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## **Final Research Report**

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## Summary of the project

**Abstract.** Anonymous tip lines have the potential to improve school safety by providing secure multi-modal reporting systems and enabling a coordinated response between schools, law enforcement and crisis responders. The SS-ARS, developed and implemented by the Sandy Hook Promise (SHP) Foundation, is an educational school safety initiative that trains youth, parents, schools, and communities to recognize warning signs in writing, speaking, or web content that could lead to harmful behaviors towards themselves or others, and to safely report potential threats. SS-ARS combines a school-wide violence prevention program that enhances risk recognition, empowers and engages school communities in violence prevention, and facilitates coordination between schools and law enforcement with a multi-modal ARS. SHP has implemented the Say Something program in schools across the U.S. and trained over 12 million students (Sandy Hook Promise Foundation). In a recent systematic review of anonymous reporting systems (ARS) in U.S. schools, Messman et al. (2021) identified just four empirical studies pertaining to the implementation or effectiveness of ARS, but none of these studies used experimental designs. To address this gap of research, we examined the effectiveness of the Say Something Anonymous Reporting System (SS-ARS) program in improving school safety in a cluster randomized control trial in collaboration with the Miami-Dade County Public Schools (M-DCPS).

### **I. Major goals and objectives**

The current project had four major goals. Our **goals** for the project were to:

1. Conduct a cluster randomized control trial to test the effectiveness of the SS-ARS intervention to improve participants' ability to recognize signs of mental duress, violent antecedents and other risk behaviors, increase reporting of risks behaviors, and improve school community response and school climate over time;
2. Examine changes in violence in school communities (e.g., fights, bullying) and student criminal justice involvement stemming from improved recognition and reporting of risk behaviors;
3. Identify key factors associated with program fidelity, reach, adoption and sustainability;
4. Perform a cost/effectiveness analysis.

We had five main objectives under these goals. Our objectives were to:

1. Recruit 30 schools that will be randomly assigned to receive the SS-ARS program (intervention group) or to receive the usual school safety practices (control condition).
2. Conduct pre- and post-test surveys of students, teachers and administrators attending both the intervention and control schools. Participants will be followed longitudinally over the study period (from baseline to 18 mo. post-test survey).
3. Conduct structured interviews with key program personnel at all treatment schools to assess program implementation factors and outcomes.
4. Extract administrative data from both intervention and control school records to assess violent incidents and school response. We will also work with the Miami-Dade Schools Police Department (M-DSPD) to extract geocoded crime data in surrounding neighborhoods.

5. Compare change over time between the intervention and control groups. Analyses will include both student and school-level data. We will examine the stability of change with three data points over 18 months post-intervention. Analyses will examine program effectiveness and the implementation factors associated with program effectiveness.

## **II. Research Questions**

Our research questions concerned the overall effectiveness of the SS-ARS, as well as implementation factors that facilitate or impede the program outcomes. The following questions guided our investigation:

### **Overall effectiveness**

1. Is a mobile anonymous reporting system (ARS) paired with threat recognition training (Say Something; SS) an effective approach for reducing violence in school communities?
2. Does the SS-ARS program improve students', teachers' and administrators' recognition of mental duress, violent antecedents and other risk behaviors in a student population?
3. Does exposure to the SS-ARS program increase the reporting of risk behaviors?
4. Does exposure to the SS-ARS program improve school response to risk behaviors?

### **Program Implementation**

1. What implementation factors facilitate or impede SS-ARS implementation outcomes (i.e., fidelity, reach, adoption)?
2. What is the relationship between SS-ARS fidelity and program outcomes?
3. What is the relationship between SS-ARS reach and program outcomes?

## **III. Research design, methods, analytical and data analysis techniques**

### **A. Research Design**

The proposed plan was to recruit 30 middle or high schools within the M-DCPS to participate in the evaluation study. We conducted a cluster randomized control trial where half of the schools were randomly assigned to the intervention group and received the SS-ARS programing; others served as control schools receiving no intervention. Using data from self-reports surveys, interviews, the ARS system data, and school administrative data, we focused on short- and long-term outcomes at both the individual and school level for youth participants exposed to the SS-ARS program relative to those who are not exposed. Primary program outcomes were evaluated at both the school (i.e., pre/post changes in school level response and school climate) and individual level (i.e., pre/post change of risk recognition, intention toward reporting, and actual reporting behavior) with data from students, teachers/staff and key administrators. We also examined how variations of implementation fidelity may influence the program outcomes.

**SS-ARS Intervention.** SS-ARS intervention includes three components. **Anonymous Reporting System:** In collaboration with M-DCPS and M-DSPD, SHP established a 24/7-call center with multi-lingual operators and a direct line to crisis hotlines (as needed), and protocols to triage all reports (i.e., calls, app, mobile/web-based submissions) and route them to appropriate school and/or law enforcement officials for handling. These protocols were guided by school policies and practices. SHP also provided trainings for school teachers and administrators to respond to and manage the SS-ARS via a multi-disciplinary team. **Say Something Educational Training.** SHP worked with schools to identify an adult champion and a student organization to lead the efforts in the school. SHP staff led a 30-40 minute school-wide assembly to educate students to: 1) recognize the signs and signals of at-risk behaviors; 2) take every sign and signal seriously and act quickly to get help by talking to a trusted adult; and 3) use the ARS for reporting concerns. The program focuses on violence, suicide and threat prevention, and covers topics such as bullying, abuse, mental disorders, substance abuse, sexual predation and victimization. **Student Engagement.** Following the presentation, SHP engaged students through SAVE promise clubs, an awareness campaign including signage, wristbands, and a call-to action week. SHP then worked with a school-based adult “school champion” and student organization to take ownership of the Say Something (SS) program, led ongoing SS activities during the program period, and led a call-to-action week. The student engagement component varied by school depending on the school setting, scheduling and existing resources.

## **B. Theoretical Underpinnings**

**SS-ARS, Self-efficacy, and Intention to Report.** In line with empirical observations of how ARS programs may promote youth’s reporting of violent behaviors and associated warning signs, the Theory of Planned Behavior (TPB; Ajzen, 1991) offers a theoretical underpinnings of how ARS may work in changing youth’s behavior. TPB posits that behavioral change results from an individual's motivation (intention) and perceptions of whether behavioral change is within the individual's control (self-efficacy). The intention depends on both the individual's attitude and perceived norms toward that behavior, and interacts with self-efficacy to influence behavior achievement (Ajzen, 1991). Self-efficacy and behavioral intention are the most important antecedents of behavior (Ajzen, 1991; Sheeran et al., 2016). According to TPB, programs such as SS-ARS that enhance knowledge on how to recognize and report warning signs and address norms of school safety should induce positive attitudes and subjective norms toward reporting, which, in turn, increases the intention to report. In addition, SS-ARS offers multiple channels of reporting, emphasizing the anonymous nature and the accessibility of tip lines. These features may significantly lower the perceived barriers of reporting, such as fear of retaliation and other social costs, therefore increase their self-efficacy to report the signs through appropriate channels. Both self-efficacy and intention are behavior- and context-specific cognitions (Sheeran et al., 2016). Such change in cognitions may happen soon after educational training and the availability of ARS. Therefore, we consider the self-efficacy and intention toward reporting threats or warning signs through appropriate channels as our short-term outcome variables in the present study.

**SS-ARS, School Connectedness, Trust, Safety, and Violence at School.** While improving reporting behaviors and cognitions related to reporting can help mitigate school violence, improving school connectedness, trust, and perceived safety is also critical to this effort (Gottfredson et al., 2005; Thapa et al., 2013) because they are closely linked with school

violence (Chapman et al., 2011; Henrich et al., 2005; Hilarski, 2004). Therefore, a reporting system that promotes perceptions of school connectedness, trust and safety is critical to violence prevention and the sustainability programs like SS-ARS. Perception of school safety refers to feeling and being safe physically, socially and emotionally (National School Climate Council, 2013). School connectedness refers to “the extent to which students feel personally accepted, respected, included and supported by others in the school social environment” (Goodenow, 1993) and is associated with less violence and aggression (Gerler Jr., 2004), harassment (Blaya & La Borderie, 2008; Kosciw et al., 2008) substance use, and fewer depressive symptoms among students (LaRusso et al., 2008).

A unique aspect of SS-ARS is that SHP includes their student engagement programming promoting positive norms of improving school safety, which entails the Students Against Violence Everywhere (SAVE) Promise Clubs to maintain the SS-ARS program. SAVE Promise Clubs are student-led organizations that encourage young people to take charge of keeping their friends, schools, and communities safe. Prior research showed that programs that create opportunities for youth to develop self-confidence, interact with adult role models, and address community needs enhance positive youth outcomes (e.g., academic achievement, involvement in prosocial activities, responsible decision making) and a stronger sense of trust and connectedness within school and community (Zeldin et al., 2000; Zimmerman et al., 2011). These benefits, in turn, may help reduce violent behavior, bullying and misbehavior at school (Catalano et al., 2004; Cohen & Freiberg, 2013; Stewart, 2006). Thus, it is crucial to examine SS-ARS’s influence on school connectedness and safety as a pathway to averting school violence. Yet, improvements in school safety and violence usually take longer than person-level change (e.g., cognitions, behaviors). School connectedness and safety are, therefore, considered alongside school violence as a long-term outcome in the present study.

## **C. Method**

### **School recruitment and randomization**

Our original design sought to enroll 30 schools in the Fall of 2018, with follow-up measurements in Spring 2019, Fall 2019 and Spring 2020. We had 19 schools participate in the 2018-2019 school year (as **Cohort 1**), which we expect to follow the original data collection and program implementation plan. The sample sizes at both school- and individual-levels (670 students in 19 schools) were smaller than expected due to the following challenges faced by both the study team and the schools: 1) the Memorandum of Understanding (MOU) for the Anonymous Reporting System between Sandy Hook Promise Foundation and Miami-Dade County Public Schools was obtained in late November 2018, which was later than anticipated; 2) the recruitment of schools and students could not begin until the MOU was finalized; 3) the pre-test data collection and implementation of the SS-ARS were truncated into a shorter period of time between January and March 2019.

In June 2019, we obtained NIJ approval to make a scope change to seek to recruit and enroll 11 schools in a revised study timeline (as **Cohort 2**). After working closely with the school district, we were able to enroll 10 schools in the Fall of 2019. We modified the study design for these 10



schools by conducting only one posttest after intervention (pretest in October 2019, program implementation for treatment schools in November 2019, posttest in Spring 2021).

**COVID-19 Pandemic Change**

Some aspects of our study design were affected due to the COVID-19 Pandemic, which occurred right after the cohort 2 intervention. Miami-Dade County Public Schools shifted to an online-learning environment in March, 2020. The transition to schoolhouse instruction began on Monday, October 5, 2020. The return to schoolhouse instruction created a new challenge for instructors. Many schools did not have sufficient resources to have dedicated teachers for their remote students. As a result, there were classes where onsite teachers were instructing both in-person and online students simultaneously. These circumstances (including ongoing quarantines throughout 2020-2021) affected our participant retention, particularly for cohort 2. For the cohort 2 post-test, we retained approximately 50% of the students who filled out the original survey.

Thus, the UM research team decided it would not be feasible to interview the cohort 2 school staff and administrators during the instruction modality transition period or following the return to schoolhouse learning, given the length of time between the intervention implementation and the interview period (~1 year). Finally, in the fourth wave of data collection, we added survey items specific to COVID-19 and student mental health during the pandemic.

Table 1 presents the student survey and the SS-ARS training timeline, broken down by cohort. Cohort 1 (19 schools) completed 1 pretest in January/Feb 2019, and 3 posttests (3-month, 9-month, and 2-year). Cohort 2 (10 schools) completed 1 pre-test in Fall 2019 and 1 posttest (18-month)..

**Table 1. Data collection and intervention timeline by Cohort**

	Pretest	SS-ARS Training	Posttest 1	Posttest 2	Posttest 3
Cohort 1	Jan-Feb, 2019	Feb-April, 2019	May, 2019 (3-month)	Oct-Nov, 2019 (9-month)	March-June, 2021 (2 year)
Cohort 2	Oct-Nov, 2019	Nov. 2019-Jan. 2020	March-June, 2021 (18 month)	N/A	N/A

**Pre/post student surveys**

We examined short-term and long-term program effectiveness with: 1) pre/post surveys; 2) Sandy Hook Promise Foundation (SHP) program records and implementation interviews (implementation data); 3) ARS data extraction; and 4) school administrative records and police crime incident records. We administered student questionnaires to students and teachers for both program and control schools, and structured interviews with school administrators in

program schools. The questionnaires were administered online using Qualtrics software (available through UM). We used survey data to examine the effectiveness of SS-ARS on short-term and long-term outcomes of: 1) self-efficacy and intentions to report, and actual reporting/help-seeking behavior; 2) violence to exposure at school, and 3) school climate and school safety perceptions by students.

### **SS-ARS program records and Implementation interviews**

After the SS-ARS training, we have conducted 10 interviews with staff and administrators at 8 different cohort 1 treatment schools. Interviews were digitally recorded and transcribed verbatim. Themes from the qualitative interviews are presented in **Appendix 1** and are summarized in the “outcomes” section (below). We assessed intervention implementation factors (program effort, organizational context, and implementation process) through the documentation and examination of SS-ARS program records, activity logs, and implementation interviews with SHP staff and school champions.

### **ARS data extraction**

We examined tip data submitted through the Say Something Anonymous Reporting System from February 2019-July 2020. This data includes the date of submission, the school, type of tip, and follow up actions taken. A summary of the tip data can be found in the “results” section of this report. In spring 2020, Miami Dade schools transitioned to remote learning in response to the COVID-19 pandemic. The transition was accompanied by a reduction in reporting behavior. Differential patterns of return to hybrid or in-person learning raised concerns about reliability of reporting behavior given previous findings that ARS system reports drop significantly during times when students are not in school (e.g., summer months).

### **School administrative records and police crime incident records**

We obtained school-year administrative data and crime data for 2018-2019, 2019-2020, and 2020-2021, with the goal of assessing differences between treatment and control schools on violent incidents (assault, battery), suspension/expulsion rates, and small property crimes. However, we were not able to obtain month-by-month reports of crime or other administrative-related variables; the data encompass the entire calendar year. The structure of the data induces a major challenge to test the post-test differences of outcomes accounting for baseline data. Given our interventions were delivered in the middle of the year (March 2019 for cohort 1 and November 2019-January 2020 for cohort 2), we cannot discern which incidents occurred before vs. after the intervention. Specifically, for cohort 1, the school year *post*-intervention was 2019-2020. This data was confounded by school closures related to COVID-19 and does not provide a clear cut-off point to pre-intervention (intervention happened in the middle of 2018-2019 school year). The same issue applies for Cohort 2, with the *post*-intervention administrative and crime data (2020-2021) being confounded by COVID-19 related school closures, staff and student absences, etc. We therefore decided not to proceed with analysis using either administrative data or crime data given the significant bias/confounding issues presented in the data set.

## D. Analytical and data analysis techniques

### Program Effects

We assessed the effectiveness of the anonymous reporting system (ARS) along with threat recognition training (Say Something) and student engagement programming (e.g., SAVE promise clubs) in reducing school violence. We implemented a cluster randomized control trial with the 29 participating schools in Miami-Dade County Public Schools. We assessed differences between students in the treatment and control schools in self-efficacy and intention to report warning signs, and perceptions of school-connectedness, trust, safety, and exposure to violence 3-, 9-, 18-months and 2 years after the intervention. We were not able to conduct pre/post surveys among teachers and administrators. Instead, qualitative interviews were conducted to assess perceptions of SS-ARS among key school personnel.

We used multilevel models (MLMs) to estimate whether receiving SS-ARS, relative to the control group, contributed to greater improvements in short- and long-term outcomes. Three-level MLMs were estimated to control for residual within and between correlations at the person (level 2) and school level (level 3). The key predictors of interest were time (i.e., baseline vs. post assessment), treatment (i.e., SS-ARS vs. control), and the time by treatment interaction. We additionally controlled for level 2 covariates, which include participant gender (i.e. Male, Female, Other) and racial minority status (non-Hispanic White, non-White). All models included a random intercept at the person- and school-level to adjust for residual within-person and within-school correlations. Significant interactions were probed by examining the simple slope of time among SS-ARS and control group participants. All MLMs were estimated in R (R Core Team, 2021) using the lme4 package (Bates et al., 2015), and the interactions package (Long, 2019) was used for simple slopes analysis. Results from this analysis are presented in the “outcomes” section.

### Implementation Analysis

We evaluated the influence of factors related to implementation on implementation outcomes and the relationship between implementation and behavioral outcomes. We focused on two constructs of implementation outcomes: fidelity (dose delivered) and reach. We assessed *reach* by tracking the proportion of students attending/participating in SS-ARS events, the ARS downloads, and overall reporting system usage overtime. We also use qualitative data from staff interviews to inform the quantitative findings.

*Implementation Outcomes and Behavioral Outcomes.* We used multilevel models to investigate change over time in self-efficacy and intention to report warning signs, and perceptions of school-connectedness, trust, safety, and exposure to violence among youth (controlling for baseline and sociodemographic characteristics) and investigate if trajectories vary by implementation outcomes (i.e. fidelity and reach). Results from this analysis are presented in the “outcomes” section.

## **Matching System**

To ensure de-identifiable data in the longitudinal design, we used a method developed by Ripper et al. to use respondent-generated personal codes to link longitudinal data (Ripper et al., 2017). Each participant completed a series of six questions at the beginning of each survey to generate a unique identifier to anonymously link their responses over time. In order to match participants at a reasonable rate, we used probabilistic record linkage using the Fastlink package in R (Enamorado et al., 2019). Fastlink calculates the string distance for a set of variables between time points and then calculates an overall match probability for all observations at two time points. We used the six unique identifier algorithm items and gender, race, and school to calculate match probability. As was demonstrated with high match rates and low false discovery rates in prior a study (Enamorado et al., 2019), 95% probability threshold was selected for matching. A unique study ID was assigned for linked data across time. Unmatched data in each wave were also assigned for unique study IDs separately.

## **Participants and other collaborating organizations**

The study was conducted at 29 Miami-Dade County Public Schools (M-DCPS). M-DCPS is the fourth largest school district in the United States, with over 334,000 students and 41,000 employees across 516 schools. M-DCPS has 73.4% of its students classified as economically disadvantaged, with over 18% considered English Language Learners. The demographics of students in M-DCPS is similar to that of Miami Dade County, with approximately 70% of students identifying as Hispanic or Latino, and less than 10% of students identifying as non-Hispanic white. Table 2 presents the student demographic information across the four waves of data collection.

**Table 2. Participant Demographic Characteristics by Wave**

	Wave 1		Wave 2		Wave 3		Wave 4	
	Control	Treatment	Control	Treatment	Control	Treatment	Control	Treatment
	(N=323)	(N=416)	(N=296)	(N=270)	(N=661)	(N=443)	(N=282)	(N=208)
<b>Age</b>								
10	2 (0.6%)	2 (0.5%)	1 (0.3%)	1 (0.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
11	172 (53.3%)	200 (48.1%)	64 (21.6%)	59 (21.9%)	116 (17.5%)	82 (18.5%)	2 (0.7%)	1 (0.5%)
12	134 (41.5%)	180 (43.3%)	183 (61.8%)	175 (64.8%)	388 (58.7%)	265 (59.8%)	25 (8.9%)	11 (5.3%)
13	11 (3.4%)	23 (5.5%)	15 (5.1%)	20 (7.4%)	148 (22.4%)	86 (19.4%)	112 (39.7%)	87 (41.8%)
14	2 (0.6%)	0 (0%)	1 (0.3%)	1 (0.4%)	8 (1.2%)	9 (2.0%)	132 (46.8%)	99 (47.6%)
15	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	11 (3.9%)	10 (4.8%)
Missing	2 (0.6%)	11 (2.6%)	32 (10.8%)	14 (5.2%)	1 (0.2%)	1 (0.2%)	0 (0%)	0 (0%)
<b>Gender</b>								
Male	159 (49.2%)	168 (40.4%)	131 (44.3%)	108 (40.0%)	287 (43.4%)	175 (39.5%)	104 (36.9%)	76 (36.5%)
Female	160 (49.5%)	224 (53.8%)	132 (44.6%)	143 (53.0%)	362 (54.8%)	257 (58.0%)	165 (58.5%)	112 (53.8%)
Other	1 (0.3%)	7 (1.7%)	1 (0.3%)	1 (0.4%)	7 (1.1%)	2 (0.5%)	6 (2.1%)	5 (2.4%)
Decline to Answer	1 (0.3%)	8 (1.9%)	3 (1.0%)	6 (2.2%)	5 (0.8%)	9 (2.0%)	7 (2.5%)	6 (2.9%)
Missing	2 (0.6%)	9 (2.2%)	29 (9.8%)	12 (4.4%)	0 (0%)	0 (0%)	0 (0%)	9 (4.3%)
<b>Race</b>								
Non-Hispanic White	44 (13.6%)	36 (8.7%)	31 (10.5%)	21 (7.8%)	49 (7.4%)	51 (11.5%)	20 (7.1%)	16 (7.7%)
Hispanic/Latinx	175 (54.2%)	237 (57.0%)	150 (50.7%)	159 (58.9%)	362 (54.8%)	224 (50.6%)	179 (63.5%)	110 (52.9%)

Afro-Caribbean/Caribbean Black	8 (2.5%)	13 (3.1%)	6 (2.0%)	4 (1.5%)	17 (2.6%)	7 (1.6%)	5 (1.8%)	6 (2.9%)
African-American/Black	23 (7.1%)	46 (11.1%)	23 (7.8%)	26 (9.6%)	100 (15.1%)	63 (14.2%)	38 (13.5%)	31 (14.9%)
American Indian/Alaska Native	1 (0.3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.5%)
Asian	7 (2.2%)	8 (1.9%)	7 (2.4%)	5 (1.9%)	14 (2.1%)	12 (2.7%)	7 (2.5%)	5 (2.4%)
Native Hawaiian/Pacific Islander	0 (0%)	1 (0.2%)	2 (0.7%)	0 (0%)	0 (0%)	0 (0%)	1 (0.4%)	1 (0.5%)
Other	6 (1.9%)	9 (2.2%)	2 (0.7%)	2 (0.7%)	4 (0.6%)	8 (1.8%)	3 (1.1%)	0 (0%)
Decline to Answer	52 (16.1%)	49 (11.8%)	41 (13.9%)	37 (13.7%)	111 (16.8%)	69 (15.6%)	28 (9.9%)	22 (10.6%)
Missing	7 (2.2%)	17 (4.1%)	34 (11.5%)	16 (5.9%)	4 (0.6%)	9 (2.0%)	1 (0.4%)	16 (7.7%)

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## Outcomes

### I. Activities/accomplishments

***Objective #1:*** Recruit 30 schools that will be randomly assigned to receive the SS-ARS program (intervention group) or to receive the usual school safety practices (control condition).

We recruited 29 schools to participate in the study. Our sample consists of 13 treatment schools, which were randomly assigned to receive the SS-ARS program, and 16 control schools.

***Objective #2:*** Conduct pre- and post-test surveys of students, teachers and administrators attending both the intervention and control schools. Participants will be followed longitudinally over the study period (from baseline to 18 mo. post-test survey).

We conducted pre- and post-test surveys of students, teachers, and administrators at the intervention and control schools. We completed our final post-test survey of students in June 2021.

***Objective #3:*** Conduct structured interviews with key program personnel at all treatment schools to assess program implementation factors and outcomes.

We have conducted 10 interviews with staff and administrators at 8 cohort 1 treatment schools. Interviews were digitally recorded and transcribed verbatim. Themes from the qualitative interviews are presented in Appendix 1 and are summarized in the “study findings” section (below).

***Objective #4:*** Extract administrative data from both intervention and control school records to assess violent incidents and school response. We will also work with the M-DSPD to extract geocoded crime data in surrounding neighborhoods.

We extracted publicly available data for all schools, including school population, suspensions, expulsions, and school climate survey ratings for the 2018-2019, 2019-2020 and 2020-2021 school year. We received the 2018-2019, 2019-2020, and 2020-2021 school year police incident data from MDSPD. We requested geocoded crime data in surrounding neighborhoods, but this data was not readily available from MDSPD.

We extracted tip data from the Say Something Anonymous Reporting System, including the type of tip (e.g., cyberbullying), when the tip was created, its status, the associated school, the narrative content of the tip, and the recipient (e.g., school district police, appointed school staff, district officials).

***Objective #5:*** Compare change over time between the intervention and control groups. Analyses will include both student and school-level data. We will examine the stability of change with three data points over 18 months post-intervention. Analyses will examine program effectiveness and the implementation factors associated with program effectiveness.

We currently have a paper under review that examines program effects using three waves of data from cohort 1 students (W1-W3). Findings from this analysis are described below.

We have conducted additional analyses that incorporate the fourth wave of data for cohort 1. We also examined change over time in short- and long-term outcomes for cohort 2 schools (described below).

## II. Results and findings

### A. Program effects on reporting behavior and violence prevention

We examined the effect of SS-ARS on short-term and long-term outcomes. Short-term outcomes were conceptualized as self-efficacy for identifying and reporting warning signs and intention to report warning signs. Long-term outcomes were conceptualized as perceptions of school safety, trust, and connectedness, and exposure to violence. Using survey responses, we compared 3-month, 9-month, 18-month and 2- year posttest reports of students' self-efficacy and intention to report warning signs, perceptions of school and exposure to school violence in treatment versus control schools. Multilevel models (MLMs) were used to estimate whether receiving SS-ARS, relative to the control group, contributed to greater improvements in short- and long-term outcomes. Three-level MLMs were estimated to control for residual within and between correlations at the person (level 2) and school level (level 3). The key predictors of interest were time (i.e., baseline vs. post assessment), treatment (i.e., SS-ARS vs. control), and the time by treatment interaction. We additionally controlled for level 2 covariates, which include participant gender (i.e. Male, Female, Other) and racial minority status (non-Hispanic White, non-White).

#### **Self-efficacy for identifying and reporting warning signs**

Participants rated their level of self-efficacy on a 5-point Likert scale (1=not at all confident to 5=very confident) to questions with the stem, "How confident are you in your ability to do the following things?," to measure perceived confidence level on performing a specific behavior. Two self-efficacy scales included were: 1) self-efficacy to recognize and tell an adult if someone is showing signs of hurting themselves or someone else, threatening another student, or someone being teased or bullied (4 items,  $\alpha=.75-.81$ ).

For Cohort 1, a significant time (i.e., pre-test vs. 3-month posttest) by treatment (i.e., control vs. SS-ARS) interaction was observed for self-efficacy to report using multiple channels ( $b = 0.31$ ). An 11.81% decrease in self-efficacy over time in using multiple channels to report warning signs was observed in the control group ( $b = -0.26$ ), whereas no change was observed in the SS-ARS group. In other words, compared to control school students, students receiving SS-ARS tended to retain confidence in reporting warning signs using multiple channels (i.e., app, website). Next, a time by treatment interaction was observed for self-efficacy using an anonymous reporting system (ARS) ( $b = 0.68$ ). Specifically, a 46.62% increase in self-efficacy using an ARS to report



warning signs was observed in the SS-ARS group ( $b = 0.62$ ), whereas no change was observed in the control group. See Figure 1 in Appendix. This result demonstrates that students receiving SS-ARS increased their self-efficacy to use ARS to report warning signs compared to control school students.

For Cohort 2, a significant time (i.e., pre-test vs. 18-month posttest) by treatment interaction was observed for self-efficacy to report using the ARS ( $b = .64$ ). Specifically, students at treatment schools increased in self-efficacy for reporting warning signs through the ARS over time ( $b = .56$ ), while no change was observed for control schools. Consistent with Cohort 1 results, Cohort 2 students receiving SS-ARS increased their self-efficacy to use ARS to report warning signs compared to control school students.

### **Intention to report warning signs**

Two scales were used to assess students' intention to report warning signs (3 items,  $\alpha=.78-.89$ ) and intention to report warning signs through multiple, appropriate channels (4 items,  $\alpha=.67-.74$ ).

For Cohort 1, a time by treatment interaction was observed for behavioral intention to report through multiple channels ( $b = 0.19$ ). A 5.22% decrease, over time, in behavioral intention to use multiple channels to report warning signs was observed in the control group ( $b = -0.12$ ), but not the SS-ARS group. In other words, compared to control school students who had decreased intention to report over time, the intention to report via multiple channels remained consistent among students receiving SS-ARS. A significant time by treatment interaction was also observed for behavioral intention to report through an ARS ( $b = 0.51$ ). SS-ARS participants reported an increase, over time, in their intention to report through an anonymous reporting application ( $b = 0.58$ ), whereas no change was detected within the control group. This result demonstrates that students receiving SS-ARS had increased intentions to use ARS to report warning signs compared to control school students. See Figure 1 in the Appendix.

For Cohort 2, we found no significant time by treatment interactions for either 1) behavioral intention to report through multiple channels, or 2) behavioral intention to report through ARS. Thus, there was no difference between treatment and control schools observed with regard to students' intention to report warning signs.

### **Perceptions of school safety**

We measure perceived school safety using five items ( $\alpha=.81-.85$ ) to assess student perceptions of their neighborhood and school environment (e.g., "I feel safe in the neighborhood around my school." (National Center for School Engagement, 2006)).

For Cohort 1, a significant interaction between time and treatment was observed for perception of school safety ( $b = 0.16$ ). Specifically, we observed a 7.69% decrease, over time, in the

perception of school safety within the control group ( $b = -0.24$ ), but not the SS-ARS group (no change). See Figure 1 in the Appendix.

We found similar results at the 2-year follow up for Cohort 1. There was a significant time by treatment interaction ( $b = .21$ ). Control schools demonstrated a decline in perception of school safety over time ( $b = -.41$ ), but not the treatment schools.

These results demonstrate that even though perceptions of school safety tended to decline over time, SS-ARS buffered the effect of that secular trend. Students in treatment schools reported stable and better perceptions of school safety at both 9-month and 2-year follow up surveys.

For Cohort 2, we found a non-significant time by treatment interaction for perception of school safety ( $b = .29$ ). A significant effect of wave ( $b = -.27$ ) indicates that sense of school safety declined for students in all schools, regardless of condition.

## **Trust**

We measure Trust/social emotional safety at school using 8 items ( $\alpha=.85-.88$ ), asking students their levels of trust with peers and teachers (e.g., "Students in my school can be trusted" (The Colorado Trust)).

At the 9-month follow up for Cohort 1, a non-significant interaction between time and treatment ( $b = 0.14$ ) was found. A significant main effect of time ( $b = -.25$ ), suggests that perceptions of trust, over time, declined regardless of treatment condition. See Figure 1 in the Appendix.

At the 2-year follow up, some differences emerged between treatment and control schools. Specifically, we found a significant time by treatment interaction ( $b = .29$ ). Control schools (but not treatment schools) exhibited a decline in students' sense of trust at school over time ( $b = -.29$ ).

For Cohort 2, we found a significant time by treatment interaction for trust ( $b = .44$ ). Students in treatment schools reported increased trust over time ( $b = .58$ ), while trust declined for students at control schools over time.

These results demonstrate that even though perceptions of trust tended to decline over time, SS-ARS also buffered this effect on that secular trend. Students in treatment schools reported stable and better perceptions of trust at both 9-month and 2-year follow up surveys in Cohort 1. This finding also replicated in Cohort 2.

## **School Connectedness**

We measure school connectedness using 4 items ( $\alpha=.84-.85$ ) asking how much students feel close to people at school or accepted for who they are at school (e.g., "I feel accepted for who I am at my school" (Fredricks et al., 2004). A decline in school connectedness was observed in the control group ( $b = -0.30$ ), but not the SS-ARS group at the 9-month follow up. See Figure 1 in the Appendix.

Results at the 2 year follow up further support these patterns. A significant time by treatment interaction ( $b = .29$ ) was observed. As indicated by a significant effect of wave ( $b = -.46$ ), both control and SS-ARS schools exhibited a decline in school connectedness over time. The magnitude of the decline was attenuated for SS-ARS (but not control) schools, so that by the 2 year follow up, SS-ARS schools reported a higher level of school connectedness compared to control schools.

These results, again, demonstrate the buffering effect of SS-ARS among treatment school students in Cohort 1 schools. Students in treatment schools reported stable and better school connectedness compared to control school students.

Results from Cohort 2 did not reveal any significant effect of treatment on school connectedness.

### **Exposure to violence and risk behavior at school**

We ask participants to recall how many times they were exposed to or experienced 6 scenarios of violence in the past 3 months, including bullying, gangs in school, students carrying guns or weapons, students beating up or threatening other students, and places in school where some students were afraid to go (Finkelhor et al., 2005). Responses options were 0 =0 times through 5=5 or more times. A sum of scores (range 0 to 30) of the six items ( $\alpha=.73-.80$ ) was calculated.

For Cohort 1, a significant time by treatment interaction was observed for exposure to school violence ( $b = -1.01$ ). A 13.51% decline from the baseline average of 5.90 (out of a 0-30 score) in exposure to school violence, over time, was observed in the SS-ARS group ( $b = -0.72$ ), but not the control group. Notably, we found that students in the treatment condition reported approximately 1 fewer violent event at the 9 months posttest (Figure 1 in the Appendix), while observing no change in school violence for students in the control group.

At the 2-year follow up, we found no significant effects of the program on exposure to school violence. Notably, however, this data collection time period is when schools implement both in-person and online teaching simultaneously. So this specific indicator at 2-year follow up is not considered as reliable as it is at 9-month follow up.

For Cohort 2, there was no significant time by treatment interaction for exposure to violence. A significant effect of wave ( $b = -2.82$ ) indicates that school violence declined for all schools over time, regardless of condition.

### **Summary**

Our results from Cohort 1 (Waves 1-3) support our hypotheses that SS-ARS improved both cognitive (i.e., self-efficacy and intention to report warning signs) and school climate outcomes (i.e., school safety, trust at school, and school connectedness) compared to schools without

SS-ARS. Cohort 1 students in treatment schools also reported decreased exposure to violence at school compared to control school students. Supplemental analyses examining long-term outcomes at the 2 year follow up (Wave 4) for Cohort 1 further support our hypotheses. This suggests that SS-ARS has potential for long-term, positive influences on some school safety indicators (e.g., perceived school safety and trust by students) up to 2 years after the intervention. For Cohort 2, we found significant program effect on self-efficacy to report and trust at school, and effect on intention to report, school safety or connectedness were not significant. Nevertheless, it is important to note the significant confounding due to COVID-19 pandemic for our Cohort 2 posttest data. We therefore believe our findings using Cohort 1 data collected during wave 1-3 (prior to the Pandemic) offers most reliable insight into the program effects.

Results from Cohort 1 data show that SS-ARS improved both short-term and long-term self-efficacy and intentions to report. The intervention also promotes perceptions of school safety and reduced violence exposure as long-term outcomes. Notably, we found that students in the treatment condition reported approximately 1 fewer school violence events (13.51% decline the baseline average of 5.90 out of a 0 - 30 score) at the 9 months posttest among cohort 1 schools. With regards to perceptions of school safety and school connectedness, we observed that control condition students had worsening perceptions over time, with no changes observed among students in the schools that received SS-ARS. Even though school violence was initially higher in the treatment group (for Cohort 1), the decline in the predicted level of school violence exposure suggests that SS-ARS may have the potential to reduce school violence over time.

While our Wave 4 (2-year follow up for Cohort 1) and Cohort 2 analysis provide some additional support for our hypotheses (with regard to Perceptions of School Safety and Trust), it is important to note the confounding factor of COVID-19-related school closures. Cohort 2 schools were particularly affected by this, however, COVID related factors affected our follow-up data collection at both Cohort 1 and Cohort 2 schools (2 year follow up for Cohort 1; 18 month follow up for Cohort 2). Cohort 2 schools were trained in the SS-ARS program in late 2019 and early 2020, so students transitioned to remote learning shortly after the intervention was delivered. This likely affected the degree to which the core components of the program were able to permeate the school culture at Cohort 2 schools. For both Cohort 1 and Cohort 2, the last post-test data were collected in Spring, 2021, after students had transitioned in-person learning (but with some virtual instruction when necessary). Only about half of the original sample was retained in this wave of data collection. Thus, we have the most confidence in our findings for Cohort 1 from waves 1-3, given the intervention was delivered a full year prior to the school shutdowns for cohort 1, and this time period of data precedes the COVID-19 school shutdowns.

## **B. Program implementation and program effectiveness**

### **Implementation Fidelity and Reach**

We examined the effect of program implementation **fidelity** and **reach** on short-and long-term outcomes for Cohort 1 schools (N = 8). Schools were divided into “high” and “low” groups based on the level of program implementation **fidelity** and **reach** (i.e., the percentage of students who were trained on the SS-ARS at the school). Two separate variables were created to compare

high vs. low fidelity and high vs. low reach. Table 3 summarizes SS-ARS implementation and reach across the 8 cohort 1 schools.

Implementation fidelity was defined as the degree to which schools implemented the SS-ARS training presentation, making SS-ARS materials available at the school, and engaging students in the program. **High** implementation fidelity schools (N = 4) refers to schools who participated in Save Promise Club Actions with students in addition to basic program implementation. **Low** implementation schools (N = 4) refers to schools who only engage in basic implementation.

For reach: **High** reach schools (N = 5) refer to schools who reported 90% or more of their student population attended the SS-ARS presentation. **Low** reach schools (N = 4) refer to schools who reported less than 40% of the student population attended the SS-ARS presentation.

To examine the effect of **implementation fidelity and reach** on students' outcomes, Multilevel models (MLMs) were used to estimate whether high implementation contributed to greater improvements in short- and long-term outcomes, relative to low implementation schools and control schools. Three-level MLMs were estimated to control for residual within and between correlations at the person (level 2) and school level (level 3). The key predictors of interest were time (i.e., baseline vs. post assessment), implementation fidelity *or* reach (i.e., High vs. Low), and the time by treatment interaction.

No differences were found between High vs. Low implementation schools in short-term outcomes (i.e., self-efficacy to report and behavioral intention to report). While treatment schools tended to fare better than control schools overall, a higher level of fidelity did not enhance the effects of the SS-ARS program on students' outcomes.

Notably, our results indicate that students at high-reach schools reported greater increases in self-efficacy to report warning signs through the ARS compared to students at low-reach schools and control schools ( $b = .56$ ). Similarly, students at high-reach schools reported greater increases in behavioral intention to report warning signs through the ARS ( $b = .50$ ) compared to students at low-reach schools. Finally, we found that students at high-reach schools reported greater increases in trust at school ( $b = .25$ ) compared to low-reach and control schools. See Figure 2 in the Appendix.

These results suggest that **reach** plays an important role in program effectiveness. Schools that trained more than 90% of their student population in the SS-ARS demonstrated more positive short-term and long-term outcomes compared to schools that trained less than 40% of their student population.

Interestingly, 3 out of the 5 "high reach" schools also fell into the "low implementation" category. This means that these three schools trained more than 90% of their student body in the SS-ARS, but did not engage in any more than baseline implementation activities. Along the same line, 2 of the 3 "low reach" schools also fell into the "high implementation" category. This

means that these two schools trained fewer than 40% of their student body in the SS-ARS, but engaged in Save Promise Club Actions in addition to baseline program implementation.

Findings from the current analysis seem to suggest that reach plays a critical role in program effectiveness. This is important to consider as Sandy Hook Promise develops their SS-ARS program. Ensuring the presentation reaches the majority of the student population may be a key component of program effectiveness. Further, although we did not find significant effects for fidelity, our results suggest further study of the intersections between fidelity and reach in a larger school sample to identify optimal implementation practice.

**Table 3. School-wide Implementation Fidelity and Reach of SS-ARS for Cohort 1**

Implementation Measure	School 1	School 2	School 3	School 4	School 5	School 6	School 7	School 8
<i>Say Something Student Training**</i>	x	x	x	x	x	x	x	x
<i>SS- ARS Staff Training**</i>	x	x	x	x	x	x	x	x
<i>Say Something Call to Action Week (March 2-6, 2019)</i>	x		x		x		x	x
<i>Shared Say Something Materials at School</i>	x	x	x	x	x	x	x	x
<b>Save Promise Club Actions</b>			x	x	x	x		
<i>Save Promise Club Meeting with Champion</i>	x		x	x	x	x	x	
<b>% of Student Population Trained</b>	100	34	30	99	38	90	100	100

**Implementation Facilitators and Barriers**

To gain further insight into SS-ARS implementation facilitators and barriers, we examined data from qualitative interviews with teachers and staff. A thematic codebook was developed based on the implementation interview guide. Two members of the research team independently read and coded the transcript using a line-by-line coding scheme. Codes were compared, extracted and analyzed to develop larger implementation themes. We identified nine themes across the interviews which represented barriers and facilitators to successful program implementation (summarized below). A detailed description of the interview findings are also presented in Appendix 1.

## **Facilitators**

Strong staff support and relationships were critical to obtaining the buy-in from teachers and administration (especially those heavily involved in the program implementation) and were salient facilitators to the school-wide activities (i.e. facilitating successful training and disseminating information). Many schools built the Say Something intervention into their existing programs, activities, and norms. Building school norms such as inclusivity, cohesiveness, and belonging for students are factors that have influenced implementation. Further, district-wide initiatives to help with restorative justice practices and district-wide initiatives like mental health practices helped integrate SS intervention better within schools. Program staff were very supportive in facilitating and implementing the intervention. SHP staff were described as professional, patient, understanding, courteous, helpful, involved, and knowledgeable about the program. Communication between school staff and SHP was described as helpful (i.e., school staff receive monthly emails from Sandy Hook Promise to keep them informed and in the loop). Staff indicated that they were able to rely on SHP staff since they knew SHP staff would be available and ready to help whenever staff needed anything.

The most widely reported factor that was salient to the facilitation of the implementation was the support and buy-in from teachers and the administration. The buy-in included being onboard with not only the intervention but also integrating school-wide activities. A large contribution to being onboard with the intervention was establishing a good relationship between staff and the administration. The buy-in and relationship building not only facilitated the transition of activities at the beginning of the implementation but was critical to sustain the implementation of the intervention (e.g., teachers promoting intervention activities). Below are two key quotes from staff interviews that demonstrate the theme of buy-in:

***Quote #1:*** *“My support - a lot of administration support. And I guess I had to support her, but prior to me supporting her, I had to build a relationship with her so we will be able to effectively implement the program. So we had to come - her, I, and the counselor at the time - come together, devise a plan on how we were going to implement the program. Once we devised a plan, I was able to support her throughout the process, you know, include her on the faculty meeting agenda so she would be able to share the information with the staff. So I guess it would be building a relationship with the person I put over it, which was the success coach, and then*

*providing her with the necessary support so she would be able to implement the program.”*  
(Participant #9)

**Quote #2:** *“...whatever it takes to ensure you know that our students are safe. you know, our teachers are always 100% on board...a lot of times I say the buy in actually starts with the teachers who actually assist and promoting whatever the project is with their student”*  
(Participant #27)”

## **Barriers**

The most commonly stated barrier was scheduling or time constraint. It was challenging for teachers and school staff to find their time for the program. One participant also said that it was difficult to work around the students’ schedules, such as only pulling students out of classes that were electives. Several other barriers that were mentioned include not having enough time, being online due to COVID, and the presentation materials not being engaging enough.

Finding a time to pull students from classes, that also aligned with teacher’s schedules for school-wide activities, was deemed difficult, particularly during the end of the year with testing season. Although the flexibility of Sandy Hook Promise staff was critical, participants indicated that the best time to implement the intervention was in the beginning of the year. Below are two quotes from staff interviews that demonstrate this barrier:

**Quote #1:** *“I would say time. With everything going on, especially towards the end of the year with testing and crunch time as students prepare for tests. Once the tests come in, it’s daily testing, and every person in the building is being used to facilitate or help in a test. The biggest factor which applies to many things is having more time! The program isn’t too demanding in terms of what we have to do by certain dates. With what we were given and the time we had, and in between, we were able to promote the program and speak about it.”* (Participant #10\_2)

**Quote #2:** *“So beginning of the year is great - we can do all the wonderful things that we would like to do so the closer you get to testing, teachers kind of clamp down, administration wants people to be focused, so it changes the dynamic of the campus. It becomes a more, like, ‘woah, we have to get ready for the test coming up.’ But now, with the year we’ve had, it’s now kind of like, just trying to finish the year in the strong way, now that we’re doing distance learning.”*  
(Participant #29\_1)

## **C. Resilience factors against exposure to violence**

In addition to our program effect findings, we also examined the longitudinal relationship between exposure to violence and subsequent aggression and victimization using the first two waves of data. We found that a cumulative promotive factor (CPF) consisting of perceived trust at school, school connectedness, school change efficacy, and mother support has a compensatory effect (direct effect in opposite direction of risk effect) against the effects of wave 1 exposure to violence at school on aggressive behaviors and bullying victimization at wave 2.



Further, we found that the CPF has a protective effect against the effects of wave 1 exposure to violence at school on cyberbullying victimization at wave 2. In other words, CPF mitigates the negative effects of exposure to violence on cyberbullying victimization. This manuscript, entitled "Exposure to Violence at School and Cumulative Promotive Factors: A Longitudinal Study among Urban Adolescents", is currently under review at the *Social Development*.

## D. Tip Data

Between February 2019 and January 2020, 13 schools were trained in the Say Something program and ARS. In the period from February 2019-July 2020, 128 tips were submitted. Tips came from 10 of the study schools; 3 schools had no tips reported by their students (all 3 schools also reported low % reach of Say Something training). The average number of tips per school was 9.8, but there was a great deal of variation in the number of tips submitted per school (range = 0 to 48 tips).

**Submission format** – the mobile app was most frequently used (86.8% of tipsters), 12.3% used the website, and 0.9% called the phone line

**Credibility** – 89% (114 tips) were identified as credible

### Most common tip categories (table of all tip categories by relation to tipster below)

- Depression/Anxiety – 17 tips (14.8%)
- Bullying/Cyber Bullying – 17 tips (14.8%)
- Cutting/Self Harm – 17 tips (14.8%)
- Suicide/Suicide Ideation – 11 tips (9.6%)
- Drug use/Distribution – 11 tips (9.6%)

### Relation to tipster

- 41.2% of tips did not include any information about the tipster
- 16.7% of tipsters were sharing tips about themselves (e.g., concerns about their own mental health challenges)
- 36.8% of tipsters were reporting an event related to a peer
- 5.2% of tips came from adults or other individuals

### Tip status and resolution

- 65.1% of tips are still open in the system
- 41 tips had a resolution time listed, average of 59 days for a school to close out a tip in the system

### Actions Taken

18 of the 39 closed tips in the system (46.2%) had follow-up actions taken logged by school partners. Seven of these tips had more than one action.

- Prevention/successful intervention occurred for 9 tips (7.9%)

- Counseling referrals were made for 11 tips (9.7%)
- Parents were notified for 11 tips (9.7%)
- A welfare check occurred for 1 tip (0.9%)
- The associated school handled 4 tips (3.5%) in a disciplinary fashion
- The associated school handled 6 tips (5.3%) in a non-disciplinary fashion
- Restorative practices were utilized in response to 1 tip (0.9%)
- An arrest was made for 1 tip (0.9%)
- A treatment plan was created for 1 tip (0.9%)

**Table 4. Number of Tips by School**

School	18-19 Enrollment	Training date	Total tips	% Open
1	1002	February 2019	21	47.6%
2	443	April 2019	0	0.0%
3	822	February 2019	5	60.0%
4	422	February 2019	3	100%
5	1304	February 2019	12	75.0%
6	833	February 2019	13	53.9%
7	938	February 2019	2	66.7%
8	872	February 2019	44	88.6%
9	492	November 2019	1	50.0%
10	1074	January 2020	2	0.0%
11	542	December 2019	0	0.0%
12	928	December 2019	0	0.0%
13	1305	January 2020	9	0.0%

Note: Unshaded rows correspond to Cohort 1 schools. Shaded rows correspond to Cohort 2 schools.

## E. Cost Effectiveness

Our analysis of program effects from Wave 1 to Wave 3 revealed that students in treatment schools reported approximately **one fewer incident** of school violence **in the past 3 months**. The following types of violent or risk behavior incidents were measured in the current study: bullying, physical aggression/fights, weapons carriage, using weapons to threaten others, and gang activity.

Using the 2019 Cost of Injury Data from the CDC (which is the most recent data available), we estimated the cost of four different types of violent incidents among youth (ages 0-14): homicide, suicide, assault, and self harm. Table 5 includes the rate of incidents and the estimated medical cost per incident.

The estimated potential cost, should any of these serious violent events happen, range from \$10,263-\$24,920 per incident, per school, depending on the type of violent incident. The cost of SS-ARS implementation across the 13 schools was \$36,760 per year (Table 6), suggesting an average of \$2827.69 per school for the implementation of SS-ARS. Thus, the SS-ARS may be highly cost effective method for school violence prevention.

**Table 5. Medical costs associated with four types of violent incidents among youth age 0-15 (CDC, 2019)**

	Homicide	Suicide	Self Harm	Assault
Rate (per 100,000)	1.5	0.9	76.7	168.3
Cost per Incident	\$20,157	\$12,821	\$24,920	\$10,263

**Table 6. Yearly costs associated with SS-ARS program (across 13 schools)**

Say Something Training for Students and Staff (including travel and materials)	\$13,384
Anonymous Reporting System/Crisis Centers	\$17,028
Engagement with Save Promise Clubs	\$6,348
Total	\$36,760
Average cost per school	\$2827.69

**Notes:** Training costs are estimated for in-person training across the 13 schools included in the study.

*ARS/Crisis center costs are based on the relative percentage of the SSARS department costs (less P3 license costs) based on the number of students in the study population (approx. 11k over 2 years). Plus, the Miami-Dade P3 cost for FY2019 and FY2020.*

## **F. Implications for policy and/or practice**

Our findings provide evidence across time and outcomes that the SS-ARS intervention is an effective approach to improving perceptions of school safety, increasing reporting of early signs of violence, and reducing students' report of exposure to school violence and risk behaviors (i.e., weapon carriage, gang activity). This is especially notable because SS-ARS includes three vital components. First, it focuses on interpersonal relationships among students as a way to improve school safety. Second, SS-ARS includes training to build awareness and knowledge for using the ARS system. Simply having an ARS available without such training may not be as effective as a more fully integrated program like the SS-ARS. Third, the SS-ARS program integrates youth, parents, and the entire school community to detect early warning signs of potential harm to self and others. The pattern of findings in this study are all the more relevant as over half of the states in the U.S. mandate ARS systems in schools. Our results suggest that ARS systems can be effective when ARS training is integrated into approaches of school safety. The evaluation of SS-ARS in rural and suburban districts is also necessary for determining the generalizability of its effectiveness. Finally, further research focusing on implementation fidelity of SS-ARS with a larger school sample will shed light on what constitutes optimal program design and implementation for its effectiveness. Our study, however, provides credible evidence that SS-ARS is a promising modality for preventing school violence and promoting school safety.

Our study also has implications for the SS-ARS program reach for their student population. Specifically, we found that greater program reach (i.e. training offered to a larger percentage of the student population in a given school) was associated with more positive short-term and long-term outcomes for students. Efforts to increase the percentage of students who receive the SS-ARS training may be an important practice for enhancing program effectiveness.

## **III. Limitations**

This study was conducted in Miami during two major events that may have confounded our study: 1) shooting at Majorie Stoneman Douglas (MSD) High School (located 50 miles north of Miami), occurred between baseline and Wave 2 data collection (for Cohort 1), and 2) COVID-19 pandemic, occurred between Wave 2 and Wave 3 (for Cohort1) and baseline and Wave 2 (for Cohort 2) data collection. The influences of the school shooting tragedy may be more salient to our study sample due to the geographic proximity. Further, due to the tragedy and the subsequent widespread implementations of ARS, students from control schools may have had

access to or be aware of alternative ARS systems (e.g. FortifyFL, a school-related suspicious activity reporting tool that allows Florida students to report concerns was made available in 2018). However, we have no reason to believe that this would explain our results because: 1) it is unlikely that the effect of the shooting would differ between students in treatment and control schools; and 2) the introduction of FortifyFL in the control schools would be expected to reduce treatment and control group differences (given similar exposure), strengthening our findings that the SS-ARS training components improved school safety outcomes. Finally, given the random assignment of schools, it is arguable that the effects of this event would also be somewhat randomly distributed in our sample, reducing the validity of the MSD shooting as an alternative explanation of the results (similar discussion of the limitations is included in Hsieh et al., 2022).

As is also specified in our peer-reviewed article of this study (Hsieh et al., 2022), the generalizability of our findings are somewhat limited. Our sample was drawn from one metropolitan area with a diverse, multicultural student population. We were only able to recruit 29 schools (out of 49) in MDCPS and student participation rates in schools varied. Further, our study focused on students in middle schools. Thus, our findings may not be generalizable to students in rural or suburban settings, charter schools or more homogeneous districts, as well as students in other developmental stages (Hsieh et al., 2022). Nevertheless, the fact that we found effects as hypothesized and across different kinds of outcomes at two follow-up time points offers promising evidence that the SS-ARS program can be effective to improve school safety and reduce student-reported violence exposure in public school settings.

Moreover, our measures for exposure to violence at school are based on self-report data and several violent behavior indicators (e.g. seeing someone use a weapon to threaten others) with risk behaviors that are not necessarily considered violent (e.g., seeing someone carry a weapon or observed gang activities). Each, however, represent precursors of violence at school that are important for preventive efforts.

Our findings related to tip data are also limited in that we can not link specific tips to events or prevented incidents. Our data were limited to the number and type of tip reported and did not assess actions taken by the crisis center, resolution of tips, or specific student outcomes. Future work on ARS systems should consider leveraging data around the handling and actions taken by school/law enforcement stakeholders when tips are provided.

Finally, our comparison between high vs. low implementation fidelity is based on a single variable (SAVE promise clubs) that differentiates the groups. This may not allow for a comprehensive assessment of the variation of implementation fidelity of SS-ARS. We also have a small sample size of schools to detect potentially smaller effects related to SAVE promise clubs. Future studies could develop more comprehensive measures of fidelity and incorporate indicators of exposure to other intervention components to examine their association with program effectiveness.

#### **IV. Expected applicability of the research**

This study has wide-ranging implications for criminal justice policy and practice in the U.S. **First**, anonymous tip lines have potential to promote school safety, but evidence examining effectiveness, use, and adoption of these technologies and their relationship to violence

prevention outcomes is lacking. To the best of our knowledge, this study is one of the first rigorous evaluations of ARS and expands on existing knowledge of the effects of ARSs on youth reporting behavior and attitudes and its relationship to youth violence prevention outcomes (Messman et al., 2022). **Second**, this study assessed an anonymous tip line system in a large multi-ethnic, metropolitan school district. This is an important setting that offers the opportunity to test the generalizability of this technology and implementation factors associated with changes in outcomes. **Third**, the ARS was implemented in the Miami-Dade County School District, which has an integrated police department. Our results provide vital information for improving school safety by enhancing school-police coordination and collaboration, including data sharing. **Fourth**, the study provides useful implementation data to help schools, police departments and other criminal justice organizations better collaborate and understand best practices for implementing an anonymous tip line in their communities. **Fifth**, the SS-ARS model (technology + education program) is an extension of other ARS-centered programs and includes spreading activation where youth and schools are empowered to adopt the system and encourage family and other community members to engage with the system. This approach helps communities and schools take ownership of the system, tailor it to their local context, and therefore, greater utilization of it. This study contributes to our understanding of how these programs operate to reduce youth violence and its antecedent behavior, and limit criminal justice involvement. **Finally**, the study findings are relevant for the Sandy Hook Promise Foundation in their work across the nation, informing their approach with systematic process and outcome evaluation and providing vital information for their dissemination efforts.

## Artifacts

### I. Training and professional development the project provided

We were able to include a post-doctoral fellow (Dr. Messman) in our team as the Project Director. As a result, Dr. Messman developed program management and leadership skills in the project, as well as collaborations with SHP, schools, and other stakeholders. Dr. Messman also developed content expertise in ARS and school-based program evaluation and will lead other project for relevant projects. We also included 1 master student, 2 doctoral students, and 2 post-doctoral fellow in manuscript writing for topics including school climate, violence exposure, youth resilience, and developmental outcomes. As a result, we have 1 publication, 2 manuscripts under review, and 3 manuscripts in preparation for journal submission based on the contribution from these students/fellows.

### II. Data sets generated

We collected quantitative and qualitative data. The quantitative dataset includes de-identified student survey data across four waves of data collection, including student demographic

information, attitudes toward school, reporting behaviors and exposure to violence. The qualitative dataset includes de-identified teacher and staff interview data.

### **III. Dissemination Activities**

We shared our preliminary findings with Sandy Hook Promise and the Miami-Dade County School District. We also published [a video](#) that discusses the project and our preliminary findings through the Michigan Prevention Research Center.

#### **A. Professional Presentations, Media Interviews, Videos and Podcasts**

Heinze, J.E. & Hsieh, H.F. (February 2021). Evaluation of the Say Something Anonymous Reporting System to Improve School Safety. National Institute of Justice Comprehensive School Safety Initiative. Virtual Meeting.

Masi, R., Heinze, J.E., Hsieh, H-F. (April 2021) *Michigan Prevention Research Center. Evaluation of Sandy Hook Promise Say Something Anonymous Reporting System (ARS)*. Video link: <https://www.youtube.com/watch?v=Asc6-bsN2UM>

Heinze, J.E & Hsieh, H-F. (December, 6) WXYZ News. Inside the Secret Service study that analyzed school attack plots. *News link:* <https://www.wxyz.com/news/inside-the-secret-service-study-that-analyzed-school-attack-plots>

#### **B. Published Papers**

Hsieh, H-F., Scott, B.A., Stoddard, S.A., Zimmerman, M.A., Kleinsasser, M.J., Heinze, J. (2023). Exposure to violence at school and school-related promotive factors among adolescents in urban settings. *Journal of School Violence*. <https://doi.org/10.1080/15388220.2023.2186419>

Hsieh, H-F., Lee, D.B, Zimmerman, M.A., Pomerantz, N., Cunningham, M.C., Messman E., Stoddard, S.A, Grodzinski, A.R., & Heinze, J.E.. (2022) The Effectiveness of the Say-Something Anonymous Reporting System in Preventing School Violence: A Cluster Randomized Control Trial in 19 Middle Schools, *Journal of School Violence*, 21:4, 413-428, DOI: 10.1080/15388220.2022.2105858

Messman, E, Heinze, J.E., Hsieh, H-F, et al. Anonymous Reporting Systems for School-Based Violence Prevention: A Systematic Review. *Health Education & Behavior*. 2022;0(0). doi:10.1177/10901981211073734

## Appendix

### I. Implementation Interview Themes

Theme	Description	Examples
<b>Staff/Student Training</b>	Program content, follow-up activities, and SHP presenters were informative, necessary, and thorough. A few participants mentioned the training for both students and staff could be improved by making it more interactive and engaging.	<p>“The presentation was done well, I understood how to access the actual system. The PowerPoint slides were very detailed, I don’t have any negative [comments]. There was a presentation that lost the kids a bit because it wasn’t as exciting, if you don’t make presentations exciting in the auditorium, you’ll lose the kids.”</p> <p>“I would condense the presentations shorter, make it some type of game show; incorporate student voices into the presentation. Make it interactive, poll kids from their device, since it’s anonymous they could feel comfortable.”</p>
<b>ARS</b>	Both staff and students were able to understand, handle, and utilize the system and reports coming in well. ARS system was valuable and beneficial for both staff and students. It required a team effort that was pivotal to the implementation of the ARS system. The ARS system was particularly helpful for staff who worked in teams as it allowed/required them to communicate with and respond to other staff members (administrative team, counselors, school resource officer). Schools were able to respond effectively to ARS reports by quickly contacting parents and speaking with students in a timely manner to ensure they receive appropriate support and care. Prompt response was	<p>“You know, it takes many people to make it work. That, to me, is very very helpful. I think the more we get the message out there and the students know it’s there, I think it can be - for me - access is extremely important. So that’s why I value it - me, myself. I think that would be a source of help for many students and families. So I can see the benefit in that.”</p> <p>“Our students really understood how to use it. We did have tips come in throughout the school year. We had tips come in on students possibly vaping, we have tips come in with students threatening self-harm, so the students did use it. And I think they used it in a responsible way because when he [presenter] first trained the students, they always tell you to prepare for the onslaught, because now the kids have access to this, you may have kids really over-report things. You know, out of a sense of panic or fear - but we really didn’t get that. The reports that came in for our school - the kids really</p>



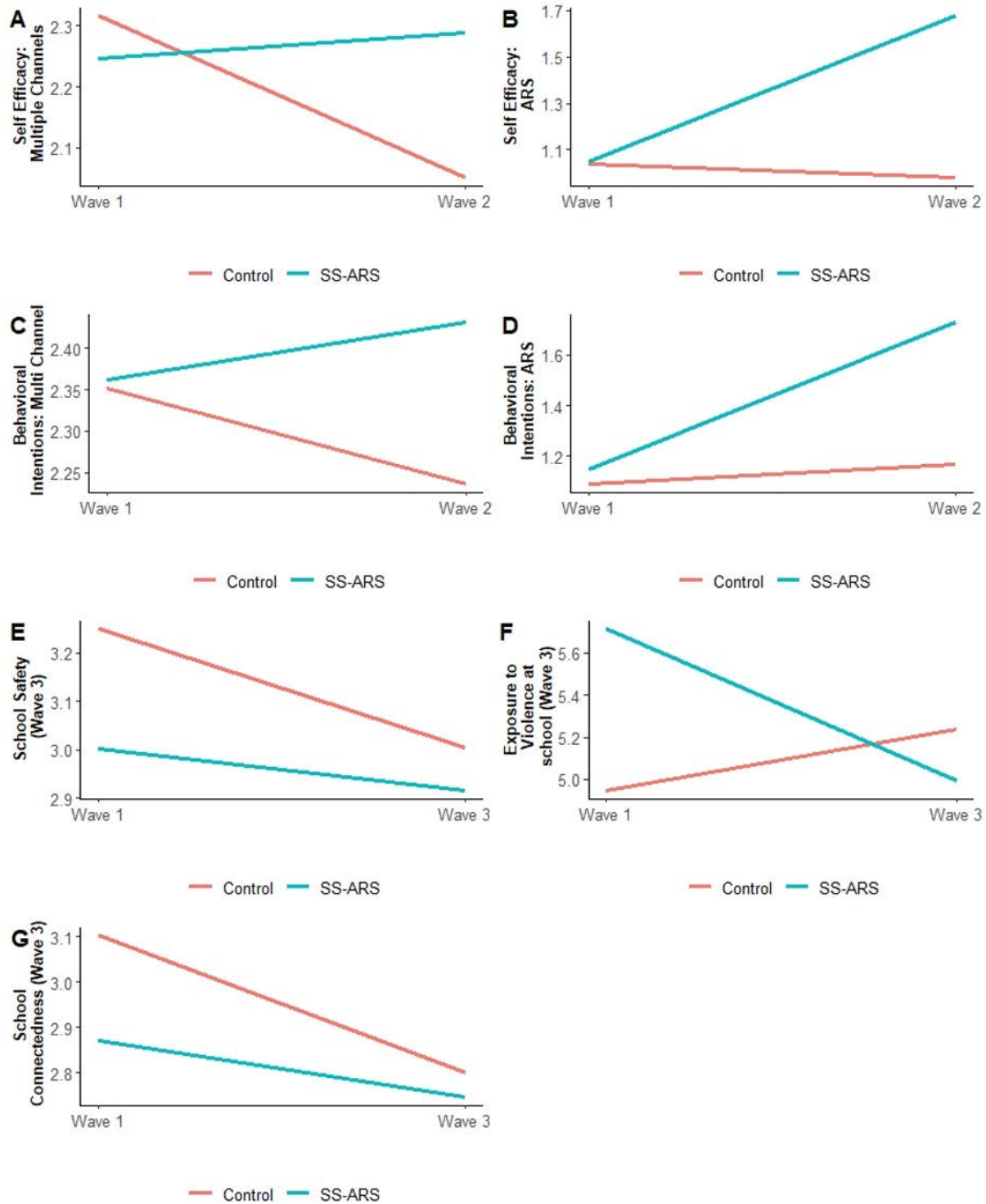
	considered a critical factor in school response success.	knew, how should I say it, "Hey, I need to get help for my friend." Usually the reports came in at times when the students were home and maybe they saw something on social media and knew that maybe they didn't have access to an adult from the school at the time. They knew when and how to use it. So I was really pleased at the way they used it. We've been able to follow up and make sure the student was okay and you know, follow through with what we needed to do in terms of our policy for whatever the concern was. I like the ease at how it comes through, like on the cell phone. I like that, you know? That helps us."
<b>Integration</b>	<p>Program is integrated into existing systems/time/resources through various ways and to varying degrees including materials (i.e. fliers) in classrooms and student services, integrating in morning announcements (scenarios and reminders that students should report), homeroom time (reiterate importance of program), SS orientation and training (and reminder every year) and providing short activities for teachers, clubs to integrate SS tools into.</p> <p>Materials/content were integrated into existing time and resources (I-Study time). COVID-19 and moving to remote classes hindered a full integration of SS. However, it provided new opportunities to engage students via online</p>	"We integrated into morning announcements. We had scenarios and reminders that if you see something, say something. If you see somebody threatening somebody, or when you feel someone's life may be in danger, it's better to say something rather than nothing. Mostly, it's during homeroom and during morning announcements. Being in homeroom, where you have only 20 minutes of taking attendance and for discussion, having that small window of 20 minutes allowed us to reiterate the importance of the program. Then seeing something that could be a danger."
<b>Youth Involvement</b>	Youth played a critical role in the intervention. Youth involvement (student engagement) was considered an advantage to both youth and others. It brings	"The youth's role was to basically, to be aware of their surroundings and what's going on. Had to see if things are going alright in the school setting. Make sure they are more open to saying something to somebody because a lot of times kids

	<p>awareness and is self-empowering to know and stop potential actions from happening. It's also coalition-building in that it brings youth together and helps bring awareness to the community (more united and develops team building). There were various levels of engagement among youth including being aware of surroundings and events happening in the school setting, ensuring that they speak up when they see something wrong, and spreading information. Challenges of youth involvement included behavioral issues, scheduling, lack of attendance, etc.</p>	<p>don't want to speak up due to numerous reasons. With this program, I found a lot of the kids felt they could and should speak, which is very important when it comes to violence and things that shouldn't be happening in schools."</p>
<p><b>Improvements</b></p>	<p>Areas of improvement included ongoing training for administrators and students, including virtual video presentation, and greater education and involvement of parents about the program (in multiple languages). Major area of improvement is having more support including having a team of 3+ people so that responsibilities are delegated (ARS team).</p>	<p>"The only thing I would suggest is having a team of more than 3 people; it becomes a lot for one person to handle if you have multiple reported situations at one time. My suggestion would be for the ARS team to be more than 3 people. Counselors are being pulled in so many areas, and to be honest, every time there is a committee needed for some initiative, district-wide or school wide, it always involves a counselor. We are wearing so many hats, part of so many committees and teams, it sometimes can be very difficult to handle when it's just the one person. I would just consider including more than a team of three to handle these types of things. To be honest, every time there is a committee needed for some initiative, district-wide or school wide, it always involves a counselor. We are wearing so many hats, part of so many committees and teams, it sometimes can be very difficult to handle when it's just the one person. Especially if you're the only counselor in the school!"</p>

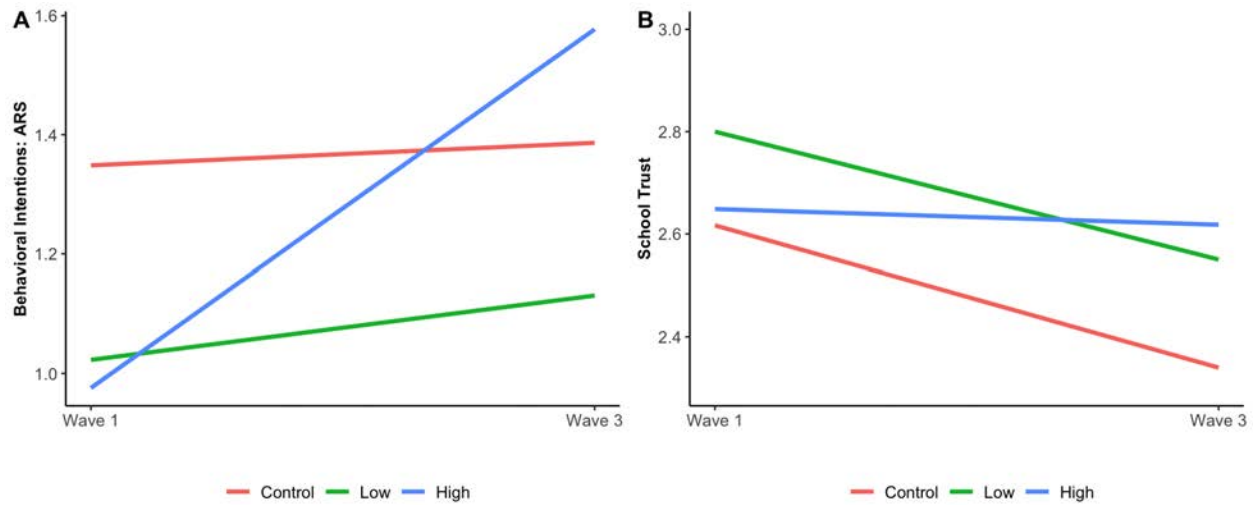
<p><b>Staff Involvement</b></p>	<p>Staff involved include counselors, success coach, student services (i.e., counselors), principal, assistant principal, administration, resource officer, fitness director, teachers, activity coordinator. A few people said that counselors and teachers were the most involved.</p>	<p>“Our student service department, our principal and assistant principal, so administration. Our resource officer was involved as well. We were mostly the ones, as the counselors, that would talk about it and any questions. It was mostly administration, student services, 2 counselors, our fitness director, she would make announcements in the morning and afternoons”  “...It usually falls on student services.”</p>
<p><b>Available Resources</b></p>	<p>Available resources include fliers that SHP gave teachers, money from the school, several clubs at school that help students report/talk about mental health and taking care of each other, SHP website resources, and restorative justice practices/tools provided by the school district. Additional materials and fresher training would be helpful since staff get rid of materials every year to the next.</p>	<p>“I still have fliers that you guys gave us because we got a lot. We also have one in every teachers’ room, in the office, in the student services office. Everybody gets a flier, especially the new kids coming in annually. We also make the kids listen to announcements during lunch regarding issues we may have. For example, one issue was kids vaping, and if a lot of kids are getting caught, we would bring up the issues and harms with vaping at a lunch announcement. That’s when we speak about Sandy Hook, ask if anything knows about the Sandy Hook program and reporting. That’s an advantage we have in continuing to speak about the program.”</p>
<p><b>Impression</b></p>	<p>The majority of people said that the program met their expectations as well as the needs of their school. A few people expressed hesitation and skepticism about the program.</p>	<p>“I guess I got what I expected, which is more student involvement, better understanding of how we’re all here to take care of each other....it’s an opportunity to help someone, or help your school, help your peers, by keeping everyone safe.”  “Well, I’m always interested in the program. I’m going to be honest - with activities, boy, I need help. I’m glad we have a good team - they provide the ideas, you know? But I’m definitely very, very interested.”</p>

<p><b>Sustainment</b></p>	<p>Schools intend to continue the program the following school year unless there are any changes in requirements from the school district. Several participants discussed continuing program activities (awareness campaign) through having signs, working with success coach, new counselor and groups of students to encourage the ARS system, reminding students of how to report things they see are wrong and how to identify if someone is getting hurt, bothered, or bullied.</p>	<p>“I will present it to the staff again. Coordinate activities in the first week of school, September, and the second semester. No longer going to be passive, we will continue to implement the program. To see it grow, it has to be consistent...as long as I am the principal, it will continue to be implemented.”</p>
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**Figure 1.** Significant cross-level interactions between time and SS-ARS for self-efficacy and behavioral intentions of reporting, school safety, school connectedness and exposure to school violence.



**Figure 2.** Significant cross-level interactions between time and program reach for among treatment schools.



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