

THE URGENCY OF DOING: ASSESSING THE SYSTEM OF SUSTAINABLE IMPLEMENTATION MODEL VIA THE SCHOOLS IMPLEMENTING TOWARDS SUSTAINABILITY (SITS) SCALE

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School-based prevention and promotion interventions (SBPPI) improve desirable outcomes (e.g., commitment to school and attendance) and reduce undesirable outcomes (e.g., suspensions and violence). Unfortunately, our understanding of how to effectively implement and sustain SBPPI outside of well-controlled conditions is lacking. To bridge this science/“real world” practice gap, a system of sustainable implementation, which merges

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implementation strategies and sustainability strategies, is proposed for SBPPI. Ecological levels and phases affect this system. This conceptualization is supported by analyses from a diverse sample of 157 schools implementing Social-Emotional Character Development, a type of SBPPI. The system of sustainable implementation was measured using the Schools Implementing Towards Sustainability (SITS) scale, which was designed to be “user-friendly” in field settings by being viable and scalable. The SITS demonstrated strong reliability as well as promising concurrent and construct validity. Implications are discussed.

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I have been impressed with the urgency of doing. Knowing is not enough; we must apply. Being willing is not enough; we must do. Leonardo da Vinci

The Elementary and Secondary Education Act (ESEA) in the United States, best known as the No Child Left Behind (NCLB) Act of 2001, requires schools to not only improve academic achievement and close the achievement gap between high-performing and low-performing students but also establish plans for being safe and drug-free, preventing school dropout, and providing support to delinquent youth to continue their education (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2005). NCLB also requires prevention programs to be grounded in scientific research and to have evidence of effectiveness; and it is clear at the time of this writing that this feature will be integrated into any form of reauthorization of the ESEA.

One type of school-based prevention and promotion intervention (SBPPI) is social-emotional character development (SECD), which combines social-emotional learning (SEL) with character and moral education. SECD is the integration of one's “capacity to recognize and manage emotions, solve problems effectively, and establish positive relationships with others” (Zins & Elias, 2006, p. 1) with prosocial attitudes, values, and judgments. When implemented correctly, SECD has been shown to improve desirable outcomes (e.g., commitment to school, standardized achievement test scores, and attendance) and reduce undesirable outcomes (e.g., suspensions, drug and alcohol use, and violence; Zins & Elias, 2006).

Unfortunately, despite two decades of steady growth in our understanding of what works for SBPPI, in general, and SECD, in particular (Dalton, Elias, & Wandersman, 2007; Kam, Greenberg, & Walls, 2003), our understanding of how to implement these interventions outside of well-controlled conditions, how to sustain them over time, and how to disseminate them widely is lacking (Elias, 2007; Elias, Zins, Graczyk, & Weissberg, 2003). This process has left us with a science of “what works” but not an equally well-developed science of “how to.” Many in the scientific community have stated that the time has come to build a science of implementation and dissemination to bridge the science/“real world” gap (Greenberg, Domitrovich, Graczyk, & Zins, 2005; Proctor et al., 2009).

Conceptualizing Implementation in Schools

SECD implementation can be described in terms of three interrelated categories: the system of sustainable implementation, the ecological levels, and the phases. However, before reviewing the conceptual framework of implementation, several key terms must be defined. *Implementation* is “the use of strategies to introduce or change evidence-based health interventions within specific settings” (The National Institutes of Health [NIH], 2005, “Research Objectives,” para. 11). *Fidelity*, also known as treatment integrity or adherence, is “the degree to which a proposed intervention is delivered as it was originally intended” (Yeaton & Sechrest, 1981, p. 160). Here, we refer to the active ingredients of the program, not simply its surface form. *Sustainability*, also known as institutionalization, is defined as a program’s ability to withstand the test of time, which requires that the program is “not dependent on an influential leader or a few staff members, all of whom will eventually leave the setting” (Dalton et al., 2007, p. 374). *Scalability* refers to the ability of an intervention to be done at many different sites effectively (Elias et al., 2003). Thus, implementation is the sum total of *how* things are done, fidelity is *obeying* the program designers, sustainability is the *durability* of a program despite changing circumstances, and scalability is the intervention’s ability to *expand*.

System of sustainable implementation. The system of sustainable implementation is the network of factors that facilitate implementation by promoting both fidelity and sustainability. The factors have been called barriers to implementation, contextual factors, effective strategies, essential elements, implementation steps, institutionalization conditions, sustainability factors, and more (Berkowitz, & Bier, 2006; CASEL, 2005; Commins & Elias, 1991; Elias, 2007; Greenberg et al., 2005; Ji et al., 2008). While at first glance this approach may appear to conflate implementation and sustainability, conceptually and pragmatically there are very few, if any, differences between the two concepts.

From a conceptual viewpoint, truly effective implementation strategies must be effective sustainability strategies. If a strategy really helps an intervention be implemented with better fidelity, then that strategy will also lead to the intervention having better staying power in the school. If a strategy really helps an intervention become a part of the school in an effective way, then that strategy will also increase the probability of having greater fidelity and higher implementation rates. An important caveat, noted by Commins and Elias (1991), is that shortcuts taken to foster initial adoption of an intervention can, in fact, compromise its sustainability. Making a program appear simpler initially than it will be in reality is an example of one such shortcut. So, in our conceptualization, we are assuming the integrity of initial implementation.

More pragmatically, the findings from studies that identify “implementation factors” are highly similar to studies that identify “sustainability factors.” Greenberg et al. (2005) identify inadequate principal leadership as a barrier to implementation, whereas Commins and Elias (1991) identify principal support as an institutionalization condition. CASEL (2005) identifies the lack of adequate staff development and continuing support as a barrier to implementation, whereas Elias (2007) identifies ongoing professional development as a sustainability factor.

When examined conceptually and empirically, studies on “implementation factors” and “sustainability factors” overwhelmingly address the same mechanisms, structures, and goals and arrive at the same findings. The high overlap allows us to combine these two areas of study that typically are kept separate, to yield a new model of implementation: the system of sustainable implementation.

Network of factors. As there is great overlap in the specific factors that make up the system of sustainable implementation, only the article with the most schools and the longest duration between the initial implementation phase and the measurement of the factors related to sustainability will be summarized: Elias (2007) conducted 21 interviews of teachers, principals, and other school staff at 15 different sites that had previously been identified as model and flagship sites (Elias et al., 1997).

Using field notes as well as the transcribed tapes from site visit interviews, Elias (2007) identified seven factors that combine to create a network of influences on sustainability, which include that there is: (a) a clear commitment, participation, and reinforcement of program implementation from key school administrators; (b) a core group of individuals, in addition to the school administrator, that strongly supports the program and is very involved in it; (c) a program language and skills present in multiple aspects of daily school life; (d) a program compatible with school needs and activities; (e) a plan that exists and is followed for perpetuating the knowledge and skills needed to implement the program; (f) a systematic set of opportunities for staff to reflect upon progress of the program; and (g) a way that information about the program's effectiveness is collected, reflected upon, and used for future planning.

Ecological levels surrounding implementation. Most SBPPI are conceptualized as individual interventions that occur in the classroom, which leads some researchers to act as if fidelity was the only key component of implementation. However, all interventions occur in a particular context. Drawing upon ecological systems theory, Greenberg et al. (2005) identify four levels that provide the context surrounding SBPPI: the classroom, the school, the district, and the community. As each level is nested within others, actions at each level are interdependent (e.g., what programs are chosen, the quality and sustainability of the programs, what adaptations are made). All four levels must be in a good-enough alignment if an intervention is going to succeed in the long term; any disincentives for implementing the intervention at an outer ecological level must be balanced by incentives at more proximal levels (Commins & Elias, 1991).

Each level contains environmental and structural aspects. Environmental aspects capture the attitudes, knowledge, and behaviors of people (e.g., student attendance, staff mobility, suspension rates) as well as the quality of interpersonal interactions (e.g., student climate, staff climate, bullying rates, violent events). The structural aspect captures the organization (e.g., grade configuration, school size, student to faculty ratio) and resources (e.g., finances). See Greenberg and colleagues (2005) for a more comprehensive review.

Phases of implementation. Implementation does not occur instantaneously but rather in phases. The number of phases varies from author to author, but all conceptualizations include a preparation phase, an initial delivery phase, and a continuing delivery phase (Commins & Elias, 1991; Greenberg et al., 2005; Ji et al., 2008). The *preparation phase* begins once the school decides to introduce an intervention (e.g., determining needs and resources, forming a committee). The *initial delivery phase* begins once the intervention has begun affecting students directly (e.g., beginning a pilot program). The *continuing delivery phase* begins once the intervention has become a part of the entire school's social, economic, and organizational culture for multiple years (e.g., securing long-term financial support).

Schools' movement between phases is highly variable, determined by the aforementioned outcomes, and never guaranteed. However, as it takes 3-5 years for positive changes to be noticeable and stable after implementing a program (Dalton et al., 2007), no school

should be considered to be in the continuing delivery phase until the initial delivery phase has been successfully applied to all eligible students for at least that much time. After a school has entered the continuing delivery phase, the school must return to the preparation phase because ongoing adaptations of the intervention are needed to address the inevitable changing conditions of the school (e.g., student demographics, legislative mandates, funding). This cyclical conceptualization is necessary because it not only sets the stage for what steps and expectations are appropriate and necessary at a given time for a school, but it also reminds the school (and intervention designers) that implementation is never truly complete.

Integrating the System of Sustainable Implementation With the Levels and Phases

Both the current phase of the intervention and the various ecological levels affect the results of each specific factor of the system of sustainable implementation. For instance, the system of sustainable implementation at the school level often determines the maximum level of fidelity and sustainability in the classrooms. If there are too many barriers, then no teacher will be able to implement the SBPPI effectively in the long run.

Additionally, the school environment and school structure influence the overall system of sustainable implementation. A positive school climate among staff, for example, promotes implementation by building a sense of professional community to collaborate and meet the challenges of implementing an intervention (Greenberg et al., 2005; King & Newmann, 2000). In contrast, a high child-to-teacher ratio or frequent teacher absences can lead to problematic social behavior in students (Substance Abuse and Mental Health Services Administration [SAMSHA], 2002), which may interfere with implementation. That said, the effects of the school structure on the system of sustainable implementation can be uncertain and complex. For instance, Hartmann and colleagues (2009) report that small high schools have better student outcomes than large high schools, but the effect disappears when the school can choose who enters the school.

Measuring Implementation

Although a conceptual framework of implementation is necessary, a true *science* of implementation requires a way of measuring implementation. Measurement can take place at all four ecological levels during all three phases and frequent measurements at multiple levels are critical to prevent drift. "Indeed, drift is a major problem in dissemination efforts generally, and thus the evaluation and maintenance of treatment fidelity may be a core component of ongoing efforts" (McHugh & Barlow, 2010, p. 74).

Common forms of measuring implementation include having teachers complete self-reports, having trained observers code the teachers' fidelity to the intervention, and conducting in-depth interviews (CASEL, 2005; Elias, 2007; Hall & Hord, 2005; Horner et al., 2004). Unfortunately, these methods are often costly (i.e., time and money) and have low scalability (e.g., observers cannot go to every school in the country). What is needed is a quick, cost-effective, scalable measure that can be used by multiple informants with robust reliability and validity.

The Present Study: The SITS

The current project examines the reliability and validity of the Schools Implementing Towards Sustainability (SITS) scale. The SITS survey was developed to be sustainable,

scalable, scientifically valid, and useful in making predictions about a range of school intervention outcomes. In fact, the acronym SITS is intended to emphasize the goal of sustainability (e.g., the intervention “sitting” within the school in an enduring way).

Research questions and hypotheses. Several research questions (labeled as “Qs”) and several hypotheses (labeled as “Hs”) were examined.

- Q1. Does the relationship between the system of sustainable implementation (as represented by SITS scores) and other constructs differ based upon who completes the SITS?
- Q2. What aspects of the school structure (defined by grade configuration and enrollment) affect the system of sustainable implementation?
- H1. Schools that receive more support from experts (as represented by Tier will have higher SITS scores.
- H2. Schools with more structural risk factors (at the school, district or community level) will have weaker systems of sustainable implementation. That is, schools in districts with lower socioeconomic status (SES) and schools with higher student to faculty ratios will have lower SITS scores.
- H3. Schools with better school environments will have higher implementation scores. That is, a more positive school climate, as perceived by students and staff, and higher student attendance will predict higher SITS scores. Conversely, higher staff mobility, higher bullying rates, higher suspension rates, and higher rates of violence will predict lower SITS scores.

METHOD

Setting

The SITS survey was distributed to all active schools participating in the Developing Safe and Civil Schools (DSACS) Project. There were 150 active schools at Time 1 (2008–2009) and 126 active schools at Time 2 (2009–2010; see Table 1). When the SITS was completed, DSACS was an ongoing, longitudinal, action-research project aimed at improving school climate and academics and decreasing violence through implementing SECD in schools (Elias, 2009).

All participating DSACS schools agreed to identify a SECD coordinator as the primary contact person to work with a designated DSACS staff member, referred to as the DSACS liaison. Key intervention tasks were as follows: to organize an SECD committee to plan, implement, and evaluate SECD in the school; to develop an annual and multiyear SECD implementation plan and to set and monitor 8-week cycle goals; and to attend DSACS professional development opportunities throughout the year. Each school’s committee, however, chose their own sequence to address the needs of their school.

Participants

Participants include all of the DSACS liaisons and school coordinators who confidentially completed the SITS (see Table 1 for school survey counts) as well as all students and teachers/staff that completed an anonymous DSACS school climate survey. DSACS obtained approval from the Institutional Review Board (IRB) of Rutgers, The State

Table 1. School Surveys Counts

| | 2008–2009 | | 2009–2010 | |
|--|-----------|--------|-----------|--------|
| Active DSACS schools | 150 | | 126 | |
| Liaison SITS surveys (%) | 138 | (92.0) | 120 | (95.2) |
| Coordinator SITS surveys (%) | 71 | (47.3) | 63 | (50.0) |
| Both SITS surveys (%) | 69 | (46.0) | 61 | (48.4) |
| Student climate surveys (%) | 84 | (56.0) | 52 | (41.3) |
| Staff climate surveys (%) | 79 | (52.7) | 34 | (27.0) |
| Both climate surveys (%) | 69 | (46.0) | 29 | (23.0) |
| Liaison SITS & student climate surveys (%) | 84 | (56.0) | 52 | (41.3) |
| Liaison SITS & staff climate surveys (%) | 79 | (52.7) | 34 | (27.0) |
| Coordinator SITS & student climate surveys (%) | 43 | (28.7) | 29 | (23.0) |
| Coordinator SITS & staff climate surveys (%) | 38 | (25.3) | 17 | (13.5) |

Note. DSACS = Developing Safe and Civil Schools; SITS = Schools Implementing Towards Sustainability Scale.

There are 157 unique schools with at least one SITS survey. Between the 2008-2009 and the 2009-2010 academic year, 18 new schools became active in DSACS and 42 old schools became inactive. Climate surveys are counted only if at least one SITS survey exists for that school. During the 2009-2010 academic year the State of New Jersey dramatically cut the budgets of all schools, which resulted in less resources (e.g., time and personnel) to complete climate surveys.

University of New Jersey and the New Jersey Department of Education (NJ DOE) to collect confidential data from liaisons, coordinators, and schools and to collect anonymous data from students, teachers, and staff as part of its ongoing program evaluation. All schools that had at least one SITS survey (by a liaison and/or coordinator) were included in this article. This resulted in 157 unique schools.

SITS demographics. All liaisons and all coordinators were invited to complete the SITS. The DSACS liaison is the outside expert on SECD and the contact person for the school. All liaisons completed the SITS at Time 1 ($n = 13$) and at Time 2 ($n = 11$). Two liaisons were White males and one was an African American female. The remaining liaisons were White females. The median number of surveys completed was four at Time 1 and three at Time 2.

The school SECD coordinator is the person in the school who leads the SECD effort in the school and acts as contact person within the school. There were no refusals at either time. Demographic information was not collected during the administration of the SITS, but most of the coordinators were White and the vast majority were female. All coordinators had other roles within the school; the most common roles were being a teacher or a school mental health professional. Most coordinators were the contact person for only one school, and the median number of surveys completed by a coordinator was one at both times.

Climate demographics. All students were invited to complete the student climate surveys, and all staff were invited to complete the staff climate surveys. There were no refusals by students or staff that were in attendance at the time of survey (see Table 1 for school survey counts). Students usually completed the survey on a typical school day; staff usually completed the survey during a faculty meeting. There were no provisions to gather data from any absentees. For the student climate surveys, the average school had 421 respondents (mean [M_1] = 386.1, standard deviation [SD_1] = 343.7, $M_2 = 443.8$, $SD_2 = 406.6$), where 49.8% ($SD = 3.6\%$) were female and 54.9% ($SD = 26.5\%$) were non-White. For the staff climate surveys, the average school had 52.81 respondents ($M_1 = 50.6$, SD_1

Table 2. School Demographics

| | 2008–2009 | | 2009–2010 | |
|---|-----------|---------|-----------|---------|
| Tier 1 (e-mail/phone support) (%) | 30 | (21.4) | 21 | (16.8) |
| Tier 2 (process support onsite) (%) | 67 | (47.9) | 60 | (48.0) |
| Tier 3 (process/content support onsite) (%) | 42 | (30.0) | 42 | (33.6) |
| Cohort 1 (began 2005-2006) (%) | 8 | (5.7) | 7 | (5.6) |
| Cohort 2 (began 2006-2007) (%) | 27 | (19.3) | 22 | (17.6) |
| Cohort 3 (began 2007-2008) (%) | 58 | (41.4) | 50 | (40.0) |
| Cohort 4 (began 2008-2009) (%) | 46 | (32.9) | 44 | (35.2) |
| Public schools (%) | 128 | (91.4) | 115 | (92.0) |
| School structure | | | | |
| School size avg. (SD) | 700.5 | (414.7) | 730.2 | (444.5) |
| Grade configuration | | | | |
| Primary schools (%) | 6 | (4.3) | 6 | (4.8) |
| Elementary schools (%) | 51 | (36.4) | 44 | (35.2) |
| Elementary/middle schools (%) | 16 | (11.4) | 9 | (7.2) |
| Middle schools (%) | 33 | (23.6) | 34 | (27.2) |
| Middle/high schools (%) | 3 | (2.1) | 3 | (2.4) |
| High schools (%) | 23 | (16.4) | 19 | (15.2) |
| Structural risk factors | | | | |
| Low SES (%) | 27 | (19.3) | 18 | (14.4) |
| Student to faculty ratio avg. (SD) | 10.6 | (1.8) | 10.6 | (1.9) |
| School environment | | | | |
| Staff mobility % avg. (SD) | 4.7 | (5.8) | 5.6 | (12.1) |
| Student attendance % avg. (SD) | 94.8 | (2.7) | 95.1 | (1.6) |
| Student suspensions avg. (SD) | 5.9 | (8.9) | 6.3 | (10.1) |
| Violent events avg. (SD) | 6.1 | (10.4) | 6.3 | (9.2) |
| Students are often bullied avg. (SD) | 3.0 | (0.4) | 3.1 | (0.4) |
| Student climate avg. (SD) | 3.5 | (0.4) | 3.4 | (0.4) |
| Staff climate (40) avg. (SD) | 3.7 | (0.4) | 3.7 | (0.3) |
| Staff climate (20) avg. (SD) | 3.7 | (0.4) | 3.7 | (0.3) |

Note. Avg = Mean average; SD = standard deviation; SES = Socioeconomic status.

Numbers represent counts unless otherwise specified. Percents do not add up to 100% due to missing data. Grade configuration: primary = no grades above 3; elementary = mostly grades 1-5; elementary/middle = mix of grades 1-8; middle = mostly grades 6-8; middle/high = mix of grades 6-12; high = mostly grades 9-12. Responses for bullying and climate range from 1 (*Disagree a lot*) to 5 (*Agree a lot*).

= 30.4, $M_2 = 56.6$, $SD_2 = 33.6$), where 82.29% ($SD = 11.7\%$) were female and 70.6% ($SD = 15.7\%$) were teachers.

School demographics. All schools were in the State of New Jersey (see Table 2 for school demographics). Almost all were public schools. A little under one-fifth were from school districts with low socioeconomic status. Over one-third were elementary schools (ES), one-fourth were middle schools (MS), and one-sixteenth were high schools (HS), with the rest having another type of grade configuration. Grades K-5, PK-5, PK-6, and K-6 (in descending order) were most common for ES, Grades 6-8 were most common for MS, and Grades 9-12 for HS.

Measures

SITS description. The SITS was created June 2009 by Dominic C. Mocerri and Maurice J. Elias of the SEL Lab at Rutgers, The State University of New Jersey after a comprehensive

review of the research literature on evidence-based SECD implementation and sustainability strategies. A rough draft of the SITS was given to the two primary DSACS liaisons (i.e., the director of field services and the project director), who provided feedback. The final survey was approved by the DSACS director of field services before being distributed to all of the DSACS liaisons. In the end, 15 factors relating to sustainable implementation were represented by 15 items in a true-false format. Before completing the SITS, respondents were given a brief definition of SECD and told to evaluate SECD as a whole if there was more than one intervention. Although respondents were told to select “Don’t Know” as often as necessary, as we were not asking them to find out any additional information, they were told to select “Don’t Know” only when they had no basis to answer the question. All SITS surveys were completed over the Internet.

Scoring of the SITS is additive, with higher scores indicating a more robust network of factors that facilitate implementation by promoting both fidelity and sustainability. The items can be mapped onto the ecological levels surrounding implementation and onto the phases of implementation (see the Appendix for items and mapping of phases and levels). The mapping of the phases is only done to demonstrate when a factor is most likely to begin being implemented; the SITS assumes that all factors ultimately must be maintained for the intervention to remain sustainable.

SITS Time 1. The liaisons completed the survey June–August 2009 for the 2008–2009 academic year (i.e., Year 4 of DSACS). All but five school coordinators completed the survey September–October of 2009 (with the last five completing the survey by November) for the 2008–2009 academic year.

SITS Time 2. Based upon feedback from the DSACS liaisons as well as a review of psychometrics, the true/false format of the SITS was changed into a 4-point scale. Although this change means that the SITS at Time 1 and Time 2 is not identical, the premise of modifying measurement scales fits with the action-research framework in which DSACS is grounded. The SITS scale at Time 2 (SITS-Tot2a) was computed by summing the responses: 0 (*False, not at all true*) and (*Don’t Know*), 1 (*Somewhat true*), 2 (*True*), and 3 (*Very true*). An alternative SITS scale at Time 2 (SITS-Tot2b) was computed to be equivalent to the Time 1 scores by summing the responses: where 0 (*False, not at all true*) and (*Don’t Know*) and 1 (*all three types of true*). SITS-Tot2b was used for calculating SITS changes across time, but SITS-Tot2a was used for all other SITS analyses for Time 2. The DSACS liaisons completed the SITS for Time 2 between June–July 2010 for the 2009–2010 academic year (i.e., Year 5 of DSACS). All but one school coordinator completed the SITS for Time 2 between April–July 2010, with the last one completing the survey in August.

Climate surveys. Every school participating in DSACS was strongly encouraged to participate in a school climate survey, which was completed by the students and staff on a yearly basis. The student climate survey, known as the DSACS Climate Survey-Student version (Elias, 2009), comprises 20 questions adapted from the School as a Caring Community Profile-II (SCCP-II; Lickona & Davidson, 2003), as well as additional questions that measure the level of student and staff approval, the utility of learning, and student pride. The staff climate survey, known as the DSACS Climate Survey-Staff version (Elias, 2009), comprises the same 20 questions from the student climate survey (where staff are asked about students’ perceptions), plus 20 additional climate questions incorporating the School Organisational Health questionnaire (Hart, Wearing, Conn, Carter, & Dingle, 2000) that focus on staff perceptions of the school as a work environment. The

internal reliability is good ($\alpha = .89$) for the student version, very good ($\alpha = .94$) for the 40-item staff version, and very good ($\alpha = .90$) for the 20-item staff version (which duplicates the student version). Sample items on the student version include “Students work well together” and “Students here have a lot of school pride.” Sample items on the staff version include “Parents show respect for teachers” and “I receive support from my colleagues.” Responses range from 1 (*Disagree a lot*) to 5 (*Agree a lot*); some items are reversed coded.

Bullying survey. Bullying items were listed after the student climate survey and used its response scale. One item (“Students are often bullied or teased in my school”), which correlated highly with all other bullying indicators, was analyzed.

DSACS variables. One variable (Tier) from the DSACS Initiative was analyzed. Tier refers to the school’s assigned format of DSACS services. Tier 1 schools received a DSACS e-mail and telephone buddy with one in-person meeting. Tier 2 schools received process focused, onsite support. Tier 3 schools received process and content onsite support. Cohort was not analyzed, as all DSACS schools were in the initial delivery phase at the time the SITS was distributed. Cohort 1 schools joined DSACS during the 2005-2006 academic year. Cohort 4 schools joined during 2008-2009. Cohorts 1-3 were assigned to Tier based upon their perceived need by the DSACS staff. Cohort 4 was randomly assigned to Tiers in a stratified manner (based upon school type and size).

NJDOE variables. Several variables from the New Jersey Department of Education (NJDOE) School Report Cards online database (<http://education.state.nj.us/rc/>) and the NJDOE Electronic Violence and Vandalism Reporting System (EVVRS) (https://homeroom2.state.nj.us/DOE_EVVRS/jsp/login.jsp) were utilized. These variables included grade configuration, school size (i.e., enrollment), student to faculty ratio, staff mobility, student attendance rate, number of suspensions, school violence rates, and the District Factor Grouping (DFG). DFG is an indicator of socioeconomic status (SES; NJDOE, 2004). The two lowest DFG categories were designated low DFG; all others were nonlow DFG.

RESULTS

Preliminary analyses revealed that the distribution of tier, cohort, and grade configuration for the SITS surveys was heavily unbalanced. Therefore, it was not possible to analyze interaction effects; and all tiers, cohorts, and school structures were analyzed together (unless otherwise noted) for the reliability, concurrent validity (H1), and construct validity (H2, H3) of the SITS.

Table 2 contains overall descriptives for the dataset. All means and standard deviations for analyses of variance (ANOVAs) used Tukey’s honestly significant difference (HSD) for post-hoc analyses.

Effect sizes. For correlations, an r of .1 is small, .3 is medium, and .5 is large (Cohen, 1992). For one-way ANOVAs, a partial eta squared (η_p^2) value of .02 is small, .13 is medium, and .26 is large (Cohen, Cohen, West, & Aiken, 2002). For independent-samples t tests, a Hedge’s g (unbiased) of .2 is small, .5 is medium, and .8 is large (using Cohen [1992]’s conventions for d). Hedge’s g (unbiased) is a more conservative effect size than d and was

computed using DeFife (2009). All other statistics were calculated using SPSS Statistics v.19.

Outliers. To maximize generalizability, conservative guidelines for identifying outliers were adopted from Tabachnick and Fidell (2006). Specifically, a variable was labeled an outlier if its univariate z score was greater than 3.39, its multivariate Mahalanobis distance was greater than 10.828, and its multivariate Cook's distance was greater than 1.00. This occurred once (see student attendance). If two of these three conditions were met, the analysis was performed with and without the outliers being made less deviant. In all of those cases, the r values and p values were nearly identical and the unmodified analysis were reported.

Reliability of the SITS

Internal reliability. The internal consistency of the SITS was good at Time 1 for DSACS liaisons ($\alpha = .87$) and for school coordinators ($\alpha = .85$) and very good at Time 2 for liaisons ($\alpha = .96$ for primary coding, $\alpha = .92$ for alternative coding) and coordinators ($\alpha = .93$ for primary coding, $\alpha = .89$ for alternative coding), using conventions from Nunnally and Bernstein (1994).

Question 1: Parallel analyses. The correlation between the primary and alternative coding of the SITS at Time 2 was large for liaisons, $r(118) = .91, p < .001$, and large for coordinators, $r(61) = .77, p < .001$. Therefore, only the results for the primary coding of Time 2 were analyzed.

Coordinators provided higher student SITS scores than liaisons at Time 1, $M_L = 8.99, SD_L = 3.81; M_C = 10.14, SD_C = 3.91, t(68) = -2.17, p = .033$, and at Time 2, $M_L = 23.28, SD_L = 14.64; M_C = 27.72, SD_C = 10.81, t(60) = -2.99, p = .004$. This indicates the need for parallel analyses of the research questions and hypotheses even though there was a medium correlation between the two SITS scores at Time 1, $r(67) = .34, p = .004$, and a large correlation in Time 2, $r(59) = .62, p < .001$, at Time 2 between the two responder types. As each respondent has a unique viewpoint (i.e., the liaison as the expert on SECD and the coordinator as the expert on the school), neither group's responses will be posited to be more true than another.

Stability over time. There was a strong relationship between the SITS scores at Time 1 and 2 for liaisons, $r(99) = .57, p < .001$, and for coordinators, $r(32) = .61, p < .001$. The high stability over time approaches the traditional test-retest lower bound value of .667 (Nunnally & Bernstein, 1994), which is remarkable as (a) sustainability is an ongoing process that must be actively maintained rather than a permanent characteristic, (b) many months passed between Time 1 and Time 2 (10-13 months for the DSACS liaisons and 5-10 months for the school coordinators), and (c) the response choices changed.

The reliable change index (RCI; Jacobson & Truax, 1991), which determines whether or not change for a given case is statistically reliable, was used to determine how many schools showed meaningful change in their SITS scores over time. As the RCI requires the short-term test-retest reliability of the measure (which is unknown for the SITS), the RCI was calculated using the correlations reported in the previous paragraph. For the liaisons, this resulted in 6.9% of the scores increasing and 3% decreasing. For the coordinators, this resulted in 8.8% of the scores increasing and 0% decreasing.

Question 2: School Structure Analyses

ANOVAs revealed an expected large effect of grade configuration on school size at Time 1 and at Time 2, so correlations were run separately for ES, MS, and HS. These correlations showed a positive association between SITS scores and school size for ES, a negative association for MS, and no association for HS.

Based upon those findings and a visual inspection of the scatter plots, school size was recoded into small (less than 400 students), medium (400-700 students), and large (over 700 students) groups. ANOVAs for school size group at Time 2 revealed a medium effect for liaison SITS scores, $F(2, 106) = 10.23, p < .001, \eta_p^2 = .16$, and a trend for a small effect for coordinator SITS scores, $F(2, 52) = 2.71, p = .076, \eta_p^2 = .09$. For liaisons, the medium group ($M = 28.35, SD = 12.82, n = 49$) had higher SITS scores than the small ($M = 19.83, SD = 12.17, n = 24$) or large ($M = 15.92, SD = 13.44, n = 36$) groups (i.e., medium size > small size = large size). For coordinators, the medium group ($M = 31.13, SD = 10.83, n = 30$) had higher SITS scores than the small ($M = 23.75, SD = 10.11, n = 12$) or large ($M = 25.31, SD = 10.31, n = 13$) groups (i.e., medium size > small size = large size); however, Tukey's HSD comparisons were not significant for coordinators. Correlations between the school size and the SITS scores at Time 2 were not significant within the three school size groups for either respondent, indicating that differences within a size group do not matter. Time 1 ANOVAs were not significant for school size groups.

The above analyses suggest that the size of a school may be more important than its grade configuration. Partial support for this idea was found when *t* tests for Time 2 SITS scores revealed no differences between ES and MS that had 400-700 students for liaisons, $t(20.12) = -.32, p = .75, g = -.12$, or for coordinators, $t(24) = -1.12, p = .275, g = -.48$. Other comparisons were not possible because of sample sizes.

Validity of the SITS

Hypothesis 1: Implementation assistance by experts. As predicted, ANOVAs of Time 1 revealed a medium effect for Tier for liaisons, $F(2, 134) = 14.72, p < .001, \eta_p^2 = .18$, and a medium effect for Tier for coordinators, $F(2, 68) = 5.69, p = .005, \eta_p^2 = .14$. For liaisons, Tier 3 ($M = 10.00, SD = 3.81, n = 41$) was greater than Tier 2; ($M = 8.41, SD = 3.70, n = 66$) and both were greater than Tier 1 ($M = 5.13, SD = 3.86, n = 30$) (i.e., Tier 3 > Tier 2 > Tier 1; see Figure 1). For coordinators, Tier 3 ($M = 10.35, SD = 3.43, n = 23$) and Tier 2 ($M = 11.24, SD = 3.63, n = 33$) were greater than Tier 1 ($M = 7.40, SD = 4.12, n = 15$); but Tiers 2 and 3 did not differ from each other (i.e., Tier 3 = Tier 2 > Tier 1).

ANOVAs of Time 2 revealed a small effect for Tier for liaisons, $F(2, 115) = 5.01, p = .008, \eta_p^2 = .08$, but no effect for coordinators, $F(2, 59) = 1.82, p = .171, \eta_p^2 = .06$. For liaisons, Tier 3 ($M = 26.05, SD = 13.17, n = 41$) was greater than Tier 1 ($M = 14.32, SD = 13.90, n = 19$); Tier 2 ($M = 21.28, SD = 13.55, n = 58$) was not different from the other tiers (i.e., Tier 3 > Tier 1).

Hypothesis 2: Structural risk factors. As predicted, low DFG (socioeconomic status) schools ($M = 5.93, SD = 3.34, n = 27$) scored lower than nonlow DFG schools ($M = 8.95, SD = 4.15, n = 102$) on the liaison SITS scores at Time 1, $t(127) = 3.49, p = .001, g = .35$, which is a small effect size. Low DFG schools ($M = 14.41, SD = 9.70, n = 17$) scored lower than nonlow DFG schools ($M = 23.87, SD = 14.04, n = 96$) on the liaison SITS scores at Time

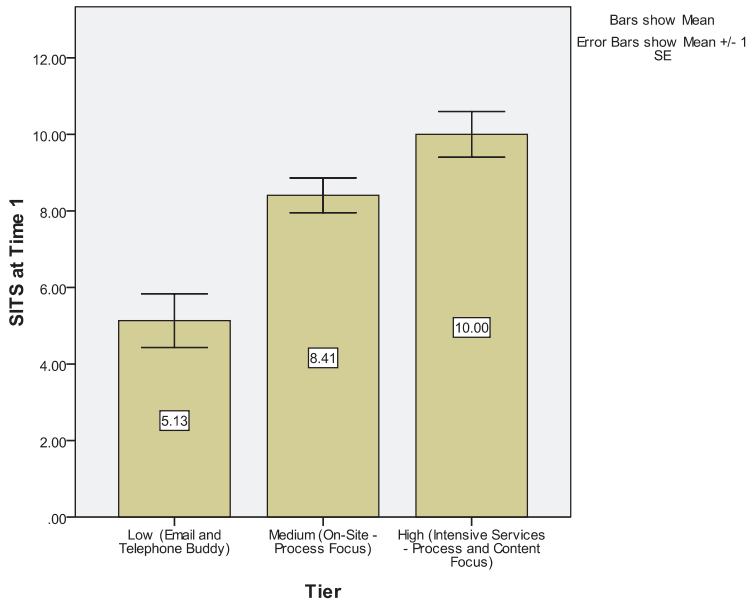


Figure 1. Effects of implementation assistance by experts on implementation and sustainability scores.

2, $t(29.40) = 3.43$, $p = .002$, $g = .70$, which is a medium effect size. Coordinator SITS scores were not significantly related to DFG status.

Contrary to the hypothesis, higher student to faculty ratios at Time 2 had a trend of a small association with higher liaison SITS scores at Time 2, $r(108) = .18$, $p = .057$, and with higher coordinator SITS scores at Time 2, $r(54) = .25$, $p = .066$. However, when three schools with high ratios (i.e., greater than 15:1) were excluded, the results were no longer significant. The student to faculty ratio association was not significant at Time 1 for either responder type.

Hypothesis 3: School environment. Student climate and staff mobility correlations were not significant for either liaison or coordinator SITS scores at Time 1 or 2.

As predicted, higher staff climate (40-item version) had a medium association with higher coordinator SITS scores at Time 1, $r(36) = .48$, $p = .002$. Higher staff climate (20-item version) had a small trend with higher liaison SITS scores at Time 1, $r(77) = .22$, $p = .052$, and a medium association with higher coordinator SITS scores at Time 1, $r(36) = .43$, $p = .006$. No other staff climate correlations were significant.

Higher student attendance rates had a small association with higher liaison SITS scores at Time 1, $r(124) = .19$, $p = .031$. In the preceding analysis, one case was recoded (from 69.2% to 85.7%) because it is a univariate (z score = -9.32) and multivariate (Mahaloni's distance = 85.83 and Cook's distance = 1.78) outlier. Higher student attendance rates had a medium association with liaison SITS scores at Time 2, $r(108) = .33$, $p = .001$. Student attendance rates were not associated with the coordinator SITS at Time 1 or Time 2.

Higher bullying rates had a medium association with lower liaison SITS scores at Time 1, $r(75) = -.30$, $p = .008$; but were not associated with coordinator SITS scores at Time 1. Bullying was not associated with either SITS score at Time 2.

Higher student suspensions had a small association with lower liaison SITS scores at Time 1, $r(124) = -.19$, $p = .030$, and at Time 2, $r(108) = -.28$, $p = .003$. Student suspensions were not associated with coordinator SITS scores at either time.

Higher violence rates at Time 2 had a medium association with lower liaison SITS scores, $r(100) = -.36$, $p < .001$, and with lower coordinator SITS scores, $r(49) = -.30$, $p = .030$. When all schools with zero reported violent events were filtered out, these relationships were stronger: a large association for liaisons, $r(61) = -.54$, $p < .001$, and a medium association for coordinators, $r(29) = -.41$, $p = .022$. Violence rates at Time 1 were not associated with liaison or coordinator SITS scores at Time 1.

DISCUSSION

A large sample of schools, diverse in terms of their school environments, sizes, ethnic compositions, and SES, supported the *system of sustainable implementation* conceptualization outlined in this article. The ecological levels affected the system, as measured by the SITS scale, generally as hypothesized. Overall, the SITS has strong reliability as well as promising concurrent and construct validity for measuring evidence-based strategies of implementation and sustainability. Higher SITS scores were associated with greater support from outside experts (i.e., higher Tier) and certain school structures (i.e., nonlow SES districts, school sizes with 400–700 students). Higher SITS scores were also associated with better school environments (i.e., better staff school climate, less bullying, higher student attendance, lower student suspensions, and lower violence rates).

Consistency With Existing Literature

The SITS is highly consistent with the literature on the implementation and sustainability of SBPPI. First, ecological levels (e.g., low SES) matter, as argued by Greenberg et al. (2005) and others. Second, implementation and sustainability strategies described by many researchers (e.g., Berkowitz, & Bier, 2006; CASEL, 2005; Commins & Elias, 1991; Elias, 2007; Greenberg et al., 2005; Ji et al., 2008) were consistently associated with better school environments. Third, the importance of maintaining a strong ongoing connection with outside experts on the intervention was consistently associated with greater implementation (Elias, 2007).

Inconsistency With Existing Literature

Nevertheless, there were two potential discrepancies between the research literature and the SITS results. One, higher staff mobility (i.e., turnover) was not associated with implementation scores. Turnover is usually considered a threat to implementation and sustainability (Elias, 2007). However, whether staff mobility hinders or helps a school depends on whether the person entering the school is supportive of the intervention or the person leaving the school is unsupportive. Perhaps, the two are linked together longitudinally rather than concurrently.

Two, higher student to faculty ratios were not associated with implementation scores (after excluding three schools with unusually high ratios). In contrast, previous work identifies student to teacher ratios as a risk factor for problematic behavior (SAMSHA, 2002). Although this difference may be because the ratio for teachers is more critical than

the ratio for faculty, it is more likely that the ratio in this study was not high enough to cause problems, as only a few schools had ratios above 15:1.

Responder Type Comparisons

Overall, there was good agreement between DSACS liaisons and school-based coordinators within a school; higher SITS scores were associated with lower structural risk factors and better school environments for both responder types. Nevertheless, the effect sizes were not always identical. Additionally, only the liaison SITS scores were associated with student attendance, suspension rates, and the SES of the district, whereas only the coordinator scores were associated with violence rates. Although one might argue that the liaisons scores are more accurate than the coordinator scores, this article advocates recognizing the expertise that each group possesses. The liaisons are outside experts who have more training and more vantage points to compare schools. Meanwhile, the coordinators are inside experts who know the details about what is happening within a school. Although it might be necessary to seek outside experts to compare implementation and sustainability across schools, the true goal of implementation research should be to track changes within a school. The results for this study suggest that both can rate implementation and sustainability reliably and validly.

Limitations and Future Research

There are several limitations to this study. First, only schools participating in the DSACS program completed the SITS, which may limit its generalizability. Second, only the SITS was used to measure implementation and sustainability. Third, all schools were in the initial delivery phase, so we were unable to determine if the SITS could distinguish between phases. Fourth, the final items were chosen by key DSACS personnel rather than through statistical analyses. Nonetheless, these limitations are mitigated by the fact that there was strong agreement within the schools between the responder types, there is no gold standard for measuring implementation across diverse interventions, the SITS was able to distinguish between tiers, and the items ultimately chosen reflected previous empirical work.

Even so, a great deal of future research is needed, especially with regard to the predictive validity of the SITS. The true test of a sustainability measure is not being able to distinguish between schools but being able to predict who will still be implementing the intervention effectively several years later. However, testing predictive validity too early could be highly misleading, as null results could lead to useful interventions (e.g., DSACS) and measures (e.g., SITS) being abandoned prematurely. Therefore, 3–7 years after the first administration of the SITS (i.e., in 2012 to 2016) the schools in this sample should be revisited. This would allow enough time for the theory of sequential change for DSACS to unfold, which states that changes in staff school climate lead to changes in student school climate, which lead to changes in student behaviors, which lead to changes in academics and standardized test scores.

The second most important task is to further increase the validity of the SITS. Experimentation with different items and different response choices are needed. Another idea is to have multiple staff within the school complete the SITS, as is done with the CASEL Rubric (Ji et al., 2008). In fact, the simple process of having multiple people complete it may strengthen the sustainability of the intervention by bringing the key stakeholders

within the school together. Additionally, the SITS needs to be tested in other settings and against other measures.

Another important task is to continue to use the SITS as a tool for studying the potential optimal conditions for creating collaborative learning communities of the kind necessary to develop, implement, and sustain SECD-related interventions. For instance, this study suggests that a school size of 400–700 is optimal for implementation purposes; but as school size is intricately tied to grade configuration and this relationship was not hypothesized a priori, this finding should be interpreted cautiously until further replication occurs.

Implications for Practice

The most important implication of this study is that implementation and sustainability can be measured and quantified in an affordable and scalable way by using the SITS. This measurement can be used to track changes within a school, even within a 1-year period. Additionally, the tier analyses strongly indicate that onsite support from outside experts is needed to maximize implementation levels; schools benefit from not only having process-focused support but also from content-focused support.

In terms of the two scale choices, this article suggests that the 4-point scale (i.e., false to very true) is more useful than the 2-point scale (i.e., true/false) for one primary reason: The correlation between the outside experts (i.e., DSACS liaisons) and the inside experts (i.e., school coordinators) was larger when using the 4-point coding. Greater similarity in ratings is more likely to encourage collaboration and foster dialogue that focuses on improvement.

An important direction for future research related to practice is to investigate possible configural relationships, or profiles, of implementation and sustainability achievements that may be related to different phases of implementation and ecological circumstances. Another area is to better understand implications of using the SITS on promoting better awareness of the factors necessary for effective long-term implementation of interventions in schools.

In short, this study supports the continued development of the system of sustainable implementation model and its assessment via the SITS. The SITS is brief, uses few resources, and requires no formal training. But most importantly the SITS provides valuable information about the implementation and sustainability strategies being used by schools for prevention and promotion interventions. Researchers, consultants, and school personnel are justified in continuing to use the SITS to add to the knowledge of how to better sustain SECD and related school-based interventions.

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APPENDIX

Schools Implementing Towards Sustainability (SITS) Scale Items

1. SECD was presented to staff as a serious, integrated commitment that will take years to implement fully and to realize full behavioral and academic benefits (not as extra or “feel-good”)^{P, S/D}
2. An SECD committee (either including a coordinator or lead person) exists and is active in sustaining SECD. That is, SECD does not rely solely on the existence of a single coordinator^{P, S}
3. The coordinator/committee helps the staff troubleshoot issues that arise in DSACS implementation and supports the teaching staff by easing access to materials and strategies^{I, S/D}
4. There exists a core group of individuals (beyond the school coordinator/committee) who strongly support SECD and are very involved in it^{I, S}
5. There are systematic opportunities for staff (more than just coordinator, at least a team of people) to reflect upon the DSACS experience and future directions for SECD^{C, S}
6. There is a clear message from the school administrator that staff are expected to implement and reinforce SECD^{P, S/D}
7. The school administrator allows for specific planning time for staff to work on DSACS implementation and planning^{I, S}

8. The school administrator is aware (by official or unofficial monitoring) of the implementation of DSACS plans in the building^{I, S/D}
9. Some type of data tracking is utilized to indicate whether there are changes in student behaviors or not^{I, S/D}
10. Quantifiable data on student behavior (e.g., # of office referrals, # of service hours completed) is collected to justify funding and time allotted to SECD^{I, S/D}
11. Members of the SECD Team have been involved in continuing professional development around SECD issues since their initial training^{C, S/D}
12. The school is moving towards (or has achieved) effective and reliable in-house staff training for SECD. That is, the school is not exclusively depending on “outsiders” to train current and new staff on how to deliver SECD^{C, S/D}
13. The school does not passively receive information from the DSACS liaison. That is, the SECD Team initiates contact with the DSACS liaison and/or looks up SECD information on their own (at least some of the time)^{I, S/D}
14. The school has shown originality in using SECD principles in a way that makes the principles “their own” and not merely a flat, “carbon copy”^{C, S/D}
15. The school has partnered with community agencies to help increase access to funds and/or opportunities for SECD^{C, M}

Note. Items with the superscript “P,” “I,” and “C” can be mapped onto the “Preparation Phase,” “Initial Delivery Phase,” and the “Continuing Delivery Phase,” respectively. Items with a superscript “S,” “D,” “S/D,” and “M” can be mapped onto the “School,” “District,” “School and District,” and “Community” levels, respectively. Superscripts are not included on the actual SITS.