

# Impact of a District-wide, Individualized, Computerized, Positive Behavioral Intervention on Discipline Referrals, In-School Suspensions and Out of School Suspensions

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## ABSTRACT

A Georgia school district's comprehensive Safe Schools/Healthy Students initiative included the implementation and evaluation of a self-regulated, computerized, social-emotional learning intervention, as a tertiary intervention for discipline-related problems. Between 2004 and 2007, 3,685 mostly low income, African American students in 40 elementary, middle and high schools were assigned self-regulated, reading-independent tutorials matched to their offenses and were encouraged also to explore underlying reasons for their behavior. A third party evaluator examined whether the self-regulated intervention would be implemented with fidelity in diverse discipline-related settings, and whether use would result in fewer behavior problems. Three types of data were used to gauge results: Quantitative usage data logged by the software, quantitative outcome data provided by the schools and district, and qualitative interview data from students, implementers and administrators. Computer-generated dosage data indicated students received on average, two hours exposure to the program. Specific tutorials were available for 99.5% of their offenses. Administrative data indicated that across all grades from first to fourth quarter, when rates of discipline-related offenses traditionally rise, discipline referrals decreased an average of 28% the first year, and increased an average of 5% the second year; in-school suspensions decreased an average of 30% the first year and 26% the second year. The greatest reductions were among high school students. Out-of-school suspensions increased an average of 48% the first year and 52% the second year from fall to spring, consistent with traditional patterns. Absent objective comparative data, we were unable to interpret the degree of positive effects on discipline referrals and ISS repeat referrals, and unable to make a judgment about whether out of school suspension differences were positive, negative, or neutral.

**KEYWORDS:** school discipline; individualized; In-School Suspension; computerized intervention

## BACKGROUND

Maintaining safe, orderly schools is a primary concern of educators. To meet these goals, most schools have policies that involve removing disruptive or aggressive students from the school, often referred to as out-of-school suspension (OSS). Economic, social, and legal concerns make OSS an unpopular option, with no evidence of effectiveness (Skiba, Michael, Nardo, & Peterson, 2002).

Schools have long used informal disciplinary techniques for minor infractions (such as sitting a student on a bench in the hall, sending the student to talk the vice-principal, etc.). For more than a decade schools have increasingly used in-school suspension (ISS) as a more formal alternative administrative sanction for student misbehavior.

ISS removes offending students from the teaching and learning environment (i.e., halls, playground, or lunch area), without separating

students entirely from the school community. The intent of ISS usage is to reduce the impact of student problem behavior on the learning or social experiences of other students and teachers, without exempting offending students from consequences, or completely separating the student from the school community and denying them the opportunity to learn. A secondary, but not insignificant effect is to maintain the revenue that is tied to daily attendance records. (When students are suspended out of school, their per capita/per diem funding goes with them.)

As a policy option, ISS is intended to promote a safer, more disciplined school climate where every student may succeed. However, in many school districts, the ISS policy has an opposite effect – repeat referrals become the norm, and disciplinary actions are linked to academic failure, not success. The disciplinary actions also frequently exacerbate racial and ethnic inequities. Across the nation, initial discipline referrals, assignment to ISS, and assignment to OSS all fall disproportionately on African American, Latino and Native American students (Skiba et al., 2002). Special Education students are also disproportionately represented in discipline referrals (Skiba, Simmons, Ritter, Gibb, Rausch, Cuadrado, & Chung, 2008). Schools struggle with the issue of how to reduce discipline referrals caused by negative behavior of Special Education students, while still respecting the legal rights of Special Needs students to the least restrictive environment (LRE) (Losen & Orfield, 2002).

Evidence-based training in socially responsible behavior has validity as a strategy for intervening with anti-social behavior (Catalano & Hawkins, 1996; Durlak, 1983; Gresham, Sugai, & Horner, 2001; Wilson & Lipsey, 2007). But, agreement on what should comprise that training is more complicated. A meta-analysis has identified five major categories of effective interventions to prevent anti-social behavior: a) behavioral approaches (behavior shaping and reinforcing), b) cognitive approaches

(cognitive restructuring, managing feelings, decision-making), c) social skill training (interpersonal skills, perspective taking, assertiveness), d) counseling, and e) parent skill training (Lipsey & Hawkins, 2007). Noticeably absent from this list is severe punitive measures.

Of the major effective approaches, no single approach is greatly more effective than the others. The approaches work for some children, in some situations, some of the time. Each approach shows more effects with children who have higher risks (Wilson & Lipsey, 2007). Again, a major challenge is to match the intervention to the disciplinary offense for which it will be most effective.

Regardless of the approach adopted, ensuring standardization and fidelity to evidence-based practices in ISS settings is difficult. While creating a plan for treatment many times involves a team of trained professionals, implementing that individualized plan, especially with students in disciplinary settings, is much more problematic. Adults supervising ISS are sometimes teachers pulled from academic classes. Other times they are non-professionals, who have experience neither in teaching, nor in counseling. Whether they are teachers, counselors, or non-professionals, few have been trained to implement social-emotional learning (SEL) programs or behavioral interventions. Many are more likely to engage in *telling* students what they should do, than in *training* them in scientifically validated, theory-based strategies of how to do it (Devaney, O'Brien, Resnik, Keister, & Weissberg, 2006).

Additionally, students who present behavior problems are often not succeeding in the classroom. The students may be academically gifted and bored, have attention deficit disorders, have cognitive impairments, or some combination of the three. The chance that any one adult's preferred mode of teaching or training is well matched to each and all of students' many diverse learning styles, abilities and limitations is very low.

All of these factors contribute to the fact that disciplinary measures are often unsuccessful in the four-part task of simultaneously addressing individual risk factors, providing training in the

skills students need to overcome adversity and engage in socially responsible behavior, accommodating individual learning differences, and obtaining the positive school outcomes which would confirm success of the interventions.

In 2002, Bibb County Public Schools in Macon, Georgia faced many of these challenges. The district had high rates of disciplinary incidents, including both ISS and OSS. The ISS program was ineffective. A systematic intervention did not exist. Rates of repeat referrals were high, and students were not leaving ISS with new skills to address their behavior problems, nor better prepared to learn. The need to find an affordable, individualized, evidence-based, and therapeutic response to discipline problems, as well as a graduated system of disciplinary actions that would have truly corrective outcomes, led BCPS to submit a Safe Schools/Healthy Students (SS/HS) grant, which was awarded in 2003. The proposal included a computerized approach to discipline problems called Ripple Effects, which met the district's criteria. The SS/HS comprehensive, intensive programming included five components: an after-school program, a truancy center, a substance abuse outpatient program, a parent resources program, and the computer-delivered training as an immediate, corrective sanction for discipline problems. Formative and summative evaluations of each component were apart of the comprehensive plan. This article focuses on evaluation of the last component, the intensive, individualized behavioral support, through computerized training and personal guidance.

Prior to submission of the BCPS SS/HS plan, two studies had examined single session (Ray, 1999) and 12-week (Stern & Repa, 2000) use of Ripple Effects as a secondary, preventive intervention to reduce aggression and promote pro-social behavior. Data from the two studies suggested efficacy in positively impacting three key risk factors—social skills, anti-social behavior and academic performance—but did not prove

effectiveness. In 2003, concurrent with the first year of the BCPS implementation of its SS/HS initiative, National Institute on Drug Abuse funded a series of six RCTs measuring the effectiveness of Ripple Effects as a secondary, preventive intervention, involving a set curriculum over seven weeks at six school sites on the West coast. Data from the studies involving students with multiple risk factors indicated that the Ripple Effects intervention resulted in higher grades by .3 to 1.5 points on a four point scale ( $p < .01$ ) for the treatment groups, when compared to control groups. Across all six studies, suspensions were significantly lower for treatment group students ( $p < .05$ ). Additionally, students in each of the studies also had lower mean scores for discipline referrals. Mean differences were clinically meaningful, but not statistically significant (Perry, Bass, Ray & Berg, 2008). Data from the studies also showed that 96% of all students who had even minimal exposure to a core set of skill-building tutorials, took advantage of the option to voluntarily explore topics of personal concern to them, with almost all exploring recognized risk factors in the various domains of self, family, peers, school, neighborhood, and society.

#### *Purpose*

The purpose of the Bibb Country evaluation is to measure implementation levels, and efficacy of the Ripple Effects computerized program as an individualized, tertiary, school-based intervention for behavior problems.

## METHOD

#### *Research Design*

This mixed methods, real-world analysis used a quasi-experimental, pretest/posttest evaluation of behavioral outcomes, with time periods as the comparison condition, as well both quantitative and qualitative analysis of data regarding the implementation process. The degree to which students sought out help with personal risk factors is reported separately (Ray, Patterson, & Berg, 2008).

Hypotheses. The hypothesis was that schools would implement the intervention for disciplinary and ISS referrals; and that self-regulated completion of a set of one or more computerized, skill training lessons, directly tied to a student's disciplinary offense, along with the option for students to privately explore additional tutorials to address personal risk factors that might underlie their behavior, would result in behavioral improvements over the course of the school year, specifically, fewer office discipline referrals (ODRs), fewer referrals to in-school suspension (ISS), and fewer out of school suspensions (OSS).

### *Participants*

*Setting.* The intervention took place over a three year period during the 2003-2004, 2004-2005 and 2006-2007 school years, at 40 schools in Bibb County Public Schools (BCPS) in Macon, Georgia. Located in the deep South, Bibb County is a geographically large school district in the center of the state. It includes 41 schools with a combined total of nearly 25,000 students. Sixty percent of the population is urban, 40% is spread out across unincorporated, mostly rural areas (*2007 Georgia County Guide*). The area is poor and predominantly African American. Twenty-nine percent of children under 18 and 38% of female-headed households with children under age 18 are living below the poverty level (*2007 Georgia County Guide*, as cited in Norris, 2007).

*Sample.* A total of 3,685 students, 15% of all students in the district, participated in the Ripple Effects intervention over the three year period: 1,560 elementary, 1,274 middle school, and 852 high school students. Approximately 73% of BCPS students are African American, 23% Caucasian, 1% multi-racial, 2% Hispanic and 1% Asian ethnicity. Seventy percent are eligible for free or reduced priced lunch (FRPL). Ripple Effects program participants were representative of this population (Norris, 2007).

*Method of selection.* For the final eight weeks of the 2004-2005 school year, and the

entire 2005-06 and 2006-07 school years, trained staff at all participating schools were mandated to assign the Ripple Effects intervention to all students who received an ODR or referral to ISS. Students who were not referred did not get exposed to the intervention.

### *Intervention*

The Ripple Effects intervention is a computerized, social-emotional training and problem-solving application comprised of a content library, a learning system, an expert system, and a data management system. Content covers hundreds of reading-independent training tutorials. Tutorials are organized into strengths (assets), problems (behavioral, academic, social), and reasons (risk factors at individual, family peer, school, community and social structure levels). The *strengths* category provides training in seven key social-emotional abilities designed to promote awareness and regulation of self and awareness of and respectful relations with others. The *problems* section specifically includes 80% of the BCPS categories of discipline referrals, all except the very uncommon ones. The *reasons* category focuses on risk factors in the multiple domains of individual, family, peers, school, community, and social structures and processes (i.e. racism, sexism).

Each tutorial includes up to twelve learning modes, and is made up of photos, illustrations, videos, sound, peer-narrated text, and interactive exercises, designed to present evidence-based strategies (cognitive, behavioral, interpersonal, social skill training, and attention) that have been shown to be effective in live instruction settings. Students complete the tutorials working directly on the computer. Each tutorial takes roughly 20 minutes, on average, to complete.

The built-in expert system presents links within each tutorial to proven strategies for dealing with that issue. The system dispenses screens of content in a sequence instantaneously developed in real time, based on unique choices each student makes, which allows both standardization of content and individualization. The data management system enables staff to monitor completion of required tutorials.

Specific conditions of use varied somewhat from school to school and student to student, mostly depending on the offense. The SS/HS team tapped the counselors and ISS teachers currently handling discipline problems, to facilitate the referred students' use of the computerized intervention, and purchased two laptops per school to run it. All staff were directed to tailor the intervention to a student's disciplinary offense, and encourage students to privately address underlying reasons for problem behavior (personal risk factors). Tailoring of training to offense thus came through three things: choice of tutorials by facilitators, choice of tutorials by students, and the expert system within the software, which matched proven effective strategies to the specific tutorials for more than 99.5% of all referrals categories and all personal risk factors.

The number of students in ISS at any one time ranged widely, from one to 20. Each student would rotate through and use the laptop to complete the required tutorials, and as time allowed, to explore on their own to address underlying issues, as directed by the facilitator. Contact hours ranged from 15 minutes to several hours, depending on the setting, the offense, and the number of students in the room. For each tutorial, the adult supervisors required students to complete the three available interactive elements (interactive journal, assessment of concept mastery, and, in some cases, a subjective self-assessment). Eight or more passive forms of learning for each tutorial were optional. After students completed required tutorials, they could follow built-in

links to go deeper into topics of personal interests. Electronic scorecards tracked completion of the interactive assessment elements. The protocol is summarized in Table 1 below.

*Staff training and implementation.* In the Fall of the 2003-04 school year, five district SS/HS staff members attended a three-day training to help them become familiar with the intervention, and determine how they planned to stage the implementation. As a result of this planning, the district created a full time staff position of *Ripple Effects Coordinator* to oversee the implementation, support school sites, and collect data on usage. BCPS also purchased two laptops for each school, installed the software, and distributed the laptops to the schools.

In the Spring of the 2004-2005 school year, a Ripple Effects trainer provided a three-hour training to sets of small teams from each BCPS school. During the training, teams learned how to introduce the software to students, show students how to use it, assign required tutorials based on the presenting offense, direct students to explore personal risk factors, and then check the electronic scorecard to monitor completion of lessons. They also identified sets of tutorials (scope and sequences) to assign for the most common disciplinary offenses.

*Cost.* Cost of the software, supplemental materials and staff and trainer training was \$250,000, representing a cost of approximately \$50 per student served, or roughly \$17 per student, per implementation year. However, the software was available at the end of the project to be used for any combination of primary, secondary and tertiary interventions, without additional cost, in perpetuity—a substantial saving over other alternatives.

Table 1.

<i>BCPS Protocol for Implementing Computerized Intervention in Discipline</i>	
Step 1: Start with learning style	Complete the learning style tutorial to identify their preferred way of learning and get coaching on how it could be leveraged for success.
Step 2: Address referral	Complete the tutorial related to the immediate offense that brought them to ISS (i.e. defiance, fighting, breaking rules, etc.)
Step 3: Student choice	Seek out what THEY think is the underlying reason for their offense (risk factors).
Step 4: End with a strength	Choose a strength to work on, or complete a profile for one of the seven key strengths, to get direction on where to start.

### *Outcome Measures and Data Collection*

Both quantitative and qualitative measures were used to evaluate implementation and intervention effectiveness.

To measure the extent and nature of exposure to the intervention, district staff and evaluators used automated student usage reports generated by the software. The software automatically logged student completion of the interactive parts of each lesson. A BCPS staff member collected the data files from each school's laptops, and aggregated them to generate reports on lesson usage and individualization. These data were collected for the 2004-05, 2005-06, and 2006-07 school years.

To measure impact on school discipline, evaluators used incidences of ODR, ISS, and OSS measured at the first and fourth quarters of each school year, for students participating in the Ripple Effects intervention. ODRs are commonly used as markers for managing and monitoring disruptive behavior in schools (Metzler, Biglan, Rusby, & Sprague, 2001; Sugai, Sprague, Horner, & Walker, 2000). BCPS used ODRs for lower-level offenses, and ISS for more serious offenses. School administrators and staff logged ODRs, ISS and OSS using an information database system called SASxp. Norris Consulting Group, an independent research firm, summarized the data. These data were collected only for the two full implementation years, 2005-06 and 2006-07.

Qualitative measures included interviews with BCPS administrators, school principals, teachers, counselors, and ISS supervisors.

### *Method of Analysis*

To evaluate the individualization of behavioral support, BCPS disciplinary offenses were matched against Ripple Effects content, to determine the degree to which offenses could be directly matched to a lesson in Ripple Effects. Usage data was evaluated using descriptive statistics, to determine the implementation rates across

the district. To evaluate impact on referrals, we compared raw numbers of referrals in each category (ODR, ISS, OSS), at each level (elementary, middle, high), to show percentage change from first to fourth grading period by year, and where possible, changes in mean referrals per student. There was insufficient data to conduct analysis of significance.

## RESULTS

### *Baseline Data*

There were two levels of baseline scores: district-level, disciplinary infraction data for all students in the district, the year prior to full implementation (2004-05), and disciplinary infraction data for the first quarter of two of the three years of the study (longitudinal baseline).

Archival data indicate the mean district-wide office disciplinary referral rate for school year (SY) 2004-2005 was 10 referrals per student. Ripple Effects began to be implemented during the last eight weeks of that year, but would have had little district-wide impact at that level of implementation. If the impact was positive, then baseline data would slightly under estimate the intervention's impact.

### *Process Outcomes*

*School and teacher implementation levels.* Over the three year period (SY 2004-05 through 2006-07), 40 of the 41 schools in the district, or 98%, implemented the intervention to some degree. This was the highest school participation rate of any of the five concurrent interventions implemented under the SS/HS initiative. Just over 100 principals, assistant principals, counselors, and ISS teachers received training.

*Student participation.* During the three years, a total of 3685 students across the 40 schools, or 15% of the total student population, used the intervention in discipline settings. Usage data indicates students typically fulfilled three of the four points of the recommended protocol. Students used the program to address specific behavioral offenses, to address personal risk factors, and to build core social-emotional abilities. However, very few first completed the

learning styles profile. Either students were not offered the opportunity, or declined to take advantage of it.

*Dosage.* Students completed the interactive components of a total of 39,397 tutorials during an estimated total of 13,232 hours. Across all students, on average each participating student completed eight tutorials, or a total of approximately two to three contact hours, depending on student pace. As can be seen in Table 2, dosage levels grew from year 2 to year 3, but decreased from year 3 to 4.

*Cross-contamination.* Ripple Effects was one of five interventions implemented

concurrently under the BCPS SS/HS initiative. In the two years for which data is available, results indicate that 37% of students in 2005-06, and 31% in 2006-07, who were exposed to the Ripple Effects intervention, were also exposed to at least one other component of the multi-part comprehensive prevention programming.

*Individualized behavioral intervention.* An analysis of BCPS's complete list of 36 categories of discipline-worthy offenses, showed a tailored Ripple Effects lesson was available for 29 of them, or 80% (Table 3). The 80% covered by the intervention included 99.5% of all actual referrals. Incidence of offenses that were not covered represented only 76 out of the 16,546 recorded in the 2005-06 school year.

Table 2.

*BCPS Ripple Effects Disciplinary Usage Levels Over Three Years*

Selected Indicators	Year 2	Year 3	Year 4	Overall
	2004-05 (Last 8 Weeks)	2005-06	2006-07	
Number (%) of schools participating	39 (95%)	39 (95%)	36 (88%)	40 (98%)
Number of Students Participating	829	2811	1150	3685 <sup>a</sup>
Number of Lessons	5173	26312	8,212	39,697
Estimated Total Hours	1724	8771	2,737	13,232
Mean Lessons/Student	6	9	7	8
Mean contact hours per student <sup>b</sup>	1.6	2.3	1.8	2.1

<sup>a</sup> 3,685 is the unduplicated total number of students who used the intervention in discipline settings over the three year period. Counting repeated uses over multiple years, there were 4,790 student contacts.

<sup>b</sup> Assumes each lesson took approximately 20 minutes.

Table 3.

*List Of BCPS 36 Offenses With and Without Associated Ripple Effects Lessons*

29 BCPS offenses with a specific Ripple Effects lesson		7 offenses with no direct RE lesson
Battery	Possession Of tobacco	Computer Trespass
Burglary	Possession of Substance	Dispensing. Alcohol
Cheating	Profanity	Distrib Tobacco Prod
Cutting class	Robbery	Fail to serve detention.
Dispensing substance	Sexual Battery	Obscene Behavior
Dress Code Violation	Sexual Harassment	Pornography
Excessive tardiness	Smoking Illegal Substance	Trespassing
Fighting	Smoking tobacco	
Intox/Alcohol	Threat/Intimidation	
Intoxication/substance	Truancy	
Larceny/Theft	Vandalism	
Misconduct	Violence	
Motor Veh Theft	Weapons Poss. Knife	
Poss Illegal Object	Willful Disobedience	
Possession Of Alcohol		

*Addressing personal risk factors.* Data indicate that students at every grade level chose to address personal risk factors, when given the opportunity to do so. Across all grades, roughly 34% of the most used tutorials were personal risk factors, 31% were behavior problems or referrals, and 35% were social-emotional skills. Data did not allow us to determine all topics considered by students. We do know that across all schools, students collectively addressed 22 separate personal risk factors among the most used tutorials. This coupled with the fact that 34% of most commonly addressed topics were risk factors suggests that the intervention was indeed personalized, even by students in the lower elementary grades. Findings related to this are discussed in a separate article (Ray, Patterson & Berg, 2008).

#### *Discipline Outcomes*

*Year over year total mean disciplinary referrals.* As can be seen in Table 4, analysis of the data indicate a 41% decrease in mean disciplinary referrals between the district-wide per student rate for the 2004-05 school year (before the intervention), and the intervention group rates for the first year of the study. Mean referrals for Ripple Effects students further declined in the 2006-07 school year to 4.2, a 28% reduction from the prior year.

*Fall to spring disciplinary referrals.* As can be seen in Table 5, the data indicate substantial decreases in disciplinary referrals from first to fourth grading period for the 2005-06 school year, at elementary, middle, and high school levels. For the 2006-07 school year, disciplinary referrals increased from fall to spring for elementary and middle school students, and decreased for high school students, with an overall district-wide increase of 5%.

Table 4.  
*Mean Per Student Total Yearly BCPS Disciplinary Referrals School-Wide at Baseline, and for Year One, and Year Two for Students Participating in RE Computerized Intervention*

	2004-05 School-wide baseline year	2005-06 RE students	2006-07 RE students
Students N =	24,662	2,811	1,150
Total Referrals	246,620	16,546	4,851
Mean referrals	10	5.9	4.2
Change from prior year		-41%	-28%

Table 5.  
*Changes in BCPS Disciplinary Referrals Involving Ripple Effects Students from 1st to 4th Grading Period, Over Two Years*

Level	2005-2006			2006-2007		
	ODRs Per Grading Period		Difference %	ODRs Per Grading Period		Difference %
	1	4		1	4	
Elementary	1283	954	-26%	188	212	13%
Middle	1498	1367	-9%	417	529	27%
High	1661	859	-48%	315	228	-28%
Total	4442	3180	-28%	920	969	5%

*Fall to spring ISS.* As can be seen in Table 6, the data show substantial decreases in referrals to ISS from first to fourth quarter, both years, at all school levels. District-wide, ISS referrals declined 30% in 2005-06, and 26% in 2006-07.

Data also indicate that mean ISS referrals per student declined at all school levels year over year. From the fall period of the 2005-06 school year, to the same period the following year, ISS referrals declined from 3% fewer at the elementary level, to 16% fewer at the middle school level, to 8% fewer at the high school level (Figure 1).

Table 6.

*Changes in BCPS In-School Suspensions Involving Ripple Effects Students, from 1st to 4th Grading Period, for Two Years*

School level	2005-2006 School Year			2006-2007 School Year		
	ISS Referrals Per Grading Period		Difference	ISS Referrals Per Grading Period		Difference
	1	4	%	1	4	%
Elementary	508	395	-22%	107	101	-6%
Middle	571	466	-18%	285	227	-20%
High	563	285	-49%	206	113	-45%
Total	1,642	1,146	-30%	598	441	-26%

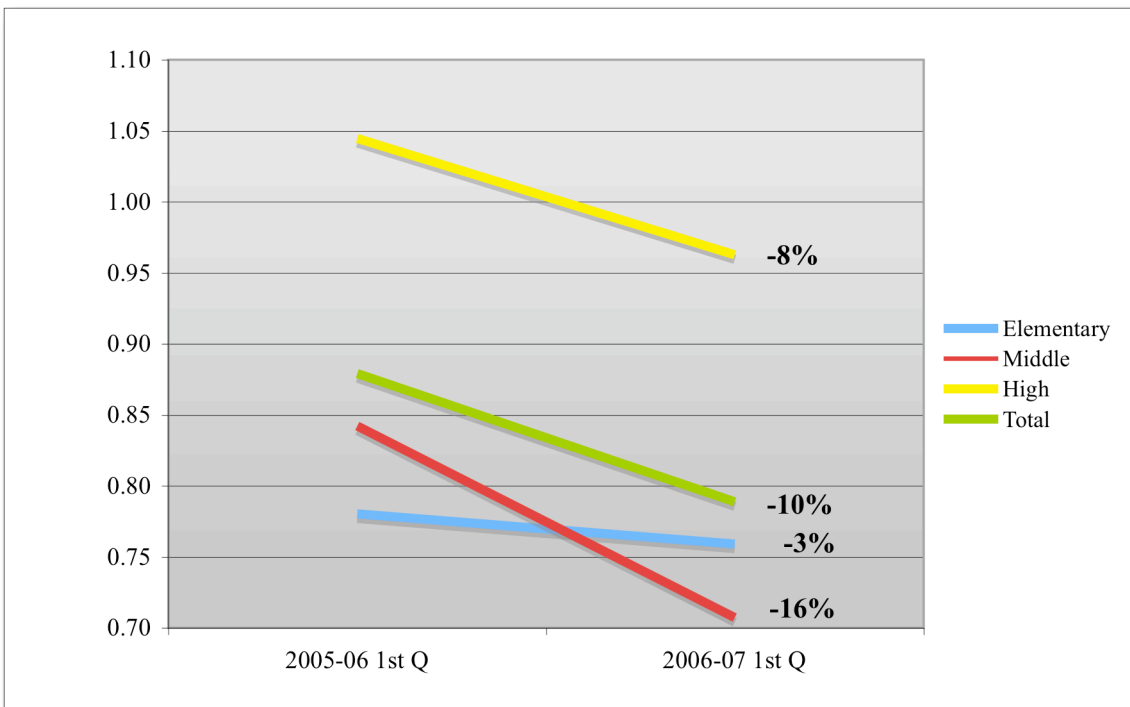


Figure 1. Year Over Year Changes in Mean ISS Referrals Per Student, From Fall 2005-06 to Fall 2006-07, by School Level and Overall

*Fall to spring OSS.* As can be seen in Table 7, the data indicate increases from first to fourth quarter each year for OSS at elementary, middle, and high school levels.

*Qualitative Data*

Qualitative data indicated that users of the intervention at all levels valued it highly,

and that student exposure to the intervention resulted in higher rates disclosure of serious personal problems to responsible adults in the school settings. Table 8 presents selected comments, representing the responses of people at every level of the implementation process, from district level administrators to counselors.

Table 7.

*Change in Out-of-School Suspensions Involving Ripple Effects Students from First to Fourth Grading Period For Two Years*

Level	2005-2006			2006-2007		
	OSS Referrals Per Grading Period		Difference	OSS Referrals Per Grading Period		Difference
	1	4	%	1	4	%
Elementary	313	406	30%	80	112	40%
Middle	223	446	100%	138	277	101%
High	204	246	21%	112	114	2%
Total	740	1,098	48%	330	503	52%

Table 8.

*Selected Comments From Interviews With BCPS SS/HS Participants*

Assistant Superintendent	Ripple Effects has been meaningful and good for our students. We will continue to use it.
District Ripple Effects Coordinator	Ripple Effects helps students to be aware of feelings, manage feelings, and solve problems in a simulated real-world learning context. Thanks to this cutting edge technology our district is able to integrate social emotional learning into the academic setting and meet the needs of the “whole child.” As students improve social and emotional competencies, academic achievement and personal success improves.
Elementary School Principal	Many of our kids have never seen other ways to solve a problem. They don’t come from a strong language environment where explanations and solutions are offered. Now, our students have a better opportunity to experience uncomfortable or difficult situations that they may face every day, and learn to make sound decisions that lead to positive outcomes.
Middle School Principal	In the day and age of technology, it is great to have a technological program for our students that shows examples of students their age experiencing the same difficulties. We have experienced extreme success with this program.
ISS Teacher	When they are really upset about something I can put them on it, and I see them calm down. It’s a safe, independent, personalized way to get help and reflect on their behavior.
School Counselor	The program is helping with individuals when I can sit with an individual and process what they are doing. Many kids have said, “I like this!”

## DISCUSSION

This evaluation supports the hypothesis that a computerized intervention could provide individualized, positive behavioral training district-wide in discipline settings, and suggests that the intervention would positively impact ODR and ISS referral rates.

Outcome data indicate that over time, disciplinary referrals for minor offenses decreased among students who used the intervention. This supports the hypothesis that, if it is truly tailored to each individual's needs, one-shot, targeted skill training, where fidelity to evidence-based practices is assured, may be an effective approach for reducing misconduct. Outcome data also indicates that use of the Ripple Effects program resulted in reduced referrals to ISS from the start to the end of the school year, opposite the trend commonly found. This supports the hypothesis that enabling students to privately and independently address the underlying causes of their behavior can lead to positive behavioral change, without requiring an adult mediator. Additionally, interviews with counselors and teachers suggest that the program itself may be a mediator for better communication with adults, including disclosure of serious personal problems.

### *Implications for Practice*

*Challenge to conventional thinking on dosage.* The data and analysis indicate that the effective minimum dosage levels of the this computerized intervention are much lower than previous research has suggested. Roughly two contact hours was sufficient to reduce repeat ISS referrals rates at all three school levels. A strong body of evidence supports the contention that a one-shot intervention simply cannot work to create long-term behavioral change (Greenberg et al, 2003). However, almost all of the evidence comes from comparing long-term, group-level interventions with either: a) one-shot group interventions that are comprised of a narrow content base and delivered through

a single, fixed mode of learning; or b) a single, live counseling session where there may be one or several weaknesses (insufficient time to establish a ground of trust; a group, rather than private setting; insufficient expertise to correctly match an individual student's need with the most appropriate evidence-based practice). A better test would be to compare outcomes with a one-shot, intensive intervention, tailored to a particular individual's behavior problem, interests, needs, risk factors and learning style.

*Factors in effectiveness.* We can hypothesize about what contributed to the very low dose effectiveness of this computerized approach for tertiary intervention. We know that the *tailoring* of the intervention to each student's behavioral infractions, preferred learning style, and individual risk factors, is what sets this intervention apart from many interventions that have not been shown to be effective in low doses. We hypothesize that built-in fidelity to science in the content; built-in fidelity to proven strategies for facilitating social-emotional learning in the learning system; compression of the learning process through self-selection of only the most personally relevant content and processes; privacy and the psychological safety that brings; personal relevance; interactivity; reading independence; rich media; use of peers, rather than adults to mediate content; leverage of most teachable moments through immediate, therapeutic sanctions; and/or other factors we have not even identified, may all play a part.

*Cost.* Cost is an important factor in weighing the value of any intervention. The cost of the Ripple Effects intervention is estimated at \$5.30 per individualized lesson for the first three years, with at least two more years to expand use without further investment. If use of the software continued in future years, even at the same rate, cost to Bibb County Public Schools would be further reduced to about \$1.60 per private lesson, compared with \$40 to \$50 per private session for a school counselor. (These are not mutually exclusive resources. Counselors reported it enhanced rather than replaced their time with students.)

### *Limitations*

Three limitations to this study were all related to limited resources. First, it was funded as an evaluation of a comprehensive set of five programming initiatives. Although the computerized intervention was the only behavioral component of the multi-part programming, the interconnection of academic, behavioral, substance-abuse and family risk factors is well established. Since roughly 35% of students exposed to Ripple Effects were also exposed to one or more of the four other program components that addressed those factors, the positive outcomes described here cannot be causally attributed solely to this intervention.

A second limitation of this study is one shared by many evaluations of real-world interventions: it did not include a control or comparison group. The study included 40 out of 41 schools in the district, so selection bias was not the issue. Some district-wide baseline data from the prior year was available for comparison, but by definition, that included many students who would eventually be exposed to Ripple Effects. Since theoretically, past behavior is somewhat predictive of future behavior, students who were involved in disciplinary proceedings the previous year, were more likely than other students to become part of the treatment group during the period of the intervention. Implementation was an inexact, rolling process, with some students who had disciplinary infractions, not receiving exposure. All of these factors would lead to underestimating, rather than overestimating, effect sizes.

Resource limitations also meant that a complete set of data, and data tied to individual students, was unavailable. For example, the reported quantitative data did not include standard deviations, which made it impossible to detect whether the results could be attributed to a few students having large reductions in disciplinary behavior, many students having small changes, or some of both.

The fall to spring longitudinal measure may also have led to underestimating effects. Across schools, throughout the country, rates of discipline referrals, rates of ISS, and rates of OSS typically all increase as the school year progresses. Because prior year's data was not available for comparison, that likely upward slope is not taken into account in this analysis. Data on model prevention programs demonstrates that a significant positive effect for some effective interventions is a reduction in the degree of fall to spring increase, rather than a reversal of direction (Flay & Allred, 2003).

In addition, in any system of graduated consequences, the most extreme consequence, Out of School Suspension, is not imposed until other sanctions have been exhausted. Thus, it is highly unlikely that fall rates could exceed spring rates. This may partly explain the finding that OSS rates rose over the course of each year, while ISS and discipline referral rates decreased. We had insufficient prior year data on OSS, to know whether the degree of increase represented a positive, negative, or neutral effect.

All of this is an argument for a replication study, with expanded resources for data collection, and a more rigorous research design.

### CONCLUSION

This was a real-world study of the impact of a computerized intervention on thousands of students, with multiple risks for life-long, negative health, education, economic and criminal justice outcomes.

The data suggest that this computerized positive behavioral intervention, with an intelligent system to individualize response, can play a valuable role as part of a comprehensive plan to address school discipline issues, among students with elevated risk of behavior-related school failure. The intervention provided economical, tailored correction for discipline problems with thousands of students, helped students to individually address risk factors that underlie those problems, and provided training to promote core social-emotional strengths that can increase resiliency. The computerized intervention provided these services in less time,

and at less cost, than is traditionally required to achieve comparable results.

This study focused primarily on students in one ethnic group who are at elevated risk for disciplinary action, students who also often have a cultural disconnect with teachers and counselors: low income, African American students from both urban and rural settings. As such, even with some flaws in the design, to discount what it can tell us would be a perpetuation of past patterns of discrimination.

Because of study limitations, however, we must look at these data as the beginning, not end point, of the study of effectiveness of what appears to be a promising approach. Larger studies are needed to be able to present clear evidence as to both *how* and *why* this intervention works to reduce discipline problems, especially at such low dosage levels.

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