A Tier 1 Intervention to Increase 9th Grade Engagement and Success: Results from a Randomized Controlled Trial

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Abstract

Although high school graduation rates are improving, a large number of students are still not successful. Research has documented that 9th grade is a pivotal year in determining whether a student will graduate or drop out. The purpose of this randomized controlled trial was to assess the effects of a Tier 1 intervention model (Freshmen Success) for 9th graders to increase school engagement, attendance, credits earned, and grade point average (GPA). This study included 1,588 students in 9th grade across four comprehensive high schools. Treatment schools implemented the Freshmen Success components: a 9th grade Leadership Team, a curriculum, and support from Peer Navigators. Control schools continued business as usual. Results showed statistically significant and educationally meaningful effects on student motivation, engagement and attendance, and a moderate-to-large effect for credits earned; however, there was no significant effect found for GPA.

Keywords: high school, attendance, school engagement, prevention

Impact and Implications Statement

This study demonstrates that the FS model, when implemented with fidelity, increased 9th grade student engagement, attendance, and credits earned. However, the intervention was not associated with significant improvements in GPA.

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Although graduation rates are improving nationally, too many students still do not complete high school. School dropouts, when compared with their graduating peers, are more likely to be unemployed or underemployed, live in poverty, have poor health, and become involved in criminal activities (Belfield, Levin, & Rosen, 2012; Christle, Jolivette, & Nelson, 2007; McFarland, Cui, & Stark, 2018). Research has documented that the path to dropping out is a gradual process of diminishing school engagement (Reschly & Christensen, 2012) and, for many, begins with the transition from middle to high school (Allensworth & Easton, 2005; Benner, 2011; Somers & Garcia, 2016). In particular, 9th-graders have been shown to have lower attendance rates (Jerald, 2006), higher rates of disciplinary action (Flannery, Fenning, McGrath Kato, & Bohanon, 2013; Kaufman et al., 2010; Spaulding et al., 2010) and lower course performance (Allensworth & Easton, 2007; Roderick, Kelly, Kemple, Johnson, & Beecham, 2014) than their older peers. In fact, Allensworth and Easton (2007) found that students who fell behind in 9th grade had a graduation rate 60% lower than that of students who were able to stay on track during the 9th-grade year.

To prevent high school dropout, a growing body of research supports the implementation of multi-tiered systems of support (MTSS) to foster student engagement, positive social interactions, and academic achievement for all students (Brown-Chidsey & Steege, 2010; Goss & Andren, 2014). MTSS provides a framework for schools to implement evidence-based interventions as they supply (a) systems needed for initial and sustained implementation, (b) guidance in the selection and implementation of practices that match the needs of the school, and (c) systems for using data to identify areas of concern and guide decision-making regarding

interventions (Ervin, Schaughency, Matthews, Goodman, & McGlinchey, 2007; Sugai & Horner, 2009). This continuum of supports begins with the whole school and becomes more intensive and individualized based on student need. Tier 1 (i.e., universal, schoolwide) emphasizes prevention and is designed for all students, adults, and school contexts. The Tier 2 (i.e., targeted) consists of efficient interventions offered to groups of students who need additional support. Finally, Tier 3 (i.e., individualized) provides the highest need students with intensive supports (see www.pbis.org). These preventive models have been shown to be successful in high schools by reducing problem behavior, increasing attendance, and improving student access to needed interventions (Bohanon et al., 2006; Flannery, Fenning, McGrath Kato, & McIntosh, 2014; Morrissey, Bohanon, & Fenning, 2010; Muscott, Mann, & LeBrun, 2008) and also have recent application to dropout prevention and transition programming (Dynarski et al., 2008; Furlong & Christenson, 2008; Hammond, Linton, Smink, & Drew, 2007; MacIver & MacIver, 2009).

A review of the What Works Clearinghouse for practices related to improving graduation that included 9th graders yielded seven interventions with positive or potentially positive effects (https://ies.ed.gov/ncee/wwc/FWW/Index). Of these, three interventions deliver Tier 2 support for specific at-risk subgroups of students, including mentorship programs, policies that place students in academic support classes, or behavior support programs such as Check and Connect (Christenson, Stout, & Pohl, 2012). Although some of these interventions have demonstrated positive impact on student outcomes, they are Tier 2 practices, designed to be implemented with a small number of students already identified as at risk (Cauley & Jovanovich, 2006; Neild, 2009; Sinclair, Christenson, & Thurlow, 2005). The remaining four interventions involve whole school restructuring (academies, alternative schools), or are strategies rarely utilized in the first

year of high school (dual enrollment). In sum, there is a lack of currently identified Tier 1 interventions for high schools aimed at the prevention of factors that lead to dropout.

The Institute of Education Sciences (IES) dropout prevention practice guide, however, identifies six main practices found to be effective in decreasing high school dropout (Dynarski et al., 2008). These practices are in alignment with the MTSS framework and include utilization of data systems, instruction and support in areas such as test taking and study skills, personalizing the learning environment, and linking classroom content to postsecondary experiences. The practices identified by IES in the dropout prevention guide extend the broad framework provided by MTSS to include strategies for enhancing student engagement (Dynarski et al., 2008; Goss & Andren, 2014), which is critical to dropout prevention (Balfanz, Herzog, & MacIver, 2007; Fredricks et al., 2011). Generally, school engagement can be defined as having three domains: behavioral engagement (e.g., doing school work and following rules), cognitive engagement (e.g., relevance of school ability to self- regulate, motivation), and emotional engagement (e.g., sense of belonging, connections in school; Fredricks et al., 2004, 2011), and any effort designed to impact school engagement would address these domains.

The Freshmen Success Intervention

The conceptual framework for MTSS emphasizes prevention, data-based decision making, the use of evidence based interventions, and implementation fidelity (Sugai & Horner, 2009). Freshmen Success (FS) was designed by the authors to be embedded within this framework to increase student engagement during the 9th grade, an established critical period for early detection and effective intervention. Freshmen Success aims to increase the engagement and performance of all 9th graders in high school, regardless of skill level, along trajectories toward increased achievement and graduation rates. The ***core components of FS*** are: (a) the use of data-based decision making by a 9th-grade leadership team, (b) explicit instruction of a

prevention-oriented engagement curriculum for all 9th-grade students and (c) utilization of engagement-focused peer support from upperclassmen who share experiences and knowledge with 9th graders (see Figure 1).

Data based decision making by a 9th-grade leadership team. The establishment of a 9th grade leadership team is at the center of FS, as this team is trained to monitor implementation, utilize 9th-grade student outcome data to guide ongoing decision making, and support the sustainability of the effort. Effective systems of support use a leadership team to focus on articulating successful practices and systems through a review of data, alignment with current initiatives, and sharing and gathering feedback from the school staff and leaders (Sugai & Horner, 2009). The FS 9th-grade Leadership Team is made up of a building administrator, three to four teachers and staff who work with 9th-graders, and student support personnel such as the school psychologist, counselor, or dean of students. The team meets monthly for about 45 minutes, follows a standard agenda and is responsible for developing consistent 9th-grade-wide policies, communicating with the broader school community, and adjusting implementation as necessary to fit the school context and ensure sustainability. The primary task of the Leadership Team is to utilize data based decision making, a key practice in effective service delivery according to the National Association of School Psychologists (National Association of School Psychologists, 2010). Key indicators when monitoring for dropout prevention include attendance, behavior (e.g., suspension, expulsion), and course performance (e.g., course failure, GPA; Allensworth & Easton 2005; 2007; Rosenkranz, de la Torre, Stevens, & Allensworth, 2014), so the Leadership Team sets and monitors regularly goals for the 9th grade in these key areas. Monitoring such early warning indicators has been shown to reduce the percentage of students with risk indicators related to chronic absence and course failure (Faria et al., 2017).

Explicit instruction of engagement skills through the FS Curriculum. The FS Curriculum consists of 12 30-minute lessons. As noted earlier, instruction in areas such as test taking and study skills, goal setting, problem solving, and decision making is an effective strategy identified in the IES dropout prevention practice guide (Dynarski et al., 2008). Similarly, a research brief by the Breakthrough Collaborative (2011) states that students "need to be explicitly taught the skills and behaviors that will help them navigate the unfamiliar and more demanding terrain of high school, including problem solving skills, time management skills, organizational skills, self-advocacy, and understanding where and when to seek help" (p. 4). All FS curricular instruction is designed to teach these skills and behaviors, with activities that align with the three areas of school engagement: behavioral (e.g., prioritization, study strategies), cognitive (e.g., on track for graduation, reading transcript) and emotional (e.g., teacher allies, getting involved; Fredericks et al., 2004, 2011).

Peer support delivered by Peer Navigators. The FS intervention includes upperclassmen known as Peer Navigators who are trained to support 9th-graders in "how to do school" and are placed in each class where the FS curriculum is taught to reinforce curricular concepts and support school engagement and learning. As part of typical development, 9th-graders are beginning to strive for autonomy, especially from adult influence. As a result, they often look to peers for information and support (Daddis, 2011), and their engagement can be enhanced through positive relationships with older peers (Dennison, 2000; Karcher, 2005; Wang & Eccles, 2012). Peer leaders who are one to two years older have been shown to facilitate prosocial and academic development, as these peers understand the school culture and develop positive strategies to overcome problems (DuBois, Holloway, Valentine & Cooper, 2002).

Purpose of the Study

This article reports the first set of research findings from a randomized controlled trial of FS, a Tier 1 intervention model for 9th-graders to increase student engagement, attendance, and course performance. Specifically, we hypothesized that the implementation of FS in treatment schools would be associated with (a) higher student motivation and engagement, (b) higher rates of school attendance, and (c) improvements in identified academic outcomes (credits earned and GPA), than for students in control schools who did not receive the intervention.

To examine the effectiveness of the FS model, we asked the following research questions:

1. What are the effects of the FS model on motivation and engagement?
2. What are the effects of the FS model on attendance?
3. What are the effects of the FS model on credits earned?
4. What are the effects of the FS model on GPA?

Method

Settings and Participants

Four public high schools (two treatment and two waitlist control) located in one state in the Pacific Northwest participated in this study during the 2017-18 school year. Schools were recruited during the 2016-17 school year, and demographic data were available from that year from the National Center for Education Statistics (NCES) database (see Table 1). Treatment school 1 was located in a midsize suburb and treatment school 2 was located in a fringe rural area. Waitlist control schools 1 and 2 were located in small cities. Treatment school 2 and waitlist control school 2 were located in the same school district. The average student enrollment across the treatment schools was 1,518, and the average student enrollment across the waitlist control schools was 1,299. None of the schools were eligible for Title I support. There was a

total of 1,588 9th-grade students across the four schools. Most students were approximately 14 years old when they entered 9th-grade. Table 2 provides demographic data on the participants. Of these students, 854 (401 females and 399 males) were from the two treatment schools. The majority of 9th students in the two treatment schools were White (*n* = 477, 55.9%) or Hispanic/Latinx (*n* = 217, 25.4%). There were 734 9th-grade students in the two wait list control schools (347 males and 339 females). The majority were White (*n* = 460, 62.7%) or Hispanic/Latinx (*n* = 97, 13.2%).

Measures

Student motivation and engagement. Student motivation and engagement were measured using the *Motivation and Engagement Scale - High School* (MES-HS; Martin, 2016), a student self-report measure of positive and negative factors affecting motivation and engagement. MES-HS surveys were administered twice (Time 1: within the first 4 weeks of the school year, Time 2: the last 4 weeks of the school year) by classroom teachers, using a paper and pencil format. The measure consists of 44 items with a 7-point Likert-type scale, from 1 (*Disagree Strongly*) to 7 (*Agree Strongly*). For example, an item on the MES-HS scale for global positive motivation includes "*If I try hard, I believe I can do my schoolwork well"* (item 13) and an item on the global positive engagement includes "*If I can't understand my schoolwork at first, I keep going over it until I do*" (item 1). Items are organized into positive and negative subscales (11 subscales; four items per subscale). Several studies have found the subscales of the MES-HS to be reliable (Cronbach's $\alpha > .75$; see Liem & Martin, 2012, for a review). These subscales can then be grouped into four global positive and negative motivation and engagement scale scores (average of the subscales scores; Martin, 2016). Based on recommendations by Martin (2016), subscales were not created if students answered fewer than three items in a subscale, and global

scores were not created if students did not have a score for each subscale used to create the global scores. A confirmatory factor analysis (CFA) was conducted with a sample of 21,579 high school students in 58 Australian schools to validate the psychometric properties of the four global MES scales. Findings indicated good model fit (Martin, 2016). Additional evidence of the reliability (coefficient alphas) of the four global scales are described below from the study sample.

Global positive engagement. The global positive engagement scale consisted of the average of three positive subscales (persistence, task management, and planning). The global positive engagement scale also had high reliability for Time 1 (α = .90) and Time 2 (α = .91).

Global positive motivation. The global positive motivation scale consisted of the average of three positive subscales (self-belief, learning focus, and valuing). The global positive motivation scale was found to be highly reliable for Time 1 (α = .91) and Time 2 (α = .92).

Global negative engagement. The global negative engagement scale consisted of eight items and was the average of two negative subscales (disengagement and self-sabotage). Alphas for Times 1 and 2 were .86 and .87, respectively.

Global negative motivation. The global negative motivation scale included three negative subscales (uncertain control, failure avoidance, and anxiety). Alphas for the 12 items for Times 1 and 2 were .86 and .87, respectively.

Attendance. Attendance was measured as the percent of a school day that each student attended in 8th and 9th grade. The mean attendance across each year was used to calculate each student's average attendance in 8^{th} and 9th grades (*ranges* = 0 – 1.00).

Credits earned. Credit data were collected for each full year. Credits earned was calculated using the sum of credits earned across semesters 1 and 2 of 9th grade (*range* = 0 – 11.50).

GPA. Student GPA was collected for each semester and included the mean full-year GPA across semesters 1 and 2 in 9th grade. All schools were located in the same state and measured GPA using a 4-point scale (*range* = 0 - 4.00) as typical for state reporting standards. Table 3 includes sample sizes, means, and standard deviations across these key variables for treatment and waitlist control groups.

Fidelity. Two measures were used to assess the fidelity of implementation of the FS model.

FS Implementation Checklist. Research staff conducted the FS implementation checklist monthly with the 9th-grade Leadership team to document fidelity of implementation of the components of the FS model. The FS Implementation Checklist was developed by the research team with input from a design team, which consisted of administrators, teachers and staff in two schools implementing Freshmen Success prior to this RCT. The design team provided ongoing input into the usefulness and appropriateness of the items on the FS Implementation Checklist in assisting their schools to implement Freshmen Success with fidelity.

The tool has four subscales: (a) six items that focus on *high school systems* needed to ensure systems-level support and integration of the intervention (e.g., school has an efficient and effective system for collecting data and providing reports on critical engagement variables), (b) 11 items focused on *9th-grade systems* (e.g., 9th-grade staff have received professional development in dropout prevention, strategies for utilizing data-based decision making, communication systems), (c) five items on the implementation of *Peer Navigators* (systems for

recruitment and training, ongoing support), and (d) four items focused on *classroom instruction and support* (e.g., school explicitly teaches to 9th graders a curriculum focused on increasing school engagement within the first semester) related to engagement skills.

Curriculum Fidelity Observation Form. For each FS lesson, research staff used the observation form to document the implementation of each lesson plan component. The form is formatted to align with the instructional concepts and activities taught in each lesson, so the number of items observed varied for each lesson. Overall, there were five to seven items for each lesson rated as taught or not taught and a single rating from 1-10 (1 = poor, 10 = excellent) on the overall quality of lesson delivery.

Procedures

Recruitment and selection. All procedures were conducted as part of an approved IRB protocol at the authors' institution. The four schools in this study were recruited during the 2016-17 school year by research staff. To be eligible, schools needed to be (a) located in the Pacific Northwest, (b) have an enrollment over 900 students, (c) have 45% or higher student percentage receiving Free or Reduced Priced Meals (FARMS), and (d) have at least 30% minority school population, and (e) be within a one hour drive of the authors' institution. A total of 13 high schools met these criteria and were contacted via email and invited to participate. Six schools expressed interest, so a researcher-developed capacity assessment was conducted by research staff with each of the six schools. This capacity assessment was designed to assess if school systems were in place that would be essential to the implementation of FS (e.g., alignment with school improvement goals, ability to attain staff consensus on implementation of teaching practices, experience with utilizing data for school wide decision making), and if the building had identified a period in their schedule for the curriculum to be taught. One school was

eliminated after the capacity assessment because it did not meet minimum criteria. Five schools went on to complete a researcher-designed systems readiness checklist. The readiness checklist was completed by research staff during in-person meetings with school administrative teams. The four schools with the highest scores on the capacity and readiness assessments were invited to participate. After selection and agreement to participate, four schools were matched into pairs based on attendance data in 2016-17 and then randomly assigned to one of two conditions (FS model or business as usual) using a coin flip. Two of the schools were located in the same district, and the randomization scheme placed each in a different condition. Schools were provided funding to offset the cost of training and data collection associated with the study but were not otherwise compensated for participation. See Figure 2 for the participant flow diagram.

Business as usual condition. Business as usual condition was agreed to by the schools assigned to this condition through a memorandum of understanding stating that during the waitlist period the school would not implement any of the features identified in the memorandum (e.g., 9th-grade leadership team, peer support for 9th graders, implementation of an engagement-focused curriculum). Adherence to the control condition was documented by the research team through a standard interview with each control school administrator following final data collection. Interview questions were designed to document any use of the three FS components the school may have implemented during the waitlist period. Control schools adhered to the memorandum of understanding and did not implement FS components. At the end of the waitlist period, neither school had a 9th-grade Leadership Team or similar group that regularly reviewed 9th-grade data or designed interventions for 9th-graders at the universal level. Neither school had a system to utilize upperclassmen to support 9th graders throughout the year, though one school included upperclassmen in orientation activities at the beginning of the year. Regarding teaching

9th grade expectations, neither school had identified or taught a set of expectations and skills needed for success in high school to 9th-graders.

Implementation of FS model. Each of the treatment schools implemented the three FS components.

FS leadership team. During the spring prior to implementation, teams received approximately 8 hours of training from research staff on the use of data-based decision making and monitoring and managing system-based interventions. During this early work, teams identified specific data-based 9th-grade goals related to attendance, behavior and course performance. The team monitored these data goals and the Implementation Checklist during monthly 90-minute FS Leadership Team meetings and reported out regularly to staff during the implementation year. Either the second or last author attended each team meeting to provide technical assistance and general consultation in FS implementation. Each has an extensive background implementing MTSS in high schools and providing technical assistance to teams in MTSS implementation. Treatment schools averaged 92.5% (*range* = 90% - 95%) on the leadership team subscale of the FS Implementation Checklist in the spring of the year of implementation.

FS curriculum. The FS curriculum was implemented in the fall of the year of implementation. Each school had or created a weekly 9th-grade advisory period in the schedule for FS lessons to be delivered. These advisory periods took place weekly for approximately 45 minutes, and all lessons were delivered by 29 advisory teachers during this time. Teachers were provided with the curriculum at the end of the prior school year, and then all teachers participated in a 4-hour training on the curriculum in the week prior to the start of the implementation year. A total of 51 FS lesson observations were completed by trained research

staff using the Curriculum Fidelity Observation Form. A sampling procedure was used to ensure that all teachers and all lessons were observed at least twice in each school each week until all lessons were delivered. The average fidelity of implementation was 94% (*range* = 40% - 100%; SD = 13%). Inter-observer agreement (IOA) was completed on 33% of opportunities and was calculated by dividing the exact item agreements by the exact item disagreements plus agreements and then multiplying by 100%, with overall IOA being 97%. Both treatment schools scored 100% on the curriculum subscale of the FS Implementation Checklist in the spring of the year of implementation.

Peer Navigators. Peer Navigators were recruited by the FS coordinator in each building during the spring prior to the year of implementation. Student applications were screened by the FS Leadership Team for attendance and grade minimums, and then students were selected, ensuring that a diverse range of students would be represented in the overall Peer Navigator pool. All students received elective credit for their participation. There were 44 Peer Navigators across schools. Peer Navigators received two hours of training prior to the start of the school year on their role, the curriculum, and how to work with their partner teacher. Peer Navigators also participated in lunch meetings with the FS building coordinator approximately monthly. Research staff observed peer navigator implementation during each curriculum observation and observed one peer navigator support lunch meeting each quarter. Both treatment schools scored 100% on the peer support subscale of the FS Implementation Checklist in the spring of the year of implementation.

Analytic Plan

The study design was a small-scale, cluster randomized controlled effectiveness trial with four high schools and randomization occurring at the school level. Because students were nested

within schools and preliminary analyses found non-zero ICCs at the school level across all dependent variables, we accounted for clustering at the school level in analyses (Peugh, 2010). As all dependent variables were continuous, effects of the FS model (control = 0, treatment = 1) were evaluated through multi-level linear regressions using the MLR (maximum likelihood estimation with robust standard errors) estimator and TYPE=COMPLEX command in M*plus* 8.1 (Muthén & Muthén, 1998-2017). This estimator was selected because it is robust to violations of assumptions of linear regression, including non-independence of observations, non-normality of observations, and heteroscedasticity (White, 1980; Muthén & Muthén, 1998-2017). Multicollinearity was also examined by correlating the treatment group variable (i.e., treatment schools vs. waitlist control schools) and the study variables. All correlations were below .80.

Covariates were included in the regression models when available. For global motivation and engagement, global motivation and engagement scores in Time 1 (beginning of year) were included as covariates for scores in Time 2 (end of year). For attendance, 8th-grade attendance was included as a covariate for 9th-grade attendance.

Effect sizes were assessed for the outcome variables regressed on the binary treatment condition variable using a web-based meta-analysis calculator (Wilson, n.d.). Using this approach, unstandardized regression coefficients of the binary treatment variable, the standard deviation of the dependent variable, and treatment group and control group sample sizes were imputed, and a Cohen's *d* standardized mean difference effect size with confidence intervals was calculated (Lipsey & Wilson, 2001). The traditional threshold for a small effect size is .2, a medium effect size is .5, and a large effect is .8 (Cohen, 1988), although more recent recommendations from the literature note effect sizes of .2 or .25 as educationally meaningful,

particualrly for universal interventions (Hedges & Hedberg, 2007; Lipsey et al., 2012; What Works Clearinghouse, 2014).

Missing data. Table 4 includes an overview of the missing data across all outcome and covariate variables. Due to the bias introduced through list-wise deletion (Graham, Olchowski, & Gilreath, 2007), multiple imputation using Bayesian analyses in M*plus* 8.1 was used. Twenty data sets were imputed to retain all 1588 cases in the analyses (Muthén & Muthén, 1998-2017).

Results

This research examined whether there were significant differences in global positive and negative motivation and engagement scores, attendance rates, credits earned, and GPA for students in the treatment schools, compared to waitlist control schools. Table 5 includes the unstandardized regression coefficients and standard errors for each of the covariates on the student outcome variables, as well as effect sizes and confidence intervals.

Student Motivation and Engagement

For research question 1, we hypothesized that there would be a significant difference in motivation and engagement scores for students in the treatment schools, compared to students in the waitlist control schools. Based on the regression analyses, there was a statistically significant difference in global positive motivation scores for students in the treatment and waitlist control condition conditions ($b = 0.22$, $p = 002$), with a small effect size ($d = .21$). Treatment conditions were also significantly different for global positive engagement ($b = 0.17$, $p < 0.001$) and global negative engagement ($b = -0.30$, $p < 0.001$). Effect sizes were small for both ($d = .15$ and .24, respectively). There were not significantly different negative motivation scores ($b = -0.08$, $p = 0.073$) between treatment and control schools.

Attendance

Our hypothesis for research question 2 was that there would be a significant difference in attendance for students in the treatment schools, compared to the waitlist control schools, after 8th-grade attendance was included as a covariate. As shown in Table 5, results supported our hypothesis, as students in the treatment schools had significantly higher rates of attendance than students in the control schools ($b = 0.01$, $p = 0.049$). The effect size for treatment condition was below the criterion for small ($d = .13$).

Credits Earned

For research question 3, we hypothesized that there would be a significant difference in credits earned for students in the treatment and waitlist control schools. Our hypothesis was supported ($b = 1.13$, $p = 0.001$), as students in the treatment schools earned significantly more credits in 9th grade. There was a large effect size for treatment condition on credits earned ($d = .79$).

GPA

Our final research question examined whether there was a significant difference in GPA across treatment and waitlist control schools. Specially, we hypothesized that students in the treatment schools would have significantly higher GPAs. As shown in Table 5, there were no significant differences between treatment conditions ($b = 1.13$, $p = .699$); thus, this hypothesis was not supported.

Discussion

High school dropout continues to be a major issue in the US, and students who dropout face underemployment, poor health and involvement in the criminal justice system. The path to dropout is gradual, making it challenging to identify when to intervene. However, because

research indicates that the transition into high school is a particularly vulnerable time, this is also an optimal time for preventive intervention.

Freshmen Success is a Tier 1 prevention-oriented intervention that is implemented within a broader MTSS framework and is aimed at increasing student engagement, attendance and academic outcomes for 9th-graders in high school.. A majority of the current interventions to improve school completion are intended for students already experiencing failure and in need of supports at the Tier 2 or 3 level. The present study extends the research on student engagement and dropout prevention for 9th graders by focusing instead on prevention at the Tier 1 level. Study results demonstrated a statistically significant difference for the treatment schools on student motivation, engagement, attendance, and credits earned compared to schools in the control condition. These effects indicate that combining multiple research-supported approaches into a cohesive Tier 1 intervention has the potential to serve as a practice framework for high schools.

Results showed that FS had statistically significant effects on a number of meaningful outcomes, with effect sizes considered small by traditional standards but educationally meaningful by contemporary standards (Hedges & Hedberg, 2007; Lipsey et al., 2012; What Works Clearinghouse, 2014). Such effects are particularly important given that it is a Tier 1 intervention, where more modest effects are expected because many students already have acceptable outcomes (Kraft, 2018). There were statistically significant effects on student motivation and engagement, as measured by scores for three of the four global MES variables (global positive motivation, global positive engagement, and global negative engagement). More specifically, students in the treatment schools showed higher ratings on subscales such as self-belief, learning focus, valuing, persistence, task management, and planning and a decrease in

rating of subscales related to disengagement and self-sabotage. This finding is encouraging, as student engagement predicts student achievement in a variety of settings (Walker, Green, & Mansell, 2006).

Moreover, the finding that implementation of FS resulted in significant, yet small, effects on attendance is also encouraging. Poor attendance is a widespread concern. Previous research has demonstrated that attendance during 9th grade is one of the most powerful predictors of whether a student will complete high school (Allensworth & Easton, 2007). By increasing the attendance rates of 9th graders, students benefit from increased instructional time and may ultimately experience increased school success and completion.

Perhaps one of the most exciting findings of the study were the significant effects of the intervention on credits earned. Results showed a large effect. "On track" credit accrual in the first year of high school is a strong predictor of later graduation outcomes (Allensworth & Easton, 2007), and affecting this variable has potential to influence graduation rates. In this way, the study on FS adds to the existing literature base and confirms that activities such as team monitoring of key student indicators, teaching students how credit accrual works, and emphasizing relationship between teacher and students can positively impact credit accrual (Neild, 2009; Rosenkranz, de la Torre, Stevens, & Allensworth, 2014).

Even with significant effects on student engagement, motivation, attendance, and credits earned, however, the study did not find implementation of FS to be associated with significant improvements in student GPA. The reasons for this finding are unclear. The FS intervention monitored student academic progress through a leadership team and taught and reinforced academic support skill areas, such as organization and note taking, through a curriculum and peer support. It is possible that new academic support skills learned through FS did not sufficiently

generalize into the students' other coursework, or that the intensity of the intervention in this area was not strong enough to increase GPA. It is important to explore this further because 9th-grade GPA is highly predictive of high school graduation and enrollment in college (Easton, Johnson, & Sartain, 2017).

Limitations

Although the results show promise for FS, several limitations could be addressed through future research. First, the intervention was implemented in a small number of schools. Replication of this study with a larger, more diverse sample (e.g., schools in large cities, remote rural areas, students with varying socioeconomic backgrounds) would provide more evidence of the effectiveness and generalizability of these results. In addition, although there were significant effects on student engagement, motivation, attendance, and credits earned, the small intervention effect sizes for some of these outcomes make it important to interpret the results with caution. Another limitation is there was not a quantitative fidelity measure of business as usual in the control schools. A study that included a rigorous fidelity measure in the control schools would enhance the methods of this study.

Implications for Future Research

The exploration of universal preventive interventions for high schools is still in the early stages. The findings from this study attempt to contribute to this emerging research base and provide information related to the development of attendance, motivation, engagement and course credit accrual in 9th-grade high school students through the FS intervention. Though results show promise, a number of research questions could be explored to increase the knowledge of the effectiveness and efficiency of this intervention. First, the intervention is comprised of three distinct components that were not tested independently of one another. It is

possible that the components had varying effects on students, but the research design did not allow for such analyses. Future research is needed to examine the impact of individual components of the model. Second, the lack of impact on GPA needs further exploration. Follow up data collection and analysis are needed to determine if there was deferred impact on GPA in later school years, or if additional, more Tier 2 interventions are needed. Third, future research could also examine whether the FS model is more effective for different groups of students (e.g., students identified as at-risk of school failure, special education identified) and possibly on different student outcomes (e.g., course grades, school climate). Last, because the intent of this intervention is retention and eventual graduation, longitudinal follow-up studies are needed.

Implications for Practice

Many schools, especially at the lower grades, include data teams or MTSS teams in their infrastructures to implement a more preventive approach. The current study is one step in contributing to a broader understanding of the implementation of Tier 1, prevention-oriented supports to support 9th graders. Schools currently implementing a MTSS could embed these three FS components (and their current practices and systems) within their current MTSS. For example, if a school has a team regularly examining schoolwide data and determining interventions at a Tier 1 level, this team could regularly examine 9th-grade data or develop a subcommittee do so. Prevention is often considered a key area of focus in primary grades, when school psychologists act as instructional experts to prevent inaccurate referrals and establish foundational skills for student success. This preventive role is equally important in high schools, however, and school psychologists serving high schools can use their data analysis and systems-change skills to prevent negative outcomes by informing faculty and staff about the increasing data available related to drop out, helping to guide decision making around student outcome data, and helping school personnel and families understand the implications if students get "off track."

School psychologists in high schools can attend to the unique needs of 9th graders in order to support interventions like FS designed to address concerns about limited graduation rates.

There are a number of implications for the practice for schools considering interventions to support 9th graders. Freshmen Success combines data based decision making through teaming, engagement-focused instruction, and guided peer support. Together, these components provide an intervention that aligns with MTSS, the school engagement literature, and the recommended practices from IES around dropout prevention. Implementing each with high fidelity can result in improved outcomes for 9th-grade students.

First, school teams can identify relevant data, set benchmarks and monitor the progress of their 9th-grade students as one system-level approach using a problem-solving model. Second, these teams, including the school psychologist as a guiding member, can build capacity for their school to design and implement solutions that address areas of concern that emerge from the data. When implementing FS, schools should begin with the implementation of these freshmen leadership teams, as they guide and support implementation of the curriculum and peer navigator components.

When implementing an engagement-focused curriculum such as FS, schools can develop lessons that align with the three areas of school engagement and are relevant specifically to their students and context. Lesson topics might include available resources in the high school, how credit accrual works, and specific study or note-taking strategies that all 9th-grade teachers agree to utilize and support in their content area classes. In this study, the curriculum was taught in an advisory period, however it could be taught in health class or career or transitions class. Finally, implementing the peer navigator component was often the most challenging logistically for schools, but also was also very rewarding. Schools can reconsider the training and job

descriptions of their upperclassmen Teaching Assistants to act more as student-centered supports than clerical teacher supports. In all, combining effective data based decision making by a 9th-grade team, teaching engagement-focused curriculum content and providing peer support opportunities to all 9th graders as they enter high school and before they fall behind will ensure all students are starting with a common level of support and understanding.

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