number of reports (range 0-12) were generated by a school user. This configuration was intended to produce a more stringent criteria of report access. Third, the average number of reports generated per month (out of a 12-month calendar year) was developed as a continuous measure of data use across the year. This configuration was intended to be more sensitive to the frequency of reports during a calendar month. Fourth, the average number of reports per school week (i.e., 36 weeks) was similarly developed to indicate level of use, considering the typical number of weeks that school is in session.

Table 2.5 provides descriptive statistics for the metrics of SWIS Core reports that were examined as potential indicators of Tier 1 data use. Table 2.6 provides descriptive statistics for the metrics of SWIS Drill Down reports that were examined as potential indicators of Tier 1 data use. These metrics were examined as potential indicators and finally the average count of core reports generated per month was selected as the measure of PBIS data use at Tier 1 for the final analysis of Tier 1 PBIS data use, fidelity, and sustainability.

Table 2.5*Descriptive Statistics for Generation of SWIS Core Reports for Three Years for All**School Types*

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
Year 3 (2018-2019)			
Count Months Generating 1+ Core Reports	298	7.82	2.81
Count Months Generating 11+ Core Reports ^a	298	4.07	3.03
Avg Count Core Reports Generated Per Month ^b	298	12.00	12.20
Avg Count Core Reports Generated Per Week ^c	298	4.00	4.07
Year 2 (2017-2018)			
Count Months Generating 1+ Core Reports	266	7.70	2.76
Count Months Generating 11+ Core Reports ^a	266	3.84	3.09
Avg Count Core Reports Generated Per Month ^b	266	10.89	10.65
Avg Count Core Reports Generated Per Week ^c	266	3.63	3.55
Year 1 (2016-2017)			
Count Months Generating 1+ Core Reports	224	7.53	2.84
Count Months Generating 11+ Core Reports ^a	224	3.88	3.08
Avg Count Core Reports Generated Per Month ^b	224	10.26	9.37
Avg Count Core Reports Generated Per Week ^c	224	3.42	3.12

Note. Schools were included if they met inclusion for one or more research question. ^a

Median split across sample for SWIS Drill Down was 9.5 reports per month. ^b Total reports generated across the year divided by the calendar months (12). ^c Total reports generated across the year divided by the average number of school weeks (36).

Table 2.6

Descriptive Statistics for Generation of SWIS Drill Down Reports for Three Years for All School Types

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
Year 3 (2018-2019)			
Count Months Generating 1+ Drill Down Reports	283	7.11	3.35
Count Months Generating 9.5+ Drill Down Reports ^a	226	4.46	2.93
Avg Count Drill Down Reports Generated Per Month ^b	283	12.63	20.60
Avg Count Drill Down Reports Generated Per Week ^c	283	4.21	6.87
Year 2 (2017-2018)			
Count Months Generating 1+ Drill Down Reports	247	6.60	3.29
Count Months Generating 9.5+ Drill Down Reports ^a	172	4.34	2.94
Avg Count Drill Down Reports Generated Per Month ^b	247	9.79	15.28
Avg Count Drill Down Reports Generated Per Week ^c	247	3.26	5.09
Year 1 (2016-2017)			
Count Months Generating 1+ Drill Down Reports	206	6.32	3.17
Count Months Generating 9.5+ Drill Down Reports ^a	146	4.32	2.80
Avg Count Drill Down Reports Generated Per Month ^b	206	8.77	11.34
Avg Count Drill Down Reports Generated Per Week ^c	206	2.92	3.78

Note. Schools were included if they met inclusion for one or more research question. ^a

Median split across sample for SWIS Drill Down was 9.5 reports per month. ^b Total reports generated across the year divided by the calendar months (12). ^c Total reports generated across the year divided by the average number of school weeks (36).

Check-In Check-Out School-Wide Information System (CICO-SWIS)

To explore potential indirect measures of school team data use at advanced tiers, school user access to reports about student points earned on a daily progress report in the Check-In Check-Out School-Wide Information System (CICO-SWIS; May et al., 2008) were analyzed. CICO-SWIS was originally developed to align with the CICO intervention but schools anecdotally report using the system for a wide range of interventions that rely on a daily progress report. School users access reports in CICO-SWIS by (a) navigating to a menu of report options, (b) choosing from the five report types, (c) adjusting specific report settings (e.g., date range), and then (d) clicking the “Generate” button. As of March 2021, the PBISApps organization reported that over 3,600 schools subscribed to CICO-SWIS in the U.S. and abroad. In the first year of the study, a total of 72 schools reported student intervention data in CICO-SWIS and agreed to share their data for research and evaluation purposes. In year 1 there were an average of 9.51 students enrolled in CICO-SWIS per month ($SD = 8.35$), an average of 41.81 days of point data per enrolled student ($SD = 24.46$), and an average daily score of 78% per student ($SD = 23\%$). In year 2, a total of 97 schools reported student intervention data in CICO-SWIS with an average of 8.80 students enrolled per month ($SD = 8.62$), an average of 41.43 days of data per student, and an average daily score of 79% of points per student ($SD = 22\%$). In year three of the study, a total of 144 schools reported student intervention data in CICO-SWIS with an average of 9.22 students enrolled per month ($SD = 11.44$), an average of 39.00 days of data per student ($SD = 24.75$) and an average daily score of 81% of points earned per student ($SD = 19\%$).

According to a recent evaluation brief (Conley et al., 2018), schools using CICO-SWIS identified a median of 5 school-wide or behavioral expectations (range = 3 - 5) and 8

opportunities to earn points each day (range = 2 - 22) on their student daily progress report cards. The default school goal is 80% of points (range = 60% - 90%) although CICO-SWIS allows for individual student goals to vary. The median percent of enrolled students that were enrolled into CICO-SWIS was 3% (range = 0% - 29%) and descriptively varied by school size (i.e., total enrollment) and rates of discipline referrals.

Core CICO-SWIS reports disaggregate student point data for a specified date range either across all participating students or for individual students. These reports collectively provide an overall indicator of effectiveness of the intervention in supporting students in meeting behavioral expectations. Schools that subscribe to CICO-SWIS commit to maintaining a PBIS or Tier 2 leadership team that will analyze CICO-SWIS reports at least twice monthly. While CICO-SWIS is primarily designed for monitoring student point data from the Tier 2 Check-In Check-Out (CICO) intervention, it may be used for any intervention that similarly relies on a standardized daily progress report (point card).

The procedures used to develop 4 metrics of Tier 1 data use were repeated for the CICO-SWIS data to represent data use at advanced tiers. First, the count of months in the year when at least one CICO-SWIS report was generated. Second, the count of months that the median count of CICO-SWIS (10.25) reports were generated. Third, the average number of CICO-SWIS reports generated per month was analyzed. Finally, the average number of reports generated per school week was calculated. Table 2.7 provides descriptive statistics for the metrics of CICO-SWIS reports that were examined as potential indicators of advanced tier data use. All four metrics were examined as potential indicators and the average count of CICO-SWIS reports generated per week was selected as the final indicator of advanced tier data use.

Table 2.7

Descriptive Statistics for Generation of CICO-SWIS Reports for Three Years for All School Types

Variables	<i>N</i>	<i>M</i>	<i>SD</i>
Year 3 (2018-2019)			
Count Months Generating 1+ CICO Reports	162	5.97	3.17
Count Months Generating 10.25+ CICO Reports ^a	100	4.55	2.81
Avg Count CICO Reports Generated Per Month	162	10.73	18.53
Avg Count CICO Reports Generated Per Week ^b	162	3.58	6.18
Year 2 (2017-2018)			
Count Months Generating 1+ CICO Reports	112	6.61	3.05
Count Months Generating 10.25+ CICO Reports ^a	89	4.13	2.64
Avg Count CICO Reports Generated Per Month	112	10.86	13.79
Avg Count CICO Reports Generated Per Week ^b	112	3.62	4.60
Year 1 (2016-2017)			
Count Months Generating 1+ CICO Reports	88	6.61	3.41
Count Months Generating 10.25+ CICO Reports ^a	66	4.74	2.95
Avg Count CICO Reports Generated Per Month	88	12.07	15.27
Avg Count CICO Reports Generated Per Week ^b	88	4.02	5.09

Note. Schools were included if they met inclusion for one or more research question. ^a

Median split across sample for SWIS Drill Down was 11 reports per month. ^b Total reports generated across the year divided by the average number of school weeks (36).

Procedures

Extant data examined in this study were collected from three sources over two phases. School demographic data, both measures of PBIS sustainability, and year 3 PBIS fidelity data were collected by an independent research group within the University of Oregon for a separate longitudinal study of PBIS sustainability. Additional fidelity data for the two years prior to the original study and the measures of PBIS data use were requested by the author from the PBISApps organization and were merged with the original study data.

Original School Demographic, PBIS Sustainability, and PBIS Fidelity Variables

The two measures of PBIS sustainability, the SUBSIST and ALTITUDE were collected separately by an independent research group at the University of Oregon during the 2018-2019 school year using the online survey tool Qualtrics. Surveys were completed by school respondents who self-identified as representatives of the school's PBIS implementation efforts. Respondents were recruited from state leaders affiliated with the Center on PBIS (Kittelman, Mercer, McIntosh, & Nese, 2021) at the request of the researchers. Demographic data were collected from the NCES database by the PBISApps organization and represent school information from the 2016-2017 school year. PBIS fidelity data were collected in the PBIS Assessment data system. Researchers then requested school demographic and PBIS fidelity data across tiers for the 2018-2019 school year from the PBISApps database and were merged with PBIS sustainability as part of the original longitudinal study by McIntosh, Mercer, Horner, et al. (2018). Data were identifiable by a research ID contained in the PBISApps database.

Additional PBIS Fidelity and PBIS Data Use Variables

Once original sustainability data were provided by the original research team at the University of Oregon, the author requested a separate dataset from the PBISApps organization for the specific sample of schools in the original study using a research identification number. The additional data included the PBIS fidelity data collected as part of the original study for the two years prior (2016-2017 and 2017-2018) as well as PBIS Data Use variables from the SWIS and CICO-SWIS data systems for all three years of the study. These variables included raw numbers of counts of reports generated for each individual type of report available in the two data systems.

Data Cleaning and Preparation

Once both sets of data were received, the data were merged using a research identifier as the matching variable. Once merged, the data were cleaned and organized to match the research questions identified for this study. A simplified measure of school type was generated to allow for examination of variations by school type (elementary, secondary, other, all school types). PBIS fidelity data for Tier 1 were consolidated across the three measures (SET, TFI-Tier 1, BoQ) using the cascading logic procedure implemented by Nese et al. (2016) and all fidelity scores were standardized to use the total ratio scores for each tier across all three years. The individual counts of reports were recalculated into the consolidated metrics previously identified for SWIS Core reports, SWIS Drill Down reports, and CICO-SWIS reports including count of months with any reports generated, count of months that the median number of reports were generated, the average number of reports generated per month, and the average number of reports generated per school week.

Data Analyses

Four types of statistical procedures were used to analyze PBIS sustainability, fidelity, and data use across tiers of support including Spearman's rho correlations, multiple linear regression, partial correlations, and Kendall's Tau-U-b correlations. All analyses were completed using the IBM SPSS Statistics for Windows, Version 26.0 (IBM, 2019). A Bonferroni adjustment procedure was applied to several analyses to better control for multiple comparisons. Determination of Bonferroni adjustment use was based on recommendations from the literature for specific analytic procedures (e.g., Spearman's rho correlations, multiple linear regression). When appropriate, analyses were also conducted to determine the impact of school type and whether it was appropriate to report the aggregated results, provide disaggregated results, or report only results for specific school type(s) with sufficient sample size(s).

Research Question 1

To examine the relation between PBIS Tier 1 fidelity and PBIS Tier 1 sustainability for research question one, both correlations and regressions were conducted.

RQ1. Spearman's Rho Correlations

Given the non-normality of the fidelity and sustainability scores, Spearman's rho non-parametric correlations using list-wise deletion were conducted to identify the strength and direction of relation across the different variables (Mukaka, 2012; Onwuegbuzie & Daniel, 1999). Specifically, correlations between (a) PBIS Tier 1 fidelity overall scores from the SET, BoQ, or TFI-T1 in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019); (b) the overall SUBSIST score from year 3 (2018-2019); and finally, (c) the individual factor scores on the SUBSIST (School Priority, School Team Use of Data,

District Priority, District Capacity Building) were analyzed. A Bonferroni adjustment procedure was applied to address concerns of multiple testing (Armstrong, 2014).

RQ1. Multiple Linear Regression

To further examine relation between PBIS Tier 1 fidelity and PBIS Tier 1 sustainability and to determine whether Tier 1 fidelity scores predicted scores of Tier 1 sustainability (potential to sustain core elements of PBIS over time) on the SUBSIST, multiple linear regressions were conducted. Multiple linear regression allows for examination of a set of predictor variables, in this study PBIS fidelity scores, on a dependent variable, in this study the overall or factor-level PBIS sustainability score (Uyanik & Güler, 2013; Vesey et al., 2011). Specifically, regressions were conducted to determine whether PBIS Tier 1 fidelity overall scores from the SET, BoQ, or TFI-T1 in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019) would predict overall Tier 1 PBIS sustainability on the SUBSIST measure and what value individual years of fidelity contribute.

Research Question 2

To examine the relation between PBIS fidelity across tiers and PBIS sustainability at advanced tiers of support for research question two, both correlations and regressions were conducted.

RQ2. Spearman's Rho Correlations

Given the non-normality of the fidelity and sustainability scores, Spearman's rho non-parametric correlations using list-wise deletion were conducted to identify the strength and direction of relation across the different variables (Mukaka, 2012; Onwuegbuzie & Daniel, 1999). Specifically, correlations between (a) PBIS Tier 1, Tier 2, and Tier 3 fidelity

overall scores from the SET, BoQ, or TFI-T1 in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019); (b) the overall ALTITUDE score from year 3 (2018-2019); and finally, (c) the individual factor scores on the ALTITUDE (Tier 2 and Tier 3 General, Tier 2 Specific, Tier 3 Specific) were analyzed. A Bonferroni adjustment procedure was applied to address concerns of multiple testing (Armstrong, 2014).

RQ2. Multiple Linear Regression

To further examine relation between PBIS fidelity across tiers and PBIS sustainability at advanced tiers of support and to determine whether PBIS fidelity scores predicted scores of advanced tier sustainability (potential to sustain core elements of PBIS over time) on the ALTITUDE, multiple linear regressions were conducted. Multiple linear regression allowed for examination of relation between a set of predictor variables or PBIS fidelity scores, on a dependent variable, the PBIS sustainability score (Uyanik & Güler, 2013; Vesey et al., 2011). Specifically, regressions were conducted to determine whether PBIS Tier 1, Tier 2, and Tier 3 fidelity overall scores from the SET, BoQ, TFI-T1, TFI-T2, or TFI-T3 in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019) would predict overall advanced tier PBIS sustainability on the ALTITUDE measure and what value individual years of fidelity contribute.

Research Question 3

To examine the relation between PBIS Tier 1 sustainability on the SUBSIST and PBIS sustainability at advanced tiers on the ALTITUDE for research question three, two types of correlations were conducted.

RQ3. Spearman's Rho Correlations

Given non-normality in the sustainability scores, Spearman's rho non-parametric

correlations, using list-wise deletion, were conducted to identify the strength and direction of relation across the different variables (Mukaka, 2012; Onwuegbuzie & Daniel, 1999). Specifically, correlations between the (a) overall SUBSIST score from year 3 (2018-2019), (b) individual factor scores on the SUBSIST (School Priority, School Team Use of Data, District Priority, District Capacity Building), (c) overall ALTITUDE score from year 3 (2018-2019), and finally, (d) individual factor scores on the ALTITUDE (Tier 2 and Tier 3 General, Tier 2 Specific, Tier 3 Specific) were analyzed. A Bonferroni adjustment procedure was applied to address concerns of multiple testing (Armstrong, 2014).

RQ3. Partial Correlations

When results of the Spearman's rho were analyzed, multicollinearity between the overall scores and factor-level scores across both the SUBSIST and ALTITUDE were detected, and it was determined that nonparametric correlations for some relations between overall and individual variables would be skewed. Further analysis of partial correlations allowed pairs of variables to be examined individually while controlling for related variables that may inflate the correlation coefficient and cause Type I errors in interpretation of results (Aloe & Thompson, 2013). Controlled variables were determined uniquely for each pairing, for example, when examining the relation between the School Priority factor on the SUBSIST measure of Tier 1 PBIS sustainability and the Tier 2 Specific factor on the ALTITUDE measure of advanced tier PBIS sustainability, all other SUBSIST factors (School Team Use of Data, District Priority, District Capacity) and ALTITUDE factors (Advanced Tier General, Tier 3 Specific) scores were controlled. A Bonferroni adjustment procedure was also applied to address concerns of multiple testing (Armstrong, 2014).

Research Question 4

To examine the relation between school access of Tier 1 progress monitoring data (SWIS), PBIS Tier 1 fidelity (SET, BoQ, TFI-T1), and Tier 1 sustainability (SUBSIST) for research question four, correlations were conducted.

RQ4. Kendall's Tau-b Correlations

For question four, Kendall's tau-b was selected due to the non-normal distributions, dissimilar ranking (i.e., inclusion of continuous and ordinal variables with different score ranges), and the non-linear relations between the various sustainability, fidelity, and data use variables (O'Gorman & Woolson, 1995; Xu et al., 2013). Specifically, correlations were conducted for (a) patterns of school access to several SWIS reports in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019); (b) PBIS Tier 1 fidelity overall scores from the SET, BoQ, or TFI-T1 in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019); (c) the overall SUBSIST score from year 3 (2018-2019), and finally, (d) the individual factor scores on the SUBSIST (School Priority, School Team Use of Data, District Priority, District Capacity Building) were analyzed.

The analyses were conducted in phases. First, Kendall's tau-b correlations were first conducted between PBIS sustainability at Tier 1 (SUBSIST) overall and by factor, fidelity across tiers for year 3 (2018-2019) only, and eight exploratory metrics of Tier 1 data use using SWIS core and drill down reports for year 3 (2018-2019) only. Using these results, one final measure of data use (average SWIS core reports generated per month) was selected for the subsequent analysis between the SUBSIST overall and School Data Use factor score in year 3 and three years of both PBIS fidelity and data use at Tier 1. The final decisions for selection of data use variables at Tier 1 and advanced tiers, were based on

three considerations: (a) larger significance and size (level) of the correlation coefficient; (b) a preference for continuous variables; (c) larger sample size, specifically for the metric with more stringent criteria; and finally (d) alignment with theoretical model and literature on use of data (e.g., monthly Tier 1 school team meetings).

Research Question 5

To examine the relation between school access of advanced tier student behavior data from CICO-SWIS, PBIS fidelity across tiers (SET, BoQ, TFI-T1, TFI-T2, TFI-T3), and advanced tier sustainability on the ALTITUDE for research question five, correlations were conducted.

RQ5. Kendall's Tau-b Correlations

For question five, Kendall's tau-b was selected due to the non-normal distributions, dissimilar ranking (i.e., inclusion of continuous and ordinal variables with different score ranges), and the non-linear relations between the various sustainability, fidelity, and data use variables (O'Gorman & Woolson, 1995; Xu et al., 2013). Specifically, correlations were conducted for (a) patterns of school access to several CICO-SWIS reports in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019); (b) PBIS fidelity across tiers overall scores from the SET, BoQ, TFI-T1, TFI-T2, or TFI-T3 in year 1 (2016-2017), year 2 (2017-2018), and year 3 (2018-2019); (c) the overall ALTITUDE score from year 3 (2018-2019), and finally, (d) the individual factor scores on the ALTITUDE (Tier 2 and Tier 3 General, Tier 2 Specific, Tier 3 Specific) were analyzed.

The analyses were conducted in phases. First, Kendall's tau-b correlations were first conducted between PBIS sustainability at advanced tiers (ALTITUDE) overall and by factor, fidelity scores across tiers for year 3 (2018-2019) only, and four exploratory metrics

of advanced tier data use using CICO-SWIS reports for year 3 (2018-2019) only. Using these results, one final measure of data use (average count CICO-SWIS reports generated per week) was selected for the subsequent analysis between the SUBSIST overall and School Team Use of Data factor score in year 3 and three years of both PBIS fidelity and data use at Tier 1. The final decisions for selection of data use variables at Tier 1 and advanced tiers, were based on three considerations: (a) larger significance and size (level) of the correlation coefficient; (b) a preference for continuous variables; (c) larger sample size, specifically for the metric with more stringent criteria; and finally (d) alignment with theoretical model and literature on use of data (e.g., twice monthly advanced tier team meetings).

CHAPTER III

RESULTS

To examine the associations between sustainability, fidelity, and data use in PBIS, several correlational analyses and multiple linear regressions were conducted. For research question 1, relations between Tier 1 PBIS sustainability and Tier 1 PBIS fidelity across three years were examined. For research question 2, relations between advanced tier PBIS sustainability and PBIS fidelity for all tiers across three years were examined. For research question 3, relations between factors of Tier 1 sustainability and advanced tier sustainability were examined and reported for both all grade levels as well as the subsample of elementary schools. For research question 4, relations between generation of Tier 1 student outcome reports, fidelity, and sustainability were examined. For research question 5, relations between generation of advanced tier student outcome reports, fidelity, and sustainability were examined. For both research questions 4 and 5 the results varied by grade level and only results for the elementary schools are reported, given the smaller sample sizes for secondary and other types of schools in the sample.

Research Question 1. To what extent is PBIS Tier 1 fidelity related to factors predicting sustainability of PBIS at Tier 1 (as measured by the SUBSIST)?

To examine relations between the fidelity and sustainability of Tier 1 PBIS implementation, two types of analyses were conducted. First, Spearman's rank-order correlations were analyzed to identify patterns of relations across the variables. Table 3.1 presents these correlations. All relations between Tier 1 PBIS sustainability using the SUBSIST measure (overall score and four individual factors) and Tier 1 PBIS fidelity scores using the SET, TFI, and BoQ were significantly and positively correlated.

Tier 1 PBIS fidelity at year 3 was moderately correlated with factors of Tier 1 sustainability including the overall SUBSIST score ($r_{Spearman} = .43, p < .007$), the School Priority factor ($r_{Spearman} = .43, p < .007$), the School Team Use of Data factor ($r_{Spearman} = .45, p < .007$), the District Priority factor ($r_{Spearman} = .34, p < .007$), and the District Capacity Building factor ($r_{Spearman} = .30, p < .007$). Tier 1 PBIS fidelity at year 2 was moderately and positively correlated with the overall Tier 1 sustainability score ($r_{Spearman} = .34, p < .007$) as well as the two school-level factors of School Priority ($r_{Spearman} = .34, p < .007$) and School Team Use of Data ($r_{Spearman} = .38, p < .007$). Correlations were positive but small between year 2 fidelity and district-level factors of Tier 1 sustainability as well as for all year 1 (2016-2017) Tier 1 fidelity and Tier 1 sustainability in year 3 (2018-2019).

Multiple linear regressions using PBIS Tier 1 fidelity to predict PBIS Tier 1 sustainability were conducted using each year's overall Tier 1 fidelity score as a predictor of the SUBSIST Tier 1 PBIS sustainability total ratio score across factors. Initially, the regressions were run for 294 schools of all types (e.g., elementary) that had reported PBIS Tier 1 fidelity across all three years. A Bonferroni adjustment procedure was applied to results to control for Type 1 error due to multiple predictors (Mundfrom et al, 2006). Results are presented in Table 3.2 and indicate that PBIS Tier 1 fidelity scores predict 46% of the variance in PBIS Tier 1 sustainability scores, but that year 3 (2018-2019) Tier 1 PBIS fidelity was the only significant predictor within the model ($b = 0.21, t(290) = 7.03, p < .001$). Correlations and regressions were further examined by school type and were found to support the original results.

Research Question 2. To what extent is PBIS Tier 1, Tier 2 and Tier 3 fidelity related to factors predicting sustainability of PBIS at advanced tiers (as measured by the ALTITUDE)?

To examine relations between the fidelity and sustainability of advanced tier PBIS implementation, two types of analyses were conducted. First, Spearman's rank-order correlations were analyzed to identify patterns of relations across the variables for the 291 schools that reported PBIS implementation fidelity for all three years of the study. Fidelity across tiers for year 3 (2018-2019) were generally significant and moderately-to strongly, positively correlated with overall advanced tier PBIS sustainability as well as the Tier 2 and Tier 3 General and Tier 2 Specific factors. Tier 1 fidelity in year 3 was strongly and positively correlated with the overall ALTITUDE score ($r_{Spearman} = .50, p < .002$) and Tier 2 and Tier 3 General factor ($r_{Spearman} = .56, p < .002$) and moderately positively correlated with the Tier 2 Specific factor and Tier 3 Specific factor scores. Tier 2 fidelity in year 3 was strongly and positively correlated with the overall ALTITUDE ($r_{Spearman} = .57, p < .002$), Tier 2 and Tier 3 General factor ($r_{Spearman} = .60, p < .002$), and the corresponding Tier 2 Specific factor ($r_{Spearman} = .53, p < .002$) with moderate correlations with the Tier 3 Specific factor score. Tier 3 fidelity in year 3 of the study (2018-2019) was strongly and positively correlated with the overall ALTITUDE ($r_{Spearman} = .58, p < .002$), Tier 2 and Tier 3 General factor ($r_{Spearman} = .55, p < .002$), and corresponding Tier 3 Specific factor ($r_{Spearman} = .58, p < .002$) scores as well as moderately correlated with the Tier 2 Specific factor score.

For year 2 (2017-2018) PBIS fidelity there were moderate positive correlations across the overall and individual factor sustainability scores except for Tier 1 fidelity,

which had a small positive correlation with Tier 3 Specific sustainability and Tier 2 fidelity which had a large positive correlation with the overall ALTITUDE score. Tier 1 fidelity in year 2 was strongly and positively correlated with both the overall ALTITUDE ($r_{Spearman} = .53, p < .002$) and Tier 2 and Tier 3 General factor ($r_{Spearman} = .55, p < .002$) scores with moderate correlations with tier-specific factors of the ALTITUDE. Tier 2 fidelity in year 2 was strongly correlated with both the overall ALTITUDE ($r_{Spearman} = .51, p < .002$) and the Tier 2 Specific factor ($r_{Spearman} = .50, p < .002$) scores with moderate correlations with the Tier 2 and Tier 3 General and Tier 3 Specific scores. Tier 3 fidelity in year 2 was strongly and positively correlated with both the overall ALTITUDE ($r_{Spearman} = .52, p < .002$) and the Tier 3 Specific factor ($r_{Spearman} = .56, p < .002$) score.

For year 1 (2016-2017), Tier 1 fidelity was strongly, positively correlated with the Tier 2 and Tier 3 General factor ($r_{Spearman} = .50, p < .002$), and moderately correlated with the overall ALTITUDE and Tier 2 Specific factor score of sustainability. There was a small, positive correlations between Tier 1 fidelity in year 1 with the Tier 3 Specific factor score. Tier 2 fidelity for year 1 results indicated large positive correlations with the Tier 2 Specific factor ($r_{Spearman} = .50, p < .002$) score and moderate positive correlations with the overall ALTITUDE, Tier 2 and Tier 3 General factor, and Tier 3 Specific factor scores. Tier 3 fidelity for year 1 results indicated moderate positive correlations with the overall ALTITUDE as well as the Tier 2 and Tier 3 General and Tier 2 Specific factor scores and a large positive correlation with the Tier 3 Specific factor score ($r_{Spearman} = .53, p < .002$). Table 3.3 presents all correlations between PBIS fidelity across tiers for the three years of the study and the year 3 advanced tier PBIS sustainability overall and individual factor scores of the ALTITUDE.

Multiple linear regression was then conducted to determine whether PBIS fidelity scores across tiers for all three years predict PBIS advanced tier sustainability for the 68 schools that reported PBIS fidelity across tiers and completed the advanced tier PBIS sustainability measure (ALTITUDE). A Bonferroni adjustment procedure was applied to results to control for Type 1 error due to multiple predictors (Mundfrom, et al, 2006). Results indicated that the model explained 55% of the variance in overall PBIS advanced tier sustainability but there were no statistically significant individual predictors of PBIS fidelity within the model either before or after applying the Bonferroni adjustment procedure. The regression model was revised to include only year 3 PBIS fidelity across tiers to predict overall advanced tier PBIS sustainability. This model, presented in Table 3.4, included 282 schools, and explained 24% of variance with two statistically significant positive predictors including Tier 1 PBIS fidelity for year 3 ($b = 0.23, t(278) = 2.82, p = .005$) and Tier 2 PBIS fidelity ($b = 0.30, t(278) = 4.38, p < .001$). Regressions were further examined for the subsample of 174 elementary schools to identify variance by school type and are presented in Table 3.5. For elementary schools, year 3 PBIS fidelity across tiers explained 22% of the variance of overall advanced tier PBIS sustainability, but only Tier 2 PBIS fidelity was a significant, positive predictor ($b = 0.28, t(170) = 3.50, p = .001$).

Research Question 3. To what extent are factors of sustainability of PBIS at Tier 1 (as measured by the SUBSIST) related to factors of sustainability of PBIS at advanced tiers (as measured by the ALTITUDE)?

To examine relations between the factors of sustainability for Tier 1 on the SUBSIST and the more recently developed ALTITUDE measure of advanced tier sustainability of PBIS implementation, two types of analyses were conducted. First,

Spearman's rank-order correlations were analyzed to identify patterns of relations across the variables for the 534 schools that completed both the SUBSIST and ALTITUDE surveys in year 3 of the study (2018-2019). Table 3.6 (below the diagonal) presents the nonparametric correlations between overall and individual factors of sustainability across PBIS tiers. All relations between Tier 1 PBIS sustainability (SUBSIST overall and four factor scores) and advanced tier PBIS sustainability (ALTITUDE overall and three factor scores) were statistically significant and positively correlated. The Tier 1 Team Use of Data and Tier 1 District Priority factors of the SUBSIST were moderately positively correlated with the Tier 3 Specific factor of the ALTITUDE. All other relations were strongly positively correlated.

Next, partial correlations were conducted to control for the multicollinearity between individual and overall factors. Table 3.6 (above the diagonal) presents the partial correlations. Each individual relation was examined separately while controlling for non-target variables. The overall Tier 1 and advanced Tier scores were not analyzed within the partial correlations since it would not be appropriate to control for individual factors that contribute to the overall score. For example, when analyzing the relation between overall Tier 1 PBIS sustainability on the SUBSIST and Tier 2 Specific factor on the ALTITUDE, I controlled for the Advanced Tier General factor and Tier 3 Specific factor on the ALTITUDE. Appendix I provides the full syntax and results for specific procedures for each correlation.

Results of the partial correlations indicate that, when controlling for other advanced tier PBIS sustainability factors, the overall Tier 1 PBIS sustainability score is significantly positively correlated with the Advanced Tier (Tier 2 and Tier 3) General

factor ($r_{\text{partial}} = .34, p < .001$), and the Tier 2 Specific factor ($r_{\text{partial}} = .32, p < .001$), but was significantly and negatively correlated with the Tier 3 Specific factor ($r_{\text{partial}} = -.14, p = .001$). The Tier 1 School Priority sustainability factor, when controlling for other individual Tier 1 and advanced tier PBIS sustainability factors, was positively correlated with both the overall advanced tier PBIS sustainability score ($r_{\text{partial}} = .29, p < .001$) and the Advanced Tier General factor score ($r_{\text{partial}} = .28, p < .001$) but was not significantly correlated with the Tier 2 Specific factor or Tier 3 Specific factor once the Bonferroni adjustment procedure was applied.

The Tier 1 PBIS School Team Use of Data factor, when controlling for other Tier 1 and advanced tier PBIS sustainability factors, was not significantly related to the overall advanced tier PBIS sustainability or any of the individual factors. The Tier 1 PBIS District Priority factor, when controlling for other Tier 1 and advanced tier PBIS sustainability factors, was positively correlated with overall advanced tier PBIS sustainability ($r_{\text{partial}} = .18, p < .001$), but not with the individual factors (Advanced Tier General, Tier 2 Specific, Tier 3 Specific). The Tier 1 PBIS District Capacity factor was significantly and positively correlated with both the overall advanced tier PBIS sustainability score ($r_{\text{partial}} = .14, p = .001$) and the Tier 2 Specific factor ($r_{\text{partial}} = .18, p < .001$) but was not significantly correlated with the Advanced Tier General or Tier 3 Specific factors.

Research Question 4. To what extent is access of progress monitoring data about Tier 1 student behavior patterns related to (a) fidelity of PBIS at Tier 1 and (b) sustainability of PBIS at Tier 1 (as measured by the SUBSIST)?

To examine the relations between Tier 1 PBIS sustainability, fidelity across three

years, and data use (SWIS) across three years, Kendall's tau-b correlations were analyzed. Kendall's tau-b was selected due to the non-normal distributions of variables, dissimilar ranking (i.e., inclusion of continuous and ordinal variables with different score ranges), and the non-linear relations between the various sustainability, fidelity, and data use variables. Additionally, the Bonferroni adjustment procedure applied to the previous research questions was not recommended for use with the Kendall's tau-b correlations within the literature or by methodologists consulted during this study.

The analyses were conducted in phases. First correlations were examined between Tier 1 fidelity, sustainability (SUBSIST), and the eight exploratory indirect metrics of Tier 1 data use using school generation of SWIS core and drill down reports for year 3 (2018-2019) only. Results were analyzed by school type to determine whether variations existed for elementary, secondary, and other school types. There were no significant correlations between Tier 1 access to student outcome data and fidelity or sustainability for secondary schools or for other school types so only elementary schools were reported.

Results of the Kendall's tau-b correlations for the exploratory phase indicated that for elementary schools there were no significant correlations between any of the eight indirect measures of Tier 1 data use metrics and Tier 1 sustainability (overall or by factor). There were significant correlations between all four of the Tier 1 data use metrics using access of SWIS Core reports and fidelity of PBIS implementation, but not with indirect measures using access of SWIS drill down reports. Results indicated there were small significant correlations between both average reports generated per month and average reports per school week with Tier 1 fidelity ($n = 162$, $\tau_b = .16$, $p = .003$) and Tier 2 PBIS fidelity ($n = 136$, $\tau_b = .23$, $p < .001$). The final indirect measure of data use selected was

average number of SWIS core reports generated per month based on three considerations: (a) larger significance and size (level) of the correlation coefficient (correlations between Tier 1 fidelity and both average reports per month and per school week were identical); (b) a preference for continuous variables (both average reports per month and per week were continuous, although there were different ranges); (c) larger sample size, specifically for the metric with more stringent criteria (identical for average reports per month and per week); and (d) alignment with literature and theory about data use at Tier 1 (literature and the SWIS readiness requirements indicate Tier 1 school teams meet monthly to review data). Table 3.7 presents the exploratory correlations.

Next, a Kendall's tau-b correlation was run to determine the relation between overall Tier 1 sustainability as well as the School Data Use factor of the SUBSIST in year 3, three years of Tier 1 fidelity, and three years of Tier 1 data use (average core SWIS reports generated per month). There were no significant correlations between Tier 1 sustainability overall or the School Data Use factor and Tier 1 data use. Results indicated there were small positive correlations between the indirect measure of Tier 1 data use in year 3 and Tier 1 fidelity in year 3 ($n = 162, r_{tb} = .16, p = .003$) and year 2 ($n = 143, r_{tb} = .16, p < .007$). Additionally, there was a small positive correlation between Tier 1 data use in year 1 and Tier 1 fidelity in year 1 ($n = 102, r_{tb} = .24, p = .001$). Table 3.8 presents the correlation coefficients between Tier 1 sustainability, Tier 1 fidelity, and Tier 1 data use.

Research Question 5. To what extent is access of progress monitoring data about student behavior related to (a) fidelity of PBIS at Tiers 2 and 3 and (b) sustainability of PBIS at advanced tiers (as measured by the ALTITUDE)?

To examine the relations between PBIS sustainability at advanced tiers, fidelity for

all tiers across three years, and data use at advanced tiers (CICO-SWIS) for three years, correlations were analyzed. Kendall's tau-b was selected due to the non-normal distributions of variables, dissimilar ranking (i.e., inclusion of continuous and ordinal variables with different score ranges), and the non-linear relations between the various sustainability, fidelity, and data use variables. The analyses were conducted in phases. First, correlations were examined between sustainability (SUBSIST), fidelity for all tiers, and the four exploratory metrics of advanced tier data use from CICO-SWIS reports for year 3 (2018-2019) only. Results were analyzed by school type to determine whether variations existed for elementary, secondary, and other school types. There were no significant correlations between Tier 1 data use and fidelity or sustainability for secondary schools and varying results for the small ($n_s = 9 - 29$) subsample of other school types, so only results for elementary schools were reported.

Results of the Kendall's tau-b correlations for the exploratory phase indicated that for elementary schools, there were no significant correlations between any of the four advanced tier data use metrics and advanced tier sustainability (overall or by factor). There were significant correlations between three of the four Tier 1 data use metrics and fidelity of PBIS implementation, a moderate or medium correlation between the count of months that a school generated at least 10.25 reports ($n = 54, r_{tb} = .35, p = .001$). There were small, significant, and identical correlations between the count of months that one or more CICO reports were generated and average reports per school week with Tier 2 fidelity ($n = 84, r_{tb} = .27, p = .001$). The final measure of data use selected was average number of SWIS core reports generated per week (total reports divided by 36 school weeks). The final measure of data use was based on three considerations: (a) larger significance and size (level) of the

correlation coefficient (medium correlations between Tier 2 fidelity and count of months where median number of reports were generated, both count of months with any reports and average reports generated per school week yielded small but significant correlations); (b) a preference for continuous variables (both average reports per month and per week were continuous, although there were different ranges but only average reports per school week was significantly correlated with Tier 2 fidelity); (c) larger sample size, specifically for the metric with more stringent criteria (only 54 schools included in the count of months where the median number of reports were generated, compared to 84 for all other metrics); and (d) alignment with literature and theory about data use at Tier 1 (literature and the CICO-SWIS readiness requirements indicate Tier 2 school teams meet twice monthly or approximately every two weeks to review data). Table 3.9 presents the exploratory correlations.

Next, a Kendall's tau-b correlation was run to determine the relation between overall advanced tier sustainability as well as the Tier 2 Specific factor (i.e., the variable most closely associated with CICO-SWIS data) of the SUBSIST in year 3, three years of Tier 2 and Tier 3 (advanced tier) fidelity, and three years of advanced tier data use (average CICO reports generated per week). Results indicated there were small, positive correlations between CICO report generation per week in Year 1 of the study with advanced tier sustainability overall ($n = 63, r_{tb} = .21, p < .05$) and the Tier 2 Specific factor ($n = 63, r_{tb} = .20, p < .05$) in Year 3 of the study. There were small, positive correlations between the indirect measure of advanced tier data use in Year 3 and Tier 2 fidelity in the same year (Year 3; $n = 84, r_{tb} = .21, p < .01$), the prior year (Year 2; $n = 65, r_{tb} = .28, p < .01$), and two years prior (Year 3; $n = 45, r_{tb} = .21, p < .05$). There were also small, positive

correlations between frequency of access to CICO reports in Year 2 (2017-2018) with Tier 2 fidelity in Year 3 ($n = 65$, $r_{tb} = .27$, $p < .01$) and Year 2 ($n = 55$, $r_{tb} = .28$, $p < .01$).

Finally, there were small, positive correlations between the indirect measure of advanced tier data use in Year 1 with all Tier 2 PBIS fidelity in Year 3 ($n = 54$, $r_{tb} = .29$, $p < .01$), Year 2 ($n = 46$, $r_{tb} = .23$, $p < .01$), and Year 1 ($n = 39$, $r_{tb} = .26$, $p < .05$). Table 3.10 presents the correlation coefficients between advanced tiers of PBIS sustainability, fidelity, and data use.

Table 3.1

Correlations (Spearman's Rho) for Tier 1 PBIS Sustainability and Tier 1 PBIS Fidelity Across Three Years for All School Types

Variables	1	2	3	4	5	6	7
1. Tier 1 Sust. Overall Yr 3	-						
2. Tier 1 Sust. Sch. Priority Factor Yr 3	.88**	-					
3. Tier 1 Sust. Sch. Team Use of Data Factor Yr 3	.81**	.74**	-				
4. Tier 1 Sust. Dist. Priority Factor Yr 3	.89**	.68**	.62**	-			
5. Tier 1 Sust. Dist. Capacity Factor Yr 3	.85**	.67**	.62**	.66**	-		
6. Tier 1 Fidelity Yr 3 (2018-2019)	.43**	.43**	.45**	.34**	.30**	-	
7. Tier 1 Fidelity Yr 2 (2017-2018) ^a	.34**	.34**	.38**	.28**	.23**	.57**	-
8. Tier 1 Fidelity Yr 1 (2016-2017) ^b	.25**	.27**	.29**	.17**	.16**	.43**	.63**

Note. $N = 291$. ^a Year 2 fidelity scores for schools that reported PBIS Tier 1 fidelity for at least Year 2 and Year 3. ^b Year 3 fidelity scores for schools that reported PBIS Tier 1 fidelity for all three years of the study.

* $p < .05$ ** $p < .007$ (Bonferroni adjustment)

Table 3.2

Regression Coefficients of Tier 1 PBIS Fidelity on Tier 1 PBIS Sustainability Overall in Year 3 (2018-2019) For All School Types

Variable	<i>b</i> (<i>SE</i>)	<i>SE</i>
Constant	.30**	.06
1. Tier 1 PBIS Fidelity Year 3 (2018-2019)	.51**	.07
2. Tier 1 PBIS Fidelity Year 2 (2017-2018)	.10	.08
3. Tier 1 PBIS Fidelity Year 1 (2016-2017)	-.01	.04
R ²	.21**	

Note. $N = 294$.

* $p < .05$ ** $p > .017$ (Bonferroni adjustment)

Table 3.3*Correlations (Spearman's Rho) for Advanced Tier PBIS Sustainability and Fidelity Across Tiers for Three Years for All Types*

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Adv Tier Sust. Overall Yr 3 (2018-2019)	-											
2. Adv Tier Sust. Tier 2/3 Gen Factor Yr 3	.88**	-										
3. Adv Tier Sust. Tier 2 Specific Factor Yr 3	.89**	.79**	-									
4. Adv Tier Sust. Tier 3 Specific Factor Yr 3	.92**	.69**	.71**	-								
5. Tier 1 Fidelity Yr 3 (2018-2019)	.50**	.56**	.44**	.40**	-							
6. Tier 2 Fidelity Yr 3 (2018-2019)	.57**	.60**	.53**	.43**	.65**	-						
7. Tier 3 Fidelity Yr 3 (2018-2019)	.58**	.55**	.40**	.58**	.45**	.58**	-					
8. Tier 1 Fidelity Yr 2 (2017-2018) a	.53**	.55**	.47**	.43**	.65**	.58**	.59**	-				
9. Tier 2 Fidelity Yr 2 (2017-2018) a	.51**	.49**	.50**	.38**	.62**	.75**	.48**	.65**	-			
10. Tier 3 Fidelity Yr 2 (2017-2018) a	.52**	.42**	.35**	.56**	.38**	.47**	.72**	.67**	.53**	-		
11. Tier 1 Fidelity Yr 1 (2016-2017) b	.42**	.50**	.39**	.29**	.56**	.53**	.46**	.56**	.42**	.41**	-	
12. Tier 2 Fidelity Yr 1 (2016-2017) b	.49**	.44**	.50**	.38**	.44**	.58**	.47**	.48**	.69**	.54**	.44**	-
13. Tier 3 Fidelity Yr 1 (2016-2017) b	.49**	.42**	.32*	.53**	.33*	.44**	.71**	.47**	.34**	.80**	.43**	.55**

Note. $N = 65$. ^a Year 2 fidelity scores for schools that reported PBIS Tier 1 fidelity for at least Year 2 and Year 3. ^b Year 3

fidelity scores for schools that reported PBIS Tier 1 fidelity for all three years of the study.

* $p < .05$. ** $p < .002$ (Bonferroni adjustment)

Table 3.4

Regression Coefficients of Year 3 (2018-2019) PBIS Fidelity on Overall Advanced Tier PBIS Sustainability for All School Types

Variable	<i>b</i>	<i>SE</i>
Constant	.16*	.07
Tier 1 Fidelity Year 3	.23**	.08
Tier 2 Fidelity Year 3	.30**	.07
Tier 3 Fidelity Year 3	.09*	.04
<i>R</i> ²	.24**	

Note. *N* = 282.

p* < .05 *p* < .017 (Bonferroni adjustment)

Table 3.5

Regression Coefficients of Year 3 (2018-2019) PBIS Fidelity in on Overall Advanced Tier PBIS Sustainability for Only Elementary Schools

Variable	<i>b</i>	<i>SE</i>
Constant	.16	.10
Tier 1 Fidelity Year 3	.30*	.13
Tier 2 Fidelity Year 3	.28**	.08
Tier 3 Fidelity Year 3	.05	.05
<i>R</i> ²	.22**	

Note. *N* = 174.

p* < .05 *p* < .017 (Bonferroni adjustment)

Table 3.6*Spearman's Rho and Partial Correlations for PBIS Sustainability Across Tiers in Year 3 (2018-2019) for All School Types*

Variables	1	2	3	4	5	6	7	8	9
1. Tier 1 Sust. Overall	-	.78** (614)	.82** (614)	.79** (612)	.82** (612)	-	.34** (537)	.32** (537)	-.14** (537)
2. Tier 1 Sust. Sch. Priority Factor	.88**	-	.62** (610)	.27** (610)	-.06 (610)	.29** (610)	.28** (534)	.06 (534)	-.11 (534)
3. Tier 1 Sust. Sch. Team Use of Data Factor	.86**	.81**	-	-.01 (610)	.34** (610)	.00 (610)	.01 (534)	.03 (534)	-.05 (534)
4. Tier 1 Sust. Dist. Priority Factor	.90**	.72**	.67**	-	.44** (610)	.28** (610)	.03 (534)	.03 (534)	.09* (534)
5. Tier 1 Sust. Dist. Capacity Factor	.87**	.68**	.69**	.71**	-	.14** (610)	-.01 (534)	.18** (534)	-.06 (534)
6. Adv Tier Sust. Overall	.71**	.68**	.61**	.62**	.59**	-	-	-	-
7. Adv Tier Sust. Tier 2/3 General Factor	.73**	.73**	.64**	.62**	.60**	.91**	-	-	.27** (537)
8. Adv Tier Sust. Tier 2 Specific Factor	.73**	.69**	.64**	.63**	.62**	.92**	.82**	-	.42** (537)
9. Adv Tier Sust. Tier 3 Specific Factor	.55**	.52**	.46**	.50**	.44**	.92**	.73**	.76**	-

Note. $N = 534$. Nonparametric zero-order correlations are reported below the diagonal. Partial correlations between ALTIUDE and SUBSIST scores are reported above the diagonal with sample sizes reported in parentheses below correlation coefficients.

* $p < .05$ ** $p < .004$ (Bonferroni adjustment)

Table 3.7

Correlations (Kendall's Tau-b) for Tier 1 PBIS Sustainability, Fidelity, and Exploration of Indirect Metrics of Data Use in Year 3 (2018-2019) for Elementary Schools

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Tier 1 PBIS Sust. Overall	-														
2. Tier 1 Sust. Sch. Priority Factor	.68** (374)	-													
3. Tier 1 Sust. Sch. Team Use of Data Factor	.65** (374)	.57** (374)	-												
4. Tier 1 Sust. Dist. Priority Factor	.71** (372)	.51** (372)	.46** (372)	-											
5. Tier 1 Sust. Dist. Capacity Factor	.69** (372)	.49** (372)	.48** (372)	.52** (370)	-										
6. Tier 1 Fidelity	.33** (324)	.32** (324)	.37** (324)	.24** (322)	.23** (323)	-									
7. Tier 2 Fidelity	.20** (280)	.22** (280)	.22** (280)	.15** (278)	.11* (279)	.44** (282)	-								
8. Tier 3 Fidelity	.11* (275)	.16** (275)	.12* (275)	.06 (274)	.05 (275)	.28** (288)	.46** (290)	-							
9. Count Months Generating 1+ Core Reports	-.01 (159)	-.04 (159)	.08 (159)	.01 (157)	-.03 (159)	.16* (162)	.24** (136)	.09 (72)	-						
10. Count Months Generating 11+ Core Reports	-.04 (138)	-.02 (138)	.01 (138)	-.03 (136)	-.08 (138)	.12 (141)	.21** (120)	.11 (67)	.56** (152)	-					

Table 3.7 (continued)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11. Avg Count Core Reports Generated Per Mo	.02 (159)	.01 (159)	.07 (159)	.02 (157)	-.02 (159)	.16** (162)	.23** (136)	.17* (72)	.62** (177)	.80** (152)	-				
12. Avg Count Core Reports Generated Per Wk	.02 (159)	.01 (159)	.07 (159)	.02 (157)	-.02 (159)	.16** (162)	.23** (136)	.17* (72)	.62** (177)	.80** (152)	1.00** (177)	-			
13. Count Months Generating 1+ Drill Down Reports	.07 (151)	.01 (151)	.11 (151)	.10 (149)	.04 (151)	.09 (153)	.08 (128)	.02 (69)	.34** (165)	.19** (147)	.29** (165)	.29** (165)	-		
14. Count Months Generating 11+ Drill Down Reports	.04 (119)	.05 (119)	.02 (119)	.05 (117)	.02 (119)	.09 (123)	.04 (102)	-.03 (54)	.26** (132)	.19** (124)	.21** (132)	.21** (132)	.62** (132)	-	
15. Avg Count Drill Down Reports Generated Per Mo	.01 (151)	-.03 (151)	.05 (151)	.05 (149)	-.01 (151)	.03 (153)	.05 (128)	-.05 (69)	.25** (165)	.16* (147)	.27** (165)	.27** (165)	.70** (166)	.82** (132)	-
16. Avg Count Drill Down Reports Generated Per Wk	.01	-.03	.05	.05	-.01	.03	.05	-.05	.25**	.16**	.27**	.27**	.70**	.82**	1.00**

Note. Correlation sample sizes are reported in parentheses beneath regression coefficients for each model.

* $p < .05$ ** $p < .01$

Table 3.8

Correlations (Kendall's Tau-b) for Tier 1 PBIS Sustainability in Year 3 (2018-2019), Fidelity Across Three Years, and Tier 1 PBIS Data Use (Average Count of SWIS Core Reports Generated per Month) Across Three Years for Only Elementary Schools

Variables	1	2	3	4	5	6	7
1. Tier 1 PBIS Sust. Overall	-						
2. Tier 1 Sust. Sch. Team Use of Data Factor	.65** (374)	-					
3. Tier 1 Fidelity Year 3	.33** (324)	.37** (324)	-				
4. Tier 1 Fidelity Year 2	.25** (236)	.30** (236)	.47** (250)	-			
5. Tier 1 Fidelity Year 1	.14** (198)	.19** (198)	.30** (208)	.47** (208)	-		
6. Avg Count Core Reports Generated Per Mo Year 3	.02 (159)	.07 (159)	.16** (162)	.16** (143)	.16* (115)	-	
7. Avg Count Core Reports Generated Per Mo Year 2	-.01 (152)	.04 (152)	.13* (150)	.10 (136)	.12 (115)	.43** (157)	-
8. Avg Count Core Reports Generated Per Mo Year 1	.06 (136)	.11 (136)	.16* (129)	.16* (114)	.24** (102)	.41** (130)	.50** (138)

Note. Correlation sample sizes are reported in parentheses beneath regression coefficients for each model.

* $p < .05$ ** $p < .01$

Table 3.9

Correlations (Kendall's Tau-b) for Advanced Tier PBIS Sustainability, PBIS Fidelity Across Tiers, and Indirect Metrics of Advanced Tier PBIS Data Use in Year 3 (2018-2019) for Only Elementary Schools

Variables	1	2	3	4	5	6	7	8	9	10
1. Adv Tier Sust. Overall	-									
2. Adv Tier Sust. Tier 2/3 General Factor	.74** (380)	-								
3. Adv Tier Sust. Tier 2 Specific Factor	.76** (375)	.64** (375)	-							
4. Adv Tier Sust. Tier 3 Specific Factor	.76** (329)	.53** (329)	.56** (328)	-						
5. Tier 1 Fidelity	.28** (329)	.31** (329)	.29** (325)	.18** (282)	-					
6. Tier 2 Fidelity	.30** (287)	.29** (287)	.32** (284)	.21** (245)	.44** (282)	-				
7. Tier 3 Fidelity	.25** (178)	.26* (178)	.20** (175)	.25** (166)	.28** (178)	.46** (178)	-			
8. Count Months Generating 1+ CICO Reports	.09 (98)	.14 (98)	.09 (97)	.08 (82)	.04 (96)	.27** (84)	.03 (56)	-		
9. Count Months Generating 10.25+ CICO Reports	.12 (65)	.13 (65)	.18* (64)	.12 (53)	.10 (62)	.35** (54)	.17 (36)	.53** (67)	-	
10. Avg Count CICO Reports Generated Per Mo	.08 (98)	.11 (98)	.08 (97)	.03 (82)	.04 (96)	.21** (84)	.03 (56)	.69** (102)	.76** (67)	-
11. Avg Count CICO Reports Generated Per Wk	.08 (98)	.11 (98)	.08 (97)	.03 (82)	.04 (96)	.21** (84)	.03 (56)	.69** (102)	.76** (67)	1.00** (102)

Note. Correlation sample sizes are reported in parentheses beneath regression coefficients for each model.

* $p < .05$ ** $p < .01$

Table 3.10

Correlations (Kendall's Tau-b) for Advanced Tier PBIS Sustainability in Year 3 (2018-2019), Advanced Tier PBIS Fidelity Across Three Years, and Advanced Tier PBIS Data Use (Average Count of CICO-SWIS Reports Generated Per Week) Across Three Years for Only Elementary Schools

Variables	1	2	3	4	5	6	7	8	9	10
1. Adv Tier Sust. Overall	-									
2. Adv Tier Sust. Tier 2 Specific Factor	.76** (375)	-								
3. Tier 2 Fidelity Year 3	.30** (287)	.32** (284)	-							
4. Tier 2 Fidelity Year 2	.33** (164)	.31** (163)	.59** (167)	-						
5. Tier 2 Fidelity Year 1	.28** (104)	.24** (104)	.43** (106)	.60** (106)	-					
6. Tier 3 Fidelity Year 3	.25** (178)	.20** (175)	.46** (178)	.37** (109)	.35** (75)	-				
7. Tier 3 Fidelity Year 2	.24** (80)	.10 (80)	.28** (81)	.37** (78)	.42** (62)	.46** (81)	-			
8. Tier 3 Fidelity Year 1	.21* (50)	.05 (50)	.14 (51)	.04 (50)	.32** (50)	.49** (51)	.58** (51)	-		
9. Avg Count CICO Reports Generated Per Wk Year 3	.08 (98)	.08 (97)	.21** (84)	.28** (65)	.21* (45)	.03 (56)	-.10 (36)	-.25 (21)	-	
10. Avg Count CICO Reports Generated Per Wk Year 2	.13 (76)	.11 (76)	.27** (65)	.28** (55)	.11 (45)	.05 (43)	-.12 (32)	-.13 (21)	.48** (72)	-
11. Avg Count CICO Reports Generated Per Wk Year 1	.21* (63)	.20* (63)	.29** (54)	.23* (46)	.26* (39)	.04 (38)	-.19 (29)	-.13 (21)	.55** (57)	.66** (58)

Note. Correlation sample sizes are reported in parentheses beneath regression coefficients for each model.

* $p < .05$ ** $p < .01$

CHAPTER IV

DISCUSSION

General Discussion

This study proposed to answer five primary research questions. The first two research questions focused on examining associations between measures of PBIS fidelity reported by schools over a three-year period (implementation history) and measures of PBIS sustainability reported during the third year across tiers of support. The third research question focused on examining associations between a measure of PBIS sustainability at Tier 1 and a newly developed measure of PBIS sustainability at advanced tiers (Tier 2, Tier 3). Finally, questions four and five focused on examining potential indirect measures of data use across tiers of PBIS, as well as associations between three years of data use and implementation fidelity with sustainability of PBIS across tiers.

Sustainability, fidelity, and data use are constructs identified in literature about school improvement and implementation of evidence-based innovations, including the innovation of focus for this study, the PBIS framework. Research on the fidelity, sustainability (indicators of potential to sustain implementation), and sustained implementation of PBIS is emerging, especially at Tier 1, but this study attempted to examine historical indicators of implementation fidelity and data use that preceded and included the school year that sustainability measures were collected. The construct of data use at a system or school-wide level has yet to be operationally defined in a way that would allow for a direct measure to be established for purposes of evaluation or research. Comprehensive understanding of data use may include procedures for measurement (data) prioritization, frequency of analysis, organization of data (e.g., charts, graphs), procedures

for sharing with stakeholders, and many other aspects of the data and decision systems. Improved understanding of data use would allow school PBIS leadership teams, district leaders, and researchers to establish data use guidelines and criteria that will maximize use of resources (e.g., staff time, data system adoption) and improve the efficiency of decision-making about implementation fidelity, outcomes, capacity, and sustainability of PBIS and the specific practices and systems embedded within the framework.

PBIS Fidelity and Sustainability

For research questions one and two, the original hypothesis was that there will be a positive relation between Tier 1 fidelity across three years and Tier 1 sustainability scores in year 3, as well as a positive relation between Tier 2 and Tier 3 fidelity and advanced tier sustainability. For research question one that focused on these relations for only Tier 1 PBIS implementation, results of the Spearman's rho correlations indicate that relations between Tier 1 fidelity across the three years of the study were positively associated with the overall and individual factors of Tier 1 PBIS sustainability on the SUBSIST measure. The relations with Tier 1 PBIS sustainability scores were comparatively highest for fidelity in year 3, the concurrent year that sustainability was collected, slightly smaller for fidelity in year 2, and smallest for fidelity in year 1. Correlations between fidelity in year 3 (2018-2019) and overall SUBSIST scores in year 3 as well as individual sustainability factors (School Priority, School Team Use of Data, District Priority, District Capacity Building) were moderate ($r_{Spearman} = .34 - .45$). Tier 1 fidelity in year 2 (2017-2018) was moderately positively correlated with the overall and school-level factors of the SUBSIST. All other correlations between year 1 and year 2 fidelity and sustainability, while significant, were small ($r_{Spearman} = .16 - .29$). Similarly, when multiple linear regression was used to

determine whether Tier 1 fidelity across years predicted Tier 1 PBIS sustainability, the model explained 21% of variance in overall SUBSIST scores, but only Tier 1 fidelity in year 3 was a significant predictor within the model.

Examining advanced tiers yielded more complex results, given the inclusion of all nine PBIS fidelity variables (three tiers X three years). The results of the initial Spearman's rho correlations indicated large positive correlations between the overall ALTITUDE score and fidelity across tiers in year 2 and year 3 and moderate correlations between overall ALTITUDE score and fidelity across tiers in year 1. Correlations between individual factors of the ALTITUDE and fidelity were also positive at moderate and large levels. Correlations indicated that fidelity for all three tiers across three years was not a useful model in identifying predictors of advanced tier sustainability overall. For the aggregated sample of schools across types, both Tier 1 and Tier 2 fidelity in year 3 were significant predictors of advanced tier sustainability but when disaggregated by school type the results varied.

For elementary schools, which made up most of the sample, only Tier 2 fidelity in year 3 was a significant predictor of advanced tier sustainability. Given these results, the general hypothesis of positive relations between fidelity and sustainability was supported for research questions 1 and 2. However, inclusion of prior years of overall fidelity scores did not provide a clear contribution toward better understanding factors of PBIS sustainability, likely because the variance of fidelity in the final year (Year 3) was most closely related to variance in sustainability for the concurrent (same) year. Relation between fidelity and advanced tier sustainability may require further examination given the strong correlations between tier-specific measures (e.g., Tier 2 Specific sustainability and

Tier 2 fidelity across years).

PBIS Sustainability

For research question three, the original hypothesis was that there would be a positive relation between factors of Tier 1 sustainability and factors of advanced tier sustainability in year 3. Results of the initial Spearman's rho correlations indicated strong correlations between Tier 1 and advanced tier sustainability of PBIS overall and between the various factors of sustainability. However, due to multicollinearity within factors of the measure, it was appropriate to further analyze the results while controlling for the influence of either overall scores or specific factors within the measures (selected individually for each comparison).

The results of the partial correlations revealed that there were moderate correlations between overall Tier 1 sustainability on the SUBSIST and both the Advanced Tier General and Tier 2 Specific factors of the ALTITUDE. Interestingly there was a small significant negative correlation between overall Tier 1 sustainability on the SUBSIST and the Tier 3 Specific factor of the ALTITUDE. There were small positive correlations between the Tier 1 School Priority factor of the SUBSIST and the overall advanced tier sustainability on the ALTITUDE and the Advanced Tier General factor, but not with the Tier 2 Specific or Tier 3 Specific factors. Curiously, there were no significant correlations between Tier 1 School Team Use of Data on the SUBSIST and advanced tier sustainability (overall or individual factors) on the ALTITUDE. There was a small positive correlation between the District Priority factor of the SUBSIST and the overall advanced tier sustainability score on the ALTITUDE, but no significant correlations with any of the individual factors. Finally, there were two small positive correlations between the District Priority factor of the

SUBSIST and both the overall advanced tier sustainability score and the Tier 2 Specific factor on the ALTITUDE. Given these results, the general hypothesis of positive relations between Tier 1 and advanced tier PBIS sustainability was partially supported, but once the use of partial correlations was introduced, only specific relations were significant. Additionally, the small but significant negative correlation between overall Tier 1 sustainability and the Tier 3 Specific factor of advanced tier sustainability bears further examination.

PBIS Data Use, Fidelity, and Sustainability

For research questions four and five, the original hypothesis was that there would be modest positive associations between indirect measures of data use across tiers, sustainability across tiers, and fidelity across tiers of support. This hypothesis was based on results from previous studies that pointed to school and team use of data as a predictor of PBIS Tier 1 sustainability in schools (McIntosh et al., 2015; McIntosh et al., 2013). This study also sought to expand on the use generation of reports about student discipline as an indirect measure of data use (Kittelman et al., 2019). Results of the exploratory Kendall's tau-b correlations guided in the selection of the measure of data use at Tier 1 (average SWIS core reports generated per month) and advanced tiers (average CICO-SWIS reports generated per week). The subsequent results analyzing three years of data use, three years of fidelity, and the overall sustainability scores indicated a small positive relation between the indirect measure of Tier 1 data use in year 3 and Tier 1 fidelity in year 2 and year 3, but no relations were found between use of data and sustainability at Tier 1. For advanced tiers of support there were small and moderate correlations found between use of data and Tier 2 fidelity in both year 2 and year 3. Small correlations were also found between generation of

advanced tier reports in year 1 with overall and Tier 2 Specific advanced tier sustainability. Given these results, the hypotheses were not clearly supported, at least not at a socially relevant scale of importance. Kittelman et al. (2019) found modest but significant positive correlations between school generation of discipline data reports and the Team Use of Data subscale of the SUBSIST across stages of implementation. The contrasting results of the present study to may be due to the inclusion of additional variables within the analyses, including multiple variations of report generation in the exploration phase and multiple years of the same measure for the second phase. Further replication is needed, but there may be a need for more sophisticated methods to measure school use of data across tiers of the PBIS framework to better represent the nuances of school use of data for decisions related to PBIS fidelity and sustainability.

Limitations

Several limitations should be considered when interpreting results of this study and conducting future research using the measures of PBIS sustainability, fidelity, and especially data use. Two broad categories of limitations include (a) measurement limitations and (c) sample sizes.

Measurement Limitations

A major limitation for this study is related to the measures used to represent the constructs of sustainability, fidelity, and data use in PBIS. Several of the measures were self-reports by one or more representatives of the school, so the accuracy of scores is dependent on the competence and honesty of the respondents. The two self-reported measures of PBIS sustainability (SUBSIST, ALTITUDE) were completed by individuals who self-identified as representatives who were knowledgeable about one or more school's

implementation efforts. While the recruitment and survey materials provided instructions on respondent criteria, there was no external validation to confirm that the respondent (a) was knowledgeable about school PBIS implementation efforts and (b) accurately represented those implementation efforts.

PBIS fidelity measures were retrieved from the PBIS Assessment data system, which does not monitor the training or competence of the evaluators or accuracy of the data. One of the PBIS fidelity measures (SET) was originally designed as an external evaluation by someone trained in administering the tool, but the other two measures (TFI, BoQ) are designed to be conducted by the PBIS team and with an external PBIS coach if possible. Instructions and training materials are publicly available via the PBISApps website to guide school use of the fidelity measures. A further limitation of this study's use of fidelity measure was the use of multiple measures of Tier 1 PBIS fidelity to increase the sample size. While there was a precedence for using a cascading logic to consolidate these measures, the procedure limited the analysis of specific subscales of fidelity that would have been available if only one measure (e.g., TFI) were selected. Given the breadth of the constructs explored in this study (sustainability, fidelity, data use), the increased precision of fidelity subscales may have allowed for expanded analyses of relations with factors of sustainability and data use.

The variables to examine PBIS data use were based on reports accessed from two specific data systems, were not self-reports but were highly simplified, distal indicators of a broad and complex construct. A review of literature indicates few efforts to identify simple and direct measures of data use by school PBIS teams. The research on the Team Initiated Problem Solving (TIPS) model measured team activities through observation of team

meetings and analysis of permanent meeting products (i.e., meeting minutes) over time (Algozzine et al., 2016). While comprehensive in examining team procedures, the procedures of analysis (aggregation and disaggregation) were not explicitly identified. Additionally, the resources required to examine student team meetings at greater depth are both labor and cost intensive. While attempting to validate findings from an early PBIS sustainability study, Kittelman et al (2019) explored a simpler though less direct measure of school data use, the count of months that reports about discipline referrals in SWIS were generated. This study attempted to expand on this simpler indicator of data use by examining two types of SWIS reports (Core, Drill Down) and CICO-SWIS reports. The generation of reports were organized into four potentially useful formats related to count of months and average reports accessed to determine whether an ideal measure of data use at Tier 1 and advanced tiers (specifically Tier 2) could be identified.

The average count of reports generated (per month or week) and the count of months that reports were generated (any report or above the median across schools) indicate only that a school user associated with the school clicked on a report available in SWIS or CICO-SWIS. Without additional measures (e.g., meeting minutes, communications between school staff), it is not possible to verify the quality of training received by the user to select and interpret the reports appropriately or the extent that reports accessed were connected to decision making. Future research should include both measures of access and permanent products or observations of the team actions following the access of reports. Secondly, the use of the CICO-SWIS data system is primarily recommended for standardized tier 2 interventions. While schools anecdotally report using CICO-SWIS for a broader range of interventions, there is no indicator within CICO-SWIS

of whether the point card is standardized or individualized. Ideally, this information would be collected for future or research and separate measures of individualized Tier 3 data use will be identified. Within the existing measures it may also be useful to analyze the specific types of reports in SWIS (e.g., referrals by location, referrals by problem behavior) and CICO-SWIS (e.g., average daily points per student) to determine whether patterns of use for specific reports vary or are differentially associated with problem-solving and decision making. For example, what differences exist in decisions made by teams that use a few reports frequently and teams that use many of the standardized and custom reporting options less frequently, possibly on a rotating basis. Future research should also analyze changes in actual data (discipline referral rates, percent of daily points earned) to examine relations between use of data (specific or general) and changes in student outcomes.

Sample Size Limitations

Another area of limitation of the study is related to sample size. The sample sizes varied for each question, especially questions that analyzed measures of Tier 3 supports and data collected in year 1 (2016-2017) of the study. Further disaggregating results by school type created extremely small sample sizes and, in some cases, made certain analyses (e.g., multiple regressions, correlations for secondary schools only) inappropriate. To compensate for the small sample sizes, research questions three, four, and five included use of pairwise deletion within the analyses to maximize the information across the sample, but further limits interpretation of results since schools with one year of data were compared with schools that reported two or three years of data. Another method employed to retain adequate sample sizes was the consolidation of three separate PBIS fidelity measures (SET, TFI, BoQ) into a single measure of overall fidelity at Tier 1.

Implications for Future Research

Future research on sustainability, fidelity, and data use is needed to improve our understanding of factors that impact a school's sustained implementation of PBIS with sufficient fidelity to realize valued academic and social benefits for students.

Data Use and Implementation Science

The goal of implementation science is to understand the variables that improve speed, efficiency, and durability of the processes used by schools and other organizations to adopt promising and evidence-based innovations for improvement purposes. Results of the present study expose a series of inter-related relations between implementation fidelity, factors of implementation sustainability, and data use by implementation teams. These inter-relations may encourage future research to focus on the design of instruments that comprehensively measure constructs of implementation including fidelity, sustainability, and use of data by leadership teams. One smaller step toward this goal is to examine the functions that data systems (e.g., measures, collection procedures) and decision systems (e.g., sharing, problem identification, solution development, action planning) serve in implementation activities across different fields including social behavior, academic and professional growth, healthcare, business, and social justice. For example, implementation scientists are encouraged to examine relations between variables of data use (e.g., teaming, collection, analysis, sharing) and an organization's capacity to scale the innovation, maintain adequate fidelity of implementation, monitor adaptations to the innovation, increase social/cultural acceptability of the innovation, or sustain use of the innovation over time (especially when known barriers are present). Identifying these relations with precision will allow developers of new innovations to embed the most critical variables of

data use into standard procedures for data use within the implementation protocol. Additionally, researchers will have the information needed to build valid and reliable implementation measures that are robust across common barriers encountered and include the necessary weights or modifications to be useful for any given stage of implementation.

School and District Data Use Across Stages of PBIS Implementation

PBIS evidence has focused on the school as the unit of analysis, but district influence on school implementation and improvement (outcomes) has been recognized and recommended as a separate or inter-related unit of analysis (George et al., 2018; Sugai & Horner, 2019). Future research on use of data within PBIS schools should also target the shared and unique information needed by different stakeholders at the school and district levels at given stages of implementation. Table 4.1 presents a set of implementation questions that school and district leadership teams should ask at each stage. Measures of implementation and outcomes should be designed to guide teams in answering these question as well as the related decision or action taken by the team in response.

While questions may be similar for school and district leadership teams, the measures that answer questions and guide decisions may vary from school-to-school or between school and district. For example, school capacity to implement the CICO intervention across all (and only) students who are likely to benefit may rely on a variety of universal screeners or matching criteria while the district capacity to support school implementation of CICO may focus on number of individuals in the district with the expertise and time to train school staff or coach school teams. Research to develop or improve existing measures should focus on identifying indicators shared across types of decisions and prioritizing indicators that are unique to only one type of decision.

Table 4.1*Questions to Guide PBIS Decisions by Implementation Stage*

Implementation Stage	Type of Decision	Data Use Question
Exploration	Readiness	What are the immediate and long-term needs we need to meet (or improve) within PBIS?
		What innovations (e.g., practices, interventions) are available?
		What is the evidence base?
		What is the fit of the innovation to the need and context?
		What core elements of the innovation are in place, partially in place, and not in place?
Installation and Initial Implementation	Fidelity	What is our current stage/status of implementation?
	Prioritization	What activities are complete, in process, and ready to start?
	Planning	What are the next activities to attend to?
	Sustainability	Have past activities/improvements been sustained?
	Impact	What initial impact has implementation had on student social, emotional, and behavioral indicators?
Full Implementation	Fidelity	Which core elements are consistently in place? Which elements may benefit from further attention (e.g., training, adaptation)?
	Outcomes	What distal impact has implementation had on student social, emotional, and behavioral indicators?
	Contextual Fit	Do stakeholder groups generally agree that current PBIS practices are aligned to local values? Are there differences reported across groups?
	Capacity	Is the innovation reaching all (or only) students who are likely to benefit? Is it feasible to increase access if needed?
	Sustainability	Is implementation likely to sustain for at least 5 years, even if common barriers (e.g., turn-over, new initiatives) arise?
	Adaptation	What adaptations have been made to increase fidelity, outcomes, fit, capacity, or sustainability? How have adaptations directly and indirectly impacted fidelity, outcomes, fit, capacity, and sustainability?

Another potentially fruitful area for future research is the design of measures that incorporate specific areas of PBIS adaptation. During the early stage of PBIS implementation, adaptations often focus on addressing barriers to move toward the next stage of implementation and address barriers or concerns from stakeholders. Early adaptations by newly trained leadership teams often require high levels of support from a technical assistance provider (e.g., coach, trainer) to ensure that adaptations will not degrade fidelity or capacity of the innovation to meet the original need. During (or perhaps beyond) full implementation the focus is on embedding PBIS deeply into the routines and values of the organization and general competency of implementers and leadership teams has been established. This competency allows for broader adaptations to be folded into the PBIS framework.

As previously mentioned, research groups have offered companion guides to the TFI, encouraging schools to weight the original PBIS-general fidelity items with criteria or follow-up questions related to specific initiatives that fit to or align with the goal of improving student social, emotional, and behavioral outcomes. One example is the Interconnected System Framework Action Planning Companion Guide to SWPBIS-Tiered Fidelity Inventory (Barrett et al., 2016), which provides enhanced criteria for scoring key items on the standard TFI to specifically address student mental health within PBIS. Schools that previously scored Team Operating Procedures as fully in place using the standard criteria may score the same item as partially in place using the enhanced criteria and identify this as an area for improvement to target. Much work remains to understand the role and effectiveness of these companion guides within PBIS decision making. The potential benefit of using these types of companion guides is that the measure becomes

flexible to local adaptations and improvement priorities over time, but further research is needed to establish indicators that a school or district is ready for any (or a specific) adaptation and the impact of adaptations on implementation of the original core elements of PBIS. Future companion guides may target areas of common areas of adaptation including restorative practices, trauma-informed practices, or family engagement.

A potential barrier to the use of companion guides is the need to manage or consolidate enhancements over time as target areas expand or shift. For example, a district may introduce a companion guide to embed restorative practices within PBIS for three years to schools at full implementation. At the end of three years the district may identify that several, but not all schools have successfully embedded restorative practices and are interested in next targeting family engagement into their PBIS framework and would like a similar companion guide to use with their existing fidelity measure (e.g., TFI). These schools will want to monitor and sustain improvement of restorative practices as they shift towards increasing family engagement but administering multiple companion guides will likely reduce team efficiency. Consolidating multiple companion guides into the original measure may initially seem feasible but would evolve into an ever-growing set of criteria and the need to regularly manage and revise, eventually leading back to reduced efficiency. This scenario would become further complicated if significant barriers to PBIS occurred (e.g., administrative turn-over, budget reduction) and resulted in the need for the school or district to simplify implementation efforts or even move back to an earlier implementation stage and cut down on the enhanced criteria. Further research should focus on studying a wide range of adaptations to PBIS, and the indicators needed to drive implementation decisions about adaptations over time, especially during periods when major barriers to

sustained implementation occur (e.g., budget reduction, world-wide pandemic).

Implications for Practice

While the results of this study were modest and further research is needed to guide efforts toward use of data to sustain fidelity of PBIS implementation over time, the results offer implications for school and district leaders engaged in PBIS implementation efforts.

School Administrators and PBIS Leadership Teams

All school personnel and many other stakeholders (e.g., district personnel, students, family members) are involved in PBIS implementation activities, but school administrators and decision-making teams are intended to represent the broader stakeholder group(s) and provide the leadership and organization for PBIS and related practices that establish the competency. For example, PBIS school leaders influence the selection of behavioral practices and data sources to guide decisions, the organization and presentation of those data to different stakeholder groups and choose procedures for translating data into information that will drive decisions. Two implications of research on fidelity, sustainability, and data use in PBIS are the use of implementation focused (vs outcome) measures and the use of decision guidelines or rules that integrate various data sources.

Use of Implementation-Focused Measures

Measures that focus on features of implementation (e.g., fidelity, sustainability, capacity), rather than outcomes have been historically viewed as research or accountability tools, providing documentation of treatment integrity with little application to iterative decision cycles. Over the last decade, the field of education has sought to expand the role, format, and functions of implementation measures, especially measures of implementation fidelity. Beyond external accountability, implementation-focused measures are collected

for: (a) shared internal accountability to sustain adopted practices, (b) formative assessment of need and readiness for an innovation or practice, (c) guidance during the multi-year stages of implementing complex educational innovations, and (d) ongoing guidance in efforts to sustain core elements of the innovation while making adaptations to improve contextual fit and local effectiveness.

In addition to measuring implementation fidelity or alignment to core elements of the target innovation, implementation-focused measures may also be modified to also include measurement of other constructs like capacity and sustainability. Capacity measures serve to evaluate the scale or availability of the innovation to meet the intended recipients or organization needs. For example, school leaders may use referral patterns and student interviews to determine that the CICO intervention is beneficial to some recipients but has been over-delivered to students who are less likely to benefit from the intervention based on behavioral patterns and under-delivered to students who are likely to benefit. Measurement of sustainability evaluates the potential for future use (and benefit) of the innovation. For example, school leaders may use fidelity measures and staff survey results to determine that staff perceptions of PBIS are not favorable and that PBIS is viewed as a fad innovation that will soon fade if the school team does not increase visibility and direct relevance to implementer routines. Over time, the addition of items (or modifications to existing items) of implementation-focused measures may add a modest amount of effort to the completion of implementation measures, but gaining this information would allow the school PBIS team to intentionally address specific staff concerns early, possibly by increasing transparency and staff involvement. Monitoring features of fidelity, capacity, and sustainability will increase the ability of school decision makers to confidently and

efficiently make implementation decisions, allocate local resources, and advocate for resources (e.g., training, materials, staff) when needed.

Comprehensive Decision Guidelines for Data Use and Sharing

A second implication of this study for school PBIS leaders is the need for decision guidelines to improve the use of data for decision making within iterative decision cycles. Too often in education, data collection is seen as a task performed by schools but delivered to the district, state, and federal levels for accountability and decision making at broad scales. The theoretical model of PBIS School Team Data Use identifies decision rules and guidelines as a set of pre-determined indicators used by school and district teams for data to guide decisions targeting school improvement. Decision guidelines allow a team to bypass lengthy discussions about whether data patterns (level, trend, peaks/valleys) indicate a need for action. Clear decision guidelines also allow the team to entrust the role of data analyst to an individual or subcommittee without sacrificing representative input in prioritizing the data shared with the team because the team has already come to agreement about the data patterns most likely to indicate a need for action, or at least further attention, by the team.

Decision rules are sometimes organized around a set of evaluation questions, including: (a) Is the innovation being implemented with adequate fidelity? (b) Is the innovation sustainable or robust to common barriers (e.g., staff turn-over, new initiatives)? (c) Are an adequate number of students receiving access to the innovation? (d) Are an adequate number of students responding positively to the innovation? (e) Are there subgroups of students less likely to receive access or respond positively to the innovation? Decision rules may also be organized to support specific implementation actions that the team are likely to consider including: no action (e.g., continue using existing procedures),

scale up or expand usage of an innovation (e.g., train additional staff, recruit students), modification to intensify implementation efforts (e.g., increase dosage, increase data collection), modification to reduce implementation efforts (e.g., fade or simplify procedures), or discontinue use of a practice or intervention. Tiered decision systems will include decision guidelines for specific practices (e.g., CICO) or tiers (e.g., Tier 2 supports) as well as broader systems shared across practices. Comprehensive decision guidelines will also include indicators of implementation (e.g., fidelity, sustainability, capacity) as well as indicators of student outcomes.

Training materials for the Team Initiated Problem Solving (TIPS) model includes a generic template of decision rules that teams can adapt with specific fidelity and outcome data sources (Horner et al., 2016). This template is provided in Appendix J and includes sample decision rules by implementation question for Tier 1 (p. 4), Tier 2 (p. 6), and Tier 3 (p. 8). To competently develop decision guidelines using this or other templates, school teams should also receive adequate training and coaching on data and decision systems so that the final guidelines directly inform contextually relevant decisions about PBIS practices, systems, data, and outcomes across all tiers of support.

District Leadership Teams

While schools and school PBIS teams were the unit of analysis for this study, there are also implications for the broader regional or district leaders. PBIS and improvement science literature both point to the need for supportive leadership to support development and sustainability of both organization and competency drivers within the organization. In education, the district leaders often have a greater influence on resource allocation and accountability standards than school leadership teams (Datnow, 2005). To better support

schools in use of data and sustained, high-fidelity implementation of PBIS, district leadership teams may benefit from engaging school team leaders in identifying a set of data systems that are likely to benefit school-level decisions about fidelity, sustainability, capacity, and outcomes. These data systems can be recommended to other schools and the district can coordinate access not only to the recommended data systems but also training and coaching on use of data for decisions that includes those data systems.

A second implication for district leaders is the modeling of data use at the district-level. District leadership teams involved in PBIS implementation also need data and decision systems to guide their decisions and making those data and procedures available to school-level stakeholders may contribute toward creating a strong data culture across the district. Sharing of district-level data may also include aggregated or even disaggregated school-level data to support district decisions about allocation of resources or policy development to address implementation needs. District sharing of school-level data should be a collaborative process to alleviate potential misuse or misrepresentation of data that may reflect poorly on PBIS implementation or broader school improvement efforts. Initial efforts to share data across schools should focus on acknowledging and reinforcing school efforts and successes in use of data to improve school outcomes. Once a culture of trust and shared data use has been established it may be acceptable to begin sharing data that represent ongoing improvements and highlight implementation problems. It may be necessary to anonymize this type of data but eventually normalizing transparency about implementation challenges as well as successes may benefit school and district stakeholder decision making.

A final implication for district leaders involved in PBIS implementation is public

commitment. The PBIS sustainability literature points to both school and district factors in predicting the sustained implementation of PBIS with adequate fidelity. While the current literature base of PBIS sustainability has focused on Tier 1, it is likely that district factors also predict sustainability of advanced tiers, especially at Tier 3 which often involves district personnel (e.g., behavior coach, district psychologist). One strategy for supporting school sustainability is to make district commitment to PBIS a consistent message for a predetermined number of years. For example, the district leadership may publicly commit to supporting school implementation of PBIS for a specific number of years and regularly include PBIS updates in messaging (e.g., newsletters, training, year-end reports). Committing for a specific number of years will also provide periodic opportunities to revisit PBIS commitment and to elicit school feedback about current implementation efforts and student outcomes before making an intentional decision to recommit or abandon the framework.

Conclusion

This study explored relations between three key aspects of school implementation of PBIS across tiers of support: sustainability, fidelity, and use of data. Many innovations (e.g., strategies, practices, interventions) have been identified over the last several decades to effectively meet student social, emotional, and behavioral needs. Recent attention has turned to questions about how best to implement one or more of those innovations at an adequate level of fidelity over a sustained period that will result in socially relevant scales of effects for students. The theoretical model adopted in this study identifies use of data as a key influencer of implementation including fidelity, scale or capacity, and sustainability. This study identified a small number of potential measures of data use to explore these

relations. Results indicate that simple and indirect measures of data use, based on access of student behavioral data, are insufficient to understand these complex relations at the school level. There may be many different uses of data that are influenced by stage of implementation, the purpose or priorities of the team, and the data or decision systems available to the team. Further research is needed to examine the role of data use in implementation of innovations within and across tiers of support in the PBIS framework.

APPENDIX A

SWIS READINESS CHECKLIST



SWIS Readiness Checklist School-wide Information System

School/Facility: _____ Certified SWIS Facilitator: _____ Date: _____

SWIS Requirements	Data Source	Status			Next Check
		Not in place	Partial	In Place	
1. Building administrator supports the implementation and use of SWIS.	Administrator Interview				
2. A school/facility-wide behavior support team exists and reviews SWIS referral data at least monthly.	Team Roster & Meeting Schedule				
3. The school/facility has an incident referral form and definitions for behaviors resulting in administrative-managed (major) vs. staff-managed (minor) incidents in place that is compatible with SWIS referral data entry.	Incident Referral Form(s) Problem Behavior Definitions				
4. Within three months of SWIS licensing, the school/facility is committed to having in place a clearly documented, predictable system for managing disruptive behavior (e.g., School-wide PBIS).	Written Guidelines				
5. Data entry time and staffing are scheduled to ensure that incident referral data will be current to within a week at all times. Data entry staff have access to all necessary information (e.g., student records).	Data Entry & Report Generation Schedule				
6. A small number of people within the school/facility are identified to gain SWIS access and are scheduled to attend a 3-hour Swift at SWIS Training conducted by a certified SWIS Facilitator.	Specific Date, Time, Location, Computers, Internet Access				
7. The school/facility agrees to maintain technology (i.e., internet browsers, district permissions) compatible with SWIS.					
8. The school/facility agrees to both initial and ongoing coaching on the use of SWIS for school/facility-wide decision making.	Administrator/ Coordinator Interview				
9. The school/facility agrees to maintain SWIS compatibility and maintain communication with a certified SWIS Facilitator who agrees to provide ongoing support to the school/facility on the use of SWIS.	Administrator/ Coordinator Interview				

Items that are Not in Place or Partially in Place can be organized into an action plan.

APPENDIX B

SWIS REFERRAL COMPATIBILITY CHECKLIST



SWIS Referral Form Compatibility Checklist

School: _____

Date: _____

Compatibility Item	Date		Date	
	Yes	No	Yes	No
Does a form exist that is SWIS compatible for SWIS data entry that includes the required categories (listed below)?	Yes	No	Yes	No
Student name	Yes	No	Yes	No
Student's grade level	Yes	No	Yes	No
Referring staff member	Yes	No	Yes	No
Date of incident	Yes	No	Yes	No
Time of incident	Yes	No	Yes	No
Location of incident	Yes	No	Yes	No
Problem Behavior	Yes	No	Yes	No
Perceived Motivation	Yes	No	Yes	No
Others involved	Yes	No	Yes	No
(Optional) Restraint/Seclusion	Yes	No	Yes	No
Actions Taken	Yes	No	Yes	No
(Optional) Notes	Yes	No	Yes	No
(Optional) Custom Fields	Yes	No	Yes	No
Does a set of definitions exist that clearly defines all categories on the office discipline referral form?	Yes	No	Yes	No
Does a clear distinction between problem behaviors that are staff managed versus office managed exist?	Yes	No	Yes	No
Is the referral process documented and available for staff reference?	Yes	No	Yes	No
Next review date:				

**Redesign your process, form, and definitions until answers to all questions are “Yes.”
When answers to all questions are “Yes”, readiness requirements 4 & 5 are complete.**

APPENDIX C

CICO-SWIS READINESS CHECKLIST



CICO-SWIS Readiness Checklist Check In Check Out SWIS

School/Facility: _____ Certified CICO-SWIS Facilitator: _____ Date: _____

CICO-SWIS Requirements	Data Source	Status			Next Check
		Not in place	Partial	In Place	
1. Building administrator supports the implementation and use of the Check In Check Out Intervention and CICO-SWIS.	Administrator Interview				
2. A school/facility-wide behavior support team exists with access to training and support for the CICO Intervention and reviews CICO-SWIS data at least twice monthly.	Team Roster & Meeting Schedule				
3. The school/facility has a CICO point card with the following information: Standard for all students Defined number of check-in periods (up to ten) Defined number of expectations/goals (3-5) A three-point rating scale	CICO Point Card				
4. Within three months of CICO-SWIS licensing, the school/facility is committed to having a clearly documented CICO system. Procedures include: Description of program CICO Coordinator Process for identifying students for CICO Process/materials for training adults, students, and families	Written Guidelines				
5. Data entry time and staffing are scheduled to ensure that point card data will be current to within three days at all times. Data entry staff have access to all necessary information (e.g., student records).	Data Entry & Report Generation Schedule				
6. A small number of people within the school/facility are identified to gain CICO-SWIS access and are scheduled to attend a 90-minute Swift at CICO-SWIS Training conducted by a certified CICO-SWIS Facilitator.	Specific Date, Time, Location, Computers, Internet				
7. The school/facility agrees to maintain technology (i.e., internet browsers, district permissions) compatible with CICO-SWIS.	Administrator/Coordinator Interview				
8. The school/facility agrees to both initial and ongoing coaching and support on the use of CICO-SWIS with a certified CICO-SWIS Facilitator.	Administrator/Coordinator Interview				
9. The school/facility agrees to maintain CICO-SWIS readiness/compatibility.	Administrator/Coordinator Interview				

Items that are Not in Place or Partially in Place can be organized into an action plan.

APPENDIX D

SET: SCHOOL-WIDE EVALAUTION TOOL SCORING GUIDE

(Sugai, Lewis-Palmer, Todd, & Horner, 2005)

School-wide Evaluation Tool (SET) Scoring Guide

School _____
 District _____
 Pre _____ Post _____

Date _____
 State _____
 SET data collector _____

Feature	Evaluation Question	Data Source (circle sources used) P= product; I=interview; O= observation	Score: 0-2
A. Expectations Defined	1. Is there documentation that staff has agreed to 5 or fewer positively stated school rules/ behavioral expectations? (0=no; 1= too many/negatively focused; 2= yes)	Discipline handbook, Instructional materials Other _____	P
	2. Are the agreed upon rules & expectations publicly posted in 8 of 10 locations? (See interview & observation form for selection of locations). (0= 0-4; 1= 5-7; 2= 8-10)	Wall posters Other _____	O
B. Behavioral Expectations Taught	1. Is there a documented system for teaching behavioral expectations to students on an annual basis? (0= no; 1 = states that teaching will occur; 2= yes)	Lesson plan books, Instructional materials Other _____	P
	2. Do 90% of the staff asked state that teaching of behavioral expectations to students has occurred this year? (0= 0-50%; 1= 51-89%; 2=90%-100%)	Interviews Other _____	I
	3. Do 90% of team members asked state that the school-wide program has been taught/reviewed with staff on an annual basis? (0= 0-50%; 1= 51-89%; 2=90%-100%)	Interviews Other _____	I
	4. Can at least 70% of 15 or more students state 67% of the school rules? (0= 0-50%; 1= 51-69%; 2= 70-100%)	Interviews Other _____	I
	5. Can 90% or more of the staff asked list 67% of the school rules? (0= 0-50%; 1= 51-89%; 2=90%-100%)	Interviews Other _____	I
C. On-going System for Rewarding Behavioral Expectations	1. Is there a documented system for rewarding student behavior? (0= no; 1= states to acknowledge, but not how; 2= yes)	Instructional materials, Lesson Plans, Interviews Other _____	P
	2. Do 50% or more students asked indicate they have received a reward (other than verbal praise) for expected behaviors over the past two months? (0= 0-25%; 1= 26-49%; 2= 50-100%)	Interviews Other _____	I
	3. Do 90% of staff asked indicate they have delivered a reward (other than verbal praise) to students for expected behavior over the past two months? (0= 0-50%; 1= 51-89%; 2= 90-100%)	Interviews Other _____	I
D. System for Responding to Behavioral Violations	1. Is there a documented system for dealing with and reporting specific behavioral violations? (0= no; 1= states to document; but not how; 2= yes)	Discipline handbook, Instructional materials Other _____	P
	2. Do 90% of staff asked agree with administration on what problems are office-managed and what problems are classroom-managed? (0= 0-50%; 1= 51-89%; 2= 90-100%)	Interviews Other _____	I
	3. Is the documented crisis plan for responding to extreme dangerous situations readily available in 6 of 7 locations? (0= 0-3; 1= 4-5; 2= 6-7)	Walls Other _____	O

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Feature	Evaluation Question	Data Source (circle sources used) P= product; I=interview; O= observation	Score: 0-2		
	4. Do 90% of staff asked agree with administration on the procedure for handling extreme emergencies (stranger in building with a weapon)? (0= 0-50%; 1= 51-89%; 2= 90-100%)	Interviews Other ____ I			
E. Monitoring & Decision-Making	1. Does the discipline referral form list (a) student/grade, (b) date, (c) time, (d) referring staff, (e) problem behavior, (f) location, (g) persons involved, (h) probable motivation, & (i) administrative decision? (0=0-3 items; 1= 4-6 items; 2= 7-9 items)	Referral form (circle items present on the referral form) P			
	2. Can the administrator clearly define a system for collecting & summarizing discipline referrals (computer software, data entry time)? (0=no; 1= referrals are collected; 2= yes)	Interview Other ____ I			
	3. Does the administrator report that the team provides discipline data summary reports to the staff at least three times/year? (0= no; 1= 1-2 times/yr.; 2= 3 or more times/yr)	Interview Other ____ I			
	4. Do 90% of team members asked report that discipline data is used for making decisions in designing, implementing, and revising school-wide effective behavior support efforts? (0= 0-50%; 1= 51-89%; 2= 90-100%)	Interviews Other ____ I			
F. Management	1. Does the school improvement plan list improving behavior support systems as one of the top 3 school improvement plan goals? (0= no; 1= 4 th or lower priority; 2 = 1 st , 3 rd priority)	School Improvement Plan, Interview Other ____ P I			
	2. Can 90% of staff asked report that there is a school-wide team established to address behavior support systems in the school? (0= 0-50%; 1= 51-89%; 2= 90-100%)	Interviews Other ____ I			
	3. Does the administrator report that team membership includes representation of all staff? (0= no; 2= yes)	Interview Other ____ I			
	4. Can 90% of team members asked identify the team leader? (0= 0-50%; 1= 51-89%; 2= 90-100%)	Interviews Other ____ I			
	5. Is the administrator an active member of the school-wide behavior support team? (0= no; 1= yes, but not consistently; 2= yes)	Interview Other ____ I			
	6. Does the administrator report that team meetings occur at least monthly? (0=no team meeting; 1=less often than monthly; 2= at least monthly)	Interview Other ____ I			
	7. Does the administrator report that the team reports progress to the staff at least four times per year? (0=no; 1= less than 4 times per year; 2= yes)	Interview Other ____ I			
	8. Does the team have an action plan with specific goals that is less than one year old? (0=no; 2=yes)	Annual Plan, calendar Other ____ P			
G. District-Level Support	1. Does the school budget contain an allocated amount of money for building and maintaining school-wide behavioral support? (0= no; 2= yes)	Interview Other ____ I			
	2. Can the administrator identify an out-of-school liaison in the district or state? (0= no; 2=yes)	Interview Other I			
Summary Scores:	A = /4	B = /10	C = /6	D = /8	E = /8
	F = /16	G = /4	Mean = /7		

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APPENDIX E

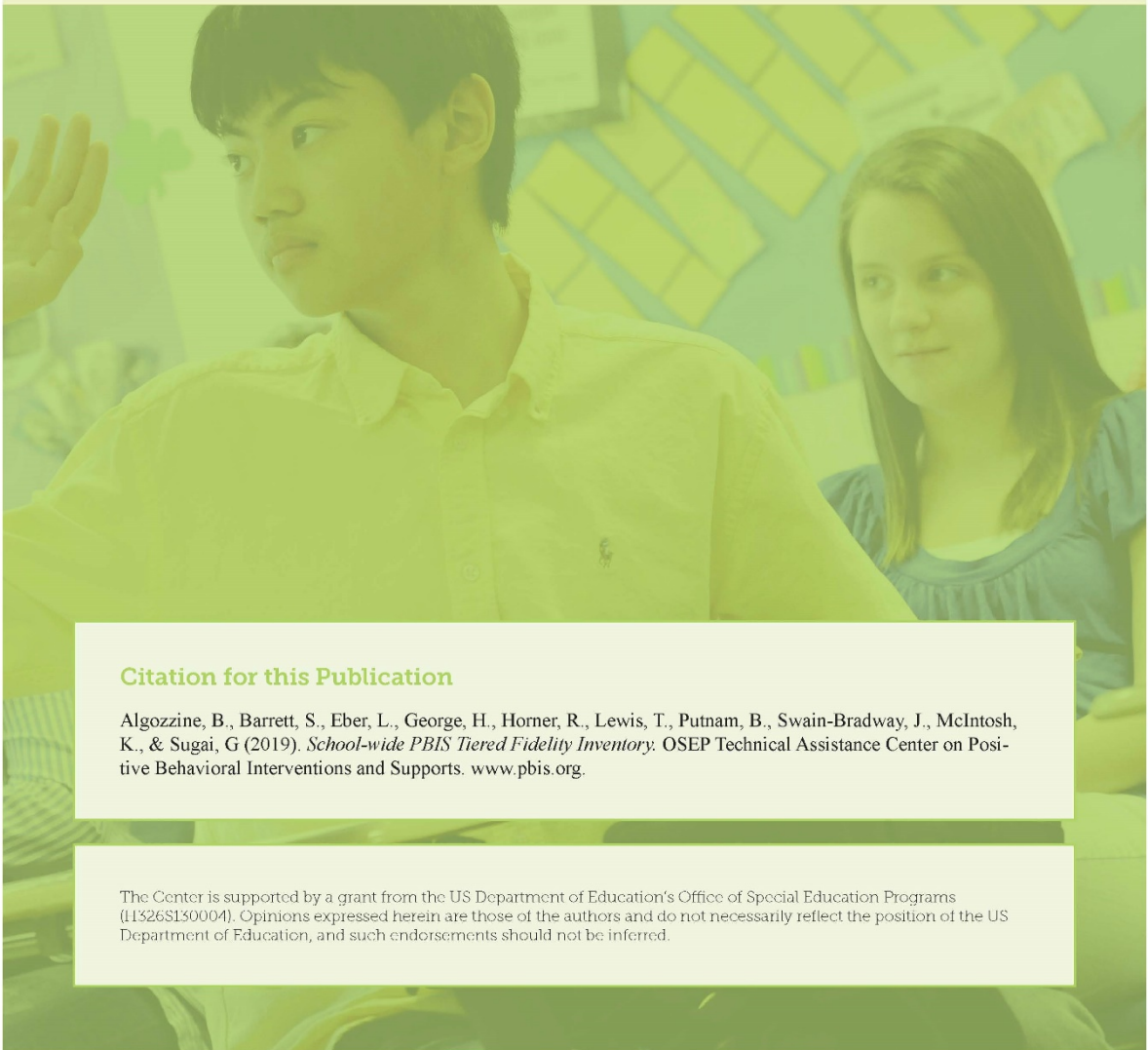
TFI: SWPBIS TIERED FIDELITY INVENTORY VERSION 2.1

(Algozzine, Barrett, Eber, George, Horner, Lewis, Putnam,
Swain-Bradway, McIntosh, & Sugai, 2019)



SWPBIS Tiered Fidelity Inventory

version 2.1



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Tier 1: Universal SWPBIS Features

NOTE: This section may be completed individually or with other tiers as part of the full Tiered Fidelity Inventory

Feature	Possible Data Sources	Scoring Criteria
Subscale: Teams		
<p>1.1 Team Composition: Tier 1 team includes a Tier 1 systems coordinator, a school administrator, a family member, and individuals able to provide (a) applied behavioral expertise, (b) coaching expertise, (c) knowledge of student academic and behavior patterns, (d) knowledge about the operations of the school across grade levels and programs, and for high schools, (e) student representation.</p>	<ul style="list-style-type: none"> School organizational chart Tier 1 team meeting minutes 	<p>0 = Tier 1 team does not exist or does not include coordinator, school administrator, or individuals with applied behavioral expertise</p> <p>1 = Tier 1 team exists, but does not include all identified roles or attendance of these members is below 80%</p> <p>2 = Tier 1 team exists with coordinator, administrator, and all identified roles represented, AND attendance of all roles is at or above 80%</p>
<p>1.2 Team Operating Procedures: Tier 1 team meets at least monthly and has (a) regular meeting format/agenda, (b) minutes, (c) defined meeting roles, and (d) a current action plan.</p>	<ul style="list-style-type: none"> Tier 1 team meeting agendas and minutes Tier 1 meeting roles descriptions Tier 1 action plan 	<p>0 = Tier 1 team does not use regular meeting format/agenda, minutes, defined roles, or a current action plan</p> <p>1= Tier 1 team has at least 2 but not all 4 features</p> <p>2 = Tier 1 team meets at least monthly and uses regular meeting format/agenda, minutes, defined roles, AND has a current action plan</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
Subscale: Implementation		
<p>1.3 Behavioral Expectations: School has five or fewer positively stated behavioral expectations and examples by setting/location for student and staff behaviors (i.e., school teaching matrix) defined and in place.</p>	<ul style="list-style-type: none"> • TFI Walkthrough Tool • Staff handbook • Student handbook 	<p>0 = Behavioral expectations have not been identified, are not all positive, or are more than 5 in number</p> <p>1 = Behavioral expectations identified but may not include a matrix or be posted</p> <p>2 = Five or fewer behavioral expectations exist that are positive, posted, and identified for specific settings (i.e., matrix) AND at least 90% of staff can list at least 67% of the expectations</p>
<p>1.4 Teaching Expectations: Expected academic and social behaviors are taught directly to all students in classrooms and across other campus settings/locations.</p>	<ul style="list-style-type: none"> • TFI Walkthrough Tool • Professional development calendar • Lesson plans • Informal walkthroughs 	<p>0 = Expected behaviors are not taught</p> <p>1 = Expected behaviors are taught informally or inconsistently</p> <p>2 = Formal system with written schedules is used to teach expected behaviors directly to students across classroom and campus settings AND at least 70% of students can list at least 67% of the expectations</p>
<p>1.5 Problem Behavior Definitions: School has clear definitions for behaviors that interfere with academic and social success and a clear policy/procedure (e.g., flowchart) for addressing office-managed versus staff-managed problems.</p>	<ul style="list-style-type: none"> • Staff handbook • Student handbook • School policy • Discipline flowchart 	<p>0 = No clear definitions exist, and procedures to manage problems are not clearly documented</p> <p>1 = Definitions and procedures exist but are not clear and/or not organized by staff- versus office-managed problems</p> <p>2 = Definitions and procedures for managing problems are clearly defined, documented, trained, and shared with families</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>1.6 Discipline Policies: School policies and procedures describe and emphasize proactive, instructive, and/or restorative approaches to student behavior that are implemented consistently.</p>	<ul style="list-style-type: none"> • Discipline policy • Student handbook • Code of conduct • Informal administrator interview 	<p>0 = Documents contain only reactive and punitive consequences</p> <p>1 = Documentation includes and emphasizes proactive approaches</p> <p>2 = Documentation includes and emphasizes proactive approaches AND administrator reports consistent use</p>
<p>1.7 Professional Development: A written process is used for orienting all faculty/staff on 4 core Tier 1 SWPBIS practices: (a) teaching school-wide expectations, (b) acknowledging appropriate behavior, (c) correcting errors, and (d) requesting assistance.</p>	<ul style="list-style-type: none"> • Professional development calendar • Staff handbook 	<p>0 = No process for teaching staff is in place</p> <p>1 = Process is informal/unwritten, not part of professional development calendar, and/or does not include all staff or all 4 core Tier 1 practices</p> <p>2 = Formal process for teaching all staff all aspects of Tier 1 system, including all 4 core Tier 1 practices</p>
<p>1.8 Classroom Procedures: Tier 1 features (school-wide expectations, routines, acknowledgements, in-class continuum of consequences) are implemented within classrooms and consistent with school-wide systems.</p>	<ul style="list-style-type: none"> • Staff handbook • Informal walkthroughs • Progress monitoring • Individual classroom data 	<p>0 = Classrooms are not implementing Tier 1</p> <p>1 = Classrooms are informally implementing Tier 1 but no formal system exists</p> <p>2 = Classrooms are formally implementing all core Tier 1 features, consistent with school-wide expectations</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>1.9 Feedback and Acknowledgement: A formal system (i.e., written set of procedures for specific behavior feedback that is [a] linked to school-wide expectations and [b] used across settings and within classrooms) is in place and used by at least 90% of a sample of staff and received by at least 50% of a sample of students.</p>	<ul style="list-style-type: none"> • TFI Walkthrough Tool • Staff handbook 	<p>0 = No formal system for acknowledging students</p> <p>1 = Formal system is in place and is used by at least 90% of staff OR received by at least 50% of students</p> <p>2 = Formal system for acknowledging student behavior is used by at least 90% of staff AND received by at least 50% of students</p>
<p>1.10 Faculty Involvement: Faculty are shown school-wide data regularly and provide input on universal foundations (e.g., expectations, acknowledgements, definitions, consequences) at least every 12 months.</p>	<ul style="list-style-type: none"> • PBIS Self-Assessment Survey • Informal surveys • Staff meeting minutes • Team meeting minutes 	<p>0 = Faculty are not shown data at least yearly and do not provide input</p> <p>1 = Faculty have been shown data more than yearly OR have provided feedback on Tier 1 foundations within the past 12 months but not both</p> <p>2 = Faculty are shown data at least 4 times per year AND have provided feedback on Tier 1 practices within the past 12 months</p>
<p>1.11 Student/Family/Community Involvement: Stakeholders (students, families, and community members) provide input on universal foundations (e.g., expectations, consequences, acknowledgements) at least every 12 months.</p>	<ul style="list-style-type: none"> • Surveys • Voting results from parent/family meeting • Team meeting minutes 	<p>0 = No documentation (or no opportunities) for stakeholder feedback on Tier 1 foundations</p> <p>1 = Documentation of input on Tier 1 foundations, but not within the past 12 months or input but not from all types of stakeholders</p> <p>2 = Documentation exists that students, families, and community members have provided feedback on Tier 1 practices within the past 12 months</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
Subscale: Evaluation		
<p>1.12 Discipline Data: Tier 1 team has instantaneous access to graphed reports summarizing discipline data organized by the frequency of problem behavior events by behavior, location, time of day, and by individual student.</p>	<ul style="list-style-type: none"> • School policy • Team meeting minutes • Student outcome data 	<p>0 = No centralized data system with ongoing decision making exists</p> <p>1 = Data system exists but does not allow instantaneous access to full set of graphed reports</p> <p>2 = Discipline data system exists that allows instantaneous access to graphs of frequency of problem behavior events by behavior, location, time of day, and student</p>
<p>1.13 Data-based Decision Making: Tier 1 team reviews and uses discipline data at least monthly for decision-making.</p>	<ul style="list-style-type: none"> • Data decision rules • Staff professional development calendar • Staff handbook • Team meeting minutes 	<p>0 = No process/protocol exists, or data are reviewed but not used</p> <p>1 = Data reviewed and used for decision-making, but less than monthly</p> <p>2 = Team reviews discipline data and uses data for decision-making at least monthly. If data indicate a problem, an action plan is developed to enhance or modify Tier 1 supports</p>
<p>1.14 Fidelity Data: Tier 1 team reviews and uses SWPBIS fidelity (e.g., SET, BoQ, TIC, SAS, Tiered Fidelity Inventory) data at least annually.</p>	<ul style="list-style-type: none"> • School policy • Staff handbook • School newsletters • School website 	<p>0 = No Tier 1 SWPBIS fidelity data collected</p> <p>1 = Tier 1 fidelity collected informally and/or less often than annually</p> <p>2 = Tier 1 fidelity data collected and used for decision making annually</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>1.15 Annual Evaluation: Tier 1 team documents fidelity and effectiveness of Tier 1 practices at least annually (including year-by-year comparisons) that are shared with stakeholders (staff, families, community, district) in a usable format.</p>	<ul style="list-style-type: none"> • Staff, student, and family surveys • Tier 1 handbook • Fidelity tools • School policy • Student outcomes • District reports • School newsletters 	<p>0 = No evaluation takes place, or evaluation occurs without data</p> <p>1 = Evaluation conducted, but not annually, or outcomes are not used to shape the Tier 1 process and/or not shared with stakeholders</p> <p>2 = Evaluation conducted at least annually, and outcomes shared with stakeholders, with clear alterations in process based on evaluation</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Tier 2: Targeted SWPBIS Features

NOTE: This section may be completed individually or with other tiers as part of the full Tiered Fidelity Inventory

Feature	Possible Data Sources	Scoring Criteria
Subscale: Teams		
<p>2.1 Team Composition: Tier 2 (or combined Tier 2 & 3) team includes a Tier 2 systems coordinator and individuals able to provide (a) applied behavioral expertise, (b) administrative authority, (c) knowledge of students, and (d) knowledge about operation of school across grade levels and programs.</p>	<ul style="list-style-type: none"> School organizational chart Tier 2 team meeting minutes 	<p>0 = Tier 2 team does not include coordinator or all 4 core areas of Tier 2 team expertise</p> <p>1 = Tier 2 team does not include coordinator and all 4 core areas of Tier 2 team expertise OR attendance of these members is below 80%</p> <p>2 = Tier 2 team is composed of coordinator and individuals with all 4 areas of expertise, AND attendance of these members is at or above 80%</p>
<p>2.2 Team Operating Procedures: Tier 2 team meets at least monthly and has (a) regular meeting format/agenda, (b) minutes, (c) defined meeting roles, and (d) a current action plan.</p>	<ul style="list-style-type: none"> Tier 2 team meeting agendas and minutes Tier 2 meeting roles descriptions Tier 2 action plan 	<p>0 = Tier 2 team does not use regular meeting format/agenda, minutes, defined roles, or a current action plan</p> <p>1 = Tier 2 team has at least 2 but not all 4 features</p> <p>2 = Tier 2 team meets at least monthly and uses regular meeting format/agenda, minutes, defined roles, AND has a current action plan</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>2.3 Screening: Tier 2 team uses decision rules and multiple sources of data (e.g., ODRs, academic progress, screening tools, attendance, teacher/family/student nominations) to identify students who require Tier 2 supports.</p>	<ul style="list-style-type: none"> • Multiple data sources used (e.g., ODRs, time out of instruction, attendance, academic performance) • Team decision rubric • Team meeting minutes • School policy 	<p>0 = No specific rules for identifying students who qualify for Tier 2 supports</p> <p>1 = Data decision rules established but not consistently followed or used with only one data source</p> <p>2 = Written policy exists that (a) uses multiple data sources for identifying students, and (b) ensures that families are notified promptly when students enter Tier 2 supports</p>
<p>2.4 Request for Assistance: Tier 2 planning team uses written request for assistance form and process that are timely and available to all staff, families, and students.</p>	<ul style="list-style-type: none"> • School handbook • Request for assistance form • Family handbook 	<p>0 = No formal process</p> <p>1 = Informal process in place for staff and families to request assistance</p> <p>2 = Written request for assistance form and process are in place and team responds to request within 3 days</p>
Subscale: Interventions		
<p>2.5 Options for Tier 2 Interventions: Tier 2 team has multiple ongoing behavior support interventions with documented evidence of effectiveness matched to student need.</p>	<ul style="list-style-type: none"> • School Tier 2 handbook • Targeted Interventions Reference Guide 	<p>0 = No Tier 2 interventions with documented evidence of effectiveness are in use</p> <p>1 = Only 1 Tier 2 intervention with documented evidence of effectiveness is in use</p> <p>2 = Multiple Tier 2 interventions with documented evidence of effectiveness matched to student need</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>2.6 Tier 2 Critical Features: Tier 2 behavior support interventions provide (a) additional instruction/time for student skill development, (b) additional structure/predictability, and/or (c) increased opportunity for feedback (e.g., daily progress report).</p>	<ul style="list-style-type: none"> • Universal lesson plans • Tier 2 lesson plans • Daily/weekly progress report • School schedule • School Tier 2 handbook 	<p>0 = Tier 2 interventions do not promote additional instruction/ time, improved structure, or increased feedback</p> <p>1 = All Tier 2 interventions provide some but not all 3 core Tier 2 features</p> <p>2 = All Tier 2 interventions include all 3 core Tier 2 features</p>
<p>2.7 Practices Matched to Student Need: A formal process is in place to select Tier 2 interventions that are (a) matched to student need (e.g., behavioral function), and (b) adapted to improve contextual fit (e.g., culture, developmental level).</p>	<ul style="list-style-type: none"> • Data sources used to identify interventions • School policy • Tier 2 handbook • Needs assessment • Targeted Interventions Reference Guide 	<p>0 = No process in place</p> <p>1 = Process for selecting Tier 2 interventions does not include documentation that interventions are matched to student need</p> <p>2 = Formal process in place to select practices that match student need and have contextual fit (e.g., developmentally and culturally appropriate)</p>
<p>2.8 Access to Tier 1 Supports: Tier 2 supports are explicitly linked to Tier 1 supports, and students receiving Tier 2 supports have access to, and are included in, Tier 1 supports.</p>	<ul style="list-style-type: none"> • Universal lesson plans and teaching schedule • Tier 2 lesson plans • Acknowledgement system • Student of the month documentation • Family communication 	<p>0 = No evidence that students receiving Tier 2 interventions have access to Tier 1 supports</p> <p>1 = Tier 2 supports are not explicitly linked to Tier 1 supports and/or students receiving Tier 2 interventions have some, but not full access to Tier 1 supports</p> <p>2 = Tier 2 supports are explicitly linked to Tier 1 supports, and students receiving Tier 2 interventions have full access to all Tier 1 supports</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>2.9 Professional Development: A written process is followed for teaching all relevant staff how to refer students and implement each Tier 2 intervention that is in place.</p>	<ul style="list-style-type: none"> Professional development calendar Staff handbook Lesson plans for teacher trainings School policy 	<p>0 = No process for teaching staff in place</p> <p>1 = Professional development and orientation process is informal</p> <p>2 = Written process used to teach and coach all relevant staff in all aspects of intervention delivery, including request for assistance process, using progress report as an instructional prompt, delivering feedback, and monitoring student progress</p>
Subscale: Evaluation		
<p>2.10 Level of Use: Team follows written process to track proportion of students participating in Tier 2 supports, and access is proportionate.</p>	<ul style="list-style-type: none"> Tier 2 enrollment data Tier 2 team meeting minutes Progress monitoring tool 	<p>0 = Team does not track number of students responding to Tier 2 interventions</p> <p>1 = Team defines criteria for responding to each Tier 2 intervention and tracks students, but fewer than 5% of students are enrolled</p> <p>2 = Team defines criteria and tracks proportion, with at least 5% of students receiving Tier 2 supports</p>
<p>2.11 Student Performance Data: Tier 2 team tracks proportion of students experiencing success (% of participating students being successful) and uses Tier 2 intervention outcomes data and decision rules for progress monitoring and modification.</p>	<ul style="list-style-type: none"> Student progress data (e.g., % of students meeting goals) Intervention Tracking Tool Daily/Weekly Progress Report sheets Family communication 	<p>0 = Student data not monitored</p> <p>1 = Student data monitored but no data decision rules established to alter (e.g., intensify or fade) support</p> <p>2 = Student data (% of students being successful) monitored and used at least monthly, with data decision rules established to alter (e.g., intensify or fade) support, and shared with stakeholders</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>2.12 Fidelity Data: Tier 2 team has a protocol for ongoing review of fidelity for each Tier 2 practice.</p>	<ul style="list-style-type: none"> • Tier 2 coordinator training • District technical assistance • Fidelity probes taken monthly by a Tier 2 team member 	<p>0 = Fidelity data are not collected for any practice</p> <p>1 = Fidelity data (e.g., direct, self-report) collected for some but not all Tier 2 interventions</p> <p>2 = Periodic, direct assessments of fidelity collected by Tier 2 team for all Tier 2 interventions</p>
<p>2.13 Annual Evaluation: At least annually, Tier 2 team assesses overall effectiveness and efficiency of strategies, including data-decision rules to identify students, range of interventions available, fidelity of implementation, and on-going support to implementers; and evaluations are shared with staff and district leadership.</p>	<ul style="list-style-type: none"> • Staff and student surveys • Tier 2 handbook • Fidelity tools • School policy • Student outcomes • District reports 	<p>0 = No data-based evaluation takes place</p> <p>1 = Evaluation conducted, but outcomes not used to shape the Tier 2 process</p> <p>2 = Evaluation conducted at least annually, and outcomes shared with staff and district leadership, plus clear alterations in process proposed based on evaluation</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Tier 3: Intensive SWPBIS Features

NOTE: This section may be completed individually or with other tiers as part of the full Tiered Fidelity Inventory

Feature	Possible Data Sources	Scoring Criteria
Subscale: Teams		
<p>3.1 Team Composition: Tier 3 systems planning team (or combined Tier 2 & 3 team) includes a Tier 3 systems coordinator and individuals who can provide (a) applied behavioral expertise, (b) administrative authority, (c) multi-agency supports (e.g., person centered planning, wraparound, RENEW) expertise, (d) knowledge of students, and (e) knowledge about the operations of the school across grade levels and programs.</p>	<ul style="list-style-type: none"> School organizational chart Tier 3 team meeting minutes 	<p>0 = Tier 3 team does not include a trained systems coordinator or all 5 identified functions</p> <p>1 = Tier 3 team members have some but not all 5 functions, and/or some but not all members have relevant training or attend at least 80% of meetings</p> <p>2 = Tier 3 team has a coordinator and all 5 functions, AND attendance of these members is at or above 80%</p>
<p>3.2 Team Operating Procedures: Tier 3 team meets at least monthly and has (a) regular meeting format/agenda, (b) minutes, (c) defined meeting roles, and (d) a current action plan.</p>	<ul style="list-style-type: none"> Tier 3 team meeting agendas and minutes Tier 3 meeting roles descriptions Tier 3 action plan 	<p>0 = Tier 3 team does not use regular meeting format/agenda, minutes, defined roles, or a current action plan</p> <p>1 = Tier 3 team has at least 2 but not all 4 features</p> <p>2 = Tier 3 team meets at least monthly and uses regular meeting format/agenda, minutes, defined roles, AND has a current action plan</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>3.3 Screening: Tier 3 team uses decision rules and data (e.g., ODRs, Tier 2 performance, academic progress, absences, teacher/family/student nominations) to identify students who require Tier 3 supports.</p>	<ul style="list-style-type: none"> School policy Team decision rubric Team meeting minutes 	<p>0 = No decision rules for identifying students who should receive Tier 3 supports</p> <p>1 = Informal process or one data source for identifying students who qualify for Tier 3 supports</p> <p>2 = Written data decision rules used with multiple data sources for identifying students who qualify for Tier 3 supports, and evidence the policy/rubric includes option for teacher/family/student nominations</p>
<p>3.4 Student Support Team: For each individual student support plan, a uniquely constructed team exists (with input/approval from student/family about who is on the team) to design, implement, monitor, and adapt the student-specific support plan.</p>	<ul style="list-style-type: none"> Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = Individual student support teams do not exist for all students who need them</p> <p>1 = Individual student support teams exist, but are not uniquely designed with input from student/family and/or team membership has partial connection to strengths and needs</p> <p>2 = Individual student support teams exist, are uniquely designed with active input/approval from student/family (with a clear link of team membership to student strengths and needs), and meet regularly to review progress data</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
Subscale: Resources		
<p>3.5 Staffing: An administrative plan is used to ensure adequate staff is assigned to facilitate individualized plans for the students enrolled in Tier 3 supports.</p>	<ul style="list-style-type: none"> • Administrative plan • Tier 3 team meeting minutes • FTE (i.e., paid time) allocated to Tier 3 supports 	<p>0 = Personnel are not assigned to facilitate individual student support teams</p> <p>1 = Personnel are assigned to facilitate some individual support teams, but not at least 1% of enrollment</p> <p>2 = Personnel are assigned to facilitate individualized plans for all students enrolled in Tier 3 supports</p>
<p>3.6 Student/Family/Community Involvement: Tier 3 team has district contact person(s) with access to external support agencies and resources for planning and implementing non-school-based interventions (e.g., intensive mental health) as needed.</p>	<ul style="list-style-type: none"> • Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = District contact person not established</p> <p>1 = District contact person established with external agencies, OR resources are available and documented in support plans</p> <p>2 = District contact person established with external agencies, AND resources are available and documented in support plans</p>
<p>3.7 Professional Development: A written process is followed for teaching all relevant staff about basic behavioral theory, function of behavior, and function-based intervention.</p>	<ul style="list-style-type: none"> • Professional development calendar • Staff handbook • Lesson plans for teacher trainings • School policy 	<p>0 = No process for teaching staff in place</p> <p>1 = Professional development and orientation process is informal</p> <p>2 = Written process used to teach and coach all relevant staff in basic behavioral theory, function of behavior, and function-based intervention</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
Subscale: Support Plans		
<p>3.8 Quality of Life Indicators: Assessment includes student strengths and identification of student/family preferences for individualized support options to meet their stated needs across life domains (e.g., academics, health, career, social).</p>	<ul style="list-style-type: none"> Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = Quality of life needs/goals and strengths not defined, or there are no Tier 3 support plans</p> <p>1 = Strengths and larger quality of life needs and related goals defined, but not by student/family or not reflected in the plan</p> <p>2 = All plans document strengths and quality of life needs and related goals defined by student/family</p>
<p>3.9 Academic, Social, and Physical Indicators: Assessment data are available for academic (e.g., reading, math, writing), behavioral (e.g., attendance, functional behavioral assessment, suspension/expulsion), medical, and mental health strengths and needs, across life domains where relevant.</p>	<ul style="list-style-type: none"> Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = Student assessment is subjective or done without formal data sources, or there are no Tier 3 support plans</p> <p>1 = Plans include some but not all relevant life-domain information (e.g., medical, mental health, behavioral, academic)</p> <p>2 = All plans include medical, mental health information, and complete academic data where appropriate</p>
<p>3.10 Hypothesis Statement: Behavior support plans include a hypothesis statement, including (a) operational description of problem behavior, (b) identification of context where problem behavior is most likely, and (c) maintaining reinforcers (e.g., behavioral function) in this context.</p>	<ul style="list-style-type: none"> Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = No plans include a hypothesis statement with all 3 components, or there are no Tier 3 support plans</p> <p>1 = 1 or 2 plans include a hypothesis statement with all 3 components</p> <p>2 = All plans include a hypothesis statement with all 3 components</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>3.11 Comprehensive Support: Behavior support plans include or consider (a) prevention strategies, (b) teaching strategies, (c) strategies for removing rewards for problem behavior, (d) specific rewards for desired behavior, (e) safety elements where needed, (f) a systematic process for assessing fidelity and impact, and (g) the action plan for putting the support plan in place.</p>	<ul style="list-style-type: none"> Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = No plans include all 7 core support plan features, or there are no Tier 3 support plans</p> <p>1 = 1 or 2 plans include all 7 core support plan features</p> <p>2 = All plans include all 7 core support plan features</p>
<p>3.12 Formal and Natural Supports: Behavior support plan(s) requiring extensive and coordinated support (e.g., person centered planning, wraparound, RENEW) documents quality of life strengths and needs to be completed by formal (e.g., school/district personnel) and natural (e.g., family, friends) supporters.</p>	<ul style="list-style-type: none"> At least one Tier 3 behavior support plan requiring extensive support (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = Plan does not include specific actions, or there are no plans with extensive support</p> <p>1 = Plan includes specific actions, but they are not related to the quality of life needs and/or do not include natural supports</p> <p>2 = Plan includes specific actions, linked logically to the quality of life needs, and they include natural supports</p>
<p>3.13 Access to Tier 1 and Tier 2 Supports: Students receiving Tier 3 supports have access to, and are included in, available Tier 1 and Tier 2 supports.</p>	<ul style="list-style-type: none"> Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = Individual student support plans do not mention Tier 1 and/or Tier 2 supports, or there are no Tier 3 support plans</p> <p>1 = Individual supports include some access to Tier 1 and/or Tier 2 supports</p> <p>2 = Tier 3 supports include full access to any appropriate Tier 1 and Tier 2 supports and document how access will occur</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
Subscale: Evaluation		
<p>3.14 Data System: Aggregated (i.e., overall school-level) Tier 3 data are summarized and reported to staff at least monthly on (a) fidelity of support plan implementation, and (b) impact on student outcomes.</p>	<ul style="list-style-type: none"> • Reports to staff • Staff meeting minutes • Staff report 	<p>0 = No quantifiable data</p> <p>1 = Data are collected on outcomes and/or fidelity but not reported monthly</p> <p>2 = Data are collected on student outcomes AND fidelity and are reported to staff at least monthly for all plans</p>
<p>3.15 Data-based Decision Making: Each student's individual support team meets at least monthly (or more frequently if needed) and uses data to modify the support plan to improve fidelity of plan implementation and impact on quality of life, academic, and behavior outcomes.</p>	<ul style="list-style-type: none"> • Three randomly selected Tier 3 student behavior support plans created in the last 12 months (see TFI Tier 3 Support Plan Worksheet) 	<p>0 = Student individual support teams do not review plans or use data</p> <p>1 = Each student's individual support team reviews plan, but fidelity and outcome data are not both used for decision making or not all teams review plans</p> <p>2 = Each student's individual support team continuously monitors data and reviews plan at least monthly, using both fidelity and outcomes data for decision making</p>
<p>3.16 Level of Use: Team follows written process to track proportion of students participating in Tier 3 supports, and access is proportionate.</p>	<ul style="list-style-type: none"> • Student progress data • Tier 3 team meeting minutes 	<p>0 = School does not track proportion or no students have Tier 3 plans</p> <p>1 = Fewer than 1% of students have Tier 3 plans</p> <p>2 = All students requiring Tier 3 supports (and at least 1% of students) have plans</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

Feature	Possible Data Sources	Scoring Criteria
<p>3.17 Annual Evaluation: At least annually, the Tier 3 systems team assesses the extent to which Tier 3 supports are meeting the needs of students, families, and school personnel; and evaluations are used to guide action planning.</p>	<ul style="list-style-type: none"> • Tier 3 team meeting minutes • Tier 3 team action plan • Team member verbal reports 	<p>0 = No annual review</p> <p>1 = Review is conducted but less than annually, or done without impact on action planning</p> <p>2 = Written documentation of an annual review of Tier 3 supports, with specific decisions related to action planning</p>

Scoring Criteria: 0=Not implemented; 1=Partially implemented; 2=Fully implemented

APPENDIX F

BOQ: BENCHMARKS OF QUALITY FULL INSTRUMENT

(Algozzine, Barrett, Eber, George, Horner, Lewis, Putnam,
Swain-Bradway, McIntosh, & Sugai, 2019)



Tier 1 Benchmarks of Quality (BoQ)



Kincaid, D., Childs, K., & George, H. (2010). Tier 1 Benchmarks of Quality (Revised).
<https://www.livebinders.com/play/play?id=2127037>

The Revised Tier 1 Benchmarks of Quality (BoQ) – Full Instrument



Feature	Possible Data Sources	Scoring Criteria	Score
Critical Element: PBIS Team			
1. Team has administrative support.	Meeting agendas, minutes, and materials Tier 1 action plans School improvement plan	0 = Administrator(s) do not actively support the PBIS process. 1 = Administrator(s) support the process but don't take as active a role as the rest of the team, and/or attends only a few meetings. 2 = Administrator(s) support the process, take as active a role as the rest of the team, and/or attend most meetings. 3 = Administrator(s) attended training, play an active role in the PBIS process, actively communicate their commitment, support the decisions of the PBS Team, and attend all team meetings.	
2. Team has regular meetings (at least monthly).	Meeting agendas, minutes, and materials Tier 1 action plans	0 = Team seldom meets (fewer than five monthly meetings during the school year). 1 = Team meetings are not consistent (5-8 monthly meetings each school year). 2 = Team meets monthly (minimum of 9 one-hour meetings each school year).	
3. Team has established a clear mission/purpose.	Purpose and Mission Statement on website, meeting agendas, handouts, staff handbook Tier 1 action plan	0 = No mission statement/purpose written for the team. 1 = Team has a written purpose/mission statement for the PBIS team (commonly completed on the cover sheet of the action plan).	
Critical Element: Faculty Commitment			
4. Faculty are aware of behavior problems across campus through regular data sharing.	Meeting agendas, minutes, and materials Tier 1 Walkthrough Staff surveys and interviews Communication with staff (e.g. email, newsletters, bulletin boards)	0 = Data are not regularly shared with faculty. Faculty may be given an update 0-2 times per year. 1 = Data regarding school-wide behavior are occasionally shared with faculty (3-7 times per year). 2 = Data regarding school-wide behavior are shared with faculty monthly (min. of 8 times per year).	
5. Faculty involved in establishing and reviewing goals.	Meeting agendas, minutes, and materials Communication with staff (e.g. email, newsletters, bulletin boards) Staff surveys or interviews Tier 1 action plans	0 = Faculty does not participate in establishing PBIS goals. 1 = Some of the faculty participates in establishing PBIS goals (i.e. surveys, "dream", "PATH") on at least an annual basis. 2 = Most faculty participate in establishing PBIS goals (i.e. surveys, "dream", "PATH") on at least an annual basis.	

Feature	Possible Data Sources	Scoring Criteria	Score
6. Faculty feedback is obtained throughout the year.	Surveys, voting, emails or suggestion boxes Meeting agendas, minutes, and materials Tier 1 action plans	0 = Faculty are rarely given the opportunity to participate in the PBIS process (fewer than 2 times per school year). 1 = Faculty are given some opportunities to provide feedback, to offer suggestions, and to make some choices during the PBIS process. However, the team also makes decisions without input from staff. 2 = Faculty are given opportunities to provide feedback, to offer suggestions, and to make choices in every step of the PBIS process (via staff surveys, voting process, suggestion box, etc.) Nothing is implemented without the majority of faculty approval .	
Critical Element: Effective Procedures for Dealing with Discipline			
7. Discipline process described in narrative format or depicted in graphic format.	Staff handbook Student handbook or code of conduct School discipline policies Discipline flow charts Substitute packets	0 = Team has not established clear, written procedures for discipline incidents and/or there is no differentiation between major and minor incidents. 1 = Team has established clear, written procedures that lay out the process for handling both major and minor discipline incidents (does not include crisis situations). 2 = Team has established clear, written procedures that lay out the process for handling both major and minor discipline incidents (includes crisis situations).	
8. Discipline process includes documentation procedures.	Staff handbook Student handbook or code of conduct Minor and major referral forms Tracking system /database	0 = There is not a documentation procedure to track both major and minor behavior incidents (i.e., form, database entry, file in room, etc.). 1 = There is a documentation procedure to track both major and minor behavior incidents (i.e., form, database entry, file in room, etc.).	
9. Discipline referral form includes information useful in decision making.	Staff handbook Student handbook or code of conduct Minor and major referral forms	0 = The referral form lacks one or more of the required fields or does not exist. 1 = The referral form includes all of the required fields, but also includes unnecessary information that is not used to make decisions and may cause confusion. 2 = Information on the referral form includes ALL of the required fields: Student's name, date, time of incident, grade level, referring staff, location of incident, gender, problem behavior, possible motivation, others involved, and administrative decision.	
10. Problem behaviors are defined.	Staff handbook Student handbook or code of conduct Training materials include examples	0 = No written documentation of definitions exists. 1 = Not all behaviors are defined or some definitions are unclear. 2 = All of the behaviors are defined but some of the definitions are unclear. 3 = Written documentation exists that includes clear definitions of all behaviors listed.	

Feature	Possible Data Sources	Scoring Criteria	Score
11. Major/minor behaviors are clearly differentiated.	Staff handbook Student handbook or code of conduct Training materials include examples Staff survey Administrator interview	0 = Specific major/minor behaviors are not clearly defined, differentiated or documented. 1 = Some staff are unclear about which behaviors are staff managed and which are sent to the office (i.e., appropriate use of office referrals) or no documentation exists. 2 = Most staff are clear about which behaviors are staff managed and which are sent to the office (i.e., appropriate use of office referrals). Those behaviors are clearly defined, differentiated and documented.	
12. Suggested array of appropriate responses to major (office-managed) problem behaviors.	Staff handbook Student handbook or code of conduct Major referral form Discipline data	0 = There is evidence that some administrative staff are not aware of, or do not follow, an array of predetermined appropriate responses to major behavior problems. 1 = There is evidence that all administrative staff are aware of and use an array of predetermined appropriate responses to major behavior problems.	
Critical Element: Data Entry & Analysis Plan Established			
13. Data system is used to collect and analyze ODR data.	Discipline data Data presentations & displays (e.g., data summaries, emails to staff, presentations, handouts) Tracking system /database Meeting agendas, minutes, and materials	0 = The data system is not able to provide any of the necessary information the team needs to make school-wide decisions. 1 = Only partial information can be obtained (lacking either the number of referrals per day per month, location, problem behavior, time of day, student, and compare patterns between years). 2 = ALL of the information can be obtained from the database (average referrals per day per month, by location, by problem behavior, by time of day, by student, and compare between years), though it may not be in graph format, may require more staff time to pull the information, or require staff time to make sense of the data. 3 = The database can quickly output data in graph format and allows the team access to ALL of the following information: average referrals per day per month, by location, by problem behavior, by time of day, by student, and compare between years.	
14. Additional data are collected (attendance, grades, faculty attendance, surveys) and used by SWPBIS team.	Meeting agendas, minutes, and materials Tier 1 action plans Data presentations & displays (e.g., data summaries, emails to staff, presentations, handouts)	0 = The team does not collect or consider data other than discipline data to help determine progress and successes (e.g., attendance, grades, faculty attendance, school surveys, etc.). 1 = The team collects and considers data other than discipline data to help determine progress and successes (e.g., attendance, grades, faculty attendance, school surveys, etc.).	
15. Data analyzed by team at least monthly.	Meeting agendas, minutes, and materials Data presentations & displays (e.g., data summaries, emails to staff, presentations, handouts) Tier 1 action plan	0 = Data are not analyzed . 1 = Data are printed, analyzed, and put into graph format or other easy to understand format by a team member less than once a month . 2 = Data are printed, analyzed, and put into graph format or other easy to understand format by a member of the team monthly (minimum).	

Feature	Possible Data Sources	Scoring Criteria	Score
16. Data shared with team and faculty monthly (minimum).	Meeting agendas, minutes, and materials Action plans Communication with staff (e.g. email, newsletters, bulletin boards)	0 = Data are not reviewed each month by the PBIS team and shared with faculty. 1 = Data are shared with the PBIS team and faculty less than one time a month . 2 = Data are shared with the PBIS team and faculty at least once a month .	
Critical Element: Expectations & Rules Developed			
17. 3-5 positively stated school-wide expectations are posted around school.	Tier 1 Walkthrough Posters of expectations across campus	0 = Expectations are not posted or team has either too few or too many expectations. 1 = 3-5 positively stated expectations are not clearly visible in common areas. 2 = 3-5 positively stated expectations are visibly posted in most important areas (i.e. classroom, cafeteria, hallway), but one area may be missed. 3 = 3-5 positively stated school-wide expectations are visibly posted around the school. Areas posted include the classroom and a minimum of 3 other school settings (i.e., cafeteria, hallway, front office, etc.).	
18. Expectations apply to both students and staff.	Tier 1 Walkthrough or staff/student interviews Posters of expectations across campus Staff and student handbooks – schoolwide matrix Professional development materials	0 = There are no expectations. 1 = Expectations refer only to student behavior. 2 = PBIS team has expectations that apply to all students AND all staff but haven't specifically communicated that they apply to staff as well as students. 3 = PBIS team has communicated that expectations apply to all students and all staff.	
19. Rules are developed and posted for specific settings (settings where data suggest rules are needed).	Tier 1 Walkthrough Posters of expectations in problematic areas across campus Discipline data Professional development materials	0 = Rules are not posted in any of the most problematic areas of the school. 1 = Rules are posted in some, but not all of the most problematic areas of the school. 2 = Rules are posted in all of the most problematic areas in the school.	
20. Rules are linked to expectations.	Lesson plans Tier 1 Walkthrough or staff/student interviews Classroom Assessment Tool (CAT) Staff handbook	0 = When taught or enforced, staff do not consistently link the rules with the school-wide expectations and/or rules are taught or enforced separately from expectations. 1 = When taught or enforced, staff consistently link the rules with the school-wide expectations.	

Feature	Possible Data Sources	Scoring Criteria	Score
21. Staff are involved in development of expectations and rules.	Staff survey or interviews Meeting agendas, minutes, and materials Action plans	0 = Staff were not involved in providing feedback/input into the development of the school-wide expectations and rules. 1 = Some staff were involved in providing feedback/input into the development of the school-wide expectations and rules. 2 = Most staff were involved in providing feedback/input into the development of the school-wide expectations and rules (i.e., survey, feedback, initial brainstorming session, election process, etc.).	
Critical Element: Reward/Recognition Program Established			
22. A system of rewards has elements that are implemented consistently across campus.	Reports from reward system (PBIS Apps, Class Dojo) Staff handbook Professional development materials Tracking (e.g. tokens, tickets, points, positive referrals, attendance at incentive events)	0 = There is no identifiable reward system or a large percentage of staff are not participating (less than 50% participation). 1 = The reward system guidelines and procedures are not implemented consistently because several staff choose not to participate or participation does not follow the established criteria (at least 50% participation). 2 = The reward system guidelines and procedures are implemented consistently across campus. However, some staff choose not to participate or participation does not follow the established criteria (at least 75% participation). 3 = The reward system guidelines and procedures are implemented consistently across campus. Almost all members of the school are participating appropriately (at least 90% participation).	
23. A variety of methods are used to reward students.	Tier 1 Walkthrough Staff handbook Student handbook School calendars Tracking (e.g. tokens, tickets, points, positive referrals, attendance at incentive events) Reports from reward system (PBIS Apps, Class Dojo)	0 = The school uses only one set of methods to reward students (i.e., tangibles only) or there are no opportunities for children to cash in tokens or select their reward. Only students that meet the quotas actually get rewarded, students with fewer tokens cannot cash in tokens for a smaller reward. 1 = The school uses a variety of methods to reward students, but students do not have access to a variety of rewards in a consistent and timely manner. 2 = The school uses a variety of methods to reward students (e.g. cashing in tokens/points). There should be opportunities that include tangible items, praise/recognition and social activities/events. Students with few/many tokens/points have equal opportunities to cash them in for rewards. However, larger rewards are given to those earning more tokens/points.	
24. Rewards are linked to expectations and rules.	Tier 1 Walkthrough Staff handbook Student handbook Professional development materials Samples of rewards	0 = Rewards are provided for behaviors that are not identified in the rules and expectations. 1 = Rewards are provided for behaviors that are identified in the rules/expectations but staff rarely verbalize appropriate behaviors when giving rewards. 2 = Rewards are provided for behaviors that are identified in the rules/expectations and staff sometimes verbalize appropriate behaviors when giving rewards. 3 = Rewards are provided for behaviors that are identified in the rules/expectations and staff verbalize the appropriate behavior when giving rewards.	

Feature	Possible Data Sources	Scoring Criteria	Score
25. Rewards are varied to maintain student interest.	Student surveys or interviews Tier 1 Walkthrough School calendar Tier 1 action plans Meeting agendas, minutes, and materials	0 = The rewards are not varied throughout the school year and do not reflect student's interests. 1 = The rewards are varied throughout the school year, but may not reflect students' interests. 2 = The rewards are varied throughout year and reflect students' interests (e.g., consider the student age, culture, gender, and ability level to maintain student interest).	
26. Ratios of acknowledgement to corrections are high.	Classroom observations Tier 1 Walkthrough	0 = Ratios of teacher reinforcement of appropriate behavior to correction of inappropriate behavior are low (e.g., 1:4). 1 = Ratios of teacher reinforcement of appropriate behavior to correction of inappropriate behavior are about the same (e.g., 1:1). 2 = Ratios of teacher reinforcement of appropriate behavior to correction of inappropriate behavior are moderate (e.g., 2:1). 3 = Ratios of teacher reinforcement of appropriate behavior to correction of inappropriate behavior are high (e.g., 4:1).	
27. Students are involved in identifying/developing incentives.	Student surveys or interviews Examples of student incentives Meeting agendas, minutes, and materials Action plans	0 = Students are rarely involved in identifying/developing incentives. 1 = Students are often involved in identifying/developing incentives.	
28. The system includes incentives for staff/faculty.	Staff surveys or interviews Examples of staff incentives Meeting agendas, minutes, and materials Action plans	0 = The system does not include incentives for staff/faculty. 1 = The system includes incentives for staff/faculty, but they are not delivered consistently. 2 = The system includes incentives for staff/faculty and they are delivered consistently.	
Critical Element: Lesson Plans for Teaching Expectations/Rules			
29. A behavioral curriculum includes teaching expectations and rules.	Staff handbook Master schedule Tier 1 action plans Meeting agendas, minutes, and materials	0 = Lesson plans have not been developed or used to teach rules or expectations. 1 = Lesson plans were developed and used to teach rules, but not developed for expectations or vice versa. 2 = Lesson plans are developed and used to teach rules and expectations.	
30. Lessons include examples and non-examples.	Lesson plans	0 = Lesson plans give no specific examples or non-examples or there are no lesson plans. 1 = Lesson plans include both examples of appropriate behavior and examples of inappropriate behavior.	

Feature	Possible Data Sources	Scoring Criteria	Score
31. Lessons use a variety of teaching strategies.	Lesson plans	0 = Lesson plans have not been taught or do not exist. 1 = Lesson plans have been introduced using fewer than 3 teaching strategies. 2 = Lesson plans are taught using at least 3 different teaching strategies (i.e., modeling, role-playing, videotaping).	
32. Lessons are embedded into subject area curriculum.	Lesson plans	0 = Less than 50% of all teachers embed behavior teaching into subject area curriculum or only occasionally remember to include behavior teaching in subject areas. 1 = About 50% of teachers embed behavior teaching into subject area curriculum or embed behavior teaching fewer than 3 times per week. 2 = Nearly all teachers embed behavior teaching into subject area curriculum on a daily basis.	
33. Faculty/staff and students are involved in development & delivery of behavioral curriculum.	Student surveys or interviews Staff surveys or interviews Meeting agendas, minutes, and materials Lesson plans Tier 1 action plans	0 = Faculty, staff, and students are not involved in the development and delivery of lesson plans to teach behavior expectations and rules for specific settings. 1 = Faculty, staff, and students are involved in the development and delivery of lesson plans to teach behavior expectations and rules for specific settings.	
34. Strategies to share key features of SWPBIS program with families/community are developed and implemented.	Home-school communications Family event calendars Tier 1 action plans	0 = The PBIS plan does not include strategies to be used by families and the community. 1 = The PBIS Plan includes strategies to reinforce lessons with families and the community (i.e., after-school programs teach expectations, newsletters with tips for meeting expectations at home).	
Critical Element: Implementation Plan			
35. A curriculum to teach the components of the discipline system to all staff is developed and used.	Meeting agendas, minutes, and professional development materials Staff handbook School calendar Tier 1 action plans Staff surveys or interviews	0 = Staff was either not trained or was given the information without formal introduction and explanation. 1 = The team scheduled time to present and train faculty and staff on the discipline procedures and data system, but there were no checks for accuracy of information or comprehension. OR training did not include all components (i.e., referral process (flowchart), definitions of problem behaviors, explanation of major vs. minor forms, and how the data will be used to guide the team in decision making). 2 = The team scheduled time to present and train faculty and staff on the discipline procedures and data system including checks for accuracy of information or comprehension. Training included all components (i.e., referral process (flowchart), definitions of problem behaviors, explanation of major vs. minor forms, and how the data will be used to guide the team in decision making).	

Feature	Possible Data Sources	Scoring Criteria	Score
36. Plans for training staff how to teach expectations/rules/rewards are developed, scheduled and delivered.	Meeting agendas, minutes, and professional development materials Staff handbook School calendar Tier 1 action plans Staff interviews	0 = Staff was either not trained or was given the information without formal introduction and explanation. 1 = The team scheduled time to present and train faculty and staff on lesson plans to teach students expectations and rules but there were no checks for accuracy of information or comprehension. OR Training didn't include all components: plans to introduce expectations and rules to all students, explanation of how and when to use formal lesson plans, and how to embed behavior teaching into daily curriculum. 2 = The team scheduled time to present and train faculty and staff on lesson plans to teach students expectations and rules including checks for accuracy of information or comprehension. Training included all components: plans to introduce the expectations and rules to all students, explanation of how and when to use formal lesson plans, and how to embed behavior teaching into daily curriculum.	
37. A plan for teaching students expectations/rules/rewards is developed, scheduled, and delivered.	Meeting agendas, minutes, and professional development materials Student handbook Lesson plans Tier 1 action plans School calendar Master schedule	0 = Students are not introduced/taught any of the following: school expectations, rules for specific setting, and the reward system guidelines. 1 = Students are introduced/taught only one (1) of the following: school expectations, rules for specific setting, and the reward system guidelines. 2 = Students are introduced/taught two (2) of the following: school expectations, rules for specific setting, and the reward system guidelines. 3 = Students are introduced/taught all of the following: school expectations, rules for specific setting, and the reward system guidelines.	
38. Booster sessions for students and staff are planned, scheduled, and delivered.	Tier 1 action plans Meeting agendas, minutes, and professional development materials Professional development calendar Lesson plans School calendar Master schedule	0 = Booster sessions for students and staff are not scheduled/planned. Expectations and rules are reviewed with students once a month or less . 1 = Booster sessions are not utilized fully . For example: booster sessions are held for students but not staff; booster sessions are held for staff, but not students; booster sessions are not held, but rules & expectations are reviewed at least weekly with students. 2 = Booster sessions are planned and delivered to reteach staff/students at least once in the year and additionally at times when the data suggest problems by an increase in discipline referrals per day per month or a high number of referrals in a specified area. Expectations and rules are reviewed with students regularly (at least 1x per week).	
39. Schedule for rewards/incentives for the year is planned.	Tier 1 action plans Staff handbook Meeting agendas, minutes, and materials School calendar Master schedule	0 = There is no plan for the type and frequency of rewards/incentives to be delivered throughout the year. 1 = There is a clear plan for the type and frequency of rewards/incentives to be delivered throughout the year.	

Feature	Possible Data Sources	Scoring Criteria	Score
40. Plans for orienting incoming staff and students are developed and implemented.	Tier 1 action plans Staff handbook Student handbook Meeting agendas, minutes, and professional development materials Lesson plans	0 = Team has not planned for the introduction of School-wide PBIS and training of new staff or students. 1 = Team has planned for the introduction of School-wide PBIS and training of either new students or new staff, but does not include plans for training both. OR the team has plans but has not implemented them. 2 = Team has planned for and carries out the introduction of School-wide PBIS and training of new staff and students throughout the school year.	
41. Plans for involving families/ community are developed & implemented.	Tier 1 action plans Staff handbook Meeting agendas, minutes, and professional development materials Home-school communications School calendar	0 = Team has not introduced school-wide PBIS to families/community. 1 = Team has planned for the introduction and on-going involvement of school-wide PBIS to families/ community (i.e., newsletter, brochure, PTA, open-house, team member, etc.).	
Critical Element: Classroom Systems			
42. Classroom rules are defined for each of the school-wide expectations and are posted in classrooms.	Tier 1 Walkthrough Classroom observations Classroom PBIS plans Student handbook Classroom Assessment Tool (CAT)	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	
43. Classroom routines and procedures are explicitly identified for activities where problems often occur (e.g. entering class, asking questions, sharpening pencil, using restroom, dismissal).	Tier 1 Walkthrough Classroom observations or teacher interview Classroom PBIS plans Student handbook Welcome family letters Classroom Assessment Tool (CAT)	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	
44. Expected behavior routines in classroom are taught.	Tier 1 Walkthrough Classroom observations Teacher surveys or interviews Classroom PBIS plans Lesson plans Classroom Assessment Tool (CAT)	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	

Feature	Possible Data Sources	Scoring Criteria	Score
45. Classroom teachers use immediate and specific praise.	Tier 1 Walkthrough Classroom observations Teacher surveys or interviews Classroom PBIS plans Classroom Assessment Tool (CAT)	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	
46. Acknowledgement of students demonstrating adherence to classroom rules and routines occurs more frequently than acknowledgement of inappropriate behaviors.	Tier 1 Walkthrough Classroom Assessment Tool (CAT) Classroom observations Teacher surveys or interviews Classroom PBIS plans	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	
47. Procedures exist for tracking classroom behavior problems.	Tier 1 Walkthrough Classroom Assessment Tool (CAT) Classroom observations Teacher surveys or interviews Classroom PBIS plans Minor and major referral forms	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	
48. Classrooms have a range of consequences/ interventions for problem behavior that are documented and consistently delivered.	Tier 1 Walkthrough Classroom Assessment Tool (CAT) Classroom observations Teacher surveys or interviews Classroom PBIS plans Minor and major referral forms	0 = Evident in only a few classrooms (less than 50% of classrooms). 1 = Evident in many classrooms (50-75% of classrooms). 2 = Evident in most classrooms (>75% of classrooms).	
Critical Element: Evaluation			
49. Students and staff are surveyed about PBIS.	Staff and student surveys or interviews Tier 1 action plans Meeting agendas, minutes, and materials	0 = Students and staff are not surveyed. 1 = Students and staff are surveyed at least annually (i.e. items on climate survey or specially developed PBIS plan survey), but information is not used to address the PBIS plan. 2 = Students and staff are surveyed at least annually (i.e. items on climate survey or specially developed PBIS plan survey), and information is used to address the PBIS plan.	

Feature	Possible Data Sources	Scoring Criteria	Score
50. Students and staff can identify expectations and rules.	Tier 1 Walkthrough Staff and student surveys or interviews	0 = Few of students and staff can identify the expectations and rules for specific settings OR Evaluations are not conducted (less than 50%). 1 = Many students and staff can identify the school-wide expectations and rules for specific settings (at least 50%). 2 = Almost all students and staff can identify the school-wide expectations and rules for specific settings. (can be identified through surveys, random interviews, etc...) (at least 90%).	
51. Staff use referral process (including which behaviors are office managed vs. teacher managed) and forms appropriately.	Minor and major referral forms Discipline data Staff surveys	0 = Few staff know the procedures for responding to inappropriate behavior, use forms as intended and fill them out correctly OR Evaluations are not conducted (less than 50% know/use). 1 = Some of the staff know the procedures for responding to inappropriate behavior, use forms as intended and fill them out correctly (at least 50% know/use). 2 = Many of the staff know the procedures for responding to inappropriate behavior, use forms as intended and fill them out correctly (at least 75% know/use). 3 = Almost all staff know the procedures for responding to inappropriate behavior, use forms as intended and fill them out correctly. (can be identified by reviewing completed forms, staff surveys, etc...) (at least 90% know/use).	
52. Staff use reward system appropriately.	Staff and student surveys or interviews Staff handbook Professional development materials Tracking of rewards (e.g. tokens, tickets, points, positive referrals, attendance at incentive events) Attendance at incentive events	0 = Few staff understand and use identified guidelines for the reward system OR Evaluations are not conducted at least yearly or do not assess staff knowledge and use of the reward system (less than 50% understand/use). 1 = Some of the staff understand identified guidelines for the reward system and are using the reward system appropriately (at least 50% understand/use). 2 = Many of the staff understand identified guidelines for the reward system and are using the reward system appropriately (at least 75% understand/use). 3 = Almost all staff understand identified guidelines for the reward system and are using the reward system appropriately. (can be identified by reviewing reward token distribution, surveys, etc...) (at least 90% understand/use).	
53. Outcomes (behavior problems, attendance, and morale) are documented and used to evaluate PBIS plan.	Tier 1 action plans Meeting agendas, minutes, and materials Discipline data Communication with staff (e.g. email, newsletters, bulletin boards)	0 = There is no plan for collecting data to evaluate PBIS outcomes. 1 = There is a plan for collecting data to evaluate PBIS outcomes; however, nothing has been collected to date. 2 = There is a plan for collecting data to evaluate PBIS outcomes, some of the scheduled data have been collected, AND data are used to evaluate PBIS plan. 3 = There is a plan for collecting data to evaluate PBIS outcomes, most data are collected as scheduled, AND data are used to evaluate PBIS plan.	

Total Score: 0 / 107

APPENDIX G

SUBSIST: SCHOOL-WIDE UNIVERSAL BEHAVIOR SUSTAINABILITY INDEX:

SCHOOL TEAMS

(McIntosh, Doolittle, Vincent, Horner, Ervin, 2009)

School Factors

Factor 1. School Priority

- S1.1 SWPBS (aka School-Wide PBS, PBIS, EBS) serves a critical need for the school
- S1.2 SWPBS addresses outcomes that are highly valued by school personnel
- S1.3 A vast majority of school personnel (80% or more) support SWPBS
- S1.4 SWPBS has been integrated into new school or district initiatives (e.g., renamed to meet new needs, shown how it can meet the goals of the new initiatives well)
- S1.5 Parents are actively involved in the SWPBS effort (e.g., as part of PBS team or district committee)
- S1.6 The school administrators describe SWPBS as a top priority for the school
- S1.7 The school administrators actively support school personnel when implementing and aligning initiatives (e.g., shield staff from competing demands, change language to align SWPBS with new initiatives) to allow SWPBS to occur
- S1.8 A school administrator regularly attends and participates in SWPBS team meetings
- S1.9 The practices and strategies of SWPBS are evidence based (i.e., there is published research documenting their effectiveness)

- S1.10 School personnel perceive SWPBS as an effective in helping them achieve desired outcomes
- S1.11 School personnel celebrate the positive effects of SWPBS at least yearly
- S1.12 SWPBS has a "crossover effect" in other areas (e.g., improved academic achievement scores, attendance)
- S1.13 SWPBS is effective for a large proportion of students
- S1.14 SWPBS has been expanded to other areas (e.g., classrooms, buses, students with intensive needs, parenting workshops)
- S1.15 SWPBS is implemented with fidelity (i.e., it is used as intended)
- S1.16 SWPBS becomes easier to use with continued experience
- S1.17 SWPBS is considered to be a typical operating procedure of the school (i.e., it has become "what we do here/what we've always done")
- S1.18 SWPBS is cost effective (in terms of money and effort)
- S1.19 Data collected for SWPBS are easy to collect and do not interfere with teaching
- S1.20 Materials related to SWPBS (e.g., handbook, posters) can be used or adapted with ease across years

Factor 2. Team Use of Data

- S2.1 The school team implementing SWPBS is knowledgeable and skilled in SWPBS
- S2.2 The school team implementing SWPBS is well organized and operates efficiently
- S2.3 The school team implementing SWPBS meets at least monthly
- S2.4 Needs assessments (e.g., EBS/PBIS Self Assessment Survey) are conducted

- S2.5 There is regular measurement of fidelity of implementation (e.g., team checklist, set, benchmarks of quality)
- S2.6 There is regular measurement of student outcomes (e.g., ODRs, achievement data, school safety survey, student/parent satisfaction survey)
- S2.7 Data are reviewed regularly at team meetings
- S2.8 Data are presented to all school personnel at least four times per year
- S2.9 Data are presented at least once per year to key stakeholders outside of the school (e.g., district officials, school boards, community agencies/groups)
- S2.10 Data are used for problem solving, decision making, and action planning (to make SWPBS more effective and/or efficient)
- S2.11 All school personnel have a basic understanding of SWPBS (i.e., know the critical features and practices)

District Factors

Factor 3. District Priority

- D1.1 There are adequate district resources (funding and time) allocated for SWPBS
- D1.2 The district administration actively supports SWPBS (e.g., describes SWPBS as top priority, provides clear direction)
- D1.3 State/provincial officials actively support SWPBS (e.g., promotion, publicity, providing infrastructure)
- D1.4 SWPBS is promoted and visible to important organizations (e.g., school board, community agencies, businesses, parent groups)
- D1.5 SWPBS is embedded into school and/or district policy (e.g., school improvement

plans, mission/vision statements)

Factor 4. Capacity Building

- D2.1 The school team has regular access to district SWPBS expertise (e.g., external/district coaches or consultants)
- D2.2 School teams and new personnel are provided with professional development in SWPBS at least yearly
- D2.3 The school team is connected to a "community of practice" (e.g., network of other SWPBS schools in district, local/ regional conferences)

APPENDIX H

ALTITUDE: ADVANCED LEVEL TIER INTERVENTIONS TREATMENT

UTILIZATION AND DURABILITY EVALUATION

(MCINTOSH, KITTELMAN, MERCER, NESE, 2021)

Advanced Tier General Factor

1. There is adequate communication across all teams providing Tier 1, 2, and 3 behavior support.
2. The team(s) responsible for Tier 2 and 3 behavior systems have procedures in place to select and/or train team members on supporting these behavior systems (e.g., monitoring fidelity and student performance).
3. The team(s) and school personnel responsible for implementing Tier 2 and 3 behavior interventions receive acknowledgement for implementation efforts and accomplishments.
4. School personnel understand the importance of monitoring intervention fidelity for Tier 2 and 3 behavior interventions.
5. The school principal consistently expresses the importance of implementing Tier 2 and 3 behavior interventions.
6. District administrators express a commitment that students with intensive needs should be supported within schools instead of being removed to more restrictive settings.
7. The team(s) responsible for implementing Tier 2 and 3 behavior systems are connected to a “community of practice” (i.e., a network of other schools implementing Tier 2 and 3 behavior systems in the district, state, or region).

8. Materials (e.g., documents, curricula, tools) for implementing Tier 2 and 3 behavior interventions can be used or adapted with ease over time.
9. School personnel are committed to supporting students in the classroom instead of excluding them from instruction.
10. School personnel are committed to implementing Tier 2 and 3 behavior interventions.
11. The team(s) responsible for implementing Tier 2 and 3 behavior systems effectively problem-solve barriers to implementation.
12. School personnel build strong partnerships with families to support students with Tier 2 and 3 behavior needs.
13. Classroom teachers regularly receive fidelity and student progress data about their assigned students receiving Tier 2 and 3 behavior interventions.
14. Parents/caregivers regularly receive progress data about their children and youth participating in Tier 2 and 3 behavior interventions.

Tier 2 Specific Factor

15. All Tier 2 behavior interventions (e.g., Check-In Check-Out, social/emotional skills small groups) are coordinated by one team.
16. The team responsible for Tier 2 behavior systems has adequate resources (e.g., time, personnel, materials) to implement Tier 2 behavior interventions with fidelity.
17. The team responsible for Tier 2 behavior systems has adequate access to training in Tier 2 behavior systems and interventions.

18. The team responsible for Tier 2 behavior systems has adequate access to coaching for Tier 2 behavior systems and interventions.
19. School personnel are knowledgeable in the logic and practices of Tier 2 behavior interventions (e.g., why the interventions should work, for whom specific interventions are most likely to be effective, specific skills needed to implement the interventions).
20. School personnel implementing Tier 2 behavior interventions have the necessary skills for collecting fidelity and student progress data accurately.
21. The team responsible for Tier 2 behavior systems uses fidelity and student progress data to improve behavior systems and outcomes.
22. Individuals implementing Tier 2 behavior interventions can collect fidelity and student progress data efficiently.
23. The school's Tier 2 behavior data systems are easy for the team to use for decision making.

Tier 3 Specific Factor

24. The team responsible for Tier 3 behavior systems has adequate resources (e.g., time, personnel, materials) to implement Tier 3 behavior interventions with fidelity.
25. The team responsible for Tier 3 behavior systems has adequate access to training in Tier 3 behavior systems and interventions.
26. The team responsible for Tier 3 behavior systems has adequate access to coaching for Tier 3 behavior systems and interventions.

27. School personnel are knowledgeable in the logic and practices of Tier 3 behavior interventions (e.g., why the interventions should work, for whom specific interventions are most likely to be effective, specific skills needed to implement the interventions).
28. School personnel implementing Tier 3 behavior interventions have the necessary skills for collecting fidelity and student progress data accurately.
29. The team responsible for Tier 3 behavior systems uses fidelity and student progress data to improve behavior systems and outcomes.
30. Individuals implementing Tier 3 behavior interventions can collect fidelity and student progress data without too much effort.
31. The school's Tier 3 behavior data systems are easy for the team to use for decision making.
32. District administrators promote a standard set of evidence-based Tier 3 behavior systems, data, and practices (e.g., screening tools, interventions, decision rules) to be used district-wide.

APPENDIX I

RQ3 PARTIAL CORRELATIONS SPSS SYNTAX AND RESULTS

***Part 1. SUB Overall Score.**

DATASET ACTIVATE DataSet1.

PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio SUB_201819_SchPriority_TotalRatio
 BY ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7772	.18627	614
SUB_201819_SchPriority_TotalRatio	.7919	.18662	614
Altitude Overall Score	.6101	.21302	614

Correlations

Control Variables			Subsist Overall Score	SUB_201819_SchPriority_TotalRatio	Altitude Overall Score
-none ^a	Subsist Overall Score	Correlation	1.000	.881	.688
		Significance (2-tailed)	.	.000	.000
		df	0	612	612
	SUB_201819_SchPriority_TotalRatio	Correlation	.881	1.000	.658
		Significance (2-tailed)	.000	.	.000
		df	612	0	612
	Altitude Overall Score	Correlation	.688	.658	1.000
		Significance (2-tailed)	.000	.000	.
		df	612	612	0
Altitude Overall Score	Subsist Overall Score	Correlation	1.000	.783	
		Significance (2-tailed)	.	.000	
		df	0	611	
	SUB_201819_SchPriority_TotalRatio	Correlation	.783	1.000	
		Significance (2-tailed)	.000	.	
		df	611	0	

a. Cells contain zero-order (Pearson) correlations.

DATASET ACTIVATE DataSet1.

PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio SUB_201819_DataUse_TotalRatio BY
 ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR
 /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7772	.18627	614
SUB_201819_DataUse_TotalRatio	.8131	.19497	614
Altitude Overall Score	.6101	.21302	614

Correlations

Control Variables			Subsist Overall Score	SUB_201819_DataUse_Total Ratio	Altitude Overall Score
-none ^a	Subsist Overall Score	Correlation	1.000	.888	.688
		Significance (2-tailed)	.	.000	.000
		df	0	612	612
	SUB_201819_DataUse_TotalRatio	Correlation	.888	1.000	.588
		Significance (2-tailed)	.000	.	.000
		df	612	0	612
	Altitude Overall Score	Correlation	.688	.588	1.000
		Significance (2-tailed)	.000	.000	.
		df	612	612	0
Altitude Overall Score	Subsist Overall Score	Correlation	1.000	.824	
		Significance (2-tailed)	.	.000	
		df	0	611	
	SUB_201819_DataUse_TotalRatio	Correlation	.824	1.000	
		Significance (2-tailed)	.000	.	
		df	611	0	

a. Cells contain zero-order (Pearson) correlations.

DATASET ACTIVATE DataSet1.

PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio SUB_201819_DistPriority_TotalRatio
 BY ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7778	.18590	612
SUB_201819_DistPriority_TotalRatio	.7381	.22413	612
Altitude Overall Score	.6106	.21319	612

Correlations

Control Variables			Subsist Overall Score	SUB_201819_DistPriority TotalRatio	Altitude Overall Score
-none ^a	Subsist Overall Score	Correlation	1.000	.877	.689
		Significance (2-tailed)	.	.000	.000
		df	0	610	610
	SUB_201819_DistPriority TotalRatio	Correlation	.877	1.000	.613
		Significance (2-tailed)	.000	.	.000
		df	610	0	610
	Altitude Overall Score	Correlation	.689	.613	1.000
		Significance (2-tailed)	.000	.000	.
		df	610	610	0
Altitude Overall Score	Subsist Overall Score	Correlation	1.000	.793	
		Significance (2-tailed)	.	.000	
		df	0	609	
	SUB_201819_DistPriority TotalRatio	Correlation	.793	1.000	
		Significance (2-tailed)	.000	.	
		df	609	0	

a. Cells contain zero-order (Pearson) correlations.

DATASET ACTIVATE DataSet1.
 PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio SUB_201819_DistCapacity_TotalRatio
 BY ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7782	.18583	612
SUB_201819_DistCapacity_TotalRatio	.7672	.23882	612
Altitude Overall Score	.6108	.21277	612

Correlations

Control Variables			Subsist Overall Score	SUB_201819_DistCapacity_TotalRatio	Altitude Overall Score
-none ^a	Subsist Overall Score	Correlation	1.000	.882	.687
		Significance (2-tailed)	.	.000	.000
		df	0	610	610
	SUB_201819_DistCapacity_TotalRatio	Correlation	.882	1.000	.576
		Significance (2-tailed)	.000	.	.000
		df	610	0	610
	Altitude Overall Score	Correlation	.687	.576	1.000
		Significance (2-tailed)	.000	.000	.
		df	610	610	0
Altitude Overall Score	Subsist Overall Score	Correlation	1.000	.819	
		Significance (2-tailed)	.	.000	
		df	0	609	
	SUB_201819_DistCapacity_TotalRatio	Correlation	.819	1.000	
		Significance (2-tailed)	.000	.	
		df	609	0	

a. Cells contain zero-order (Pearson) correlations.

*Exclude Overall SUBSIST with Overall ALTITUDE (not appropriate to control for individual factors).
 DATASET ACTIVATE DataSet1.
 PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio ALT1_201819_AdvTier_TotalRatio
 BY ALT1_201819_Tier2_TotalRatio
 ALT1_201819_Tier3_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7770	.18794	537
ALT1_201819_AdvTier_TotalRatio	.6301	.19852	537
ALT1_201819_Tier2_TotalRatio	.6537	.22429	537
ALT1_201819_Tier3_TotalRatio	.5457	.27130	537

Correlations

Control Variables			Subsist Overall Score	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio
-none ^a	Subsist Overall Score	Correlation	1.000	.722	.715	.518
		Significance (2-tailed)	.	.000	.000	.000
		df	0	535	535	535
	ALT1_201819_AdvTier_TotalRatio	Correlation	.722	1.000	.843	.723
		Significance (2-tailed)	.000	.	.000	.000
		df	535	0	535	535
	ALT1_201819_Tier2_TotalRatio	Correlation	.715	.843	1.000	.759
		Significance (2-tailed)	.000	.000	.	.000
		df	535	535	0	535
	ALT1_201819_Tier3_TotalRatio	Correlation	.518	.723	.759	1.000
		Significance (2-tailed)	.000	.000	.000	.
		df	535	535	535	0
ALT1_201819_Tier2_TotalRatio & ALT1_201819_Tier3_TotalRatio	Subsist Overall Score	Correlation	1.000	.342		
		Significance (2-tailed)	.	.000		
		df	0	533		
ALT1_201819_Tier3_TotalRatio	ALT1_201819_AdvTier_TotalRatio	Correlation	.342	1.000		
		Significance (2-tailed)	.000	.		
		df	533	0		

a. Cells contain zero-order (Pearson) correlations.

DATASET ACTIVATE DataSet1.
 PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio ALT1_201819_Tier2_TotalRatio BY
 ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier3_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7770	.18794	537
ALT1_201819_Tier2_TotalRatio	.6537	.22429	537
ALT1_201819_AdvTier_TotalRatio	.6301	.19852	537
ALT1_201819_Tier3_TotalRatio	.5457	.27130	537

Correlations

Control Variables			Subsist Overall Score	ALT1_201819_Tier2_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio
-none ^a	Subsist Overall Score	Correlation	1.000	.715	.722	.518
		Significance (2-tailed)	.	.000	.000	.000
		df	0	535	535	535
	ALT1_201819_Tier2_TotalRatio	Correlation	.715	1.000	.843	.759
		Significance (2-tailed)	.000	.	.000	.000
		df	535	0	535	535
	ALT1_201819_AdvTier_TotalRatio	Correlation	.722	.843	1.000	.723
		Significance (2-tailed)	.000	.000	.	.000
		df	535	535	0	535
	ALT1_201819_Tier3_TotalRatio	Correlation	.518	.759	.723	1.000
		Significance (2-tailed)	.000	.000	.000	.
		df	535	535	535	0
ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier3_TotalRatio	Subsist Overall Score	Correlation	1.000	.316		
		Significance (2-tailed)	.	.000		
		df	0	533		
ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier2_TotalRatio	Correlation	.316	1.000		
		Significance (2-tailed)	.000	.		
		df	533	0		

a. Cells contain zero-order (Pearson) correlations.

DATASET ACTIVATE DataSet1.
 PARTIAL CORR /VARIABLES= SUB_201819_OverallRatio ALT1_201819_Tier3_TotalRatio BY
 ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier2_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
Subsist Overall Score	.7770	.18794	537
ALT1_201819_Tier3_TotalRatio	.5457	.27130	537
ALT1_201819_AdvTier_TotalRatio	.6301	.19852	537
ALT1_201819_Tier2_TotalRatio	.6537	.22429	537

Correlations

Control Variables			Subsist Overall Score	ALT1_201819_Tier3_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio
-none ^a	Subsist Overall Score	Correlation	1.000	.518	.722	.715
		Significance (2-tailed)	.	.000	.000	.000
		df	0	535	535	535
	ALT1_201819_Tier3_TotalRatio	Correlation	.518	1.000	.723	.759
		Significance (2-tailed)	.000	.	.000	.000
		df	535	0	535	535
	ALT1_201819_AdvTier_TotalRatio	Correlation	.722	.723	1.000	.843
		Significance (2-tailed)	.000	.000	.	.000
		df	535	535	0	535
	ALT1_201819_Tier2_TotalRatio	Correlation	.715	.759	.843	1.000
		Significance (2-tailed)	.000	.000	.000	.
		df	535	535	535	0
ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier2_TotalRatio	Subsist Overall Score	Correlation	1.000	-.141		
		Significance (2-tailed)	.	.001		
		df	0	533		
ALT1_201819_Tier2_TotalRatio & ALT1_201819_Tier3_TotalRatio	ALT1_201819_Tier3_TotalRatio	Correlation	-.141	1.000		
		Significance (2-tailed)	.001	.		
		df	533	0		

a. Cells contain zero-order (Pearson) correlations.

*Part 2. School Priority partial correlations controlling for all others (including overall and factor-level scores).

PARTIAL CORR /VARIABLES=SUB_201819_SchPriority_TotalRatio
 SUB_201819_DataUse_TotalRatio BY SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL
 /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
Altitude Overall Score	.6113	.21295	610

Correlations

			SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	Altitude Overall Score
Control Variables							
-none ^a	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.823	.695	.641	.660
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	SUB_201819_DataUse_TotalRatio	Correlation	.823	1.000	.649	.695	.588
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_DistPriority_TotalRatio	Correlation	.695	.649	1.000	.723	.610
		Significance (2-tailed)	.000	.000	.	.000	.000
		df	608	608	0	608	608
SUB_201819_DistCapacity_TotalRatio	Correlation	.641	.695	.723	1.000	.576	
	Significance (2-tailed)	.000	.000	.000	.	.000	
	df	608	608	608	0	608	
Altitude Overall Score	Correlation	.660	.588	.610	.576	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.	
	df	608	608	608	608	0	
SUB_201819_DistPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio & Altitude Overall Score	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.617			
		Significance (2-tailed)	.	.000			
		df	0	605			
	SUB_201819_DataUse_TotalRatio	Correlation	.617	1.000			
		Significance (2-tailed)	.000	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_SchPriority_TotalRatio SUB_201819_DistPriority_TotalRatio BY
 SUB_201819_DataUse_TotalRatio SUB_201819_DistCapacity_TotalRatio
 ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR
 /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
Altitude Overall Score	.6113	.21295	610

Correlations

Control Variables			SUB_201819_SchPriority_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio	Altitude Overall Score	
-none ^a	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.695	.823	.641	.660	
		Significance (2-tailed)	.	.000	.000	.000	.000	
		df	0	608	608	608	608	
	SUB_201819_DistPriority_TotalRatio	Correlation	.695	1.000	.649	.723	.610	
		Significance (2-tailed)	.000	.	.000	.000	.000	
		df	608	0	608	608	608	
	SUB_201819_DataUse_TotalRatio	Correlation	.823	.649	1.000	.695	.588	
		Significance (2-tailed)	.000	.000	.	.000	.000	
		df	608	608	0	608	608	
	SUB_201819_DistCapacity_TotalRatio	Correlation	.641	.723	.695	1.000	.576	
		Significance (2-tailed)	.000	.000	.000	.	.000	
		df	608	608	608	0	608	
	Altitude Overall Score	Correlation	.660	.610	.588	.576	1.000	
		Significance (2-tailed)	.000	.000	.000	.000	.	
		df	608	608	608	608	0	
	SUB_201819_DataUse_TotalRatio & SUB_201819_DistCapacity_TotalRatio & Altitude Overall Score	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.267			
			Significance (2-tailed)	.	.000			
			df	0	605			
SUB_201819_DistCapacity_TotalRatio & Altitude Overall Score	SUB_201819_DistPriority_TotalRatio	Correlation	.267	1.000				
		Significance (2-tailed)	.000	.				
		df	605	0				

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_SchPriority_TotalRatio SUB_201819_DistCapacity_TotalRatio BY
 SUB_201819_DataUse_TotalRatio SUB_201819_DistPriority_TotalRatio ALT1_201819_OverallRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
Altitude Overall Score	.6113	.21295	610

Correlations

Control Variables			SUB_201819_SchPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	Altitude Overall Score
-none ^a	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.641	.823	.695	.660
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	SUB_201819_DistCapacity_TotalRatio	Correlation	.641	1.000	.695	.723	.576
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_DataUse_TotalRatio	Correlation	.823	.695	1.000	.649	.588
		Significance (2-tailed)	.000	.000	.	.000	.000
		df	608	608	0	608	608
	SUB_201819_DistPriority_TotalRatio	Correlation	.695	.723	.649	1.000	.610
		Significance (2-tailed)	.000	.000	.000	.	.000
		df	608	608	608	0	608
	Altitude Overall Score	Correlation	.660	.576	.588	.610	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.
		df	608	608	608	608	0
SUB_201819_DataUse_TotalRatio & SUB_201819_DistPriority_TotalRatio	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	-.062			
		Significance (2-tailed)	.	.130			
		df	0	605			
SUB_201819_DistCapacity_TotalRatio & Altitude Overall Score	SUB_201819_DistCapacity_TotalRatio	Correlation	-.062	1.000			
		Significance (2-tailed)	.130	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES= SUB_201819_SchPriority_TotalRatio ALT1_201819_OverallRatio BY
 SUB_201819_DataUse_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
Altitude Overall Score	.6113	.21295	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610

Correlations

Control Variables			SUB_201819_SchPriority_TotalRatio	Altitude Overall Score	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio
-none ^a	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.660	.823	.695	.641
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	Altitude Overall Score	Correlation	.660	1.000	.588	.610	.576
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_DataUse_TotalRatio	Correlation	.823	.588	1.000	.649	.695
		Significance (2-tailed)	.000	.000	.	.000	.000
		df	608	608	0	608	608
	SUB_201819_DistPriority_TotalRatio	Correlation	.695	.610	.649	1.000	.723
		Significance (2-tailed)	.000	.000	.000	.	.000
		df	608	608	608	0	608
	SUB_201819_DistCapacity_TotalRatio	Correlation	.641	.576	.695	.723	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.
		df	608	608	608	608	0
	SUB_201819_DataUse_TotalRatio & SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.290			
		Significance (2-tailed)	.	.000			
		df	0	605			
	SUB_201819_DistPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio	Correlation	.290	1.000			
		Significance (2-tailed)	.000	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

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/VARIABLES=SUB_201819_SchPriority_TotalRatio ALT1_201819_AdvTier_TotalRatio BY
SUB_201819_DataUse_TotalRatio SUB_201819_DistPriority_TotalRatio
SUB_201819_DistCapacity_TotalRatio ALT1_201819_Tier2_TotalRatio
ALT1_201819_Tier3_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR
/MISSING=LISTWISE.

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Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

Control Variables			SUB_201819_SchPriority_TotalRatio	ALT1_201819_AdvTier_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio
-none ^a	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.722	.836	.691	.640	.672	.478
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.722	1.000	.642	.619	.587	.842	.724
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_DataUse_TotalRatio	Correlation	.836	.642	1.000	.647	.706	.621	.425
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
	SUB_201819_DistPriority_TotalRatio	Correlation	.691	.619	.647	1.000	.723	.623	.492
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
		df	532	532	532	0	532	532	532
SUB_201819_DistCapacity_TotalRatio	Correlation	.640	.587	.706	.723	1.000	.622	.442	
	Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000	
	df	532	532	532	532	0	532	532	
ALT1_201819_Tier2_TotalRatio	Correlation	.672	.842	.621	.623	.622	1.000	.759	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000	
	df	532	532	532	532	532	0	532	
ALT1_201819_Tier3_TotalRatio	Correlation	.478	.724	.425	.492	.442	.759	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.	
	df	532	532	532	532	532	532	0	
SUB_201819_DataUse_TotalRatio & SUB_201819_DistPriority_TotalRatio	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.279					
		Significance (2-tailed)	.	.000					
		df	0	527					
SUB_201819_DistPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	Correlation	.279	1.000					
		Significance (2-tailed)	.000	.					

Control Variables		SUB_2 01819_ SchPrio rity_Tot alRatio	ALT1_ 201819_ AdvTi er_Tot alRatio	SUB_2 01819_ DataUs e_Tot alRatio	SUB_2 01819_ DistPrio rity_Tot alRatio	SUB_2 01819_ DistCap acity_T otalRati o	ALT1_ 201819_ Tier2 TotalRa tio	ALT1_ 201819_ Tier3 TotalRa tio
tCapacity_TotalR atio & ALT1_201819_Ti er2_TotalRatio & ALT1_201819_Ti er3_TotalRatio	df	527	0					

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_SchPriority_TotalRatio ALT1_201819_Tier2_TotalRatio BY
 SUB_201819_DataUse_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier3_TotalRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

Control Variables			SUB_201819_SchPriority_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio
-none ^a	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.672	.836	.691	.640	.722	.478
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_Tier2_TotalRatio	Correlation	.672	1.000	.621	.623	.622	.842	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_DataUse_TotalRatio	Correlation	.836	.621	1.000	.647	.706	.642	.425
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
	SUB_201819_DistPriority_TotalRatio	Correlation	.691	.623	.647	1.000	.723	.619	.492
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
		df	532	532	532	0	532	532	532
	SUB_201819_DistCapacity_TotalRatio	Correlation	.640	.622	.706	.723	1.000	.587	.442
		Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000
		df	532	532	532	532	0	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.722	.842	.642	.619	.587	1.000	.724
		Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000
		df	532	532	532	532	532	0	532
	ALT1_201819_Tier3_TotalRatio	Correlation	.478	.759	.425	.492	.442	.724	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.

Control Variables			SUB_201819_SchPriority_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio
	df		532	532	532	532	532	532	0
SUB_201819_DataUse_TotalRatio & SUB_201819_DistPriority_TotalRatio	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	.064					
		Significance (2-tailed)	.	.139					
	df		0	527					
SUB_201819_DistCapacity_TotalRatio & ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio	Correlation	.064	1.000					
		Significance (2-tailed)	.139	.					
	df		527	0					

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES= SUB_201819_SchPriority_TotalRatio ALT1_201819_Tier3_TotalRatio BY
 SUB_201819_DataUse_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier2_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534

Correlations

			SUB_201819_SchPriority_TotalRatio	ALT1_201819_Tier3_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio
Control Variables	-none ^a	SUB_201819_SchPriority_TotalRatio	1.000	.478	.836	.691	.640	.722	.672
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_Tier3_TotalRatio	Correlation	.478	1.000	.425	.492	.442	.724	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_DataUse_TotalRatio	Correlation	.836	.425	1.000	.647	.706	.642	.621
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
	SUB_201819_DistPriority_TotalRatio	Correlation	.691	.492	.647	1.000	.723	.619	.623
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
		df	532	532	532	0	532	532	532
	SUB_201819_DistCapacity_TotalRatio	Correlation	.640	.442	.706	.723	1.000	.587	.622
		Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000
		df	532	532	532	532	0	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.722	.724	.642	.619	.587	1.000	.842
		Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000

		SUB_2 01819 SchPri ority_T otalRat io	ALT1 201819 _Tier3 _Total Ratio	SUB_2 01819 DataUs e_Tota lRatio	SUB_2 01819 DistPri ority_T otalRat io	SUB_2 01819 DistCa pacity_ TotalR atio	ALT1 201819 _AdvT ier_Tot alRatio	ALT1 201819 _Tier2 _Total Ratio
Control Variables		df	532	532	532	532	0	532
ALT1_201819_Tier2_TotalRatio		Correlation	.672	.759	.621	.623	.622	.842
		Significance (2-tailed)	.000	.000	.000	.000	.000	.000
		df	532	532	532	532	532	0
SUB_201819_DataUse_TotalRatio & SUB_201819_DistPriority_TotalRatio	SUB_201819_SchPriority_TotalRatio	Correlation	1.000	-.109				
		Significance (2-tailed)	.	.013				
		df	0	527				
SUB_201819_DistCapacity_TotalRatio & ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio	Correlation	-.109	1.000				
		Significance (2-tailed)	.013	.				
		df	527	0				
ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier2_TotalRatio								

a. Cells contain zero-order (Pearson) correlations.

*Part 3. SUB Team data use.

PARTIAL CORR

/VARIABLES=SUB_201819_DataUse_TotalRatio SUB_201819_DistPriority_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DistCapacity_TotalRatio
 ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR
 /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
Altitude Overall Score	.6113	.21295	610

Correlations

Control Variables			SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	Altitude Overall Score
-none ^a	SUB_201819_DataUse_TotalRatio	Correlation	1.000	.649	.823	.695	.588
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	SUB_201819_DistPriority_TotalRatio	Correlation	.649	1.000	.695	.723	.610
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_SchPriority_TotalRatio	Correlation	.823	.695	1.000	.641	.660
		Significance (2-tailed)	.000	.000	.	.000	.000
	df	608	608	0	608	608	
SUB_201819_DistCapacity_TotalRatio	Correlation	.695	.723	.641	1.000	.576	
	Significance (2-tailed)	.000	.000	.000	.	.000	
	df	608	608	608	0	608	
Altitude Overall Score	Correlation	.588	.610	.660	.576	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.	
	df	608	608	608	608	0	
SUB_201819_SchPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio	SUB_201819_DataUse_TotalRatio	Correlation	1.000	-.007			
		Significance (2-tailed)	.	.861			
		df	0	605			
SUB_201819_DistCapacity_TotalRatio & Altitude Overall Score	SUB_201819_DistPriority_TotalRatio	Correlation	-.007	1.000			
		Significance (2-tailed)	.861	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DataUse_TotalRatio SUB_201819_DistCapacity_TotalRatio BY

SUB_201819_SchPriority_TotalRatio SUB_201819_DistPriority_TotalRatio
 ALT1_201819_OverallRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR
 /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
Altitude Overall Score	.6113	.21295	610

Correlations

			SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DistPriority_TotalRatio	Altitude Overall Score
Control Variables							
-none ^a	SUB_201819_DataUse_TotalRatio	Correlation	1.000	.695	.823	.649	.588
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	SUB_201819_DistCapacity_TotalRatio	Correlation	.695	1.000	.641	.723	.576
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_SchPriority_TotalRatio	Correlation	.823	.641	1.000	.695	.660
		Significance (2-tailed)	.000	.000	.	.000	.000
		df	608	608	0	608	608
	SUB_201819_DistPriority_TotalRatio	Correlation	.649	.723	.695	1.000	.610
		Significance (2-tailed)	.000	.000	.000	.	.000
		df	608	608	608	0	608
	Altitude Overall Score	Correlation	.588	.576	.660	.610	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.
		df	608	608	608	608	0
	SUB_201819_SchPriority_TotalRatio & SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.339			
		Significance (2-tailed)	.	.000			
		df	0	605			
	SUB_201819_DistPriority_TotalRatio & Altitude Overall Score	Correlation	.339	1.000			
		Significance (2-tailed)	.000	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DataUse_TotalRatio ALT1_201819_OverallRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
Altitude Overall Score	.6113	.21295	610
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610

Correlations

Control Variables		SUB_201819_DataUse_TotalRatio	Altitude Overall Score	SUB_201819_SchPriority_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio
-none ^a	SUB_201819_DataUse_TotalRatio	1.000	.588	.823	.649	.695
	Significance (2-tailed)	.	.000	.000	.000	.000
	df	0	608	608	608	608
	Altitude Overall Score	.588	1.000	.660	.610	.576
	Significance (2-tailed)	.000	.	.000	.000	.000
	df	608	0	608	608	608
	SUB_201819_SchPriority_TotalRatio	.823	.660	1.000	.695	.641
	Significance (2-tailed)	.000	.000	.	.000	.000
	df	608	608	0	608	608
	SUB_201819_DistPriority_TotalRatio	.649	.610	.695	1.000	.723
	Significance (2-tailed)	.000	.000	.000	.	.000
	df	608	608	608	0	608
	SUB_201819_DistCapacity_TotalRatio	.695	.576	.641	.723	1.000
	Significance (2-tailed)	.000	.000	.000	.000	.
	df	608	608	608	608	0
SUB_201819_SchPriority_TotalRatio & SUB_201819_DistPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	1.000	.004			
	Significance (2-tailed)	.	.930			
	df	0	605			
SUB_201819_DistPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio	Altitude Overall Score	.004	1.000			
	Significance (2-tailed)	.930	.			
	df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DataUse_TotalRatio ALT1_201819_AdvTier_TotalRatio BY

SUB_201819_SchPriority_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_Tier2_TotalRatio
 ALT1_201819_Tier3_TotalRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

			SUB_201819_DataUse_TotalRatio	ALT1_201819_AdvTier_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio
Control Variables	-none ^a		1.000	.642	.836	.647	.706	.621	.425
	SUB_201819_DataUse_TotalRatio	Correlation		.642	.836	.647	.706	.621	.425
		Significance (2-tailed)		.000	.000	.000	.000	.000	.000
		df		0	532	532	532	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.642	1.000	.722	.619	.587	.842	.724
		Significance (2-tailed)	.000		.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	Correlation	.836	.722	1.000	.691	.640	.672	.478
		Significance (2-tailed)	.000	.000		.000	.000	.000	.000
		df	532	532	0	532	532	532	532
	SUB_201819_DistPriority_TotalRatio	Correlation	.647	.619	.691	1.000	.723	.623	.492
		Significance (2-tailed)	.000	.000	.000		.000	.000	.000
		df	532	532	532	0	532	532	532
	SUB_201819_DistCapacity_TotalRatio	Correlation	.706	.587	.640	.723	1.000	.622	.442
		Significance (2-tailed)	.000	.000	.000	.000		.000	.000
		df	532	532	532	532	0	532	532
	ALT1_201819_Tier2_TotalRatio	Correlation	.621	.842	.672	.623	.622	1.000	.759
		Significance (2-tailed)	.000	.000	.000	.000	.000		.000
	df	532	532	532	532	532	0	532	
ALT1_201819_Tier3_TotalRatio	Correlation	.425	.724	.478	.492	.442	.759	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000		
	df	532	532	532	532	532	532	0	
SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	Correlation	1.000	.013					
		Significance (2-tailed)		.760					

Control Variables			SUB_201819_DistCapacity	ALT1_201819_AdvTier	SUB_201819_SchPriority	SUB_201819_DistPriority	SUB_201819_DistCapacity	ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio
o &	df		0	527					
SUB_201819_DistPriority	ALT1_201819_AdvTier	Correlation	.013	1.000					
ty_TotalRatio	_TotalRatio	Significance (2-tailed)	.760	.					
o &	df		527	0					
SUB_201819_DistCapacity	TotalRatio	&							
ALT1_201819_Tier2_TotalRatio	&								
ALT1_201819_Tier3_TotalRatio									

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DataUse_TotalRatio ALT1_201819_Tier2_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier3_TotalRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

Control Variables			SUB_201819_DataUse_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio
-none ^a	SUB_201819_DataUse_TotalRatio	Correlation	1.000	.621	.836	.647	.706	.642	.425
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
ALT1_201819_Tier2_TotalRatio		Correlation	.621	1.000	.672	.623	.622	.842	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
SUB_201819_SchPriority_TotalRatio		Correlation	.836	.672	1.000	.691	.640	.722	.478
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
SUB_201819_DistPriority_TotalRatio		Correlation	.647	.623	.691	1.000	.723	.619	.492
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
		df	532	532	532	0	532	532	532
SUB_201819_DistCapacity_TotalRatio		Correlation	.706	.622	.640	.723	1.000	.587	.442
		Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000
		df	532	532	532	532	0	532	532
ALT1_201819_AdvTier_TotalRatio		Correlation	.642	.842	.722	.619	.587	1.000	.724
		Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000
		df	532	532	532	532	532	0	532
ALT1_201819_Tier3_TotalRatio		Correlation	.425	.759	.478	.492	.442	.724	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.

Control Variables			SUB_2 01819_ DataUs e_Tot alRatio	ALT1 201819 Tier2 TotalRa tio	SUB_2 01819_ SchPrio rity_Tot alRatio	SUB_2 01819_ DistPrio rity_Tot alRatio	SUB_2 01819_ DistCap acity_T otalRati o	ALT1 201819 AdvTi er_Tot alRatio	ALT1_2 01819_ Tier3_T otalRati o
		df	532	532	532	532	532	532	0
SUB_201819_SchPriority_Tot alRatio	SUB_201819_DataUse TotalRatio	Correlation	1.000	.032					
		Significance (2-tailed)	.	.463					
		df	0	527					
SUB_201819_DistPriority _TotalRatio	ALT1_201819_Tier2_T otalRatio	Correlation	.032	1.000					
		Significance (2-tailed)	.463	.					
		df	527	0					
SUB_201819_DistCapacit y_Tot alRatio	ALT1_201819_AdvTier_T otalRatio								
	ALT1_201819_Tier3_Tota lRatio								

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DataUse_TotalRatio ALT1_201819_Tier3_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DistPriority_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier2_TotalRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534

Correlations

Control Variables			SUB_201819_DataUse_TotalRatio	ALT1_201819_Tier3_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio
-none ^a	SUB_201819_DataUse_TotalRatio	Correlation	1.000	.425	.836	.647	.706	.642	.621
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_Tier3_TotalRatio	Correlation	.425	1.000	.478	.492	.442	.724	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	Correlation	.836	.478	1.000	.691	.640	.722	.672
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
	SUB_201819_DistPriority_TotalRatio	Correlation	.647	.492	.691	1.000	.723	.619	.623
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
		df	532	532	532	0	532	532	532
	SUB_201819_DistCapacity_TotalRatio	Correlation	.706	.442	.640	.723	1.000	.587	.622
		Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000
		df	532	532	532	532	0	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.642	.724	.722	.619	.587	1.000	.842
		Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000
		df	532	532	532	532	532	0	532
	ALT1_201819_Tier2_TotalRatio	Correlation	.621	.759	.672	.623	.622	.842	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.
		df	532	532	532	532	532	532	0

Control Variables			SUB_2 01819_ DataUs e_Tota Ratio	ALT1 201819 _Tier3 _Total Ratio	SUB_2 01819_ SchPri ority_T otalRat io	SUB_2 01819_ DistPri ority_T otalRat io	SUB_2 01819_ DistCa pacity_ TotalR atio	ALT1 201819 _AdvTi er_Tota lRatio	ALT1 201819 _Tier2 _TotalR atio
SUB_201819_SchPriority_TotalRatio & SUB_201819_DistPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	Correlation Significance (2-tailed) df	1.000 .	-.049 .265					
SUB_201819_DistPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier3_TotalRatio	Correlation Significance (2-tailed) df	-.049 .265	1.000 .					
ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier2_TotalRatio			527	0					

a. Cells contain zero-order (Pearson) correlations.

*Part 4. SUB Dist Priority.

PARTIAL CORR

/VARIABLES=SUB_201819_DistPriority_TotalRatio SUB_201819_DistCapacity_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio ALT1_201819_OverallRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
Altitude Overall Score	.6113	.21295	610

Correlations

Control Variables		SUB_201819_DistPriority_TotalRatio	SUB_201819_DistCapacity_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	Altitude Overall Score
-none ^a	SUB_201819_DistPriority_TotalRatio	1.000	.723	.695	.649	.610
	Correlation					
	Significance (2-tailed)	.	.000	.000	.000	.000
	df	0	608	608	608	608
	SUB_201819_DistCapacity_TotalRatio	.723	1.000	.641	.695	.576
	Correlation					
	Significance (2-tailed)	.000	.	.000	.000	.000
	df	608	0	608	608	608
	SUB_201819_SchPriority_TotalRatio	.695	.641	1.000	.823	.660
	Correlation					
	Significance (2-tailed)	.000	.000	.	.000	.000
	df	608	608	0	608	608
	SUB_201819_DataUse_TotalRatio	.649	.695	.823	1.000	.588
	Correlation					
	Significance (2-tailed)	.000	.000	.000	.	.000
	df	608	608	608	0	608
	Altitude Overall Score	.610	.576	.660	.588	1.000
	Correlation					
	Significance (2-tailed)	.000	.000	.000	.000	.
	df	608	608	608	608	0
SUB_201819_SchPriority_TotalRatio & SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	1.000	.438			
	Correlation					
	Significance (2-tailed)	.	.000			
	df	0	605			
SUB_201819_DataUse_TotalRatio & Altitude Overall Score	SUB_201819_DistCapacity_TotalRatio	.438	1.000			
	Correlation					
	Significance (2-tailed)	.000	.			
	df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistPriority_TotalRatio ALT1_201819_OverallRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio
 SUB_201819_DistCapacity_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610
Altitude Overall Score	.6113	.21295	610
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610

Correlations

Control Variables			SUB_201819_DistPriority_TotalRatio	Altitude Overall Score	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio
-none ^a	SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.610	.695	.649	.723
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	Altitude Overall Score	Correlation	.610	1.000	.660	.588	.576
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_SchPriority_TotalRatio	Correlation	.695	.660	1.000	.823	.641
		Significance (2-tailed)	.000	.000	.	.000	.000
		df	608	608	0	608	608
	SUB_201819_DataUse_TotalRatio	Correlation	.649	.588	.823	1.000	.695
		Significance (2-tailed)	.000	.000	.000	.	.000
		df	608	608	608	0	608
	SUB_201819_DistCapacity_TotalRatio	Correlation	.723	.576	.641	.695	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.
		df	608	608	608	608	0
	SUB_201819_SchPriority_TotalRatio & SUB_201819_DataUse_TotalRatio	Correlation	1.000	.176			
		Significance (2-tailed)	.	.000			
		df	0	605			
	SUB_201819_DistCapacity_TotalRatio & Altitude Overall Score	Correlation	.176	1.000			
		Significance (2-tailed)	.000	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistPriority_TotalRatio ALT1_201819_AdvTier_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_Tier2_TotalRatio
 ALT1_201819_Tier3_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

		SUB_201819_DistPriority_TotalRatio	ALT1_201819_AdvTier_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio	
Control Variables	-none ^a								
	SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.619	.691	.647	.723	.623	.492
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.619	1.000	.722	.642	.587	.842	.724
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	Correlation	.691	.722	1.000	.836	.640	.672	.478
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
SUB_201819_DataUse_TotalRatio	Correlation	.647	.642	.836	1.000	.706	.621	.425	
	Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000	
	df	532	532	532	0	532	532	532	
SUB_201819_DistCapacity_TotalRatio	Correlation	.723	.587	.640	.706	1.000	.622	.442	
	Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000	
	df	532	532	532	532	0	532	532	
ALT1_201819_Tier2_TotalRatio	Correlation	.623	.842	.672	.621	.622	1.000	.759	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000	
	df	532	532	532	532	532	0	532	
ALT1_201819_Tier3_TotalRatio	Correlation	.492	.724	.478	.425	.442	.759	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.	
	df	532	532	532	532	532	532	0	

	SUB_201819_DistPriority_TotalRatio	ALT1_201819_SchPriority_Tier_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_Tier2_Tier3_TotalRatio				
Control Variables								
SUB_201819_SchPriority_TotalRatio & SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.025				
		Significance (2-tailed)	.	.562				
		df	0	527				
SUB_201819_DistCapacity_Tier2_Tier3_TotalRatio & ALT1_201819_SchPriority_Tier_TotalRatio	ALT1_201819_AdvTier_Tier_TotalRatio	Correlation	.025	1.000				
		Significance (2-tailed)	.562	.				
		df	527	0				

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistPriority_TotalRatio ALT1_201819_Tier2_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier3_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

		SUB_201819_DistPriority_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio	
Control Variables	-none ^a								
	SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.623	.691	.647	.723	.619	.492
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_Tier2_TotalRatio	Correlation	.623	1.000	.672	.621	.622	.842	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	Correlation	.691	.672	1.000	.836	.640	.722	.478
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
SUB_201819_DataUse_TotalRatio	Correlation	.647	.621	.836	1.000	.706	.642	.425	
	Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000	
	df	532	532	532	0	532	532	532	
SUB_201819_DistCapacity_TotalRatio	Correlation	.723	.622	.640	.706	1.000	.587	.442	
	Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000	
	df	532	532	532	532	0	532	532	
ALT1_201819_AdvTier_TotalRatio	Correlation	.619	.842	.722	.642	.587	1.000	.724	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000	
	df	532	532	532	532	532	0	532	
ALT1_201819_Tier3_TotalRatio	Correlation	.492	.759	.478	.425	.442	.724	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.	
	df	532	532	532	532	532	532	0	

Control Variables			SUB_201819_DistPriority_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio
SUB_201819_SchPriority_TotalRatio & SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	Correlation	1.000	.033					
		Significance (2-tailed)	.	.448					
		df	0	527					
SUB_201819_DistCapacity_TotalRatio & ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio	Correlation	.033	1.000					
		Significance (2-tailed)	.448	.					
		df	527	0					

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistPriority_TotalRatio ALT1_201819_Tier3_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio
 SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier2_TotalRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534

Correlations

Control Variables		SUB_201819_DistPriority_TotalRatio	ALT1_201819_Tier3_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio
-none ^a	SUB_201819_DistPriority_TotalRatio	1.000	.492	.691	.647	.723	.619	.623
	Correlation							
	Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
	df	0	532	532	532	532	532	532
	ALT1_201819_Tier3_TotalRatio	.492	1.000	.478	.425	.442	.724	.759
	Correlation							
	Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
	df	532	0	532	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	.691	.478	1.000	.836	.640	.722	.672
	Correlation							
Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000	
df	532	532	0	532	532	532	532	
SUB_201819_DataUse_TotalRatio	.647	.425	.836	1.000	.706	.642	.621	
Correlation								
Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000	
df	532	532	532	0	532	532	532	
SUB_201819_DistCapacity_TotalRatio	.723	.442	.640	.706	1.000	.587	.622	
Correlation								
Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000	
df	532	532	532	532	0	532	532	
ALT1_201819_AdvTier_TotalRatio	.619	.724	.722	.642	.587	1.000	.842	
Correlation								
Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000	
df	532	532	532	532	532	0	532	
ALT1_201819_Tier2_TotalRatio	.623	.759	.672	.621	.622	.842	1.000	
Correlation								
Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.	
df	532	532	532	532	532	532	0	

Control Variables			SUB_2 01819_ DistPrio rity_Tot alRatio	ALT1_ 201819 _Tier3 TotalRa tio	SUB_2 01819_ SchPrio rity_Tot alRatio	SUB_2 01819_ DataUs e_Total Ratio	SUB_2 01819_ DistCap acity_T otalRati o	ALT1_ 201819 _AdvTi er_Tota lRatio	ALT1_ 201819 _Tier2 TotalRa tio
SUB_201819_SchPriority_TotalRatio & SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	Correlation Significance (2-tailed) df	1.000 .034 0	.092 .034 527					
SUB_201819_DistCapacity_TotalRatio & ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio	Correlation Significance (2-tailed) df	.092 .034 527	1.000 .034 0					

a. Cells contain zero-order (Pearson) correlations.

*Part 5. SUB District Capacity.

PARTIAL CORR

/VARIABLES=SUB_201819_DistCapacity_TotalRatio ALT1_201819_OverallRatio BY

SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio

SUB_201819_DistPriority_TotalRatio

/SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistCapacity_TotalRatio	.7682	.23838	610
Altitude Overall Score	.6113	.21295	610
SUB_201819_SchPriority_TotalRatio	.7931	.18618	610
SUB_201819_DataUse_TotalRatio	.8147	.19390	610
SUB_201819_DistPriority_TotalRatio	.7392	.22316	610

Correlations

Control Variables			SUB_201819_DistCapacity_TotalRatio	Altitude Overall Score	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio
-none ^a	SUB_201819_DistCapacity_TotalRatio	Correlation	1.000	.576	.641	.695	.723
		Significance (2-tailed)	.	.000	.000	.000	.000
		df	0	608	608	608	608
	Altitude Overall Score	Correlation	.576	1.000	.660	.588	.610
		Significance (2-tailed)	.000	.	.000	.000	.000
		df	608	0	608	608	608
	SUB_201819_SchPriority_TotalRatio	Correlation	.641	.660	1.000	.823	.695
		Significance (2-tailed)	.000	.000	.	.000	.000
		df	608	608	0	608	608
	SUB_201819_DataUse_TotalRatio	Correlation	.695	.588	.823	1.000	.649
		Significance (2-tailed)	.000	.000	.000	.	.000
		df	608	608	608	0	608
	SUB_201819_DistPriority_TotalRatio	Correlation	.723	.610	.695	.649	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.
		df	608	608	608	608	0
	SUB_201819_SchPriority_TotalRatio & SUB_201819_DataUse_TotalRatio	Correlation	1.000	.140			
		Significance (2-tailed)	.	.001			
		df	0	605			
	SUB_201819_DistPriority_TotalRatio	Correlation	.140	1.000			
		Significance (2-tailed)	.001	.			
		df	605	0			

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistCapacity_TotalRatio ALT1_201819_AdvTier_TotalRatio BY
 SUB_201819_SchPriority_TotalRatio SUB_201819_DataUse_TotalRatio
 SUB_201819_DistPriority_TotalRatio ALT1_201819_Tier2_TotalRatio ALT1_201819_Tier3_TotalRatio
 /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

		SUB_201819_DistCapacity_TotalRatio	ALT1_201819_AdvTier_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio
Control Variables	-none ^a	1.000	.587	.640	.706	.723	.622	.442
	SUB_201819_DistCapacity_TotalRatio	Significance (2-tailed)	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532
	ALT1_201819_AdvTier_TotalRatio	Correlation	.587	1.000	.722	.642	.619	.842
		Significance (2-tailed)	.000	.	.000	.000	.000	.000
		df	532	0	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	Correlation	.640	.722	1.000	.836	.691	.672
		Significance (2-tailed)	.000	.000	.	.000	.000	.000
		df	532	532	0	532	532	532
	SUB_201819_DataUse_TotalRatio	Correlation	.706	.642	.836	1.000	.647	.621
		Significance (2-tailed)	.000	.000	.000	.	.000	.000
		df	532	532	532	0	532	532
	SUB_201819_DistPriority_TotalRatio	Correlation	.723	.619	.691	.647	1.000	.623
		Significance (2-tailed)	.000	.000	.000	.000	.	.000
		df	532	532	532	532	0	532
	ALT1_201819_Tier2_TotalRatio	Correlation	.622	.842	.672	.621	.623	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.000	.
		df	532	532	532	532	532	0
ALT1_201819_Tier3_TotalRatio	Correlation	.442	.724	.478	.425	.492	.759	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000	
	df	532	532	532	532	532	0	
SUB_201819_	SUB_201819_	Correlation	1.000	-.007				

Control Variables	SUB_2 01819_ DistCa pacity_ TotalRa tio	ALT1_ 201819_ AdvTi er_Tota lRatio	SUB_2 01819_ SchPrio rity_To talRatio	SUB_2 01819_ DataUs e_Tota lRatio	SUB_2 01819_ DistPri ority_T otalRati o	ALT1_ 201819_ Tier2_ TotalR atio	ALT1_ 201819_ Tier3_ TotalRa tio
SchPriority_Tot_DistCapacit alRatio & y_TotalRatio (2-tailed)	Significance (2-tailed)	.880					
SUB_201819_ DataUse_Total Ratio & SUB_201819_ DistPriority_To talRatio & ALT1_201819_ Tier2_TotalRati o & ALT1_201819_ Tier3_TotalRati o	df	0	527				
	Correlation	-.007	1.000				
	Significance (2-tailed)	.880	.				
	df	527	0				

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistCapacity_TotalRatio ALT1_201819_Tier2_TotalRatio BY
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 SUB_201819_DistPriority_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier3_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534

Correlations

Control Variables		SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio	
-none ^a	SUB_201819_DistCapacity_TotalRatio	Correlation	1.000	.622	.640	.706	.723	.587	.442
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
ALT1_201819_Tier2_TotalRatio		Correlation	.622	1.000	.672	.621	.623	.842	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
SUB_201819_SchPriority_TotalRatio		Correlation	.640	.672	1.000	.836	.691	.722	.478
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
SUB_201819_DataUse_TotalRatio		Correlation	.706	.621	.836	1.000	.647	.642	.425
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
		df	532	532	532	0	532	532	532
SUB_201819_DistPriority_TotalRatio		Correlation	.723	.623	.691	.647	1.000	.619	.492
		Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000
		df	532	532	532	532	0	532	532
ALT1_201819_AdvTier_TotalRatio		Correlation	.587	.842	.722	.642	.619	1.000	.724
		Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000
		df	532	532	532	532	532	0	532
ALT1_201819_Tier3_TotalRatio		Correlation	.442	.759	.478	.425	.492	.724	1.000
		Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.

Control Variables			SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier2_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier3_TotalRatio
	df		532	532	532	532	532	532	0
SUB_201819_SchPriority_TotalRatio & SUB_201819_DistCapacity_TotalRatio	Correlation		1.000	.177					
	Significance (2-tailed)		.	.000					
	df		0	527					
SUB_201819_DataUse_TotalRatio & ALT1_201819_Tier2_TotalRatio	Correlation		.177	1.000					
	Significance (2-tailed)		.000	.					
	df		527	0					
SUB_201819_DistPriority_TotalRatio & ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier3_TotalRatio									

a. Cells contain zero-order (Pearson) correlations.

PARTIAL CORR

/VARIABLES=SUB_201819_DistCapacity_TotalRatio ALT1_201819_Tier3_TotalRatio BY
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 SUB_201819_DistPriority_TotalRatio ALT1_201819_AdvTier_TotalRatio
 ALT1_201819_Tier2_TotalRatio /SIGNIFICANCE=TWOTAIL /STATISTICS=DESCRIPTIVES
 CORR /MISSING=LISTWISE.

Descriptive Statistics

	Mean	Std. Deviation	N
SUB_201819_DistCapacity_TotalRatio	.7682	.23864	534
ALT1_201819_Tier3_TotalRatio	.5464	.27184	534
SUB_201819_SchPriority_TotalRatio	.7925	.18830	534
SUB_201819_DataUse_TotalRatio	.8133	.19671	534
SUB_201819_DistPriority_TotalRatio	.7383	.22568	534
ALT1_201819_AdvTier_TotalRatio	.6308	.19873	534
ALT1_201819_Tier2_TotalRatio	.6543	.22470	534

Correlations

		SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier3_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio	
Control Variables	-none ^a	1.000	.442	.640	.706	.723	.587	.622	
	SUB_201819_DistCapacity_TotalRatio	Correlation	1.000	.442	.640	.706	.723	.587	.622
		Significance (2-tailed)	.	.000	.000	.000	.000	.000	.000
		df	0	532	532	532	532	532	532
	ALT1_201819_Tier3_TotalRatio	Correlation	.442	1.000	.478	.425	.492	.724	.759
		Significance (2-tailed)	.000	.	.000	.000	.000	.000	.000
		df	532	0	532	532	532	532	532
	SUB_201819_SchPriority_TotalRatio	Correlation	.640	.478	1.000	.836	.691	.722	.672
		Significance (2-tailed)	.000	.000	.	.000	.000	.000	.000
		df	532	532	0	532	532	532	532
	SUB_201819_DataUse_TotalRatio	Correlation	.706	.425	.836	1.000	.647	.642	.621
		Significance (2-tailed)	.000	.000	.000	.	.000	.000	.000
	df	532	532	532	0	532	532	532	
SUB_201819_DistPriority_TotalRatio	Correlation	.723	.492	.691	.647	1.000	.619	.623	
	Significance (2-tailed)	.000	.000	.000	.000	.	.000	.000	
	df	532	532	532	532	0	532	532	
ALT1_201819_AdvTier_TotalRatio	Correlation	.587	.724	.722	.642	.619	1.000	.842	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.	.000	
	df	532	532	532	532	532	0	532	
ALT1_201819_Tier2_TotalRatio	Correlation	.622	.759	.672	.621	.623	.842	1.000	
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000	.	
	df	532	532	532	532	532	532	0	

Control Variables			SUB_201819_DistCapacity_TotalRatio	ALT1_201819_Tier3_TotalRatio	SUB_201819_SchPriority_TotalRatio	SUB_201819_DataUse_TotalRatio	SUB_201819_DistPriority_TotalRatio	ALT1_201819_AdvTier_TotalRatio	ALT1_201819_Tier2_TotalRatio
SUB_201819_SchPriority_TotalRatio & SUB_201819_DistPriority_TotalRatio & ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier2_TotalRatio	SUB_201819_DistCapacity_TotalRatio	Correlation Significance (2-tailed) df	1.000 .207 0	-.055 .527					
SUB_201819_DataUse_TotalRatio & SUB_201819_DistPriority_TotalRatio & ALT1_201819_AdvTier_TotalRatio & ALT1_201819_Tier2_TotalRatio	ALT1_201819_Tier3_TotalRatio	Correlation Significance (2-tailed) df	-.055 .527	1.000 0					

a. Cells contain zero-order (Pearson) correlations.

APPENDIX J

TIPS TIERED DECISION GUIDELINES

Measuring System Implementation & Student Outcomes Tiered Problem Solving & Decision-Making Guidelines for Social and Academic Behavior

This document provides a general framework for team organization, problem solving, and decision-making for both academic and social behavior/performance across the three Tiers of Support.

To enhance the effectiveness and efficiency of decision-making, teams need a *tool for getting organized for team problem solving and decision making*. Team organization follows a similar format for teams across the tiers. Team organization begins by defining a set of meeting foundations that provide clarity of purpose, predictability for team meetings, and the decisions that the team needs to make. Even though teams across the tiers of support have different purposes and goals, each team needs to be organized *and* needs to be clear regarding what decisions they are able to make, the decision-making cycle, the data source(s) used, and goal/benchmark levels. Every plan put in place, no matter the tier, needs to have two parts to the evaluation plan: 1) a plan and schedule for monitoring and reporting implementation fidelity at both systems and student intervention levels, and 2) a plan for monitoring student progress toward goals/benchmarks. Measuring student outcomes comes after reviewing implementation fidelity data for both systems features and intervention implementation (for specific problems).

The systems fidelity measure referenced in this document is the Tiered Fidelity Inventory (TFI). To monitor implementation fidelity of specific solutions to specific problems, teams use a variety of strategies ranging from a show of hands, verbal check-ins, and short survey's (public and/or private). Student performance is measured through a variety of tools that collect and summarize student academic and social performance. Within each tier, teams determine the status of student outcome data in relation to national data and/or desired targets. Teams use those data for further queries as they drill down to determine if there are potential problems/referrals.

Tier I Systems of Support include:

- 3-5 positively stated expectations/ academic curriculum with implementation plan for
- defining & teaching expectations/lesson plans,
- instructional schedule with explicit goals & strategies for meeting goals,
- acknowledgement system for student success,
- corrective processes and procedures for academic and social errors, and
- a schedule for using data to monitor implementation fidelity and effects on student outcomes/ progress toward goals.

The purpose of the Tier I team is to:

- coordinate implementation of Tier I systems and supports,
- monitor fidelity of implementation & overall status of progress towards goals/grade level benchmarks.
- identify & develop data-based plans for new problems.
- communicate with other school teams

Tier II Systems of Supports include:

- interventions that provide supplemental support (additional instruction, additional structure & predictability, and increased opportunity for feedback) that is systematic, consistent, and always available for student access.
- A link to Tier I supports
- Student plans, data collection and data entry are consistent across students accessing Tier II support(s).

The purpose of a Tier II team is to:

- coordinate, identify & select students in need of Tier II supports,
- monitor progress for students receiving Tier II supports and,
- monitor fidelity of Implementation of Tier II supports.

Tier III Systems of Supports include:

- interventions that provide & monitor intensive individualized support,
- a Systems Coordination Team to monitor systems implementation fidelity and student referrals for support,
- Individual Student Support Teams

The purpose of the Tier III Systems Coordination Team is to:

- Coordinate implementation of Tier III systems and supports
- Establish and facilitate individual support teams as needed
- Monitor systems & interventions for fidelity of implementation
- Monitor overall status of student progress towards goals.

The purpose of an Individual Student Support Team is:

- Recruit team members
- Complete functional behavior assessment
- Develop the competing behavior pathway and support plan strategies
- Implement plan and measure interventions for fidelity of implementation
- Monitor overall status of student progress towards goals.
- Report student progress to Tier III Coordination Team

The decision-making guidelines outlined, are organized with both academic and social performance in mind, as well as system implementation. A set of decision guidelines, decision-making cycle and goals/benchmarks are provided for each of the four teams described above.

Tier I Coordination and Problem-Solving Team Meeting Foundations

Tier I Team Purpose	Team Agreements
1. Develop and implement Tier I systems & interventions for academic and social success 2. Monitor fidelity of implementation of Tier I systems & supports 3. Monitor academic and social progress for all students 4. Screen, select, & refer students in need of Tier II & III supports	Respect <ul style="list-style-type: none"> • Before meeting, complete tasks, inform facilitator of absence/tardy, avoid side talk • During meeting, avoid side talk, stay focused • Start and end meeting on time Relevance <ul style="list-style-type: none"> • Question fidelity of implementation • Make data-based decisions based on precision statements (what, where, when, who, why & how often) Reality <ul style="list-style-type: none"> • Consider feasibility, social acceptability, & contextual fit

Team Members					
	Facilitator	Minute Taker	Data Analyst	Administrator	Others
Primary					
Back Up					

Team Meeting Schedule			
When	Where	Start/End Time	Meeting Minute Location

	Question	Data Collection & Data Entry Schedule <i>What, Who & When</i>	Report Generation <i>What, Who & When</i>
Fidelity of Implementation	Are systems of support in place and being implemented as planned?		
Student Outcomes	How many months are problem levels at or below the national median or expected for each grade?		
	Is there a gradual increase or decrease in problem levels across a 4-month period of time?		
	Are there peaks in problem levels or dips in academic data that are 15-20% higher/lower?		
	Are Tier I interventions working for 80-85% of students? What percentage of students are receiving Tier II and Tier III supports?		
	Do any students need Tier II or Tier III supports?		

Tier I / Primary Level of Support			
Social and Academic Performance & System Evaluation and Student Outcome Guidelines			
<i>Used for monitoring system implementation & effectiveness of school wide academic and social performance</i>			
Measure	Questions to Answer <i>per plan/goal</i>	Target (Goal)/Review Cycle	
		Behavior Monthly Review Cycle	Academic Quarterly/ Benchmark Review
Implement- ation Fidelity	Are systems of support in place and being implemented as planned?	<i>Aim for 70% implementation fidelity (e.g., TFI-I review quarterly, staff reporting 80% implementation fidelity/ review monthly, students/families/ community members' input/ review annually)</i>	<i>Aim for 80% implementation fidelity on R-TFI/quarterly, and staff reporting 80% implementation fidelity/review monthly</i>
Current Problem Levels	How many months are problem levels at or below the national median or expected for each grade?	<i>Aim for 8 of 10 months to be at or below the national median across a school year/review monthly</i>	<i>Aim for 8 of 10 months to be at or above the expected level for each grade level/review monthly</i>
Trends	Is there a gradual increase or decrease in problem levels across a 4-month period of time?	<i>Aim for consistent and/or decrease in problem levels across time and grade levels/ review monthly</i>	<i>Aim for consistent increase in growth toward benchmark/ review monthly</i>
	Are there peaks in problem levels or dips in academic data that are 15-20% higher/lower?	<i>Aim for consistent and/or decrease in problem levels across time and grade levels/review monthly</i>	<i>Aim for all grade levels being within the benchmark range across time/ review monthly</i>
Student Proportions	Are Tier I interventions working for 80-85% of students? What percentage of students are receiving Tier II and Tier III supports?	<i>Aim for 85% of students having no more than one major ODR across time and grade levels/review monthly</i>	<i>Aim for 80% emerging/on grade level, 15% strategic, and 5% intensive/ review monthly</i>
Groups and Individual Students	Do any students need Tier II or Tier III supports?	<i>Aim for no more than 15% students requiring Tier II supports and no more than 5% of student requiring Tier III supports/review monthly</i>	<i>Aim for no more than 15% students requiring Tier II supports and no more than 5% of student requiring Tier III support/review monthly</i>
<i>Use information to create A Big Picture-Overall Status Statement (Primary Statement) regarding Behavior and Academic performance in relation to national data and to trigger further queries of data.</i>			

Tier I New Problem	Tier I Progress Monitoring Guidelines
<ul style="list-style-type: none"> • Check levels of implementation fidelity • Look for increase/spike in errors/problem behaviors • Review of skills & expectations after extended absences • Use previous year's data trends for prevention planning 	<u>Fidelity of Implementation</u> <ul style="list-style-type: none"> • TFI-Tier I to measure the systems procedures & processes • Fidelity checklist for participating staff <u>Student Outcomes</u> <ul style="list-style-type: none"> • If less than 85% of students are succeeding review implementation fidelity before adjusting the plan • Make sure the problem is defined with precision and solutions with contextual fit • Consider Tier II or III supports for students with 2+ referrals

Tier II Coordination and Problem-Solving Team Meeting Foundations

Tier II Team Purpose	Team Agreements
<ul style="list-style-type: none"> • Identify & select students in need of Tier II supports • Monitor progress for students receiving Tier II supports • Monitor fidelity of Implementation of Tier II supports 	<ul style="list-style-type: none"> • Inform facilitator of absence/tardy before meeting • Avoid side talk • Stay focused & active • Start and end on time

Team Members					
	Facilitator	Minute Taker	Data Analyst	Administrator	Others
Primary					
Back Up					

Team Meeting Schedule			
When	Where	Start/End Time	Meeting Minute Location

Question	Data Collection & Data Entry Schedule <i>What, Who & When</i>	Report Generation <i>What, Who & When</i>
Fidelity of Implementation		
Student Outcomes		

Tier II (Secondary Level): Social and Academic Performance & System Evaluation and Student Outcome Guidelines <i>Used for monitoring system implementation and effectiveness of Tier II academic and social supports</i>		
Questions to Answer per plan/goal		Target (Goal)/ Monthly Review Cycle
Implement- ation Fidelity	Are systems of support in place and being implemented as planned?	<i>Aim for 70% systems implementation fidelity on TFI-II, quarterly & staff reporting 80% implementation fidelity, monthly</i>
Current Level of student proportion	How many students are receiving Tier II supports?	<i>Aim for no more than 15% of student population (at one time) requiring Tier II supports, monthly</i>
Trends in student proportion	What proportion of our students is receiving Tier II supports?	<i>Aim for no more than 15% of student population (at one time) requiring Tier II supports, monthly</i>
Trends in overall student progress	What are the trends of overall progress across students with Tier II supports?	<i>At least 70% of students receiving Tier III supports are starting or progressing, monthly</i>
	What proportion of students receiving Tier II support for 6 weeks are progressing and have met goals?	<i>Aim for 80% of students receiving Tier II support for at least 6 week to be progressing, monthly</i>
Trends in individual student data	Do any students need to be referred for Tier III supports?	<i>Aim for no more than 5% of student population (at one time) requiring Tier III supports, monthly</i>
<i>Use information to create an Overall Status Statement regarding fidelity of implementation and student progress toward goals & to trigger further queries of the data.</i>		

Tier II New Problem/ New Referral Triggers	Tier II Progress Monitoring Guidelines
<ul style="list-style-type: none"> • Student was receiving Tier II support in prior placement • Students who enroll in school after the first 3 weeks of the school year participate in CICO for the first 2-5 days of attendance as an orientation to school expectations, procedures and locations • Student receives 2 or more office discipline referrals • Student has more than 5 absences in a 30-day period • There is significant concern regarding mental health issues, anti-social behavior, or serious concerns about family support • Student has a 504 plan • Student, teacher and/or family request • Student is not in crisis • Instructional staff are trained to implement Tier II interventions (fidelity of implementation) 	<p><u>Fidelity of Implementation Measures</u></p> <ul style="list-style-type: none"> • Tiered Fidelity Inventory for Tier II (TFI-Tier II) to measure the systems procedures and processes • Fidelity Checklist for participating staff <p><u>Student Outcomes</u></p> <ul style="list-style-type: none"> • As defined by student support plan/IEP • After documenting fidelity of implementation <ul style="list-style-type: none"> <u>Retain</u> intervention for at least 6 weeks of success or upward trend toward goal <u>Modify</u> intervention with more intensive supports if after two weeks of implementation, there is no improvement <ul style="list-style-type: none"> • add to basic CICO, or • move to Tier III supports & create a student support team <u>Fade</u> supports to a self management system when student has been successful 4 days a week (80% of time) for at least 6 weeks <u>Graduate</u> off Tier II intervention with self management success for 4-6 weeks

Tier III Coordination Team Meeting Foundations

Tier III Team Purpose	Team Agreements
<ul style="list-style-type: none"> • Coordinate implementation of Tier III systems and supports • Establish and facilitate individual support teams as needed • Monitor systems & interventions for fidelity of implementation • Monitor overall status of student progress towards goals. 	<ul style="list-style-type: none"> • Inform facilitator of absence/tardy before meeting • Avoid side talk • Stay focused & active • Start and end on time

Team Members					
	Facilitator	Minute Taker	Data Analyst	Administrator	Others
Primary					
Back Up					

Team Meeting Schedule			
When	Where	Start/End Time	Meeting Minute Location

Question	Data Collection & Data Entry Schedule <i>What, Who & When</i>	Report Generation <i>What, Who & When</i>
Fidelity of Implementation		
Student Outcomes		

Tier III System Evaluation Guidelines		
<i>Used for monitoring system implementation and effectiveness of individual student support plans</i>		
Questions to Answer		Target (Goal)/ Bi-Weekly Review Cycle
Implementation Fidelity	What percentage of system features is in place?	<i>Aim for 70% on TFI-Tier III or equivalent measure, quarterly & staff reporting 80% implementation fidelity, weekly</i>
Current Level of student proportions	What proportion of our students is receiving Tier III supports?	<i>Aim for no more than 5% of student population (at one time) requiring Tier III supports, monthly</i>
Trends in student proportions	What are the trends of overall progress across students with Tier III supports?	<i>At least 70% of students receiving Tier III supports are starting or progressing, monthly</i>
Trends in overall progress	What percentage of students receiving Tier III support for 6 weeks are progressing and have met goals?	<i>Aim for 80% of students receiving Tier III support for at least 6 week to be progressing, bi-weekly</i>
<i>Use information to create A Big Picture- Overall Status Statement (Primary Statement) regarding Tier III systems & to trigger further queries of the data.</i>		

Tier III New Problem/ New Referral Triggers	Tier III Progress Monitoring Guidelines
<ul style="list-style-type: none"> • Progress is below the expected rate after 2-6 weeks of receiving Tier II supports • Student receives 6 office discipline referrals • Student has more than 5 absences in a 30-day period • There is significant concern regarding mental health issues, anti-social behavior, or serious concerns about family support • Student's behavior poses a potential risk to self or others. • Student has an IEP • Teacher and/or family request 	<p><u>Fidelity of Implementation</u></p> <ul style="list-style-type: none"> • Tiered Fidelity Inventory for Tier III (TFI-Tier III) to measure the systems procedures and processes • Fidelity Checklist for staff participating in Tier III intervention implementation as defined by student support plan <p><u>Student Outcomes</u></p> <ul style="list-style-type: none"> • Use goals defined in student support plan • <i>After documenting fidelity of implementation</i> <p><u>Retain</u> intervention for at least 6 weeks of success or upward trend toward goal</p> <p><u>Modify</u> intervention if after two weeks of implementation, there is no improvement</p> <p><u>Fade</u> supports to an individualized self management system or Tier II Check In Check Out system when student has been successful 4 days a week (80% of time) for at least 6 weeks</p>

Tier III Individual Student Support Team Meeting Foundations

Tier III Individual Student Support Team Purpose	Team Agreements
<ul style="list-style-type: none"> • Recruit team members • Complete functional behavior assessment • Develop the competing behavior pathway and support plan strategies • Implement plan and measure interventions for fidelity of implementation • Monitor overall status of student progress towards goals. • Report student progress to Tier III Coordination Team 	<p>Respect</p> <ul style="list-style-type: none"> • Before meeting, complete tasks, inform facilitator of absence/tardy, avoid side talk • During meeting, avoid side talk, stay focused • Start and end meeting on time <p>Relevance</p> <ul style="list-style-type: none"> • Question fidelity of implementation • Make data based decisions based on precision statements (what, where, when, who, why & how often) <p>Reality</p> <ul style="list-style-type: none"> • Think about feasibility, social acceptability, & contextual fit

Student Information

Name _____ Grade _____ IEP? 504?

Team Members					
	Facilitator	Minute Taker	Data Analyst	Administrator	Others
Primary					
Back Up					

Team Meeting Schedule			
When	Where	Start/End Time	Meeting Minute Location

Question	Data Collection & Data Entry Schedule <i>What, Who & When</i>	Report Generation <i>What, Who & When</i>
Fidelity of Implementation		
Student Outcomes		

Tier III Individual Student Support Evaluation Guidelines <i>Used for monitoring individual student progress toward goals</i>		
Questions to Answer per plan/goal		Target (Goal)/ Weekly Review Cycle
Implementation Fidelity	Was the plan implemented as planned?	<i>Aim for 80% implementation fidelity, weekly</i>
Current Level of student problem	What is the current status of problem in relation to previous review and goal?	<i>Aim for making progress toward goal, weekly</i>
Trends in frequency	What are the trends of overall progress toward goal(s)?	<i>Aim for increasing trend toward goal, weekly</i>
Peaks in frequency	Are there peaks in problem behavior across time	<i>Aim for consistent and/or decrease in problem level across time (or increase in skill level), weekly</i>

Team Name : _____

Date: _____

Team Purpose	Team Agreements

Team Members					
	Facilitator	Minute Taker	Data Analyst	Administrator	Others
Primary					
Back Up					

Team Meeting Schedule			
When	Where	Start/End Time	Meeting Minute Location

Question	Data Collection & Data Entry Schedule <i>What, Who & When</i>	Report Generation <i>What, Who & When</i>
Fidelity of Implementation		
Student Outcomes		

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tips2info@blogspot.com

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