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Improving SEL outcomes for US 9th graders: Results from a District Wide School Reform

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ABSTRACT

This study examined the impact of Personalization for Academic and Social Emotional Learning (PASL), a school-based social emotional reform implemented in the Broward County Florida Public Schools. Taking advantage of a phased roll out of PASL, we analyzed data collected during the first implementation year (2017–18) and compared 205 9th grade students in 6 schools that received PASL with 1139 comparison group students in 5 schools that received PASL in later years. Focusing on student social emotional outcomes, including school engagement, self-efficacy, and self-regulation, we found that PASL effects, though small and insignificant on average, might vary by students and depend on their initial engagement at the beginning of the 9th grade. The lower a student's initial engagement, the stronger the PASL effects on end-of-year engagement and self-efficacy.

1. Introduction

Demand for effective Social Emotional Learning (SEL) programming is growing among school leaders. A nationally representative survey of US educators in 2021 revealed that an overwhelming majority of educators (84%) believe that incorporating SEL programming into the school curriculum has become even more important since the COVID-19 pandemic (McGraw Hill, 2021). There is a general sense that building student's social and emotional skills goes hand in hand with better academic outcomes for students. Within this context, it is important to understand which programs are effective and for which students. In this article, we examine a reform implemented in Broward County Public Schools (Florida, USA) (BCPS) called Personalization for Academic and Social Emotional Learning (PASL). PASL is a systemic, school-based reform based on research that finds that successful high schools work as systems of essential components, which are: school leadership, professional capacity, parent-community ties, student-centered learning climate, and instructional guidance (Bryk et al., 2010; Goldring et al., 2009). This paper presents the results from the first-year implementation of PASL funded by an Investing in Innovation (i3) grant from the US Department of Education. We begin by introducing the PASL reform including its history in BCPS and key components and discuss PASL's theory of action and how this reform is situated within current thinking on SEL reforms in schools. Subsequently we discuss new guidance on interpreting effect sizes in educational research and how that can influence our view of the effect sizes of SEL reforms. We then present our methods, data, and results and conclude with a discussion of where PASL is working, where it is not, and where improvements must be made for this promising program to have a broader impact on 9th grade students.

1.1. History of PASL in BCPS

PASL was first identified from a year-long study of four schools in BCPS, in which researchers found that administrators, guidance counselors, and teachers in the higher performing schools deliberately attended to a set of organizational routines and norms of practice that fostered caring and supportive adult-student relationships (Rutledge & Cannata, 2016). Building on the findings, a partnership of researchers, developers, and stakeholders from BCPS distilled the findings on PASL into an implementable reform (Rutledge, Cohen-Vogel, Osborne-Lampkin, & Roberts, 2015). During the 2014–15 school year, three schools piloted PASL. Since then, 50 additional BCPS middle and high

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schools have gradually enrolled into PASL, mostly with 9th graders.

1.2. What is PASL?

PASL can be understood as a set of five components that is implemented through a process of continuous improvement. When educators adopt PASL, they intentionally attend to students' academic, social emotional, and behavioral needs by engaging in the organizational routines and norms of practice embodied in five components: (1) routine rapid check ins between adults and students—where adults intentionally and routinely check in with a targeted group of students, (2) goal achievement activities that help students set short and long term goals, (3) intentional use of data to track student progress, (4) educator teams of administrators, guidance counselors, and teachers that meet to discuss student progress and PASL activities, and (5) a culture of personalization that emphasizes student engagement. Stakeholders participate in a structured process of improvement (Cohen-Vogel et al., 2015) within a networked improvement community (Rutledge, Cannata, Brown, & Traeger, 2020) to implement PASL. At quarterly meetings, teams from participating schools meet to share practices and set goals for the next cycle.

Central to the logic of PASL is the idea that when adults deliberately foster caring and supportive adult-student relationships through both culture building and organizational routines, adults help students increase their engagement in school that, in turn, leads to higher levels of engagement, self-efficacy, student success and academic success. Put differently, by institutionalizing systemic personalization through the five components, educators improve their relationships with students, with students feeling heard and cared for. It is thought that when these elements are well implemented in schools, students increase their sense of engagement in school, which leads to greater self-efficacy beliefs and creates the conditions needed to help students learn self-regulation strategies. PASL also strives to build upon and strengthen existing, and sometimes informal, networks of communication that happen when students and adults check in regularly. It represents a systemic approach to school improvement predicated on strengthening and bridging academic and social emotional practices common in high schools. PASL works by both strengthening organizational structures for teachers, guidance counselors, and administrators as they track and guide students in need of support and intervention, and by building commitment among faculty that strengthens informal networks of communication when students and adults check in with each other regularly and teachers intentionally connect to students' interests and experiences.

1.3. Social cognitive theory, engagement, self-regulation, and self-efficacy

PASL builds on social cognitive theory that finds that educators play a critical role in supporting student engagement. When adults show interest in students' experiences and learning needs, students' engagement in their own learning tends to be increased (Hallinan, 2008; Jenkins & Keefe, 2002; McLaughlin et al., 1990). In turn, when students feel connected to their school and their academic pursuits, they are more likely to be attentive in class, open to learning, and willing to participate in school activities such as extracurricular activities, athletics and other pro-social school activities (Fredricks, 2012; McNeal, 1995). Students, therefore, show engagement in school academically and socially.

PASL also draws on social cognitive theory which suggests that when adults show interest and caring toward students, they engage in practices that increase students' self-efficacy, self-regulation, and development of personal agency (Bandura, 1977, 2000, 2001; Pajares, 1996; Zimmerman, 1990). Further, personalization—in which adults show interest in students' experiences and learning needs—bolsters students' engagement in their own learning (Hallinan, 2008; Jenkins & Keefe, 2002; McLaughlin et al., 1990). This is all directly related to the goal of PASL to foster trusting relationships between teachers and students and create a culture of caring that allows each student to feel seen and connected to school.

1.3.1. Student engagement in school

PASL strives to improve student's engagement with schooling, which often wanes as high schoolers get closer to graduation (Calderon & Yu, 2017). Engagement encompasses students' relationships with their teachers, other students, and school staff; their level of attention and interest in learning and school activities; and their sense of belonging and being a part of the school community (Furlong et al., 2003; Wang & Peck, 2013). Numerous studies have demonstrated that high school students who exhibit higher levels of engagement with school have higher levels of academic achievement, report a greater sense of overall well-being, and are less likely to drop out of school (Caraway et al., 2003; Finn & Zimmer, 2012; Li et al., 2011; Wang & Eccles, 2012). Engagement has been shown to be a critical precursor to academic achievement (Rumberger & Rotermund, 2012; Wang & Hofkens, 2019). For PASL, the component of engagement that is most likely to be influenced is student connections to teachers and other responsible adults in the school.

1.3.2. Self-efficacy and self-regulation

Secondary outcomes explored in this paper include self-regulation and self-efficacy, both of which have been shown to have positive impacts on student well-being and academic achievement. Self-regulation is defined as the ability to set goals and defer short-term gratification to engage in work and activities such as studying that result in beneficial longer-term outcomes (Davisson & Hoyle, 2017; Galla et al., 2019; Hofmann et al., 2009). Higher levels of self-regulation are associated with learners who are more independent and achieve higher grades and increased school success (DiBenedetto, 2018; Poropat, 2009; Willingham et al., 2002; Zimmerman, 1990). Self-efficacy refers to a student's belief that he or she can achieve a goal (Bandura, 1997; Eccles & Wigfield, 2002). As with self-regulation, higher levels of self-efficacy are associated with positive school outcomes, including higher academic achievement and satisfaction with school (Honicke & Broadbent, 2016; Pajares & Schunk, 2001; Usher et al., 2019).

In summation, PASL is hypothesized to impact student's engagement in school by providing students with regular, personalized access to adults who can, for example, monitor progress, address problems, and direct them to relevant courses and extracurricular activities. PASL is hypothesized to influence students' self-regulation by encouraging goal setting exercises that are monitored by school staff throughout the academic year. Self-efficacy is hypothesized to be influenced because students, through their personalized PASL experiences with school staff and progress monitoring, will be more likely to experience improved relationships and academic achievement, which, in turn will make them feel more successful.

2. SEL in K-12 education

2.1. How PASL fits within the SEL framework

PASL is partially situated within the many universal K-12 school-based reforms that attend to student's social and emotional needs in the interest of improving longer term academic outcomes. School districts and researchers have designed a wide array of universal, school based SEL programs to promote social, emotional, and academic success (Durlak et al., 2011; Weissberg et al., 2015). Universal school based SEL programs involve a student-centered approach and can be broadly organized into four categories: skill-focused, academic integration, teaching practices, and organizational reform (Domitrovich et al., 2017). Organizational reforms, which most closely aligns to the goals of PASL, implement strategies and policies within and across systems (school, family, community) to create opportunities for students to develop SEL competencies. PASL also integrates key features of effective SEL programs including supportive contexts and reasonable goals

(Durlak et al., 2010; Jones et al., 2021). Finally, PASL deviates from traditional teacher-delivered programs in an important way. PASL as an approach is targeted to individual students who schools determine may benefit from direct interactions with responsible adults at their school. While some schools do choose to enroll entire grades in PASL, most use a targeted approach. A major benefit of PASL could be this direct targeting to students as opposed to programs delivered at the classroom level.

2.2. SEL and student outcomes

A well-developed research literature demonstrates that students' SEL skills significantly affect their behavior and achievement (Sklad et al., 2012; Blackwell et al., 2007; Domitrovich et al., 2017; Farrington et al., 2012; Kendziora & Osher, 2016; Yeager & Walton, 2011) as well as the broader school climate (Domitrovich et al., 2017; Foster & Bussman, 2008; Joseph & Strain, 2003; Osher et al., 2016). Specifically, studies suggest that SEL competencies promote students' well-being, foster more positive and fewer negative social behaviors and interactions (Guerra & Bradshaw, 2008; McKown et al., 2009), improve test scores and grades (Blair & Razza, 2007; Durlak et al., 2011; Weisberg et al., 2015; Zins et al., 2004), and increase high school graduation rates and college attendance (Taylor et al., 2017). Moreover, students who have positive social relationships with their teachers at school are more likely to persevere in the face of adversity and hold positive attitudes about their abilities, (Heckman & Kautz, 2012; Jones et al., 2015). The effects of school based SEL programs on various student outcomes, including intra- and interpersonal competencies, disciplinary outcomes, mental health and well-being, substance use, academic achievement, and school climate and safety have been extensively documented in several systematic reviews and meta-analyses (Durlak et al., 2011; Grant et al., 2017; van de Sande et al., 2019).

2.3. A more nuanced view of SEL program effects

As more research on the effectiveness of SEL programming has emerged in recent years, some patterns are becoming clearer, and the way program effects are being interpreted is becoming more complex. In terms of emerging patterns, SEL program effects seem to be more pronounced for younger students, making it challenging for programming in the middle and upper grades to show meaningful effects. A recent meta-analysis conducted by Yeager and colleagues (2015) found that anti-bullying programs lost their effectiveness as children aged from elementary to middle and high school. Heckman and Kautz (2014) observed that programs designed for adolescents have not been shown to be as effective as programs that target earlier ages. In a rigorous review of 60 SEL interventions that meet ESSA Tier 1 – 3 standards, Grant and colleagues (2017) found programming to be more effective in the early grades with results diminishing with age. SEL reforms, like PASL, developed for middle and high school aged students may face added challenges in improving student outcomes.

In the area of interpreting program effects, there also appears to be growing recognition that the field of educational research needs to rethink the rigid application of statistical significance and provide more reasonable effect size guidelines that can capture realistic and reasonable impacts of interventions. Recent work has demonstrated that education interventions often find effects that would be characterized as small by Cohen's (Cohen, 1988) standards (Lortie-Forgues & Inglish, 2019), but could have real practical importance for students. It could be the case that many programs with potentially important impacts are being dismissed by policymakers and funders due to unrealistic interpretations based on outdated guidelines. The field is responding. For example, the Society for Research in Educational Effectiveness (SREE)'s 2020 conference theme was *"Practical Significance and Meaningful Effects: Learning and Communicating What Matters,"* which was selected to, "highlight the importance of moving beyond statistical significance to questions of practical significance…" In response to these and other issues, new guidelines for assessing effect sizes are being proposed that relax some of the traditional Cohen guidelines proposed years ago. For example, Kraft (2020) proposes new guidelines for educational interventions with standard achievement outcomes categorizing small (less than.05), medium (0.05–0.20), and large (0.20 or greater) effect sizes differently than the classic guidelines proposed by Cohen. Kraft suggests that effect sizes for educational interventions, even when small by Cohen's standards, can be meaningful and important when interpreted relative to field-based interventions. Much like past work on interpreting effects of educational interventions (Hill et al., 2007), interpreting effects in the proper context is important to determining their practical importance. PASL is an SEL reform and therefore interpreting effects in the context of other SEL interventions can help determine the practical importance of PASL. Taylor and colleagues' (2017) recent meta-analysis of 82 universal SEL programs provides Hedge's g effect size estimates for student's attitudes toward self, others and school which include our outcome measures of school engagement, self-efficacy and self-regulation. They find mean effect sizes of.17 at posttest and.13 at follow-up for attitudes toward self, others and school, which include the SEL constructs we assess in this study.

3. Study purpose and research questions

Since 2014–15, PASL has been gradually piloted and implemented in 50 secondary schools across BCPS. While schools were granted wide flexibility in how they administered PASL and how students were identified for the program, all program plans included the five core components of the PASL program discussed earlier. In 2017, the PASL developers received an Investing in Innovation (i3) grant from the U.S. Department of Education which allowed them to extend the program to all high schools in Broward County. This study presents the results from the first year of PASL implementation funded by the i3 grant (Year 2017–18). We examined PASL effects on three SEL outcomes of PASL eligible students in 9th grade, including student engagement in school, self-regulation, and self-efficacy. Considering its multi-faceted role in student achievement, well-being, and school success, particularly at the secondary school level, improving student engagement is at the core of PASL reform. PASL envisions that students who are at the center of the systemic personalization, will have higher engagement in school. Therefore, this study evaluates students' engagement in school as the primary PASL outcome and their self-regulation and self-efficacy as distal PASL outcomes. We also assessed the moderating role of student prior engagement level in the success of PASL implementation. Specifically, we ask: 1) Did PASL participation lead to an overall improvement in students' engagement in school? 2) Did the effect depend on a student's level of school engagement prior to the intervention? 3) How did PASL participation affect distal outcomes, such as self-regulation and self-efficacy?

4. Methods

4.1. Sample, data, and measures

This study examined 11 high schools in BCPS who implemented the PASL intervention funded by an i3 grant between 2017 and 2019. BCPS opted to roll out PASL in a small number of schools each year which provided district administrators with the capacity to assist with implementation and train school-based staff in the summer prior to the implementation of PASL. The 11 schools that make up the study sample enrolled between 1000 and 3000 students in total, and all had large proportions of non-white students (40%–94%) and students who were eligible for free or reduced-price lunch (65%–91%). We collected administrative and survey data from students who were enrolled in these schools as 9th graders in the first PASL implementation year (i.e., 2017–18). The administrative data provided information on students' academic performance and disciplinary records as well as their

demographic characteristics (analysis of PASL effects on these academic outcomes will be presented in future work). The surveys were administered electronically both in the fall and spring of the study year to all 9th grade students in the 11 schools during school time. In total, 4699 students responded to both fall and spring surveys.

The treatment of interest is the PASL reform at a given school. BCPS chose six schools to begin implementation during the 2017–18 academic year based on the district's perception of school's needs and their readiness to begin PASL. These six schools are considered as treatment schools. Five schools did not start PASL implementation until 2018–19 and are considered comparison schools. As shown in Table 1, there is no statistically significant differences between treatment and comparison schools in student composition, school size, and average academic performance as indicated by 2016–17 Florida Statewide Assessment (FSA) reading test scores. However, the standardized between-group difference is larger than.2 for FSA score and school size. We controlled for FSA score (highest standardized difference) in the final outcome model (see Analytic Strategies Section). [1]

4.2. Implementation fidelity

PASL provided a large degree of flexibility to schools, therefore assessing implementation fidelity has been challenging. The study team is currently conducting several different implementation studies which will report on variations in implementation as well as exploratory studies of implementation effects. Part of PASL's appeal for schools is this flexibility around certain core components (i.e. rapid check ins) and how they are implemented. For the purposes of this impact study of PASL, we assessed how often students engaged in key PASL components on which PASL teachers were trained; 1) rapid check-ins, and 2) conversations with school based responsible adults. We included implementation items on the student posttest survey (PASL implementers only) in Spring 2018. Items included, "about how many times in the last month have you discussed your goals with an adult at your school?", and "about how many times in the last month have you received personal encouragement from an adult at your school?".

Table 1
PASL and comparison school demographics.

	PASL Schools (n = 6)	Comparison Schools (n = 5)	All (n = 11)	Standardized Difference
Student Composition				
White	37.9%	29.5%	34.1%	8.4%
African - American	54.0%	62.9%	58.0%	8.9%
Asian	3.1%	3.0%	3.1%	0.0%
Hispanic	27.5%	17.2%	22.8%	10.3%
ELL	7.8%	5.7%	6.9%	2.1%
Free or reduced-price lunch	79.0%	74.2%	76.9%	4.8%
Average FSA reading score in 2016–2017- *M (SD)*	330.58 (5.40)	335.28 (9.03)	332.72 (7.30)	0.26
Average school total enrollment -*M (SD)*	2119.67 (590.00)	2238.90 (292.42)	2173.82 (460.57)	0.64

[1] Given the limited school-level sample, we have decided to control for only one covariate. i.e., FSA score.

4.3. Outcomes

We examined three sets of student SEL outcomes captured in the pre- and post-program surveys: engagement in school, self-regulation, and self-efficacy. To measure engagement in school, we used the Teacher-Student Relationships subscale of the Student Engagement Instrument (Appleton et al., 2006; Betts et al., 2010; Lovelace et al., 2014; Martin, 2007). Students were asked to rate 9 items related to their relationships with teachers and other adults at the school as well as the school climate on a 4-point scale (from strongly disagree to strongly agree). We focused on these student teacher relationship items because of PASL's core rapid check-in activities hypothesized to drive any PASL effects. To measure student self-efficacy, we used the New General Self-Efficacy Scale (Chen et al., 2001; Chen et al., 2004). Students, on a 5-point scale, rated their level of agreement with 8 items about their ability to meet challenges, obtain desired outcomes, and perform effectively in school. To measure self-regulation, we used the Self-Efficacy for Self-Regulated Learning scale (Zimmerman et al., 1992 Zimmerman & Martinez-Pons, 1998). Students reported their self-perceived level of ability to perform 8 school tasks on a 6-point scale (from not well at all to very well). The item reliability within scales is high with Cronbach's α ranging from.87 to.93 at pre- or posttests. We created composite scores based on the responses to each scale using factor analysis and converted all the scores onto $0-5$ scale, with 0 as the lowest and 5 as the highest. Table 2 describes sample items for each scale, the distribution of the composite scores, and the corresponding item reliability at pre- and posttests. Factor analysis demonstrated that the items that made up each scale loaded on a single factor.

4.3.1. Moderator and pretreatment covariates

To examine how PASL effects differ by individual student characteristics, we used students' self-reported school engagement captured at the beginning of the study year as a moderator. In addition to pretest survey measures collected at the beginning of the school year, we considered a list of other school and student level pretreatment covariates collected from BCPS administrative records, namely: (a) student demographics such as age, gender, free/reduced priced lunch status, limited English proficiency status, special needs status, US born status, primary language, and race/ethnicity; (b) student prior academic performance, such as FSA reading test scores, whether or not passed algebra 1, and total credits earned in 8th grade; (c) student prior disciplinary behavior, including days of unexcused absence, number of suspensions, number of disciplinary incidents in prior grade; and (d) school demographics, including student race/ethnicity composition, composition of students eligible for free and reduced-price lunch, and school total enrollment, and (e) school average academic performance.

4.4. Analytic strategies

PASL has been rolled out across all Broward County public high schools over the past 6 years. However, PASL i3 implementation adopted a design that enrolled schools by two cohorts. The design enables us to compare the outcomes of the two school cohorts during the first-year implementation, treating the first cohort (2017–18 implementation) as the treatment group and the second cohort (2018–19 implementation) as the comparison group.

Although PASL is considered a whole school reform, most schools organize their program to target potentially low-engaged and/or low-achieving students when they enter high school in the 9th grade. Rapid check ins and goal achievement activities were offered to students identified by school-based staff as at risk of struggling through the 9th grade. Therefore, we decided to conduct a treatment on the treated analysis and examine the PASL effects on these students' school engagement, self-efficacy, and self-regulation.

Table 2
Pre- and post-survey measures.

	Example Items	Pretest		Posttest	
		Mean (SD)	α	*Mean (SD)*	α
School engagement	Overall, adults at my school treat students fairly. Adults at my school listen to the students. At my school, teachers care about the students.	2.93 (0.74)	0.89	2.84 (0.80)	0.90
Self-efficacy	I will be able to achieve most of the goals that I have set for myself. When facing difficult tasks, I am certain that I will accomplish them.	3.30 (0.60)	0.87	3.31 (0.64)	0.90
Self-regulation	How well can you: Finish homework assignments by deadlines? Study when there are other interesting things to do? Concentrate on school subjects?	2.65 (0.56)	0.91	2.81 (0.59)	0.93

4.4.1. Predicting counterfactual student sample

PASL school staff provided us the student IDs of the first-time 9th graders who received the PASL intervention (PASL students, $n = 205$) during Year 2017–18. These students constitute the treatment group for this study. To estimate the effects of PASL participation, students in the comparison group ideally would be those who did not receive PASL but would have received it if their schools implemented PASL during the study year. However, since the comparison schools did not start PASL implementation until 2018–19, the eligibility status of their 9th graders for the PASL intervention was not observable in 2017–18. Hence our first analytic task was to predict the counterfactual PASL eligibility status of the students in the comparison schools had their schools enrolled into PASL during the study year. We sought to understand how PASL students were identified in the treatment schools and then applied the same identification rules to students in the comparison schools. Although specific criteria for selecting students into the intervention varied by schools, most students were identified based on their prior academic performance and disciplinary records. We therefore first fit a two-level logistic model to predict the PASL eligibility of all 9th graders in the 6 PASL schools:

$$log\left(\frac{\varphi_{ij}}{1-\varphi_{ij}}\right) = \beta_0 + \beta_1 W_j + \beta_p \mathbf{X_{ij}} + u_j, \quad e_{ij} \sim N\left(0,\ \sigma^2\right) \tag{1}$$

where φ denotes the PASL eligibility status of student i in school j. The model considered school average FSA reading score W and a vector of student pretreatment variables $\mathbf{X}$ including other SEL pretest score, academic and disciplinary records in 8th grade, standardized reading scores, number of credits attempted, whether they took algebra 1 test in 8th grade, limited English proficiency status, days in school, and days in external suspension. With the estimated model parameters from the PASL schools, we then extended the identification model to the 5 comparison schools and predicted the probability of receiving the PASL intervention of all their 9th graders if the schools had implemented the program in the study year. Among the 1380 students who responded to the pre-and post-surveys in the comparison schools, 1139 were found to have a nonzero probability of receiving PASL. This group of students were then retained and served as the comparison students in the analytic sample. Table 3 compares PASL and the identified comparison students on their demographic characteristics, pre-program self-efficacy, self-regulation, and engagement ratings. A two-level model (students at level 1 and school at level 2) suggests no statistically significant between-group differences in key demographic characteristics. However, the comparison group appeared to have slightly but not significantly more black students and fewer Hispanic students. These characteristics were further controlled in the final outcome models.

Table 3
Characteristics of PASL and Comparison Students in Analytic Sample.

	PASL ($n = 205$)	Comparison ($n = 1139$)	All (n = 1344)
% Female	47.32	50.13	49.70
% White	14.14	13.16	13.32
% Black	53.17	61.98	60.64
% Hispanic	28.78	18.79	20.31
% Free/Reduced Lunch	80.00	77.52	77.90
Pre-program engagement	2.94 (0.75)	2.88 (0.73)	2.89 (0.73)
Pre-program self-regulation	2.59 (0.55)	2.61 (0.56)	2.61 (0.56)
Pre-program self-efficacy	3.32 (0.54)	3.30 (0.59)	3.30 (0.58)

4.4.2. Outcome models

To examine the overall effects of PASL participation, for each outcome Y of student i in school j, we ran a two-level model:

$$\begin{aligned} Y_{ij} &= \beta_{0j} + \beta_{1j} PreEng_{ij} + \boldsymbol{\beta_{qj}} \mathbf{X_{ij}} \quad + e_{ij}, \quad e_{ij} \sim \quad N\left(0, \quad \sigma^2\right)\beta_{0j} \\ &= r_{00} + r_{01} PASL_j + r_{02} W_j \quad + \quad u_j, \quad u_j \sim \quad N\left(0, \quad \tau_u\right), \quad \beta_{1j} = r_{10}\boldsymbol{\beta_{qj}} \\ &= \boldsymbol{r_{q0}} \end{aligned} \tag{2}$$

where *PASL* takes a value of 1 if the school was enrolled in the PASL program in 2017–18 and 0 otherwise. To improve the precision in estimation and to reduce bias, we controlled for student's prior level of engagement (*PreEng*) as well as vector of student pretreatment covariates $\mathbf{X}$ including gender, race/ethnicity, free or reduced-price lunch eligibility status, and 8th grade FSA reading score at level 1, and one school covariate W (i.e., school average prior FAS reading score) at level 2. r_{00} is expected to estimate the average outcome of all the students when their schools had not been enrolled in PASL; and r_{01} is expected to estimate the average PASL effects.

To examine whether the PASL effect depends on a students' prior school engagement, we added the interaction between the prior engagement and treatment into Eq. (2):

$$\begin{aligned} Y_{ij} &= \beta_{0j} + \beta_{1j} PreEng_{ij} + \boldsymbol{\beta_{qj}} \mathbf{X_{ij}} \quad + e_{ij}, \quad e_{ij} \sim \quad N\left(0, \quad \sigma^2\right)\beta_{0j} \\ &= r_{00} + r_{01} PASL_j + r_{02} W_j \quad + \quad u_j, \quad u_j \sim \quad N\left(0, \quad \tau_u\right), \quad \beta_{1j} \\ &= r_{10} + r_{11} PASL_j \boldsymbol{\beta_{qj}} = \boldsymbol{r_{q0}} \end{aligned} \tag{3}$$

We similarly controlled for school average FSA reading score and the vector of student covariates $\mathbf{X}$ in the model. Hence r_{11} is used to test whether PASL effects depended on student's prior engagement in school.

5. Results

5.1. Implementation of PASL with fidelity

Again, PASL provided a large degree of flexibility to schools, but all implemented some form of rapid check ins and conversations with students' responsible adults. Over 70% of PASL students reported having a conversation about high school goals in the prior month. About 75% of PASL students reported engaging in at least one conversation during the school year about career and/or post-secondary goals. Roughly 33% of PASL students reported having 3, 4, 5 or more conversations about goals

over the school year. Most PASL students reported experiencing key PASL components which leads us to conclude that PASL was implemented with moderate to strong fidelity across the study sites.

5.2. PASL effects on student engagement

Overall effects. We first examined the overall effects of PASL participation on the primary outcome, student engagement in school.

As shown in Table 4, while both PASL and comparison groups experienced a slight, and not uncommon (Calderon & Yu, 2017) decrease in school engagement over the school year, the average decrease exhibited by the PASL students was somewhat smaller (0.2 vs. 0.9). Results from the two-level analysis specified in Eq. 2 revealed that if PASL was not implemented in schools, students on average would have a school engagement score of 2.77 (*se* =0.05) at the end of the school year. PASL appeared to have slightly increased student engagement (coefficient =0.11, *se* =0.08, $t = 1.40$, $p = .60$), producing a standardized mean difference of.14 (Hedge's *g*) though the difference was not statistically significant.

5.2.1. Effect by student prior engagement

We then examined the PASL effect by student's prior engagement through analyzing Eq. 3. We were interested in whether students who started 9th grade lower on engagement benefited more from PASL participation. Table 5 shows that a student's engagement at the beginning of the school year significantly predicts their end of year engagement (coefficient =0.5, *se* =0.03, $t = -16.35$, $p < .001$, g =0.61). PASL effects remain insignificant with an effect size of.15. However, we found a significant negative interaction between PASL and prior engagement (coefficient = −0.17, *se* =0.07, $t = -2.23$, $p < .05$), suggesting t PASL effects depend on student's prior engagement. That is, the lower the engagement a student reported at the beginning of the school year, the stronger the effect of PASL on students. With one-unit lower prior engagement, PASL effects increased by.17, producing a standardized mean difference of.21.

5.3. PASL effects on self-regulation and self efficacy

Next, we examine whether PASL produced a similar effect pattern on distal SEL outcomes such as self-regulation and self-efficacy. As presented in Table 4, PASL student's self-efficacy seemed to decline a bit over the year while comparison students showed a.4 improvement. However, both PASL and comparison students experienced a similar magnitude of improvement in self-regulation over the school year. Results from the two-level modeling did not suggest any significant difference between the two groups in either of the distal outcomes, with an effect size of only.04–0.05.

5.3.1. PASL effects by student prior engagement

Table 5 shows that student's prior engagement significantly predicted their end-of-year self-efficacy (coefficient =0.05, *se* =0.02, $t = 2.16$, $p < .05$, g=0.08). While the conditional main effect of PASL on self-efficacy is trivial, the effect also depended on prior engagement (coefficient = −0.12, *se* =0.06, $t = -2.08$, $p < .05$, g=0.19). The lower a student's engagement at the beginning of the school year, the stronger the effect of PASL has. With a one-unit decrease in prior engagement, PASL effects increased by.12, producing a standardized mean difference of.19. For self-regulation, we did not find any significant PASL effect, nor did we find that effects depend on prior engagement.

6. Discussion

This study presented results from a quasi-experimental design study of PASL, a systematic school-based reform for 9th graders in which administrators, guidance counselors, and teachers intentionally attend to students' academic, social emotional, and behavioral needs. Although no statistically significant main effects were observed on any of the SEL outcomes, PASL seemed to have slightly increased average student engagement in school with an effect size of.14, a magnitude that might be considered meaningful in the context of 9th grade SEL outcomes. The reason this finding could be meaningful is that newer and more appropriate guidelines for interpreting effect sizes in education (Kraft, 2020) suggest an effect size of.14 might represent a moderate impact depending on context. And in the SEL context, an effect size of.14 could be meaningful because important meta-analyses of SEL programming has reported average effect sizes of.13 for attitudes toward self, others and school (Taylor et al., 2017), which are similar to the outcomes reported in this study. We point to this finding to encourage larger sample and more well controlled studies of PASL's effect on student engagement.

More importantly, we found that PASL effects on both engagement and self-efficacy depended on student's prior engagement before they entered 9th grade. PASL appeared to be more effective for students who entered 9th grade with lower engagement. Given PASL's primary focus on improving student's engagement in school, our findings seem to suggest that PASL is achieving its primary aim, especially among students who start high school with lower engagement levels.

PASL's positive impact on low engaged students is notable and important. It has long been known that engagement in school is critical for 9th grade students as disengaged students tend to attend class less regularly and experience more stop-out (i.e. extended period of absence) and hence are more likely to lag academically and eventually drop out of school (Finn & Zimmer, 2012; Rumberger & Rotermund, 2012). The promising evidence presented in this study offers a possible solution to supporting disengaged students. PASL represents a systemic approach to school improvement predicated on strengthening and bridging academic and social emotional practices that may already be present in high schools. With its relatively low cost and simplicity as a reform, PASL may represent a feasible response for schools looking to counter the potentially low engagement of incoming 9th graders.

The positive effects we found for students who come to 9th grade with low engagement is critically important for another reason. It is reasonable to assume that engagement problems will confront schools across the world given what every student has faced during the COVID-19 pandemic. Schools can provide a critical source of social support for teens where they can enjoy interacting with their friends during the school day. Although teachers and coaches may not be trained in mental health practices, they can notice when a student is distressed. During the COVID-19 pandemic, as schools moved to online education, teens lost access to much of this support, instead overusing the internet and social media (Liu et al., 2022). At the same time, many faced new, profound stressors such as families losing work, significant illness, and even the death of loved ones from COVID-19. Multiple studies have indicated that the COVID-19 pandemic and associated lockdowns have had a negative

Table 4
Pre- and Posttest SEL measures by treatment conditions in analytic sample.

	PASL (n = 205)		Comparison (n = 1139)		All (n = 1344)	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
School Engagement	2.94 (0.75)	2.92 (0.76)	2.88 (0.73)	2.79 (0.84)	2.89 (0.73)	2.81 (0.83)
Self-Efficacy	3.32 (0.54)	3.28 (0.60)	3.30 (0.59)	3.34 (0.64)	3.30 (0.58)	3.33 (0.63)
Self-Regulation	2.59 (0.55)	2.79 (0.54)	2.61(0.56)	2.81 (0.58)	2.61 (0.56)	2.81 (0.58)

Table 5
Estimated PASL Effects by Student Prior Engagement.

	School Engagement			Self -Efficacy			Self-regulation		
Fixed Effects	*Coeff (se)*	*t*	*g*	*Coeff (se)*	*t*	*g*	*Coeff (se)*	*t*	*g*
Intercept	2.77 (0.04)	61.82***	–	3.33 (0.02)	191.90***	–	2.82 (0.02)	180.49***	–
PASL	0.12 (0.08)	1.58	0.15	-0.02 (0.04)	-.46	0.03	-0.04 (0.04)	-.95	0.07
Prior school Engagement	0.50 (0.03)	16.35***	.61	0.05(0.02)	2.16*	.08	0.03 (0.02)	1.32	0.05
PASL* Prior School Engagement	-0.17 (0.07)	-2.23*	.21	-0.12(0.06)	-2.08*	.19	0.09 (0.05)	1.80	0.16
Female	-0.05(0.04)	-1.30	–	-0.05(0.03)	-1.54	–	0.06 (0.03)	2.22*	–
Black	-0.14(0.08)	-1.78	–	0.04(0.06)	0.69	–	-0.02 (0.05)	-.44	–
Hispanic	-0.06 (0.08)	0.71	–	-0.02(0.06)	-.35	–	-0.04 (0.06)	-.72	–
White	-0.02 (0.09)	-.25	–	-0.02(0.07)	-.22	–	-0.01 (0.06)	-.15	–
Free or reduced-price lunch eligibility	0.09 (0.05)	1.72	–	0.03(0.04)	0.77	–	-0.06 (0.04)	-1.63	–
prior FSA reading score	-0.00 (0.00)	-1.61	–	0.00(0.00)	6.07***	–	-0.00 (0.00)	-1.60	–
Prior self-efficacy	0.02 (0.04)	0.57	–	0.41(0.03)	14.83***	–	0.09 (0.02)	3.82***	–
Prior self-regulation	0.16 (0.04)	4.45***	–	0.08(0.03)	2.68**	–	0.43 (0.03)	16.84***	–
School average prior FSA reading score	0.01 (0.01)	2.16	–	-0.00 (0.00)	0.10	–	-0.01 (0.00)	-3.26*	–
Random Effects	Variance	χ^2		Variance	χ^2		Variance	χ^2	
Student level	0.52			.32			.26		
School level	0.01	21.43**		.00	8.90		0.00	6.80	

* Note: $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

impact on adolescents' mental health (e.g., Guessoum et al., 2020; Liu et al., 2022). In the coming years, schools should expect students to present with trauma from the pandemic which could easily lead to further disengagement from school. PASL offers schools a low-cost approach to respond in a way that could result in a lessening of disengagement and perhaps better outcomes as high schools move forward.

While PASL appeared to work for the school engagement and self-efficacy of some students, it was found ineffective for improving students' self-regulation. The observed zero effect on self-regulation suggests an important area for improvement. Given that engagement measured in this study includes positive relationships with teachers and other adults in schools, future PASL design and implementation can build on those relationships to influence self-regulation. Again, post COVID-19, self-regulation (i.e., setting goals, managing time to meet objectives) is likely to become more important for student success. While our implementation data suggests that PASL students were checking in and having conversations with adults, those conversations might need to be more formalized and implementers might want to revisit the goal setting approaches they are using. We were surprised that PASL student's self-regulation did not improve, and it might be because conversations with adults did not focus on activities that would improve goal setting or time management. PASL developers are aware of this finding and will adjust their training accordingly. Future investigations of PASL will assess how well these trainings were modified.

6.1. Limitations and future directions

Like many other QED studies, our work has been constrained by the local implementation design and the quality of available data. Half of BCPS high schools had implemented PASL prior to the 2017–18 school year eliminating them as possible study sites. Furthermore, BCPS administrators did not make us aware of objective criteria used to determine which schools would receive PASL in a given year. Our team was only informed of where PASL would be implemented and had to develop an appropriate methodological design. With the limited number of schools participating in the study, our analysis does not have sufficient statistical power to detect the significance of the PASL effects. Moreover, our study was only able to cover a single academic year which may not have been adequate to uncover effects given recent evidence that SEL programs may show delayed impact after program implementation (Taylor et al., 2017). We also would have liked to measure all our outcomes, but engagement specifically, at more times points during the year given that perceptions of these skills can ebb and flow. But the level of burden on schools associated with that much measurement was not something we decided to ask schools to take on. We tried to maintain school-level baseline equivalence by limiting the study sample to mid-size schools with large proportions of minority and low-income students and found no significant between-group differences in key demographic and school performance variables (see Table 1) on average. However, individual school differences may still confound the estimated PASL effects. The current findings should be interpreted with caution and will be further evaluated using a different sample and design in our ongoing work.

Our study of SEL outcomes relied entirely on student self-reports of their SEL skills. We did not collect teacher SEL ratings of their students nor were we able to supplement self-report data with another type of data (i.e., performance tasks). If we were to assess the SEL skills of students today, we would likely adopt a different measurement approach that would include more direct assessments of students. Despite these limitations, we believe the SEL scales used in this study were reliable (see Table 2) and validly measured key components that PASL is expected to influence. Therefore, we do believe that the impact study results we present effectively assess PASL's ability to impact key SEL outcomes. We also cannot completely rule out crossover effects. It is possible that some schools in the comparison group could have put some elements of PASL into place prior to their scheduled implementation. However, we think this is unlikely because summer training and professional development only included staff from schools implementing PASL in the upcoming school year. Comparison staff did not receive training and implementation supports from BCPS until 2018–19 which would have made it particularly challenging to implement PASL well.

The above limitations notwithstanding, judging by the effect size ($g = 0.14$), we suspect with a larger sample the overall PASL effect on student engagement could become more pronounced. We also wonder, given previous findings that SEL program effects seem to be more pronounced for younger students (Grant et al., 2017; Heckman & Kautz, 2012; Yeager et al., 2015), if there are characteristics of the organization of high schools that might be mediating effects. In fact, our qualitative work suggests that teachers' routine and explicit focus with students on their grades, attendance and progress generally is new and uncomfortable for some students, thus leading them to report lower outcomes in the short term, but perhaps higher outcomes at a later time, such as in the area of self-efficacy, as they pass courses and have higher test scores.

Future studies could add to our results by extending the study period to capture more years of high school and perhaps provide a view of whether the effects of PASL on other self-reported SEL outcomes, such as

self-regulation, surfaces in later years, and whether the observed effects on student engagement and self-efficacy are sustained or even enhanced through subsequent years of high school. In addition, further investigation is needed to fully understand the mechanisms which led to slightly increased engagement among PASL students. Qualitative analysis may be informative to uncover which specific program elements (i.e., rapid check-ins, goal achievement exercises) lead to student reports of higher levels of engagement at the end of the academic year and how each element works on students of different backgrounds. Studies might also explore if students reported that they had more than one teacher who they felt cared for them, suggesting that the organization of high schools where students interact with six to eight teachers in one day, may be eroding program effects.

While we could not adequately address racial, ethnic, gender or economic differences in SEL outcomes, future studies of PASL must strive to do so. There is mounting evidence that SEL skills grow differently for different racial/ethnic and gender groups (West et al., 2020) with poorer and more disadvantaged students lagging on these critical skills. We did not observe any demographic differences in any outcomes, but our subsamples were small and underpowered so our study does not represent a good test of these differences. However, there is reason to think that PASL might be beneficial for marginalized students who have poor histories with schooling in general. Providing those students with responsible adults who take a vested interest in them might prove to be what they require in order to be successful in high school and beyond. We hope to test this hypothesis in a future, more well controlled study of PASL.

7. Conclusion

The PASL reform shows promise for 9th graders' school engagement. For students who come to 9th grade disengaged, PASL may be even more promising as we found statistically significant improvements for low engaged students on their end of 9th grade school engagement and self-efficacy. Despite these promising findings, more work should be done on PASL before it is recommended outside BCPS for schools as a reform that improves the social emotional outcomes reviewed in this study. The zero findings on students' self-regulation were surprising and disappointing. We explored some reasons why no impact was observed for student's self-regulation (i.e., unstructured nature of some rapid check ins), however program developers will have to make it a priority to learn more if PASL is to improve. Furthermore, because of wide implementation flexibility for schools, it is not clear which specific components of PASL are working and where improvements are necessary. PASL's future outside of BCPS depends on determining where PASL works well and where it does not work at all. In the future, more well controlled studies of PASL will attempt to untangle the effects of each key component. Despite these limitations and challenges, there is much to like about PASL's potential as a low-cost reform for high schools. In this study, we see positive effects for low engaged 9th graders which is interesting and important enough to proceed with additional studies of PASL given how critical engagement in school is likely to become in the coming post pandemic years.

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Declaration of interest

The authors have no competing interests.

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