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Assessing the Relationship Between the Positive Behavior Interventions and Supports Framework and Student Outcomes in High Schools

Jennifer Freeman, Laura Kern, Anthony J. Gambino, Allison Lombardi, and Jennifer Kowitt

Abstract: *The relationship between PBIS implementation fidelity and reductions in student office discipline referrals (ODR) has been relatively well-established in the literature; however, results related to other student outcomes such as suspensions, attendance, and academic performance are not well explored especially at the high school level. The purpose of this study was to examine the relations between PBIS implementation fidelity and student-level behavior (ODR, suspension), attendance (days absent, tardies), and academic (GPA) outcomes in a large sample of 12,127 students from 15 high schools implementing PBIS in a natural context without direct research support. Our findings suggest high schools implementing PBIS with fidelity may see improvements in student outcomes beyond reductions in ODRs. After controlling for student and school demographic variables, schools which were implementing with higher fidelity in this sample had fewer absences, unexcused tardies, ODRs, and suspensions. This study extends the current literature by exploring typical measures of academic achievement (i.e., GPA) rather than focusing upon only standardized assessments and by examining student-level rather than school-level aggregate outcomes. Notably, results from the current study focus entirely on high school settings and demonstrate desired changes in student-level outcomes in a large sample.*

The positive behavioral interventions and supports (PBIS) framework organizes the implementation of evidence-based practices within schools and districts to maximize student behavioral and academic outcomes (Horner, Sugai, & Anderson, 2010). PBIS is a framework grounded in behavioral principles for matching school and student needs within a tiered continuum of evidence-based practices (Horner & Sugai, 2015; OSEP Technical Assistance Center on PBIS, 2015). PBIS implementation is growing globally and the framework is currently being implemented in all 50 U.S. states and at least 29 countries (George, 2018). Tier 1 includes practices and systems which are available for all students and in all school settings (e.g., establishing, teaching, and reinforcing school-wide behavioral expectations) and meets the needs of most students (approximately 80%) when implemented with fidelity (Simonsen, Sugai, & Negron, 2008). Tier 2 includes more targeted approaches for small groups of at-risk students who could use additional supports (e.g., check in/check out or targeted social skills groups) and meets the needs of approximately 15% of students when implemented with fidelity (Fairbanks, Simonsen, & Sugai, 2008). Tier 3 includes interventions targeted to more intensive needs of those students needing individualized support (e.g., individualized functional assessments and behavioral intervention plans; Fairbanks et al., 2008).

PBIS relies upon four critical implementation elements to organize implementation and increase capacity development: (a) outcomes (e.g., clearly identified academic and behavioral goals), (b) data (e.g., data-based decision-making), (c) systems (e.g., support for staff), and (d) practices (e.g., a continuum of evidence-based strategies to support students; Simonsen et al., 2008). Furthermore, each of these critical areas is informed by contextual considerations which help support successful implementation and sustainability. In other words, the culture and context of the environment impact how these components work in a particular setting and the likelihood that implementation will be successful (Sugai, O'Keeffe, & Fallon, 2012). PBIS implementation fidelity is generally measured by one of three fidelity measures (Tiered Fidelity Inventory [TFI]; School-Wide Evaluation Tool [SET]; Benchmarks of Quality [BoQ]). Each of these measures assesses the extent to which a school team has implemented the core features of PBIS through team interviews and product reviews (Algozzine et al., 2014; Cohen, Kincaid, & Childs, 2007; Sugai, Lewis-Palmer, Todd, & Horner, 2001).

PBIS is recognized as an effective framework for selecting, organizing, and implementing evidence-based practices for reducing school discipline issues (e.g., ODRs) while improving school climate (Horner, Sugai, & Anderson, 2010). Results from randomized control trials show that schools that implement PBIS with fidelity experience reductions in disciplinary rule violations, aggressive behavior, bullying, concentration problems, and also show improvements in prosocial behavior, school climate, attendance, and some academic outcomes (Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008; Bradshaw, Koth, Thornton, & Leaf, 2009; Bradshaw, Pas, Debnam, & Linstrom Johnson, 2015; Bradshaw, Mitchell, & Leaf, 2010; Bradshaw, Reinke, Brown, Bevans, & Leaf, 2008; Bradshaw, Waasdorp, & Leaf, 2012; Horner et al., 2009; Lindstrom Johnson, Pas, & Bradshaw, 2015).While there is less research focusing on the impact of PBIS implementation on students at risk for failure (Bradshaw et al., 2015), these outcomes are conceptually related to risk factors for high school dropout (Freeman et al., 2015). These results provide promising and consistent evidence of the effectiveness of the PBIS framework for addressing behavioral concerns; the relationship between academic outcomes and behavior is more complex.

PBIS and Academic Outcomes

Lindstrom Johnson, Pas, and Bradshaw (2015) documented a positive overall school climate (i.e., Tier 1) may

contribute to improved school completion outcomes. Other researchers found improvements in behavior are associated with improved academic outcomes for students in general (Algozzine, Wang, & Violette, 2011) and for students with emotional or behavioral disorders (Sanford & Horner, 2013). PBIS has been associated with increases in overall attendance, time spent on classroom instruction, and student engagement during instruction (Horner et al., 2009; Scott & Barrett, 2004), suggesting the relationship between academic performance and PBIS implementation may be an indirect one, related to improvements in behavior and attendance (Lassen, Steele, & Sailor, 2006).

Increasingly, researchers have focused on the connection between behavioral outcomes and students' academic performance, with encouraging results indicating improved academic outcomes when schools implemented PBIS with fidelity (e.g., Kelm, McIntosh, & Cooley, 2014; Madigan, Cross, Smolkowski, & Strycker, 2016; Muscott, Mann, & LeBrun, 2008). In all of these studies, academic achievement was measured only through standardized assessments. It is important to note that only two of these studies (Madigan et al., 2016; Muscott et al., 2008) included high schools in the sample and none exclusively examined high school outcomes.

Unfortunately, other results have been mixed or not as promising (e.g., Caldarella, Shatzer, Gray, Young, & Young, 2011; Freeman et al., 2015; Gage, Sugai, Lewis & Brzozowy, 2015; Horner et al., 2009; LaFrance, 2011; Lane, Wehby, Robertson, & Rogers, 2007). For example, LaFrance (2011) reported there was not an overall statistically significant relationship between the fidelity of implementation of PBIS and school-level achievement in reading and math, but there was an association between academic outcomes and fidelity of implementation for middle schools in reading. Similarly, Gage, Sugai, Lewis, and Brzozowy (2015) examined the relationship between PBIS implementation fidelity and academic achievement across states using propensity score matching. They found no statistically significant relationship between implementation fidelity and academic achievement as measured by statewide tests for math, reading, and writing. Caldarella, Shatzer, Gray, Young, and Young (2011) compared outcomes from two middle schools (one implementing PBIS with fidelity and one not implementing) and found no statistically significant difference in GPA across schools.

A few of these studies (Freeman et al., 2015; Gage et al., 2015; Lane et al., 2007) included high schools in the sample and two (Caldarella et al., 2011; Lane et al., 2007) included GPA as an indicator of academic achievement. In all, the findings on academic gains of PBIS schools are mixed and have often used only statewide standardized achievement tests to measure academic outcomes. Although GPA has limitations with respect to research and is therefore used infrequently in research, it is among the most commonly available indicators of academic performance in high schools, is linked to important long-term outcomes for students, and lends itself to meaningful interpretations of results in high schools.

The High School Context

Overall, the evidence supporting the positive impact of PBIS on student outcomes is promising. However, the vast majority of this research has been conducted in elementary or middle schools. The number of high schools implementing PBIS has grown steadily and now spans 35 states and represents about 13% (3,138) of all U.S. schools implementing PBIS (Freeman, Wilkinson, & VanLone, Nov 2016). Evidence suggests it may take high schools longer to reach fidelity and sustaining strong implementation may be more challenging than in elementary schools (Flannery, Frank, Kato, Doren, & Fenning, 2013; Swain-Bradway, Pinkney, & Flannery, 2015). Researchers have identified unique contextual characteristics that influence the adoption of the PBIS framework at the high school level. Incorporating and expanding on some of the contextual differences originally described by Bohanon and colleagues (2006), Flannery and Kato (2017) suggested three overarching contextual differences: school size, student developmental level, and an organizational culture prioritizing academic growth. These factors directly affect PBIS implementation by impacting the key foundational systems of data, leadership, and communication. For example, the larger size of a typical high school can make the logistics of teaching school-wide expectations and data collection more difficult. The developmental level of the students requires that school leadership teams consider student input and participation in the development of teaching and reinforcement practices. A school culture focusing on academic growth may make it more difficult for teachers to buy in to the need to teach behavioral skills. Therefore, it is critical that outcomes associated with PBIS are carefully examined at the high school level.

PBIS Research in High Schools

The most frequently examined student outcome associated with PBIS implementation fidelity at the high school level is the amount of office discipline referrals (ODR). A number of studies have documented reductions in overall ODRs and in the proportion of students with multiple ODRs (Bohanon et al., 2006; Flannery, Fenning, Kato, & McIntosh, 2014; Muscott et al., 2008). Of these studies, two (Bohanon et al., 2006; Muscott et al., 2008) were non-experimental and involved only a small number (2–4) of high schools. The third study (Flannery et al., 2014) was a large-scale research-supported study. Flannery et al. (2011) found (a) the majority of infractions resulting in ODR at the high school level included tardiness, defiance/disrespect, and skip/truancy; (b) freshman may be more likely to receive an ODR; and (c) students receiving excessive ODRs (more than six) typically receive several early in the school year, suggesting the possibility of early intervention. Using aggregate school-level data rather than student-level outcomes, Freeman et al. (2015) reported schools implementing PBIS with fidelity can expect to see both reductions in ODR rates and increases in average daily attendance.

Other outcomes associated with PBIS implementation fidelity have been reported with less frequency at the high school level. Freeman et al. (2016) examined school-level academic performance and dropout rates, finding that there were not statistically significant relationships between these variables and PBIS implementation, although descriptive data indicated schools implementing PBIS with fidelity for longer periods of time may have lower dropout rates. Bohanon and colleagues (2006) reported reductions in the numbers of in- and out-of-school suspensions in four high schools. A recent randomized, controlled trial at the high school level indicates PBIS implementation is associated with improvements in student perceptions of school climate and school safety (Bradshaw et al., 2014). Additionally, there is some evidence that at the individual level, PBIS practices may be more effective for students with internalizing behavior characteristics and may take more time to be effective for students with comorbid behaviors (Lane et al., 2007).

Gap in the Literature

Overall, the bulk of the experimental research on student outcomes related to PBIS has been conducted in elementary schools. At the high school level, researchers have demonstrated encouraging initial results with respect to the association between PBIS implementation fidelity and reductions in student ODR rates; however, only two of these studies (Flannery et al., 2014; Freeman et al., 2015) were conducted with a larger sample size and only one (Flannery et al., 2014) utilized student-level data. Further, none of these studies included both a larger sample and evaluated the outcomes associated with PBIS under typical (nonresearch supported) implementation conditions.

Findings related to other student outcomes such as suspensions, attendance, and academic performance, especially at the high school level, are not as frequently reported. One nonexperimental study (Bohanon et al., 2006) reported improvements in suspensions in four high schools. Only one high school study (Freeman et al., 2015) included attendance outcomes but used aggregate school-level attendance rather than student-level outcomes. In five studies, authors examined academic outcomes associated with PBIS at the high school level (Freeman et al., 2015; Gage et al., 2015; Lane et al., 2007; Madigan et al., 2016; Muscott et al., 2008) but with mixed results. Of these, four studies included standardized test outcomes (Freeman et al., 2015; Gage et al., 2015; Madigan et al., 2016; Muscott et al., 2008); one also included GPA as an indicator of academic performance (Lane et al., 2007). Only one study (Freeman et al., 2015) focused exclusively on high school outcomes; however, this study examined school-level aggregate measures rather than student-level outcomes. As the implementation of PBIS expands in high schools, it is important to have a complete understanding of the student-level outcomes associated with this framework. In sum, there is a clear need for additional research at the high school level that (a) examines ODR outcomes in larger sample sizes and under typical implementation conditions, (b) reviews other behavioral outcomes such as suspensions, (c) examines outcomes associated with attendance, and (d) examines academic outcomes beyond standardized tests.

Given these gaps in the literature, the purpose of this study was to examine the relationship between PBIS implementation fidelity and student-level behavior, attendance, and academic outcomes in a large sample of 12,127 students from 15 high schools implementing PBIS in a natural context without direct research support. Specifically, we addressed the following research questions:

1. What is the relationship between PBIS implementation fidelity and student ODR and suspension outcomes at the high school level?
2. What is the relationship between PBIS implementation fidelity and student absence and tardy outcomes at the high school level?
3. What is the relationship between PBIS implementation fidelity and student GPA outcomes at the high school level?

Data and Methods

Data

Data were collected on a total of 12,127 students from 15 high schools serving Grades 9–12 located in one midwestern U.S. state. Twelve of the schools were located in the same urban school district and the other three were in separate districts; two were located in rural areas and one in a suburban community. Table 1 details school enrollments and demographic characteristics (i.e., % minority, % free or reduced lunch, % of students with Individualized Educational Programs) for each school.

Procedures

We recruited participating schools through contacts within the Office of Special Education Programs National PBIS Technical Assistance Center and at regional and national conferences. Recruitment flyers were distributed in person at conferences and electronically via email to technical assistance and school-based contacts. Interested schools were invited to email the principal investigator (lead author) for enrollment details. Initial recruitment contacts were made in April 2014 and follow-up emails and phone calls with interested schools took place between April and June 2014.

School principals were asked to sign letters agreeing to participation and a data use agreement. Schools were provided with an Excel spreadsheet template for reporting deidentified extant school data. Once complete, school personnel were asked to upload the spreadsheet via a Qualtrics online survey platform. We asked schools to share the following school-level data: total school enrollment for 2015-2016, Title I status, geographic location, and score on one or more PBIS fidelity monitoring tools (i.e., SET, BoQ, TFI), along with the following student-level data: number of office

Table 1

Frequencies and Percentages of Students Within Each Demographic Group by School

School ID	# of Students	9th Grade	10th Grade	11th Grade	12th Grade	Native American	Asian	African American	Hispanic/ Latino	White	Female	FRL	SPED
1	795	22.9 (182)	27.5 (219)	24.0 (191)	25.5 (203)	2.1 (17)	2.0 (16)	1.1 (9)	2.0 (16)	92.7 (737)	45.4 (361)	37.1 (295)	14.7 (117)
2	343	25.9 (89)	26.5 (91)	23.6 (81)	23.9 (82)	2.3 (8)	3.5 (12)	13.7 (47)	58.9 (202)	21.6 (74)	45.8 (157)	64.7 (222)	22.4 (77)
3	679	37.6 (255)	26.7 (181)	22.5 (153)	13.3 (90)	0.7 (5)	0.7 (5)	76.4 (519)	17.1 (116)	5.0 (34)	36.5 (248)	82.6 (561)	31.2 (212)
4	223	23.8 (53)	27.8 (62)	22.0 (49)	26.5 (59)	27.4 (61)	1.3 (3)	0.4 (1)	0.9 (2)	70.0 (156)	45.3 (101)	43.0 (96)	13.9 (31)
5	1,572	37.5 (589)	24.7 (388)	21.2 (334)	16.6 (261)	1.7 (27)	4.6 (72)	34.9 (548)	43.3 (681)	15.5 (244)	43.0 (676)	70.0 (1,101)	26.0 (409)
6	175	52.0 (91)	17.7 (31)	16.0 (28)	14.3 (25)	2.3 (4)	4.6 (8)	69.1 (121)	9.7 (17)	14.3 (25)	43.4 (76)	68.6 (120)	32.0 (56)
7	879	26.3 (231)	26.5 (233)	23.5 (207)	23.7 (208)	0.7 (6)	7.4 (65)	63.8 (561)	13.2 (116)	14.9 (131)	63.0 (554)	62.6 (550)	17.4 (153)
8	569	30.6 (174)	23.9 (136)	22.0 (125)	23.6 (134)	0.9 (5)	6.3 (36)	54.0 (307)	11.1 (63)	27.8 (158)	53.3 (303)	46.0 (262)	18.5 (105)
9	773	30.9 (239)	23.5 (182)	20.4 (158)	25.1 (194)	- (0)	8.5 (66)	79.9 (618)	3.1 (24)	8.4 (65)	45.1 (349)	73.2 (566)	32.5 (251)
10	1,264	25.6 (323)	24.9 (315)	26.9 (340)	22.6 (286)	1.2 (15)	5.9 (75)	10.2 (129)	51.0 (645)	31.6 (400)	53.4 (675)	56.7 (717)	14.9 (188)
11	1,478	29.3 (433)	24.8 (367)	22.6 (334)	23.3 (344)	0.4 (6)	9.5 (140)	68.3 (1,010)	16.6 (245)	5.2 (77)	50.4 (745)	62.1 (918)	16.9 (250)
12	1,192	38.8 (462)	20.5 (244)	23.4 (279)	17.4 (207)	0.5 (6)	12.9 (154)	28.0 (334)	53.1 (633)	5.5 (65)	49.0 (584)	84.3 (1,005)	23.7 (283)
13	548	25.7 (141)	28.3 (155)	22.4 (123)	23.5 (129)	2.9 (16)	3.8 (21)	11.1 ()61	22.1 (121)	60.0 (329)	47.6 (261)	45.3 (248)	12.6 (69)
14	1,044	33.3 (348)	24.7 (258)	23.3 (243)	18.7 (195)	- (0)	2.2 (23)	92.9 (970)	2.1 (22)	2.8 (29)	45.0 (470)	78.9 (824)	24.3 (254)
15	593	31.2 (185)	27.2 (161)	24.6 (146)	17.0 (101)	0.2 (1)	5.7 (34)	90.4 (536)	1.2 (7)	2.5 (15)	43.2 (256)	85.7 (508)	26.8 (159)
All	12,127	31.3 (3,795)	24.9 (3,023)	23.0 (2,791)	20.8 (2,518)	1.5 (177)	6.0 (730)	47.6 (5,771)	24.0 (2,910)	20.9 (2,539)	48.0 (5,816)	65.9 (7,993)	21.6 (2,614)

Note: FRL = Free/Reduced Lunch. SPED = Special Education.

discipline referrals, number of in- and out-of-school suspensions, number of days absent, total number of excused and unexcused tardies, overall GPA, student grade level, gender, race, free/reduced lunch status, and disability status. Parent and student consents were not required because all data were deidentified. All recruiting, data collection, storage, and analysis procedures were approved by our institutional review board.

Measures

To assess the relationships between PBIS implementation fidelity and student behavior, absences, and academics, we used the measures detailed by school in Table 2 and described below.

Implementation fidelity. All participating schools submitted the Benchmarks of Quality (BoQ; Cohen, Kincaid, & Childs, 2007; Kincaid, Childs, & George, 2005) as their PBIS fidelity measure. The BoQ is a self-report measure completed by the school leadership team and school and district coaches. The measure includes 53 items related to areas of faculty commitment, establishing expectations, development of lesson plans, procedures for acknowledgement of positive behavior and handling inappropriate behavior, data entry and analysis, an overall implementation plan, crisis plan, and evaluation. Team members complete the team member rating form independently and the coach or facilitator completes the scoring form using the scoring guide and rubric (Kincaid, Childs, & George, 2010). The BoQ has the following psychometric properties: internal consistency a = .96; test-retest reliability r = .94; inter-rater agreement averaged 89%. Schools that meet 70% of criteria on the overall BoQ are considered to be implementing with fidelity

Table 2

Means and Standard Deviations for BoQ and Each Outcome Variable by School

School ID	# of Students	BOQ Score	GPA	Absences	ODRs	Excused Tardies	Unexcused Tardies	Suspensions
1	795	0.83	-	9.776 (12.161)	4.140 (8.141)	-	-	-
2	343	0.92	2.236 (0.813)	14.528 (17.656)	0.430 (1.727)	1.230 (2.442)	3.660 (9.673)	0.100 (0.414)
3	679	0.32	1.701 (0.868)	45.193 (38.271)	7.700 (12.389)	0.570 (1.510)	22.080 (19.724)	1.120 (2.000)
4	223	0.88	2.861 (0.861)	15.092 (15.608)	2.020 (5.351)	-	-	-
5	1,572	0.90	1.744 (0.877)	27.606 (28.763)	1.180 (2.539)	0.950 (1.937)	0.820 (2.291)	0.330 (0.891)
6	175	0.82	1.818 (0.880)	17.786 (20.474)	3.310 (5.638)	0.660 (1.117)	12.440 (19.881)	0.510 (1.039)
7	879	0.90	2.483 (0.814)	16.976 (20.258)	0.760 (2.160)	2.380 (5.403)	9.810 (14.105)	0.100 (0.494)
8	569	0.94	2.483 (0.793)	10.529 (13.221)	0.430 (1.833)	1.710 (2.750)	3.620 (8.230)	0.090 (0.413)
9	773	0.86	1.841 (0.937)	24.846 (27.151)	0.890 (2.183)	0.960 (2.066)	6.140 (9.003)	0.230 (0.653)
10	1,264	0.90	2.809 (0.867)	9.699 (14.049)	0.350 (1.976)	0.310 (1.553)	6.430 (10.900)	0.070 (0.515)
11	1,478	0.87	2.155 (0.837)	14.676 (18.874)	1.040 (2.509)	0.500 (1.186)	3.760 (6.023)	0.150 (0.524)
12	1,192	0.66	1.680 (1.032)	37.779 (39.890)	1.640 (3.437)	0.270 (0.687)	5.690 (7.962)	0.670 (1.610)
13	548	0.81	-	11.154 (13.759)	1.100 (6.167)	-	-	-
14	1,044	0.61	1.483 (0.835)	39.909 (34.176)	3.230 (5.263)	0.260 (0.667)	6.930 (9.444)	0.840 (1.531)
15	593	0.51	1.695 (0.795)	42.084 (35.357)	1.350 (2.217)	0.140 (0.524)	6.790 (9.754)	0.570 (1.077)

Note: After the second column, numbers outside of parentheses are means and numbers inside of parentheses are standard deviations. ODRs = Office Discipline Referrals.

(Cohen et al., 2007). The mean BoQ score in this sample was 78.2% (SD = 17.841; Min = 32.0, Max = 94.0), with 11 schools scoring above 70%.

Absence. Student absence was measured using the total number of days absent per student. In this sample, the mean number of absences was 23.514 (SD = 29.078; Min = 0, Max = 169, ICC = 0.190). As a secondary measure of attendance, we also collected and analyzed tardies per student. In 12 schools, we were able to differentiate between excused (Mean = .760, SD = 2.248, Min = 0, Max = 63, ICC = 0.087) and unexcused tardies (Mean = 6.330, SD = 11.213, Min = 0, Max = 150, ICC = 0.230). These measures were all positively skewed, as most students do not have a high numbers of tardies/absences. The students with high numbers of tardies/outcomes were retained in the sample for the analyses because the number of outliers was not negligible. Additionally, these students were retained to maintain the generalizability of the results, at the cost of potentially worsening model fit.

Behavior. The primary measure of student behavior was the number of ODRs received per student. The mean number of ODRs per student was 1.800 (SD = 5.046, Min = 0, Max = 116, ICC = 0.146)). In 12 schools, we were also able to examine school suspensions per student (combined in- and out-of-school; Mean = .380, SD = 1.105, Min = 0, Max = 15, ICC = 0.096). Similar to the absence outcomes, these outcomes were positively skewed due to most students not having a high number of ODRs/suspensions. The number of students with high numbers of ODRs/suspensions was again not trivial, so were retained in these models to preserve generalizability.

Academics. To assess student academic achievement, we used the student's cumulative grade point average (GPA), an indicator of a student's current academic performance, college and career readiness, and predictor of postschool outcomes (Geiser & Santelices, 2007; Hodara & Lewis, 2017). Cumulative GPA was recorded on a scale ranging from 0.0 = F to 4.0 = A. The mean GPA in our sample was 2.034 (SD = .974, Min = 0, Max = 4.000, ICC = 0.216). While all schools reported GPA, two schools reported a weighted GPA and were excluded from the model.

Demographics. To reduce potential bias in our model estimates due to omitted confounding variables (such as differences in demographic information), we used five demographic variables as controls (see Table 1). All demographic data were obtained directly from school records. The first demographic variable was student grade level (e.g., 9^{th}–12^{th} grades). The second demographic variable was race (e.g., American Indian/Alaskan Native, Asian, African American, Hispanic/Latino, White). The third demographic variable was gender (dichotomously as reported to the school). The fourth demographic variable, used here as a proxy for socioeconomic status, was free and reduced lunch status. The final demographic variable was special education status, used to control for the effects of individualized educational supports or challenges on the relation between PBIS implementation and student-level outcomes.

Analysis

To assess the relationship between school-wide PBIS fidelity and student-level outcomes, multilevel modeling was performed using Stata 15 software (StataCorp, 2017). We used restricted maximum likelihood (REML) estimation with the Kenward-Roger correction to reduce the bias in model estimates and standard errors that can occur with full information maximum likelihood (FIML) estimation when there are fewer than 30 clusters (McNeish & Stapleton, 2016). In total, six different student-level outcomes were included in the analyses. The outcomes available from all 15 schools included number of absences and number of ODRs. GPA data were included from 13 schools, and the outcomes available from only 12 schools included number of excused tardies, number of unexcused tardies, and number of suspensions. Table 2 provides descriptive summaries of all analysis variables. Multilevel modeling was utilized because the intraclass correlation coefficients (ICCs) for each of the outcome variables were nonzero (see descriptives above), indicating the observations on each of the outcomes may not be independent (Raudenbush & Bryk, 2002).

Student-level demographic variables were included in the first level of each model to serve as control variables. These were all treated as fixed effects, while the intercept was allowed to randomly vary across clusters (schools). Grade was represented by three dummy-coded binary variables indicating whether the student was in 10^{th}, 11^{th}, or 12^{th} grade (with 9^{th} grade specified as the referent group). Race was represented by four dummy-coded binary variables indicating whether the student was American Indian/Alaskan Native, Asian, African American, Hispanic/Latino (with White specified as the referent group). Gender was represented by a dummy-coded variable indicating whether the student was female (with male specified as the referent group). Free or reduced lunch was represented by a dummy-coded binary variable indicating whether the student was eligible for free and reduced lunch (FRL; with the baseline being not eligible), and special education status was represented by a dummy-coded binary variable indicating whether the student had an individualized education program (IEP; with the baseline being not having an IEP).

At the second level (the school level) of each model, the school-wide PBIS fidelity score (BoQ) was included as a predictor of the randomly varying intercept. The fidelity variable was centered to aid in interpretation of the regression coefficients because the original range of scores did not include zero. The value of 70% was used to center the fidelity variable rather than the grand mean (78.2%) so the variable was centered on the BoQ score used as the cutoff to indicate satisfactory fidelity of implementation had been achieved. In addition, school size and percentage of students eligible for FRL were considered as school-level covariates.

Preliminary models, which included only one level-two predictor at a time, were evaluated for each outcome (still including all of the student-level covariates) to assess whether the level-two covariates were related to each

of the outcomes. School size did not have a statistically significant relationship with any of the outcomes in these preliminary models. Percentage of students eligible for FRL had a statistically significant relationship with GPA, number of absences, number of excused tardies, and number of suspensions. The cluster level correlations were also evaluated between the BoQ scores, school size, and percentage of students eligible for FRL. The BoQ scores were not correlated with school size ($r = 0.045$, $p = 0.875$), but they were correlated with the percentage of students eligible for FRL ($r = -0.653$, $p = 0.008$). Based on these results, it did not seem likely that school size was a confounder of the relationship between BoQ scores and the outcomes, and so it was not included as a level-two covariate in the final models. However, the percentage of students eligible for FRL was included as a grand-mean centered level-two covariate predicting the random intercept in the final models for those outcomes.

Equation 1 represents the general form of the first level of the final multilevel models used in this study, and Equation 2 represents the second level of the multi-level models.

$$Y_{ij} = \beta_{0j} + \beta_1 G10_{ij} + \beta_2 G11_{ij} + \beta_3 G12_{ij} + \beta_4 Eth1_{ij} + \beta_5 Eth2_{ij} + \beta_6 Eth3_{ij} + \beta_7 Eth4_{ij} + \beta_8 Gender_{ij} + \beta_9 FRL_{ij} + \beta_{10} SPED_{ij} + r_{ij} \quad (1)$$

$$\beta_{oj} = \gamma_{00} + \gamma_{01} Fidelity_j + \gamma_{02} PercFRL_j + u_{0j} \quad (2)$$

The only model with a notable amount of missing data was the model for GPA. In the model for GPA, 147 students were excluded due to missing data on either the outcome or the demographic variables (leaving 10,637 of the original 10,784 students in those 13 schools). The reason for missing GPA for these students' data is unknown. For the remaining two models for outcomes in all 15 schools, there were only three students excluded in each model due to missing data (leaving 12,124 students). For the three models for outcomes in 12 schools, there were no missing data (10,561 students).

The conceptual model suggests academic improvements related to PBIS implementation would be due to increased instructional time gained from fewer behavioral incidents and improved attendance. However, it was not possible to conduct a mediation analysis to examine the indirect effects of PBIS fidelity on academic outcomes through attendance and behavioral outcomes because academic, attendance, and behavioral variables were measured concurrently.

Results

To test the hypothesis that school-wide PBIS implementation fidelity was related to each behavioral, attendance, and academic student-level outcome, we examined the linear regression coefficient corresponding to the fidelity score in each of the models for statistical significance. Results are presented by research question here and in Table 3 below.

> Research Question 1: What is the relationship between PBIS implementation fidelity and student ODR and suspension outcomes at the high school level?

We found statistically significant relationships for both behavioral outcome variables (ODRs: $\gamma_{01} = -0.060$, $p = 0.022$; suspensions: (ODRs: $\gamma_{01} = -0.011$, $p = 0.018$). Results suggest for each one unit increase in PBIS fidelity, students received 0.060 fewer ODRs and 0.012 fewer suspensions.

The practical significance of our findings can be evaluated by applying our findings to the mean values in our sample. The mean PBIS fidelity score in our sample was 78.2%. Our results predict increasing 10 points in fidelity would result in a reduction of .6 office discipline referrals per student. The mean ODR per student in our sample was 1.800, indicating that a 10-point increase in fidelity would predict a mean ODR of just 1.200 per student. Similarly, the mean number of suspensions per student in our sample was 0.380. A 10-point increase in fidelity would predict a reduction in this mean to 0.260. Given the significant impact suspensions can have on a student's academic career, this is likely a meaningful change.

Table 3

Model Results for the Multilevel Linear Model Estimated Separately for Each Outcome Variable

	Intercept			Fidelity			% FRL			Intercept Variance		Level-1 Variance	Number of Students (Schools)
Outcome	γ_{00}	*SE*	*p*	γ_{01}	*SE*	*p*	γ_{02}	*SE*	*p*	τ_{00}	*p*	σ^2	
GPA	2.196	0.071	<0.001	-0.004	0.004	0.284	-0.027	0.006	<0.001	0.028	<0.001	0.588	10,637 (13)
Absences	22.733	1.383	<0.001	-0.342	0.076	<0.001	0.416	0.087	<0.001	13.522	<0.001	668.465	12,124 (15)
ODRs	2.355	0.464	<0.001	-0.060	0.023	0.022	-	-	-	2.357	<0.001	20.940	12,124 (15)
Excused Tardies	0.767	0.288	0.026	0.008	0.015	0.582	-0.021	0.024	0.407	0.333	<0.001	4.623	10,561 (12)
Unexcused Tardies	5.843	1.361	0.002	-0.187	0.065	0.017	-	-	-	18.192	<0.001	100.037	10,561 (12)
Suspensions	0.484	0.081	<0.001	-0.011	0.004	0.018	0.002	0.006	0.717	0.022	<0.001	1.027	10,561 (12)

Research Question 2: What is the relationship between PBIS implementation fidelity and student absence and tardy outcomes at the high school level?

We found some statistically significant relationships for student attendance variables (number of absences: γ_{01} = -0.342, $p < 0.001$; number of unexcused tardies: γ_{01} = -0.187, $p = 0.017$). The relationship between PBIS fidelity and the number of excused tardies was not statistically significant ($\gamma_{01} = 0.008$, $p = 0.582$). These results indicate for each one unit increase in PBIS fidelity, students were absent 0.342 fewer days, and had 0.187 fewer tardies.

Again, applying our findings to the mean values in our sample suggests the practical significance of our findings. The mean number of absences in our sample was 25.514 and tardies was 8.220. A 10-point increase in fidelity predicts a reduction of these numbers to 18.37 absences and 6.35 tardies per student per year.

Research Question 3: What is the relationship between PBIS implementation fidelity and student GPA outcomes at the high school level?

We did not find a statistically significant relationship between PBIS fidelity and the student academic outcome variable (GPA: γ_{01} = -0.004, $p = 0.284$) after controlling for student and school level characteristics. However, because of the concurrent measurement of academic outcomes with absence and behavior outcomes, it was not possible to evaluate whether this relationship would be fully mediated by the absence and/or behavior outcomes because there was no time between the measurement of the outcomes to allow a change in absences or behavior outcomes to lead to changes in the academic outcome.

Discussion

The purpose of this study was to examine the relationship between PBIS implementation fidelity and student-level behavior, attendance, and academic outcomes at the high school level under typical implementation conditions. Our findings suggest high schools implementing PBIS with fidelity may see improvements in student outcomes beyond reductions in ODRs. After controlling for student and school demographic variables, schools that were implementing with higher fidelity in this sample had fewer absences, unexcused tardies, ODRs, and suspensions. This study extends the current literature by exploring typical measures of academic achievement (i.e., GPA) rather than focusing upon only standardized assessments (e.g., Gage et al., 2015) and by examining student-level rather than school-level aggregate outcomes (e.g., Freeman et al., 2015, 2016). Notably, results from the current study focus entirely on high school settings and demonstrate desired changes in student-level outcomes in a large sample.

Our results support and strengthen previous research findings which showed reductions in behavior referrals at the high school level as measured by both ODRs (Bohanon et al., 2006; Bohanon et al., 2012; Flannery et al., 2013; Freeman et al., 2016; Muscott et al., 2008) and suspensions (Muscott et al., 2008) with a large sample of students, and after controlling for student and school-level characteristics. PBIS implementation has been associated with improved attendance across grade levels (e.g., Caldarella, Shatzer, Gray, Young, & Young, 2011; Horner et al., 2009) and at the high school level (e.g., Freeman et al., 2015, 2016). The findings from this study build upon these previous studies by measuring attendance at the student level, examining both number of absences and tardies, and examining these outcomes specifically at the high school level in a large sample.

The results from this study help to clarify previous research on the relationship between PBIS and academic outcomes. Prior research showing a positive relationship between academics and PBIS implementation at the high school level has been limited (e.g., Madigan et al., 2016; Muscott et al., 2008) and measured only by standardized tests. Only one prior study, showing mixed effects (Lane et al., 2007), has examined the relationship between PBIS outcomes and GPA at the high school level. Our findings suggest the relationship between PBIS and academic performance may be a strictly indirect one, possibly resulting through mediating attendance and behavioral outcomes. This relationship has been suggested by prior research but not directly tested at the high school level (Lassen, Steele, & Sailor, 2006). Full mediation of the effects of PBIS fidelity on academic outcomes would lead to academic outcomes measured concurrently with attendance and behavioral outcomes to show no relationship with PBIS fidelity because insufficient time has passed between the measurements of the different types of outcomes for the effects of PBIS fidelity to reach the academic outcomes. This full mediation hypothesis implies that if one were to have measured academic outcomes for each student in the following school year, positive indirect relationships would be found between PBIS fidelity and academic outcomes through the attendance and behavioral outcomes. Future research should attempt to test this hypothesis.

Limitations

The results of this study should be interpreted in light of several significant limitations First, this is not an experimental study and no causal conclusions should be drawn from these results. Although we attempted to control for multiple student-level and school-level demographic variables, there may be other unmeasured factors which contributed to these results. Second, this sample was collected in one Midwestern state and 12 of the 15 schools were located in the same large urban district. This may impact the generalizability of our results and the available statistical power at Level 2. Third, the majority of schools in our sample were implementing PBIS at or above the 70% criteria on the BoQ, therefore limiting our ability to predict outcomes at lower levels of fidelity. Finally, although the conceptual relationship between PBIS implementation and academic improvement is an indirect relationship (related to decreases in behavioral

disruptions and increases in attendance), we were unable to test directly for mediation with this cross-sectional data set.

Implications

Practice. Despite these limitations, these results have some important implications for our field in general and for high school implementation of PBIS in particular. First, high schools that are considering implementing PBIS may be encouraged to learn that other high schools have seen positive student outcomes in ODRs, suspensions, attendance, and tardies (Bohanon et al., 2006; Bohanon et al., 2012; Flannery et al., 2013; Freeman et al., 2015, 2016; Muscott et al., 2008).

High schools that are implementing PBIS may consider collecting and reviewing attendance and academic data in addition to behavioral data both to guide their practice and to evaluate their outcomes (e.g., early warning indicators). McIntosh and Goodman (2016) provide specific guidance on integrating academic and behavioral systems. Leadership teams looking for further information on implementing systems for academic and behavioral support can find examples and guidance at the websites for Michigan's Integrated Behavior and Learning Support Initiative (MIBLSI) or the Comprehensive Integrated Three-Tiered Model of Prevention (Ci3T).

Additionally, because PBIS implementation may only be indirectly related to academic achievement through attendance and behavioral outcomes, leadership teams may consider directly teaching and reinforcing behaviors which support academic achievement and college and career readiness (e.g., study skills, collaboration, advocacy, and organization). Competing initiatives such as PBIS, college and career readiness, and academic improvements can have a negative impact on implementation unless careful attention is paid to integrating and aligning initiatives (Flannery, Sugai, & Anderson, 2009). Teams looking for guidance on integration of initiatives can find guidance in the Technical Guide for Alignment of Initiatives (National Technical Assistance Center, 2017).

Research. This study and the accompanying literature summary highlight the need for additional rigorous research on PBIS outcomes at the high school level. In particular, further longitudinal and experimental research is needed to explore the school- and student-level outcomes associated with PBIS implementation in high schools and the direct and indirect relationships to student outcomes. In addition, further research is needed exploring outcomes related to the impact of unique contextual characteristics of high schools, integrated systems of support, implementation of advanced tiers, the overall implementation process, and factors related to sustainability in high school.

Conclusion

This study examined the relationship between student behavior, attendance, and academic outcomes and PBIS implementation at the high school level. This study builds on the existing literature by demonstrating negative relationships with student-level ODRs, suspensions, absences, and tardies in a large high school sample and by demonstrating a lack of a direct relationship with student-level academic achievement, as measured by GPA. We provided suggestions for high school teams implementing PBIS with respect to integrating behavioral, attendance, and academic initiatives. Finally, we highlighted the critical need for more rigorous research to guide the work of implementing this framework at the high school level.

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Investigating Sentence Verification Technique as a Potential Curriculum-Based Measure of Science Content

Renée E. Lastrapes and Paul Mooney

Abstract: *This study examined the viability of the Sentence Verification Technique (SVT; Royer, Hastings, & Hook, 1979) assessment tool as a curriculum-based measure of science content learning. Its perceived compatibility with statewide accountability test expectations made SVT a candidate for use in content-focused response to intervention frameworks. Each SVT probe included two science-focused reading passages and 32 accompanying questions (16 per passage). Participants included 486 students in Grades 4 through 6 in a rural school district. Concurrent criterion validity correlations with one state accountability and one nationally standardized test of science content across three grades ranged from .18 to .55, with predictive correlations ranging from -.09 to .57. Internal consistency reliability correlations for the full probe ranged from .43 to .83. Test-retest reliability estimates across three grades ranged from .68 to .70. Study results inform discussions about the nature and structure of secondary school response to intervention assessment frameworks.*

According to the Nation's Report Card (2017), only 36% of public school students performed at or above proficiency level in Grade 4 reading assessments and 34% in Grade 8. These low proficiency statistics are problematic because, as students progress through primary education, there is an increased expectation that they learn content through reading (Espin et al., 2013). A potential mismatch exists between the reading proficiency level of many students and the difficulty level of the textbooks used as learning materials (Espin et al., 2013). Textbooks used in content classes such as science and social studies, in particular, often contain more advanced vocabulary and introduce a wide range of topics within a short amount of written space. Espin et al. (2013) suggested that these tools are "inconsiderate" of student and teacher needs.

Systematic work to design and evaluate interventions to address the difficulties of at-risk learners are ongoing (e.g., Boudreaux-Johnson, Mooney, & Lastrapes, 2017; Fuchs & Fuchs, 2019; Vaughn, Roberts, Miciak, Taylor, & Fletcher, 2019; Wexler, Reed, Barton, Mitchell, & Clancy, 2018). Separate from the interventions themselves, efforts exist to design and validate structured formative assessment instruments for use at the student, class, and school levels as part of upper elementary and secondary response to intervention (RTI) frameworks and alongside existing accountability structures (e.g., Barth, Tolar, Fletcher, & Francis, 2014; Conoyer et al., 2018; Johnson, Semmelroth, Allison, & Fritsch, 2013; Mooney & Lastrapes, 2018b). Given the reported reading skill delays of the majority of public school students, teachers need formative assessment instruments across content areas to help them make more timely decisions about appropriate instructional programming.

Curriculum-based measurement (CBM; Deno, 1985; Hosp, Hosp, & Howell, 2016) is an instructional assessment framework that was designed to document academic learning (Ford, Conoyer, Lembke, Smith, & Hosp, 2018; Mooney & Lastrapes, 2018a, 2018b). Curriculum-based measurement is a type of formative assessment that targets an entire school year curriculum and evaluates what a student should know or demonstrate by the end of a grade or subject. As part of the framework, purportedly equivalent measures, known as probes, are administered periodically to determine end-of-year competence in a subject area (Fuchs & Deno, 1991; Mooney & Lastrapes, 2018a, 2018b; Mooney, McCarter, Schraven, & Callicoatte, 2013). Efforts to examine different assessments to determine whether they will function as a CBM for specific content areas have increased, particularly related to science curricula (Borsuk, 2010; Espin et al., 2013; Ford et al., 2018; Ford & Hosp, 2017; Mooney & Lastrapes, 2016; Mooney, Lastrapes, Marcotte, & Matthews, 2016).

Sentence Verification Technique (SVT; Royer, Hastings, & Hook, 1979) has long been utilized as an assessment of reading comprehension (e.g., Marcotte, Rick, & Wells, 2019; Royer, 2005). The measure is based on a constructivist theory of reading comprehension, emphasizing the interaction between an incoming linguistic message and a reader's world knowledge, where the meaning of a message could be maintained in memory even if the exact structure of the message was not (Ford & Hosp, 2017; Marcotte et al., 2019). Reliability of the SVT has been investigated with Cronbach's alpha measures ranging from .5 to .9, with reliability generally increasing in magnitude in proportion to the number of passages administered (Royer, 2005). Marcotte and colleagues (2019) found that two- and three-passage formats, each including 16 questions per passage, produced reliable scores with coefficient alpha .78 for two- and .83 for three-passage probes. These positive reliability statistics are important because the assessment takes time to administer and the smaller the number of needed passages, the more acceptable the measure might be to those involved in planning, implementing, and evaluating RTI use.

Recent inquiry has sought to expand the potential utility of SVT by evaluating its ability to serve as a

formative measure of content comprehension. Mooney and Lastrapes (2016) evaluated SVT's effectiveness as a content measure as part of a study in which multiple assessments were administered and compared to criterion measures in science and social studies content. Measures targeting academic vocabulary (i.e., critical content monitoring; Mooney, McCarter, Russo, & Blackwood, 2013), written expression (i.e., written retell; Marcotte & Hintze, 2009), and reading comprehension (SVT) were positively correlated with state content accountability test scores. Results showed that SVT and critical content monitoring were significant predictors of achievement in fifth-grade science and social studies (Mooney & Lastrapes, 2016). One reason that SVT might be considered for inclusion in RTI frameworks is that students carry out tasks that are similar to what they are expected to do during state accountability testing—that is, students are presented with a content-area passage and asked to respond to multiple choice questions about the passage.

Although the research investigating different measures of reading and content comprehension has been examined, what is not known is whether a science content passage will be a valid indicator of course learning, similar to that originally proposed by Deno (1985), relative to CBM. The SVT is different from other CBM tools in that students are reading a full science content passage and responding to statements about that content that either confirm or diverge from the passage. Not only does this activity mimic what students will see on state achievement tests, but SVT is presented and automatically scored in an online version and can be administered across grades, thus making it easier for teachers to administer than paper-pencil tests. These features potentially increase its instructional utility (Mooney & Lastrapes, 2016).

The purpose of the present study was to determine if SVT was a significant indicator of science content comprehension, replicating the already robust criterion validity research and extending inquiry to areas of social validity, internal consistency, and test-retest reliability. The authors asserted that the present inquiry would inform the literature in two ways. First, robust correlations between a content SVT and content state accountability scores would potentially increase the viable CBM instrument options for practitioners and researchers at the upper elementary and secondary school levels. Inquiry in content area CBM is still in its infancy, particularly when compared with reading CBM (Mooney & Lastrapes, 2016). Second, increasing the instrument options might allow for greater flexibility in the design and implementation of screening and progress monitoring assessment frameworks at the upper elementary and secondary school levels. Such work could serve to more quickly identify at-risk learners for intervention. Research in upper elementary and secondary RTI frameworks is itself in its formative stages (Mooney & Lastrapes, 2018a), with Fuchs, Fuchs, and Compton (2010) suggesting that upper elementary and secondary systems be considered differently than the more traditional elementary-oriented frameworks.

The following research questions were addressed: (a) What is the distribution of SVT scores across grade levels? (b) What are demographic subgroup comparisons for SVT benchmark probe scores and criterion tests (i.e., a statewide science accountability test and a nationally-normed standardized achievement test)? (c) What is the strength of the relationship between the SVT benchmark probes and a state content accountability test? (d) What is the strength of the relationship between the SVT benchmark probes and a nationally representative achievement test? (e) What is the social validity of SVT? and (f) What are the internal consistency and test-retest reliability statistics for SVT measures with 16 (one-passage) and 32 (two-passage) test items?

Method

Participants

Participants were students enrolled in a rural district in south Louisiana. District students in the fourth (n = 147), fifth (n = 216), and sixth grades (n = 123) who completed all periodic SVT probes and had state achievement scores available to the district comprised the sample. Students' ages for the state test sample ranged from 9.4 to 13.9 years (mean = 11.6). The sample was 68% African American, 31.4% White, and less than 1% two or more races; 85% lower socioeconomic (SES) status; and 7% disabled. At the request of the participating school district, a subset of the sample (n = 76) in two of the district's schools was also administered the SAT 10th edition online abbreviated test (SAT-10). In School A (n = 19), only fifth and sixth graders were tested; in School B (n = 57) fourth, fifth, and sixth graders were tested. That sample makeup was 55% female, 94% African American, 96% low SES, and 3% disabled.

Instrumentation

Three benchmark SVT probes were administered along with two criterion and two social validity measures, one to teachers and one to students. Originally created in 1986 and revamped in 1999 (Decuir, 2012), the Louisiana Educational Assessment Program (LEAP) and the integrated LEAP (iLEAP; fifth and sixth grades) were used as the criterion measures. The science subtest of the online abbreviated SAT-10 was administered to the smaller sample only.

Predictor: SVT. The SVT probes used in the present study consisted of two passages and 16 accompanying sentences per passage. On an SVT test (see Figure 1 for an example), the participant read a passage and then was presented with four types of test sentences. Without referring to the previously read passage, the test taker selected *yes* if the meaning of the passage was preserved in the sentence read or *no* if the meaning was not preserved across 16 test sentences. The four item types were: originals (exact copy of a sentence from the passage), paraphrases (meaning preserved using similar but not the same wording), meaning changes (exact copy of the sentence with a minor change that altered the meaning), and distractors (a sentence that was not part of the reading passage and usually drawn from a

Litter is Pollution You Can See
Flesch-Kincaid Grade Level 5.8
We pollute when we add things to the environment that are harmful. Pollution can affect the air, soil, or water of an ecosystem. Pollution can make people or animals sick. Pollution can cause diseases or death. Trash on the ground is called litter. Littering is one way that people pollute. Litter harms both plants and animals. Litter can kill plants and entangle animals. Old fishing lines and nets kill many aquatic animals. Some animals might eat litter and get sick. Sea turtles are especially harmed when clear plastic sandwich bags are thrown into the ocean. The sea turtle thinks the bag is a jellyfish, which is what they eat. The bag gets stuck in the turtle's stomach. If a bag is stuck in an animal's stomach, it will eventually starve. Fishing lines, balloons, and plastic bags last a long time in the ocean. These plastic materials are not biodegradable, which means that they do not break down easily.

Item	Type	Statement
1	M	Litter is good for plants and animals.
2	D	Normally all ecosystems are naturally balanced.
3	D	Non-native species introduction can be a threat to ecosystems.
4	O	Trash on the ground is called litter.
5	P	Adding harmful things to the environment is called pollution.
6	O	Pollution can affect the air, soil, or water of an ecosystem.
7	P	Plants and animals can get sick because of pollution.
8	M	Litter could injure animals, but it does not affect plants.
9	D	If a species does not have a predator, it will grow out of control.
10	O	Old fishing lines and nets kill many aquatic animals.
11	M	Plastic materials are biodegradable, because they break down easily.
12	P	Plastic bags can get stuck in the stomach of a sea turtle.
13	P	A sea turtle will eat a plastic bag, because it looks like a jellyfish.
14	O	Some animals might eat litter and get sick.
15	D	Invasive earthworms eat different things than native earthworms.
16	M	Fishing lines, balloons, and plastic bags dissolve quickly in the ocean.

Figure 1. Example of SVT benchmark probe, sentence type, and (correct answer); M = meaning change (No), D = distracter (No), O = original (Yes), P = paraphrase (Yes).

nearby paragraph in the source material). In this study, there were four original, paraphrase, meaning-change, and distractor sentences that were randomly arranged for each passage. All SVT probes were developed by the first author with the assistance of a district science curriculum specialist. To create the probes, fourth-, fifth-, and sixth-grade texts and Louisiana grade-level expectations (Louisiana Department of Education; LDE, 2014a) were examined for relevant text content. Previous criterion validity correlations for a paper-pencil version of SVT were .46 (95% confidence intervals [95% CI] .21, .66) with iLEAP and .49 (.25, .67) with SAT-10 science in fifth grade (Mooney & Lastrapes, 2016).

Criterion: i/LEAP. The stated purpose of the LEAP and iLEAP was to measure progress toward Louisiana's academic standards in English/language arts, math, science, and social studies for all students in Grades 3 through 9 (LDE, 2014a). The science tests included multiple-choice questions. Science assessments addressed science as inquiry, physical, life, earth, space, and environmental science (LDE, 2014a, 2015). Achievement-level descriptors were unsatisfactory, approaching basic, basic, mastery, and advanced. Technical adequacy data for the i/LEAP tests were accessed from the LDE website. Reliability statistics consisted of internal consistency Cronbach's alpha correlations for the science subtests of .85 (fourth-grade test), .87 (fifth-grade test) and .88 (sixth-grade test; LDE, 2014b). State-provided validity data were described in terms of a content validity process that was not delineated (LDE, 2014b).

Criterion: SAT-10. The abbreviated form of the online SAT-10 was a standardized, norm-referenced achievement test battery that measured reading, mathematics, spelling, language, listening, science, and social studies performance for students in kindergarten through 12th grade. Pearson Education (2015) described the science test as aligned with national and state content standards. The test-derived scaled score was used in the present study. The scaled score was vertically equated across each subject test, reportedly allowing for the tracking of performance across grades (Pearson Education, 2015). The science test assessed science as inquiry, knowledge of life, physical, and earth sciences. The abbreviated battery content test consisted of 30 multiple-choice questions and was untimed. Mooney and Lastrapes (2016) reported a .64 (.44, .78) correlation with the i/LEAP science test in fifth grade. In the present study, correlations were .60 (.44, .74), .50 (.35, .71), and .61 (.37, .81) for fourth, fifth, and sixth grades, respectively.

Social validity. Teachers were presented with a social validity survey at the end of the school year. Two questions were presented: (a) In your opinion, would the information gained from the SVT procedure be helpful in informing your practice in developing course curriculum; establishing progress toward goals; measuring progress toward goals; deciding when to change instruction; communicating student progress to other school personnel, to parents, and to students and (b) How time consuming were the SVT procedures?

In May, two social validity statements were added to the SVT administered to the students. The researcher-created statements were (a) "I think the SVT can help me show what I am learning in class", and (b) "It was easy to use the SVT." Students responded using a Likert scale, with 1 = *not at all*, 2 = *a little bit*, 3 = *more than a little bit*, and 4 = *very much*. This was the third of three informal social validity surveys in the content CBM literature, none of which have been administered technical adequacy analyses.

Procedures

Students took three benchmark assessments, in October, January, and May, with a February probe given, identical to the May probe, for test-retest reliability purposes. The assessments were delivered via the Qualtrics online survey software system. The software presented the assessments to the students through a web link. The web links were placed on the district's website for the classroom teacher to guide students through the test-taking process. Students typed in their names and selected their school, grade, and teacher. Teachers then led students through standardized directions and oversaw test completion. Upon completion, the software presented correct and incorrect scores (and answers) to the students. The first SVT was piloted the spring of the school year prior to the start of the present study to determine how long it would take the students to complete. Times ranged from 15–20 minutes from directions being read by the teacher to completion of the test items.

The first author administered the initial October SVT probes with the teachers over the course of a week to facilitate fidelity of implementation. During subsequent administrations, district teachers were notified when the testing week would occur, and teachers administered the tests independently. The first author conducted

observations at each of the schools during the week of assessments, and anecdotal evidence indicated that SVT implementation went as planned. No formal fidelity checks were conducted. An assessment was administered in February and repeated in May for the final benchmark measure to calculate test-retest reliability. The large gap in time between assessments was filled with district-wide and state accountability testing and two week-long holiday breaks. Teachers administered the statewide accountability test in April of the academic year in accordance with guidelines established by the state department of education. Authors administered the SAT-10 test shortly before state testing.

Data Analysis

Following each administration, SVT data were downloaded from Qualtrics and maintained in an SPSS master file of total scores. Descriptive statistics were calculated and examined to determine the distribution of SVT benchmark scores and criterion test scores across grade levels. Using separate multiple regressions, comparisons were examined for the dichotomous demographic categories gender, education classification (special education vs. general education), and SES status (high vs. low). Race was treated as a dichotomous variable limited to White and African American students, as only 27 students were in a different racial category. Data from these 27 students were excluded from the analysis regarding race but included in the other analyses.

To examine criterion validity for the state test, students (level one) were nested within seven schools (level two), which implied a hierarchical structure to the data. To address this issue, initially a multilevel data analysis technique was used to determine the unexplained variation in the outcome variables (with state achievement test and SVT benchmark probe scores all continuous variables) across each school. The unconditional analysis of variance model (the null model) was examined without level one or level two predictors to determine if there were any unexplained variation among the schools. Unexplained variation was not found ($p > .05$ for all five tests) across the seven campuses for each of the outcome variables as well as SVT probes. Therefore, a single level analysis (correlation) was employed to analyze the data. To quantify the strength of the relationship between benchmark SVT probes and both the state accountability tests, point estimates and 95% CI of Pearson's r were calculated. To determine the social validity of the probes, descriptive statistics were calculated for the teachers' and students' responses. For student social validity, mean totals for each of the two statements were computed. For teacher social validity, the greatest percentages of responses chosen were reported.

Regarding reliability, SVT probes were analyzed for internal consistency reliability using Cronbach's alpha. Although the SVT benchmark probe was two passages with 32 corresponding test items, each individual passage (16 test items) was also examined for internal consistency to see if future probes of a single passage were feasible. Pearson's r was examined to determine the test-retest reliability of the February and May SVT probes, with both passages analyzed together and each passage analyzed separately.

Results

Demographics

Table 1 provides descriptive test data for the four SVT probes and both the state achievement and SAT-10 tests. Mean SVT probe scores ranged from 19.2 (of 32 possible correct answers) to 25.9 correct answers across three independently administered probes, with the lowest score across all grades in January. Table 2 compares the predictor and criterion test score patterns with respect to demographic and classification subgroups. Results demonstrated considerable variability. Statistical differences among subgroups for the May SVT probe scores matched those of the state achievement test in two of four cases and those of the national test in three of four cases. There was less agreement for the October and January comparisons. Across SVT probe scores, the only consistent match between all three predictor and both criterion measures was in regards to race.

Concurrent and Predictive Criterion

The results for concurrent and predictive correlations are reported in Table 4. Concurrent validity (May) ranged from .24 (95% CI .07, .40) to .55 (.43, .65) for SVT and i/LEAP/LEAP and .18 (-.27, .56) to .27 (-.21, .51) for SVT and SAT-10. Predictive SVT correlations ranged from .16 (-.02, .32) to .49 (.38, .58) with i/LEAP/LEAP and -.09 (-.45, .30) to .57 (.25, .77) with SAT-10. For the i/LEAP/LEAP correlations, all were statistically significantly correlated with the SVT probes for each month, with the exception of January for sixth grade. For SAT-10, only the October correlation with SVT in sixth grade was statistically significant.

Social Validity

Teachers. The social validity questionnaire was administered to the participating teachers at a Saturday meeting at the end of the school year, which was sparsely attended. Only 15 teachers completed the survey. Of those, the majority regarded the SVT as very helpful in improving practices in measuring progress toward goals and communicating student progress to other school personnel, parents, and students; helpful in establishing goals, measuring progress toward goals. and deciding when to change instruction; and somewhat helpful in course curriculum. Sixty-six percent thought the SVT procedure was not very or not at all time consuming, 27% said it was somewhat time consuming, and 7% (1 respondent) said it was very time consuming.

Students. To determine the social validity of SVT, means and standard deviations were calculated for the two statements, with a highest possible score of four. All grades agreed with both statements, with ease of use judged more favorably than its utility by the fourth and

Table 1

Distributions of Means, Standard Deviations, and [95% Confidence Intervals] by Grade

4th grade	*M*	*SD*	[95% CI]	Range	Skew	Kurtosis	*N*
SVT	21.5	3.9	[20.9, 22.1]	12-30	-.19	-.34	147
October							
January	19.4	4.2	[18.6, 20.1]	8-29	.02	-.10	147
May	24.8	4.9	[24.0, 25.6]	11-32	-.59	-.35	147
i/LEAP	324.9	45.3	[317.5-332.2]	100-407	-1.1	3.5	147
SAT-10	620.0	34.4	[607.0, 634.3]	551-681	.07	-.51	27
5th grade							
SVT	21.2	4.5	[20.6, 21.8]	11-31	.11	-.42	216
October							
January	19.5	4.7	[18.8, 20.2]	7-30	-.05	-.55	216
May	25.9	4.6	[25.3, 26.5]	10-32	-.83	.36	216
i/LEAP	306.6	46.1	[300.4, 312.8]	100-462	-.71	2.1	216
SAT-10	631.1	26.2	[619.0, 643.0]	584-681	.02	-.52	21
6th grade							
SVT	21.8	4.3	[21.0, 22.6]	10-32	-.29	.33	123
October							
January	19.2	4.9	[18.3, 20.1]	8-31	.30	-.37	123
May	24.1	5.6	[23.1, 25.1]	4-32	-.81	.66	123
i/LEAP	303.9	42.8	[306.3, 307.0]	100-384	-1.6	7.1	123
SAT-10	645.9	19.7	[638.2, 653.5]	612-703	.78	1.3	28

Note. M = mean, SD = standard deviation, CI = confidence interval; SVT = Sentence Verification Technique; i/LEAP = Louisiana state achievement test, SAT-10 = Stanford Achievement Test Series, Tenth Edition.

Table 2

Comparison of Criterion and Predictor with Respect to Differences in Subgroup Mean Scores (N = 486)

Assessment	*B*	SE_B	β
i/LEAP			
Male – Female	5.35	3.8	0.06
White – African American	-24.9	4.1	-0.27**
General education – Special education	-43.5	7.6	-0.23**
High SES – Low SES	-18.9	5.6	-0.14**
October SVT			
Male – Female	-0.74	0.38	-0.86*
White – African American	-1.22	0.40	-0.14**
General education – Special education	-3.09	0.75	-0.18**
High SES – Low SES	-0.77	0.56	-0.06**
January SVT			
Male – Female	-0.51	0.41	-0.06
White – African American	-2.11	0.44	-0.22**
General education – Special education	-2.39	0.81	-0.13**
High SES – Low SES	0.55	0.60	0.04
May SVT			
Male – Female	5.05	6.69	0.09
White – African American	-43.1	15.23	-0.33**
General education – Special education	-43.7	22.71	-0.24
High SES – Low SES	-5.44	18.4	-0.0
SAT – 10			
Male – Female	-0.56	0.43	-0.0
White – African American	-2.87	0.46	-0.21
General education – Special education	-4.47	0.86	-0.22
High SES – Low SES	0.11	0.63	0.0

Note. **p < .01, *p < .05. i/LEAP = Louisiana state achievement test; SVT = Sente Verification Technique. SES = socioeconomic status. First group is the reference gr analysis limited to African-American and White students ("Other," $N = 10$); B = Un coefficient, SE_B = Standard error of the coefficient; β = Standardized coefficient.

Table 3

Sentence Verification Technique Total Cronbach's Alpha Coefficient by Month and Grade

	Passage 1 (16 items)	Passage 2 (16 items)	Combined (32 items)
October			
Overall	.47	.58	.70
4th grade	.43	.49	.59
5th grade	.54	.58	.71
6th grade	.48	.64	.71
January			
Overall	.67	.69	.69
4th grade	.48	.40	.43
5th grade	.54	.51	.48
6th grade	.63	.57	.60
May			
Overall	.73	.70	.82
4th grade	.72	.69	.83
5th grade	.66	.71	.81
6th grade	.77	.64	.82

Table 4

Benchmark Correlations and [95% Confidence Intervals] of Sentence Verification Technique and Criterion by Grade

	Fourth Grade (N = 147)	Fifth Grade (N = 216)	Sixth Grade (N = 123)
i/LEAP			
SVT October	.45** [.31, .57]	.49** [.38, .58]	.48** [.33, .60]
SVT January	.27** [.11, .41]	.41** [.29, .51]	.16 [-.02, .32]
SVT May	.55** [.43, 65]	.53** [.43, .62]	.24** [.07, .40]
SAT-10			
SVT October	.28 [-.11, .58)	-.01 [-.44, .42]	.57** [.25, .77]
SVT January	-.09 [-.45, .30)	.12 [-.33, .52]	.13 [-.25, .48]
SVT May	.19 [-.21, .53)	.18 [-.27, .56]	.27 [-.21, .51]

Note. **Correlations are significant at $p < .01$, all others not significant. i/LEAP = Louisiana state achievement test, SAT-10 = Stanford Achievement Test Series, Tenth Edition.

fifth graders and the opposite for the sixth graders. For statement 1, "I think the SVT can help me show what I am learning in class," results were M = 3.04, SD = .94 for fourth grade (n = 194); M = 3.06, SD = .96 for fifth grade (n = 267); and M = 3.15, SD = .99 for sixth grade (n = 166). For the statement, "It was easy to use SVT," results were M = 3.12, SD = 1.0 for fourth grade; M = 3.31, SD = .89 for fifth grade; and M = 3.12, SD = 1.0 for sixth grade.

Internal Consistency and Test-Retest Reliability

For internal consistency, Cronbach's alpha was calculated for both passages separately and together (see Table 3). Alpha coefficients for the combined passages for the entire sample were .70 for October, .69 for January, and .82 for May and ranged from .43 to .83 overall by grade. Single-probe statistics ranged from .40 to .77 with May showing the strongest reliability values by individual passage overall (range .66–.77). The test-retest reliability of SVT probes for February and May were analyzed using Pearson's r statistic and 95% CIs overall and by grade. Passages were analyzed individually as well as collectively. The overall test-retest correlation, calculated for all grades with no missing data (N = 620) between February and May SVT probes, was .63 (95% CI .58, .68). For the sample by grade, the results for fourth grade (n = 193) were .70 (.62, .77); the results for fifth grade (n = 265) were .68 (.61, .74); and the results for sixth grade (n = 162) were .68 (.59, .76).

Discussion

At-risk learners can benefit from effectively designed and delivered RTI systems. Research into RTI system elements for older at-risk students is ongoing, with questions targeting content-oriented frameworks particularly prescient. The present study evaluated the utility of an online and abbreviated form of an assessment (SVT) that previously was shown to be an effective measure of reading comprehension (Marcotte & Hintze, 2009; Royer, 2005). Validity and reliability questions were addressed with a large, multigrade sample of public school students. Results on distribution patterns, reliability, and validity are discussed. Study limitations and implications are addressed.

In evaluating the tenability of a new purpose for an existing assessment instrument, it makes sense to look for similarities in the distribution of scores among predictor and criterion or comparison instruments, with the goal that an assessment would be sensitive enough to accurately detect those students who are at risk for academic difficulties. In the present data, such patterns were not readily discernible. As expected and desired from a progress monitoring determination perspective, the mean scores for the May benchmark were higher than those of October (see Table 1). That pattern was evident across all grades, which itself is informative in a content area literature that has largely targeted single-grade-level-student participation. However, the mean scores did not show a clear pattern of higher scores as the grade level of a student increases, an array that was evident with scores of the standardized SAT-10 measure. Moreover, there was variability in the performance scores, with lower mean scores in January from October across all grades. The lower scores may have been due to lower overall reliability statistics for the January probe than those of October or May.

There was also variability in the comparison of subgroup scores from criterion to predictor measure. In the content literature, there has been some measure of agreement in the few times that comparisons have been made. In the structured formative assessment (e.g., CBM) literature, measures of academic language such as vocabulary matching (Espin & Deno, 1994-1995) and critical content monitoring (Mooney et al., 2013) have demonstrated the ability to match criterion measure patterns. For example, Mooney, McCarter, Schraven, and Haydel (2010) reported that there were comparable statistical patterns in 9 of 10 cases for a sixth-grade social studies sample using vocabulary matching and state accountability test scores. In a Grades 4–5 sample, Mooney and Lastrapes (2018a) reported comparable statistical patterns with state accountability test scores for critical content monitoring relative to gender, disability status, and socioeconomic status but not for race. For SVT, there was consistency in the comparison of differences in scores across race. In all six comparisons, SVT statistical patterns mirrored those of criterion measures. One inconsistent pattern example related to disability status. That is, SVT was consistent with predictor variables for disability status in October and January but not May. These data call into question the viability of the SVT to be able to detect students at risk for learning disabilities, particularly when compared to CBM measures that have better track records of pattern matching.

Criterion-related validity correlation magnitudes were stronger for state-level comparisons and, overall, generally low to moderate in strength across grades (see Table 4). Overall, linear relations between measures ranged from .16 (95% CI -.02, .32) to .55 (.43, .65) in nine comparisons, with six of those in the moderately strong range. State-level concurrent validity correlations ranged from .24 (.07, .40) in sixth grade to .55 (.43, .65) in fourth grade. Predictive magnitudes ranged from .16 (-.02, .32) to .49 (.38, .58), with descriptively stronger correlations for the fall benchmarking period. Overall correlations between the SVT and SAT-10 national test were considerably weaker in magnitude, with only one of nine linear relationships (i.e., fall benchmark, sixth grade, .57 [.25, .77]) reported in the moderately strong range.

Concurrent validity correlations were generally lower in magnitude than those reported in the structured formative assessment literature. In science content, linear relationships for vocabulary matching (Espin et al., 2013) and content maze (Johnson et al., 2013) have been in the .6 to .7 range, while critical content monitoring has evidenced .45 to .55 findings in state-level comparisons (Mooney et al., 2013; Mooney & Lastrapes, 2018a) and .67 with a national test (Mooney & Lastrapes, 2018a). The few predictive benchmark magnitudes have generally

been lower than the concurrent associations, with correlations of .46 reported for content maze (Johnson et al., 2013) and .38–.58 for critical content monitoring (Mooney & Lastrapes, 2016, 2018a).

Social validity findings added to the small literature base in content area CBM. In the present study teachers were surveyed, a first in the literature, with a majority of those completing surveys indicating that the assessment has instructional utility. Students perceived the tool as potentially helpful to learning and easy to use. Student perspectives were similar to those surveyed in Mooney et al. (2013) targeting the critical content monitoring probe.

The SVT probe displayed moderately strong internal consistency correlations across October and May administrations of two-probe passages overall, but were more variable when analyzed by grade. Cronbach's alpha coefficients for two-passage probes ranged from .43 to .83 across grades, with only 3 of 9 coefficients above .80. Findings were comparable to previous findings for SVT reading and listening comprehension probes that ranged in length from two to six passages (e.g., Marcotte et al., 2019; Royer, Sinatra, & Schumer, 1990). In the literature, SVT alpha coefficients have varied from .5 to .9 across studies and generally increased in magnitude as the length of the probe expanded (Royer, 2005). Internal consistency results were less favorable than those reported for an adaptation of SVT known as statement verification for science that was evaluated using students in Grades 7 and 8 (Ford & Hosp, 2017). Test-retest correlations for the two-passage probe (administered in February and May) were moderately strong in magnitude across grades.

Limitations

Several limitations likely impacted the evaluation of study findings. First, although the large, multigrade sample may be representative of more urban populations, the sample was not representative of the larger United Status population demographically, thereby limiting the potential generalizability of findings. Moreover, the academic achievement of the smaller sample of students who were administered the SAT-10 science test was depressed, possibly reducing the magnitudes of the correlations with SVT. Second, because the SVT passages were adapted from classroom texts, which have been demonstrated to use higher level vocabulary, the readability levels of the SVT passages were all challenging for sample grade levels. That differed from previous probe development processes in which multiple-passage probes had readability levels below, at, and above the participant levels. The grade readability range for the Grades 4–6 population of students may have depressed scores as well as limited the generalizability of findings to the SVT literature. There were no technical adequacy checks for the social validity questionnaires, which may impact results for the teachers' and students' opinions of the measures. Finally, the particular probe administration program the authors utilized (Qualtrics) did not allow for immediate teacher access to useable data, which may have impacted subsequent SVT scores over the course of the study.

Implications for Research and Practice

With study findings and limitations described, we focus implications discussion on SVT's potential inclusion in school-based RTI frameworks and research that may be relevant to informing that circumstance. Effective implementation of RTI systems has the potential to improve academic performance for at-risk learners.

As it stands now, there is a literature base that supports SVT's inclusion in upper elementary and secondary school literacy assessment frameworks. The technical adequacy literature summarized by Royer (2005) and extended by Marcotte and Hintze (2009) is evidence of that. With supportive validity and reliability data, SVT can be considered an instrument to document school-wide student performance as part of the first tier of RTI frameworks in reading. In RTI systems, all students' performance is evaluated in a standardized fashion periodically, with those deemed at risk or delayed receiving supplementary intervention support and more frequent testing to evaluate the success of the extra school effort. The SVT assessment has a history of documenting reading achievement through paper-pencil administration procedures. As a result of the present study, there is also reason to believe that an online delivery system might facilitate extending SVT into upper elementary and secondary school RTI frameworks. Teachers seemed generally receptive to SVT, indicating that it was not overly time consuming and could assist in instructional decision-making. Teachers, with very little training, also managed to direct the assessment implementation process.

Still, our hypotheses asserted that SVT probes could be extended into science courses and provide robust technical adequacy findings as have been demonstrated in reading. We do not believe that those hypotheses were supported. The concurrent and predictive correlations with meaningful criterion were generally inferior to those of other instruments, such as vocabulary matching, critical content monitoring, and content maze, a finding that is not new (Johnson et al., 2013; Mooney & Lastrapes, 2016, 2018b). There was also not the consistency of patterns in scoring evident for the content SVT probe as there has been for vocabulary matching and critical content monitoring (Mooney & Lastrapes, 2018a; Mooney, McCarter, Schraven, & Callicoatte, 2013). As the evaluation of robust interventions to address the reading concerns of at-risk students continues, so too should the investigation of meaningful formative assessment (e.g., CBM) tools for upper elementary and secondary school students, particularly in the area of content area courses.

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A Case Study Analysis Among Former Urban Gifted High School Dropouts

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Abstract: *The dropout social problem has been the focus of researchers, business and community leaders, and school staffs for decades. Despite possessing significant academic high school capabilities, some gifted students drop out of school. The research problem for this study includes how and why former gifted urban high school students chose to drop out. The conceptual framework for this case study is Bronfenbrenner's (1996) human ecology theory. The purpose of this study was to gain an understanding of what led former gifted urban students to drop out of high school. Using purposive sampling, four participants, two men and two women, were selected for semistructured interviews. The sample included an African American, a Filipino, a Caucasian, and a Haitian/Cuban/Syrian. Their ages ranged from 38–77 years old. The semistructured interviews were analyzed using first, second, and pattern coding. The resulting themes were (a) family discord, (b) school not interesting, (c) no role model, and (d) minimum family participation. The former gifted high school students' dropout experiences were rooted in the microsystem perspective of the human ecology theory. The implications for social change from this study's findings may help inform those who manage and teach gifted programs about the mindsets of students in gifted services.*

Jordan, Kostandini, and Mykerezi (2012) theorized that the key to staying out of low-wage America is staying in school at least through high school graduation. Despite this information, high school students are still leaving school before graduating without understanding the potential negative consequences associated with this decision (Jordan et al., 2012). These negative consequences can range from poor health to earning less money than that of high school graduates (Messacar & Oreopoulos, 2013). The dropout phenomenon is a social problem that induces personal and societal consequences that are negative in nature (Freeman & Simonsen, 2015).

While there is a plethora of research regarding high school dropouts (e.g., Hickman, Bartholomew, Mathwig, & Heinrich, 2008; Hickman & Heinrich, 2011; Song, Benin, & Glick, 2012; Stanczyk, 2009; Suh, Jingyo, & Houston, 2007), dropout rates (e.g., Mishra & Azeez, 2014; Suh & Suh, 2007; Ziomek-Daigle, 2010), and a variety of other topics related to high school dropouts (e.g., Heckman & LaFontaine, 2010; Johnson, 2010; Mishra & Azeez, 2014; Patterson, Hale, & Stessman, 2007), there is very little research regarding gifted dropouts. According to Blaas (2014), gifted dropouts have been discouraged with their school experience as early as elementary school. The sources of their frustrations are documented as related to being grouped with lower achieving students, as well as various negative family and environmental issues (Zabloski & Milacci, 2012). However, gifted children often do not encounter the typical negative psychological, sociological, and familial experiences that nongifted dropouts encounter (Blaas, 2014). In other words, gifted children's shared and nonshared environmental experiences control for many of the usual negative experiences associated with typical students dropping out of high school (Zabloski & Milacci, 2012).

Hickman et al. (2008) explained that the culture of a community and manner in which the neighborhood develops influences the ability of a child to succeed and that this pattern should hold true for gifted and talented students as well. The No Child Left Behind Act (NCLB) of 2001 defines a gifted and talented student as any student who has shown high levels of academic abilities in areas of intellectual, creative, artistic, or leadership capacity, or in specific academic fields (Zabloski & Milacci, 2012). Specifically, a gifted and talented student is defined as any student with two standard deviations above the norm of IQ which puts the student at 130 IQ. Additionally, gifted and talented students are creative and use divergent thinking, and they have special talents (i.e., music, art, etc.; Zabloski & Milacci, 2012). The NCLB has since been updated by the Every Student Succeeds Act (ESSA) of 2015, which went into effect October 1, 2016. This act did not change the definitions of gifted and talented students; however, it requires states to disaggregate data in an attempt to identify gifted and talented students (ESSA, 2015).

Hickman and Heinrich (2011) noted that researchers have addressed a number of factors, such as economic, familial, educational, and cultural factors, that have played a role in the emergence of the dropout problem. Ecological frameworks on human development acknowledge the social context within which an individual's life influences one's behavior (Jablonka, 2011). When students are progressing through early adolescence, they encounter many emotional and physical changes (Sawyer et al., 2012). Puberty results in a number of physical changes, which spur students into believing that they have become mature enough to carry out their lives independently (Vijayakumar, Op de Macks, Shirtcliff, & Pfeifer, 2018). Entry into puberty is thus one of the initial push factors that places an individual on the path of deviant behavior (Tsai, Strong, & Lin, 2015). Such conduct is associated with negative engagements that are often incongruent with school standards (Fergusson, Vitaro, Wanner, & Brendgen, 2007). At this stage, peer groups, youth culture, and grown role models assume a high degree of social influence (in terms of values, attitudes, and behaviors) for the adolescents (Brundage, 2013).

Within the family unit, adolescents begin looking for more independence as well as opportunities to make personal decisions (Jablonka, 2011). However, the author observed that the changes demand a shift

in responsibilities and roles which prove challenging to the relationships and dynamics at the family level. At the same time, many adolescents transition from junior high school to high school environments (Muscarà, Pace, Passanisi, D'Urso, & Zappulla, 2018). The shift does not, however, match the developmental needs of young people (Modecki, Blomfield Neira, & Barber, 2018).

Demographic characteristics that predisposed students for dropping out of school include poverty, homelessness, sex, and ethnicity (Jeronimus, Riese, Sanderman, & Ormel, 2014). Being a minority contributes largely to the likelihood of dropping out of school (Fry, 2014). Despite being gifted, many gifted students who fall into the above demographics are at a higher risk of dropping out of school (Jablonka, 2011). The association of the demographic risk factors with school dropout is partly explained by their connection to academic factors such as poor performance, low levels of motivation, absenteeism, and behavior problems, among others (Opre et al., 2016). This developmental pathway skews exponentially, albeit in a negative direction, as students enter middle school (Fry, 2014).

Although the aforementioned research regarding high school dropouts illuminates important findings, we have found limited research that has examined the understanding of the factors of why gifted urban students drop out of school from an ecological systems perspective. Given such, further research is warranted that could address this lack of research from an ecological systems approach to address the documented problem of urban gifted students dropping out of school despite having the cognitive ability to succeed (Blaas, 2014; Zabloski & Milacci, 2012).

The purpose of this qualitative case study is to understand from an ecological perspective how gifted urban high school dropouts identify reasons for choosing to drop out of high school. Also, this case study attempts to identify, despite having the cognitive abilities to succeed academically and eventually graduate from high school, at what point their academic career began a downward spiral. To gain an in-depth understanding of this documented problem from a participant's perspective, we examined each subsystem of the ecological systems theory and the perceived effect it had on the participants throughout their lifetime. The rationale for using Urie Bronfenbrenner's ecological systems theory was to gain a better understanding of how the various interactions of subsystems influence why the students dropped out of school from their perspectives. Given such, the following research question was postulated: How do gifted urban high school dropouts, from an ecological systems theory perspective, decide to drop out of high school?

Methods

Qualitative case study design methodology was an appropriate research method and design as the purpose of our study was to investigate how former gifted urban high school students choose to drop out from a human ecology perspective. More specifically, we examined how the Microsystem, Mesosystem, Exosystem, Macrosystem, and Chronosystem effect the choices of the participants to drop out of school from their perspectives. Hence, the authors posed the following research question: How do gifted urban high school dropouts, from an ecological systems theory perspective, decide to drop out of high school?

Procedures

The procedure used to gain an understanding from an ecological theoretical framework how gifted students dropped out of high school was open-ended questions via a semistructured interview process. This form of questioning allowed the participants to tell their stories using their words. For this study, a gifted urban high school dropout was identified as a person who decided to leave high school before graduating or completion. The identified persons could have dropped out of school and returned later to earn their high school diploma or GED, as well as a postsecondary degree. A pool of potential participants was identified using the Walden University Research Pool, email, social media, and word-of-mouth. Potential participants were contacted via telephone, Skype, and/or email.

Once a pool of participants was created, an information letter detailing the nature of the study was delivered to each participant via U.S. Postal Service, by email, or in person. In this letter, we requested an appointment with the potential participant for an informative meeting to present the proposed study, provided a copy of the information letter describing the study, and addressed any questions or concerns of the potential participant. Next, we requested all interested potential participants contact us to schedule the interview. If there was no contact within one week of the informative meeting, a follow-up telephone call was made, as well as a follow-up email. At the time of the interview, each participant was given a copy of the information letter outlining the proposed study. Each participant provided a signed Consent Form prior to the start of the first interview.

Data were collected through one-on-one interviews. Initially, the background of the participant was the focus of each first interview. During the first few minutes of all interviews, the primary intent was to build rapport with the participant, which assisted in providing credibility and getting all necessary documents signed. Also, the interview assisted in gathering all the participants' information about their life, past and current. This information allowed us to put the participant's experience in context. Interview questions were focused on having the participants reconstruct their family, school, friends, neighborhood, and work experiences in phases, which yielded some context of their current situation.

Once the interviews were conducted and transcribed, the data were organized, which allowed us to obtain a general understanding of what type of information the data provided. To gain further meaning from the data, we used Dedoose qualitative data collection software program to assist us in coding and identifying themes.

The first step in analyzing the data was reading each transcript in its entirety (Ivey, 2012). By reading each transcript completely, we attained a general sense of the participant's experiences (Blake, Robley, & Taylor, 2012). Also, the data analysis process was concluded by creating individual as well as group descriptions of the lived experience of the phenomenon. The purpose of this step was to create a narrative of what it meant for each participant to be a former gifted urban high school dropout from an individual and group aspect (Lessard, Contandriopoulos, & Beaulieu, 2009; Valiee, Peyrovi, & Nasrabadi, 2014; Yilmaz, 2013).

Results

All four participants dropped out of high school, were over 18 years old, and resided in an urban area at the time they dropped out of high school. For this study, it was important to verify the students were gifted and that they dropped out of school. All four participants met both requirements of the study.

Shaun: Shaun is a 43-year-old African American male from the South. He left home at the age of 14, shortly after dropping out of high school. During the early years on his own, he ran into legal trouble that resulted in a felony record. Shaun is a Master-at-Arms in the Navy Reserve, with Level 1 clearance. He holds a bachelor's degree in interdisciplinary studies; he states, "It is basically elementary education with a concentration in reading" and a master's in education. He is now in school earning a second master's degree and gearing up for a PhD program.

Kelli: Kelli dropped out of high school at age 15 when she was in the 10th grade. Kelli describes her upbringing as constant chaos. She was born and raised in a major city on the East Coast and constantly moved around, with and without her mother. Both of her parents are immigrants, so she is part of the first generation of family members to be born in the US. She identifies as Haitian/Cuban/Syrian. This 44-year-old mother of three had goals of becoming a corporate lawyer and loved going to school when she was able to attend. She soon dropped out and later became pregnant at the age of 16. Later, Kelli earned a bachelor's degree in history and had no plans on returning to the classroom.

Jason: This 37-year-old Filipino participant is one of two participants who belongs to an IQ Society. Although not truly active, he peruses the websites and blogs for pure entertainment. Jason grew up in one of the poorest neighborhoods on the west coast. At the age of 14, he dropped out of high school. He talks about how everyone would tell him he very intelligent and smart, but that he was not living up to his potential. Like Shaun, he grew up in a single parent household without the perceived benefit of a father or positive male role model as a guide. Similar to Shaun, Jason turned to the streets and found himself in legal trouble. Due to his legal trouble, Jason was forced to obtain his GED as a condition of his probation, which he did.

Sonya: While each of the participants of this study is unique, Sonya may be the biggest surprise of them all. This participant is a 77-year-old Caucasian female who grew up in a tough Midwest city. At the age of 17, she dropped out of high school to pursue an academic career at Stanford University in Berlin, Germany. Sonya describes how during her junior year of high school she took correspondence courses to graduate early but fell short due to not having the necessary physical education credits to graduate. Her voice reflects anger as she refers to her principal as a "complete ass." Sonya talks about how disappointed she felt and decided to drop out. However, this was not the only reason she dropped out of high school.

After completing the interviews, we used the following data analysis strategy. First, we transcribed each telephone interview into a Word document to combine with the recorded interview data. Once all interviews were transcribed, we used the qualitative analysis program Dedoose to begin coding the data collected. According to Saldana (as cited in Miles, Huberman, & Saldana, 2014), there are two major stages of coding, First Cycle and Second Cycle. Each of these stages can employ a variety of methods. With this understanding of cycle coding, we carefully perused the interview syntax to obtain analogous keywords, and phrases used by the interviewees began to emerge.

Microsystem

Family. Family, as depicted by societal norms, is usually comprised of parents and the children they are rearing (Powell, 2017). This definition has evolved over the years, as the nuclear family is forever changing. In this study, each of the four participants were raised in a single parent home. The two male participants, Jason and Shaun, were raised by their mothers only and neither participant's father was involved in his life. Kelli's and Sonya's, the two female participants, fathers were involved in their rearing to some extent. In the case of Sonya, her parents divorced when she was 12 years old, while Kelli's parents never divorced; however, they separated at a very critical period in her life. Kelli, Shaun, and Sonya all had older and younger siblings with whom they were very close while growing up.

Parents. What was found in the data is three out of four of the participants were raised in completely single parent homes led by the mothers while one participant lived with both parents until the age of 12 when her parents divorced. In analyzing the data associated with women and their parents, it was revealed that both of the women participants had a strained relationship with their mothers and that their mothers were directly responsible for their dropping out. The two male participants seemingly had a good relationship with their mothers. However, unlike their female counterparts, they did not have a relationship with their fathers before the age of 18. Jason did not know his father at all, nor does he know that side of his family. According to Shaun, "I knew of my father after his death, through

family members on his side." He goes on to state his father was an imam at a mosque.

Peer Group. For this study, a peer group is considered both a social and a primary group of people who have similar interests, age, background, or social status (Ellis, Dumas, Mahdy, & Wolfe, 2012). Within these groups, individuals tend to influence a person's beliefs and behaviors (Ellis et al., 2012). In this study, the participants identified as individuals with friends. Each participant talked about being his or her own person and not being influenced by friends, whom they considered associates. The participants spoke about making life-altering decisions without consulting with their associates/ friends. Each participant's actions and statements differ from the definition of a peer group.

Community. Loosely defined, community can be described as the geographical area in which a person lives. In addition to the geographical location, people, places, and things make up the community. All the participants describe their community as low-to-middle income with not much to do. Each participant speaks about the lack of activities for children not interested in athletics or the lack of activities for children interested in learning outside of school hours. Shaun saw his community as being those who looked like him and who were the low-income families while those who did not look like him were the middle-income families. He believes, regardless of the labels, that they all were experiencing some form of poverty. Kelli's view of community differs from the other participants' from an exposure point of view. Growing up as a Haitian American, her sense of community was centered around her family, which she had at an early age while living with her aunt. She talked about knowing other children and families in the area but was not allowed to go out and play with them. Kelli remembers most of her interaction with her community centered around attending church. According to Jason, his community became smaller when he dropped out of school. While in school his community was broad and included a vast array of people from different backgrounds. Once he dropped out of school and moved out on his own, that vast array of people became much more concentrated. It is at this time he became fully engulfed with the negative aspects of his community. For example, he was drinking, selling drugs, and robbing people. Sonya describes her community a little differently than the other participants. She saw her community as diverse and socially structured. Sonya believed the social structure was based on respect and not race, religion, ethnicity, or socio-economic status.

School. While the participants attended schools in various parts of urban areas in the United States, they each talked about the lack of school support. Each participant describes feeling isolated at times. Shaun cannot remember visiting a guidance counselor to strategize about his future while Kelli talks about having feelings of disconnect. She states she did not have much in common with her peers and those she did hang around were nothing but trouble. Then, there is Jason, who had a simple, emphatic one-word response, which was "no." Jason believed his strongest social support was his first long-term relationship.

Mesosystem

Interrelationships. At first glance this researcher viewed the data obtained as showing no or minimum interrelationships; however, after greater analysis, relationships came in different forms. These interrelationships can be viewed as positive or negative, cordial or adversarial. The data obtained show that each participant's parents did not have a positive relationship with their student's teachers. The interrelationship described by the participants was that of addressing negative behaviors versus attending positive events being held at the school. None of the parents of the participants attended "Back to School Nights" or other things of that nature. This experience could also be said for the interrelationship with their children's peers.

The experience of having a very minimal relationship with their children's peers is true for all the participants except Kelli. Kelli reports that her mom allowed the "bad" neighborhood kids to hang at their house. During our interview, Kelli acknowledges that her mother did not like the kids she was hanging with and believed they were trouble but did nothing to stop the interaction. Jason's story is like that of Kelli's. Each was hanging around the "wrong" crowd, which caused them to get into some trouble. Jason talks about moving out at age 15 and getting his own place. He admits participating in illegal activity to support himself and his girlfriend.

Exosystem

Indirect forces. For the participants in this study, the indirect forces are numerous. These indirect forces stem from the lack of family-school, school-community, family-community types of relationships. However, the lack of these relationships is not evident with all the participants. The data show that indirect forces play a major role in the decision-making of these participants. For example, while Shaun and his family had strong ties in the community, he did not know his father nor his father's side of the family until the father passed away when Shaun was an adult. Shaun states that he learned that his father was an imam in the Nation of Islam, established several mosques, and was extremely intelligent with a photographic memory. This experience is very different from Kelli's. Her interview revealed a sense of loneliness, once her home life became unstable. As a child of immigrants, the family-community relationship was important; however, the community was that of other Haitian immigrants her parents knew prior to migrating to the United States. Kelli spoke of how her mother would rather work than volunteer at her school. She states the order of importance for her mother was her job, her boyfriends, putting on fronts, and then her children, which was the same for Jason and Sonya. Jason's story is very similar to Shaun's, while Sonya's is very similar to Kelli's. Sonya, like Kelli. had both parents involved her life, but neither of them had any connection to a family-school relationship. She states her mother was

very unstable emotionally and her father was a traveling salesman who lived in a different part of the state. Jason's mother knew very little English; therefore, she stayed away from school.

Macrosystem

Ideological and organizational patterns. Here the data show a distinct difference between male and female acceptance of cultural values and societal laws. Shaun, an African American male, and Jason, a Filipino American male, do not remember any sense of cultural values being instilled in them while growing up. At the same time, they adapted to the societal laws of the streets. While Kelli, a Haitian American female, and Sonya, a Caucasian American, remember having cultural values pounded into them daily. They also mentioned how they were given an understanding of societal laws and how they may change dependent upon community makeup.

Chronosystem

Life changes. The data show that despite dropping out of high school, each participant has achieved success, according to societal norms. For example, Shaun has a master's degree and works with special needs children in an urban school district. Jason works as a software engineer at Microsoft. He describes most of his colleagues as Ivy League educated, which makes him somewhat of an outsider. Sonya dropped out of high school to enroll early into Stanford. Although she did not graduate from Stanford or another college, she went on to own a very successful secretarial services business. Kelli, despite having two children by the age of 18, went on to earn her college degree and works at a state university on the east coast. Also, Kelli has had only one job for the past 20 years, which speaks to her desire for stability in contrast to her upbringing.

Discussion

This study offered an in-depth view of the lived experiences and understanding of former gifted urban high school dropouts. Emerging from a theoretical framework based in Urie Bronfenbrenner's (1996) human ecology theory, one research question was used to guide the study: How do gifted urban high school dropouts, from an ecological systems theory perspective, decide to drop out of high school? A qualitative case study analysis was conducted using a conceptual framework.

The results of this study confirmed prior research regarding why and how high school students choose to drop out from a microsystems perspective. Also, this study has confirmed why there is a lack of data associated with the remaining human ecology theory subsystems. Span and Rivers (2012) theorized boredom, lack of parental and guardian engagement, and a variety of psychosocial factors contribute to why and how high school students choose to drop out. Some of the psychosocial factors are, but are not limited to, motivation and personality (Span & Rivers, 2012). This research provided an understanding as to why and how former gifted urban high school students chose to drop out.

The microsystem of the ecological systems theory is shaped by the activities and interactions in the person's immediate surroundings: parents, school, friends, etc. (Fehler-Cabral & Campbell, 2013). Each participant had some family discord, whether caused by the relationships in the home or the lack of relationships outside the home. For example, Jason and Shaun did not have a male role model in their lives and did not feel as though they fit in at school. This experience differs from that of Kelli and Sonya, who had both of their parents involved in their lives; however, this did not prevent dysfunction and chaos.

Minimum family participation is directly tied to the mesosystem. The mesosystem of the ecological systems theory is shaped by relationships among the entities involved in the child's microsystem (Ahlin & Lobo Antunes, 2015). The lack of meaningful interaction by the parents with the school of their children may have played a direct role in the decision of the participants to drop out.

The exo, meso, macro, and chronosystems of this study went mostly unanswered, although the participants were asked direct, open-ended questions associated with these subsystems, which presented itself as an unintended limitation of this study. Several reasons may account for this lack of data. At-risk youth, adolescent egocentrism, and epistemic reasoning are a few realities associated with this lack of data (Abbate, Boca, & Gendolla, 2016; Apostu, 2017). While the participants were asked open-ended questions in an attempt to answer the research question, it was hoped that their responses would develop into themes for each of the subsystems, not just the microsystem. Based on the analysis of the data collected it appears that the lack of findings, as they would relate to the remaining four subsystems, may be the results of what is commonly known as adolescent and/or adult egocentrism (Piaget, 1973).

Egocentrism is a term first introduced and defined by Jean Piaget in the mid-1920s, which was later interpreted and extended by Eklind (Martin & Sokol, 2011). Piaget (1973) defines egocentrism as the inability of one to differentiate self from non-self. Galanaki (2012) posits "egocentrism is a differentiation failure between the subjective and the objective, a negative by-product of any emergent cognitive systems" (p. 457). While the concept of adolescent egocentrism began to draw the attention of researchers and psychologists in the mid to late 1970s (Cohn et al., 1988), it is here that this researcher sought an understanding as to why the responses provided by the participants of this study were as such.

Research by Enright, Lapsley, and Shukla (as cited in Krcmar, van der Meer, & Cingel, 2015) defined adolescent egocentrism as one being self-centered and only concerned with addressing his or her own needs. At the same time, the authors theorized that adolescent egocentrism is made up of two distinct concepts: imaginary audience and personal fable ideation. While Rai, Mitchell, Kadar, and Mackenzie (2016) posited the additional concepts of the illusion of transparency, simulation theory of mind, audience ideation and personal fable exist during adolescence.

According to Rai et al. (2016), the illusion of transparency is a concept where there is a tendency for individuals to have the belief that their lived experiences are more transparent to others than the actual case. This concept, while nurtured during adolescence, rears itself in adulthood as well, more specifically in the manner of how adults overvalue the ability of others to detect their varying feelings and emotions (Savitsky & Gilovich, 2003). Endo (2007) posits that adults misjudge how people can discern their preferences during face-to-face communication while Kruger, Epley, Parker, and Ng (2005) theorized that regarding written communication, adults misjudge their counterpart's ability to discern humor, sarcasm, sadness, and anger over email. Therefore, the participants in our study may have believed, while responding to the questions, that we may have been able to infer their true meaning behind their responses.

How does one develop the illusion of transparency? According to Artar (2007) this is accomplished through the concept of simulation theory of mind, namely the mind is a concept defined as one's own cognitive ability to understand others as intentional agents. Thus, simulation theory of mind is one's ability to mirror on the contents of not only one's own mind but that of others' minds as well (Artar, 2007). Based on our research, it appears the participants of this study should have been able to mirror the contents of our minds when the various questions were posed. Better, they should have been able to understand our intentions when posed with the questions. This did not happen, as the participants, when responding to questions regarding other subsystems, continually inferred to their microsystem. Both of these concepts might offer an explanation as to the difficulty participants had in identifying factors outside their own microsystem associated with the decision to drop out of high school.

Adult egocentrism mirrors that of adolescent egocentrism even though it is believed adults typically can overcome egocentrism (Thomas & Jacoby, 2013). Although it was believed that the participants of this study would be able to differentiate their responses to adequately answer each question, as they relate to the specific subsystem, this was not the case. According to McDonald and Stuart-Hamilton (2003) the various facets, emotional and social self-centeredness, contributed to their deviated responses, thus creating a lack of data.

Conclusion

As parents, scholars, teachers, policymakers, and community leaders, we all can do more to recognize and respond to the needs of all at-risk youth regardless of their documented or perceived academic abilities. This study explored how four former gifted urban high school dropouts decided to drop out of school. The four themes that surfaced throughout our interviews with these four participants were family discord, school not interesting, no role model, and minimum family participation. It is salient, from a microsystem perspective, that former gifted urban high school dropouts are faced with the same challenges as students not deemed gifted. Also, it is clear that the participants had a difficult time explaining how the various subsystems, other than the microsystem, played a role in their decisions to drop out. Although we attempted to gain an understanding of the decision-making process from all aspects of the human ecology system, the data obtained from the participants focused primarily on the microsystem.

The results of this case study along with the increasing evidence from prior and current research on high school dropouts indicate there are many challenges that still need to be addressed regarding our understanding of high school dropouts. It is important that no student is ignored or deemed "all right" or "fine" because the student has high cognitive ability. Through meaningful collaborations between parents, educators, policymakers, and community stakeholders, strategies can be developed to better assist gifted high school students at risk for dropping out of school. Moreover, such efforts can promote awareness and understanding that dropping out of school is not endemic to those with less intelligence and/or cognitive skills.

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Computer-Adaptive Reading to Improve Reading Achievement Among Third-Grade Students At Risk for Reading Failure

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Abstract: *An essential goal of educational instruction is to ensure that all students become competent readers. To support students in becoming qualified readers, teachers need to identify struggling students and implement adequate curriculum programs. This study examined the effects of a computer-adaptive reading program on third-grade students' reading achievement, accounting for their achievement level, their usage of computer-adaptive reading program, gender, and free and reduced lunch eligibility. Results indicated that students in the lowest academic level (below the 20th percentile; n = 5,042, 65.6% eligible for free and reduced lunch) and in the greatest need of intensive reading instruction evidenced greater gains than those above the 20th percentile (n = 17,920, 47.4% eligible for free and reduced lunch), exceeding normed expectations. On average, the achievement gap for students in the lowest academic level remained evident. The study provided evidence regarding the benefits of computer-adaptive environments to narrow achievement inequalities and increase opportunities for students who are at the greatest risk of reading failure.*

Reading is the foundation of successful academic learning (Luo, Lee, & Molina, 2017). Therefore, an essential goal of educational instruction is to ensure that all students become proficient readers (Deloza, 2013; Rabiner, Godwin, & Dodge, 2016). To support their students in becoming skilled readers, teachers need to identify struggling students and implement appropriate instruction and reading strategies (Luo et al., 2017; Putman, 2017). Given the importance of developing reading skills, educators have intensified efforts towards the improvement of students' reading, resulting in a growing number of computer-based programs intended to promote reading achievement (Carlson & Francis, 2002; Guthrie et al., 2004). Specifically, computer-adaptive reading programs (CARPs) have increased in prevalence in schools throughout the United States (Clemens et al., 2015; Flaum-Horvath, Marchang-Martella, Martella, & Kauppi, 2017; Nicolson, Fawcett, & Nicholson, 2000; Putman, 2017).

CARPs facilitate personalized learning by tailoring reading instruction. Within CARPs, students complete questions related to the reading content, and their responses provide the roadmap to adapt the curriculum to their developmental and academic needs (Luo et al., 2017). In addition, CARPs afford struggling readers opportunities to learn within their spectrum of competencies, while simultaneously building their reading efficacy and enriching their learning experience (Putman, 2017). Despite promising findings for CARPs regarding achievement growth in reading comprehension and literacy skills (Campbell, Lambie, & Sutter, 2018a; Luo et al., 2017; Patarapichayatham, 2014; Putman, 2017) and predictability studies correlating CARPs to national assessment scores (Campbell, Lambie, & Sutter, 2018b; Patarapichayatham, Fahle, & Roden, 2014), further research examining the effectiveness of CARPs is needed (Putman, 2017). Specifically, educators warrant research that examines CARPs that differentiate among students at varying academic levels to inform educational practices intended to support students placed at risk for reading failure (Cheung & Slavin, 2012; Luo et al., 2017; Putman, 2017).

Responding to the call to improve reading among all learners and narrow achievement inequalities, the present study investigates the effects of a CARP on third-grade students' reading skills. With the increasing number of elementary school students struggling to read as well as the growing implementation of technology being integrated in general educational settings, it is essential for teachers, schools, and districts to understand the impact of educational technology on learning (Cheung & Slavin, 2013).

Background

Developing proficient reading skills continues to pose a challenge for millions of students in the United States (Yakimowski, Faggella-Luby, Kim, & Wei, 2016). According to the National Center for Educational Statistics, only 37% of fourth-grade students performed at or above the proficient level on the national assessment of educational progress (NAEP) in reading in 2017 (McFarland et al., 2018). There is evidence that without adequate intervention, students lacking fundamental reading skills in early elementary school are likely to remain behind their peers throughout their academic careers (Amendum, Vernon-Feagans, & Ginsberg, 2011; Foorman & Torgesen, 2001). Without proficient reading skills and knowledge to process and apply information from text, children are placed at risk of failing and dropping out of school (Hernandez, 2012; Rabiner et al., 2016).

Risk Factors Related to Reading Achievement

There is a link between risk factors for students' underachievement in reading and their demographic characteristics. Both students' gender and socioeconomic status (SES) significantly relate to their reading achievement and development (Buckingham, Beaman, & Wheldall, 2014; Dietrichson, Bøg, Filges, & Klint-

Jørgensen, 2017). Typically, males and students from low SES families demonstrated lower reading achievement than female students and those from higher SES families (Brown, 1991; Chatterji, 2006; Scheiber, Reynolds, Hajovsky, & Kaufman, 2015). Conversely, student factors mitigating reading underachievement include: (a) parental involvement (Crosby, Rasinki, Padak, & Yildirim, 2015; Park, & Holloway, 2017), (b) improved efficacy for reading instruction among all educational stakeholders (Goddard, Hoy, & Hoy, 2000), and (c) small-group or one-to-one instruction (Chard, Vaughn, & Tyler, 2002; Vaughn, Gersten, & Chard, 2000).

Reading Instruction

Effective reading instruction includes the following components: (a) phonemic awareness, (b) alphabetic knowledge and decoding skills, (c) fluency in word recognition and text processing, (d) vocabulary, and (e) comprehension (National Reading Panel [NRP], 2000). Typically, these reading components are provided through direct face-to-face teacher instruction (NRP, 2000; Torgerson, Brooks, & Hall, 2006). However, given the diversity of students within a classroom, traditional whole-class instruction as well as "one-size-fits-all" programs do not account for students' individual differences and, consequently, fail to reduce the gap between struggling and proficient readers (Ivey & Broaddus, 2000). To reduce the high number of students struggling to read at grade level (Yakimowski et al., 2016), alternative or supplemental lesson structures have emerged, aiming to improve students' reading proficiency. The investigation conducted in this study considered a computer-adaptive reading program.

Computer-Delivered Reading Instruction

Schools incorporate computer-delivered reading programs for students; however, some of these programs are nonadaptive and thus do not provide individualized instruction (Leutner, 1993: Martin & Lazendic, 2018). Specifically, computer-adaptive supplemental reading programs for students provide individualized practice and assessment of students' reading skills to guide future instruction (Baye, Lake, Inns, & Slavin, 2016).

Consistent monitoring of students' reading proficiency enables teachers to gain insights into their students' strengths and areas of needs, allowing for differentiated instructional practices. Promising practices for supporting students' reading proficiency include linking assessment data with teachers' instruction' including identification, planning, monitoring, and assessing. Continuous progress monitoring aids teachers in the identification of students' reading achievement (Jenkins, Schulze, Marti, & Harbaugh, 2017).

In this investigation, the CARP considered students' individual needs, provided continuous progress monitoring, and facilitated teachers with differential instructional planning information (Mathes, Torgesen, & Herron, 2016). The CARP was designed to adapt to students' academic reading levels by incorporating computer-adaptive algorithms. Through the CARP assessments, the program presented items with increasing difficulty to evaluate the students' reading level of ability. The CARP provided teachers with information on students' growth in the five components of effective reading instruction: phonemic awareness, alphabetic knowledge and skills, fluency, vocabulary, and comprehension (NRP, 2000).

Purpose of the Study

The purpose of the study was to examine third-grade students' reading achievement growth as measured by Istation's Indicators of Progress Early Reading (ISIP-ER) in terms of students' (a) achievement level (above and below the 20th percentile), (b) minutes of CARP usage, (c) gender, and (d) free and reduced lunch (FRL) eligibility. The investigation addressed the call for research on the effectiveness of technology programs for students across all academic levels (Cheung & Slavin, 2012; Luo et al., 2017), as the effectiveness and usage of a reading intervention may vary based on students' reading ability (Sullivan, Kohli, Farnsworth, Sadeh, & Jones, 2017). Time on task (usage in terms of the numbers of minutes of the CARP), a known indicator of reading achievement growth, warranted the investigation of minutes of use and its effects on reading achievement (Patarapichayatham, 2014). Student data were examined, comparing growth among students who used the program for the recommended number of minutes as opposed to students who did not complete the recommended minutes. Finally, the differences of reading achievement scores by student characteristics (e.g. gender and FRL that may place students at risk for reading underachievement) were examined for students most at risk for reading failure (at or below the 20th percentile). The following research question guided the investigation: Do third-grade students' reading achievement scores change over the school year depending on their achievement level (above and below the 20th percentile) and their CARP usage when considering gender and socioeconomic status?

Method

Participants

Third-grade students' (N = 22,962; 46.4% female and 53.6% male) achievement was measured at four points during the school year: (a) assessment at the beginning of the year (BOY), (b) assessment at midyear (MOY_1), (c) assessment at midyear (MOY_2), and (d) assessment at the end of the year (EOY). For students below the 20th percentile (n = 5,042), 65.6% were economically disadvantaged, as evidenced by their eligibility for the free and reduced lunch program, compared to 47.4% for students above the 20th percentile (n = 17,920). Those who were economically disadvantaged came from both Title I and non-Title I schools.

Students scoring at or below the 20th percentile were performing below their grade level and needed intensive reading intervention. Students' expected

annual reading achievement growth, (derived from Istation Indicators of Progress – Early Reading (ISIP-ER) norms), included a 10-point gain for students in the lowest level of achievement (at or below the 20th percentile; Roden, 2011).

Procedure

In this study, de-identified assessment and usage data were collected during the 2016-2017 school year from participants (third-grade students) across one large Southeastern state. Students began using the CARP at the beginning of the school year in either August or September and continued using the CARP throughout the school year.

Measures

Istation Indicators of Progress – Early Reading (ISIP-ER) Assessment. The CARP automatically administers the ISIP-ER assessment at the beginning of each month, or the first time students log in to the reading program for that month. ISIP-ER incorporates a computer adaptive testing (CAT) algorithm that tailors each assessment to the achievement abilities of each individual student while measuring progress in the five critical early reading skill domains: (a) phonemic awareness, (b) alphabetic knowledge and skills, (c) vocabulary, (d) comprehension, and (e) fluency. The ISIP-ER score is reported as an Ability Index Score (Mathes, Torgesen, & Herron, 2011). During the assessment, the students are presented with test questions of varying ability scores or levels of difficulty. Once the difficulty level at which the student is able to perform is determined, the assessment ends and the student is assigned an overall reading ability index (Mathes et al., 2011). The reliability and validity of ISIP-ER scores is supported. Specifically, evidence of reliability of the ISIP-ER scores (item response theory analogue to internal consistency reliability) is approximately .90.

Usage of the CARP. School usage minutes were minutes completed at school as verified by the school system's Internet Protocol (IP) address. Home usage included the minutes spent on the CARP at home, at a non-school library, at an afterschool program, or at a community center. Students using the CARP at home had access only to curriculum, extra reading books, and reading practice. Students did not have access to any assessments in the home environment. Students' school and home reading usage were examined separately. The CARP utilized in this study recommended 90 minutes of CARP usage per week for students at or below the 20th percentile (Mathes et al., 2016). If a full school year is considered 30 weeks (to account for assessment periods, holidays, special programs, and days off school due to inclement weather), students at or below the 20th percentile should have completed a total of 2,700 minutes. It was possible to use the CARP beyond the regular school day, as students could access the CARP at home, at libraries, or at community centers to practice reading.

Analysis

Changes in students' reading achievement from the beginning (BOY) to the end (EOY) of the school year within the distinct groups were examined by calculating paired sample t-tests, and Cohen's d. Students' achievement scores for those scoring at or below the 20th percentile (those most at risk) were examined by CARP usage, gender, and FRL eligibility.

Results

Descriptive Results

Figure 1 demonstrates the effects of the assessment and academic level interaction, indicating that all students made gains over time, with students scoring at or below the 20th percentile making greater gains in terms of increases in points. The differences in mean scores between students who scored at or below the 20th percentile versus those students who scored above the 20th percentile remained throughout third grade. The distance between growth lines were similar between the groups, meaning, on average, students in all academic levels made upward progress from assessment to assessment. Students evidenced statistically significant score improvement throughout the assessment periods from the beginning to the end of the year. Over the course of third grade, students' above the 20st percentile achievement scores increased on average by approximately 18 points (d = 1.2), and students' scores increased by almost 23 points (d = 1.4) for those at or below the 20th percentile.

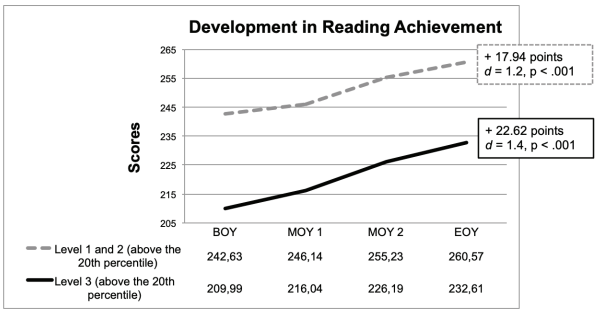

Figure 1

The change in reading achievement during third grade year (August – May)

Usage of the CARP: School and Home

In an additional step, the usage of the CARP was investigated by examining (a) the school usage and (b) the home usage for students in the lowest academic achievement level (at or below the 20th percentile). Paired sample t-tests indicated that students at or below the 20th percentile who used the CARP at home for the recommended minutes of 2,700 or more made the greatest gains in terms of points, with an average increase of 31.62 points. Students who used the program for less than the recommended number of minutes made gains, on average, of 22.56 points. Regarding school usage, students who used the program for less than 2,700

minutes evidenced an average increase of 22.68 points. Similarly, students who used the program at school for more than the recommended 2,700 minutes evidenced an average increase of 22.04 points from the beginning to the end of third grade.

Potential Risk Factors

There were differences between the achievement levels of those above and below the 20th percentile in terms of the distribution of gender and free and reduced lunch eligibility. The gender of students included more males than females. Approximately 65.6% of the students were eligible for free and reduced lunch, compared to 47.4% of the students above the 20st percentile. Independent sample *t*-tests revealed that male students (at or below the 20th percentile) scored significantly lower than female students (at or below the 20th percentile) at the beginning of the year ($M_{BOY\text{-}Male}$ = 208.51; $M_{BOY\text{-}Female}$ = 211.61); however, those differences narrowed by the end of the school year (EOY; $M_{EOY\text{-}Male}$ = 231.90; $M_{EOY\text{-}Female}$ = 233.21), resulting in nonsignificant differences (p = 0.73) between male and female students (at $p < .001$). Further, among those who were eligible for FRL and were at or below the 20th percentile, there were no significant differences at the beginning of the year; however, at the end of the year, statistically significant differences emerged. Students eligible for FRL scored slightly lower than those not eligible ($M_{EOY\text{-}FRL.ELIGIBLE}$ = 231.33; $M_{BOY\text{-}NON.ELIGIBLE}$ = 233.97).

Table 1 presents the results of the paired sample t-tests (BOY and EOY) for students by gender and FRL eligibility, accounting for school and home CARP usage. The categories less and more than 900 minutes were chosen because there were negligible differences between 900, 1,800, and 2,700 minutes of usage. For all subgroups, students made greater gains if they used the program for more than 900 minutes. Male students gained almost 27 points over the course of third grade if they used the program for more than 900 minutes at home (d = 1.69), equaling 30 minutes per week over a school year of approximately 30 weeks. Overall, students who were economically disadvantaged using the CARP for less than 900 minutes in school made the least amount of gains (d = 1.10).

Table 1 Computer-adaptive Reading for At-Risk Students

Means (M) and standard deviations (SD) in the assessments BOY and EOY and dependent statistical values of t-test for paired samples (t, df, p) and Cohen's d (d) by school and home usage for gender and socio-economic background

Students at or below the 20th percentile

		Females					**Males**				
		BOY M(SD)	EOY M(SD)	*Diff.*	*t(df)*	*d*	BOY M(SD)	EOY M(SD)	*Diff.*	*t(df)*	*d*
School usage	< 900	213.11 (13.00)	234.46 (19.11)	-21.34	-18.77* (268)	1.31	211.22 (15.81)	233.27 (20.16)	-22.01	-22.90* (431)	1.22
	> 900	211.14 (13.09)	232.73 (16.30)	-21.59	-41.98* (706)	1.46	207.53 (16.19)	231.40 (19.23)	-23.87	-48.92* (1,189)	1.33
Home usage	< 900	211.62 (13.16)	233.14 (17.17)	-21.51	-43.54* (956)	1.41	208.43 (16.22)	231.71 (19.52)	-23.29	-52.10* (1,576)	1.30
	> 900	214.76 (8.43)	236.80 (15.07)	**-22.04**	-9.52* (18)	**1.81**	211.54 (14.21)	238.29 (17.32)	**-26.75**	-7.98* (44)	**1.69**

		Non-disadvantaged					**FRL eligible (Disadvantaged)**				
		BOY M(SD)	EOY M(SD)	*Diff.*	*t(df)*	*d*	BOY M(SD)	EOY M(SD)	*Diff.*	*t(df)*	*d*
School usage	< 900	212.33 (15.36)	235.83 (19.06)	-23.59	-21.09* (291)	1.36	213.11 (13.66)	231.14 (18.66)	-18.03	-22.40* (430)	1.10
	> 900	208.75 (16.03)	233.32 (18.41)	-24.57	-44.64 (835)	1.42	209.44 (14.95)	231.38 (16.58)	-21.94	-61.07* (1,719)	1.39
Home usage	< 900	209.65 (16.04)	233.82 (18.63)	-24.17	-47.44* (1,081)	1.39	210.16 (14.69)	231.17 (17.06)	-21.01	-63.14* (2,094)	1.32
	> 900	210.33 (13.19)	237.53 (17.84)	**-27.20**	-10.75* (45)	**1.73**	210.70 (14.94)	237.32 (14.00)	**-26.62**	-10.57* (55)	**1.84**

Note. * $p < .001$

Discussion

The effects of a CARP on third-grade students' reading achievement for students scoring at or below the 20th percentile were examined in terms of usage, gender, and FRL status. The findings are discussed in relation to the following topics: (a) development of reading achievement by academic level; (b) the role of usage; (c) development of reading achievement by gender and FRL; and (d) the interrelationship between academic level, usage, and student demographics.

Development of Reading Achievement by Academic Level

Third-grade students' achievement scores improved significantly for all students regardless of their academic level when using a CARP. Students at the lowest academic level (at or below the 20th percentile) scored significantly lower throughout the school year than students in higher academic achievement levels (above the 20th percentile). However, students at or below the 20th percentile made slightly greater growth gains in terms of points and exceeded the ISIP-ER normed expectations for their academic level. The finding contributes to the field of educational research for at-risk students, in response to Cheung and Slavin's (2013) review, which concluded that "there is a limited evidence base for the use of technology applications to enhance the reading performance of struggling readers in elementary school" (p. 296). Despite students at or below the 20th percentile evidencing slightly greater gains in terms of the increase in points, their rate of progress was not sufficient to narrow the achievement gap. In fact, the reading scores of students at the lowest academic level (at or below the 20th percentile) at the end of the year remained below the scores of their counterparts above the 20th percentile from the beginning of the school year.

The Role of Usage of the CARP

With regard to students' school usage of the CARP, there were minimal differences between students who were at or below the 20th percentile who used the CARP for more than 2,700 minutes versus the students who used the program for less than 2,700 minutes but more than 900 minutes (30 minutes of usage per week for an average of 30 weeks). An examination of students' home usage of the CARP indicated students at or below the 20th percentile who used the home component for more than 2,700 minutes (on average, 90 mins per week for 30 weeks) made the greatest amount of gains in terms of growth of achievement scores with an increase of almost 32 points from the beginning to the end of third grade compared to an increase of 23 points for students who used it for less than 2,700 minutes. For these students, home usage (90 minutes per week for 30 weeks) seems to have a greater impact on achievement than just school usage, highlighting the importance of supporting students and families with home access to technology-enhanced reading instruction (KewalRamani et al., 2018).

Development of Reading Achievement by Gender and FRL Eligibility

When considering students at or below the 20th percentile by gender and FRL status, regardless of CARP usage, there were statistically significant differences by gender. At the beginning of third grade, male students scored significantly lower than female students. By the end of third grade, the achievement gap between students by gender closed and there were no significant differences in achievement. In contrast, an examination of the achievement of students classified by FRL eligibility at the beginning of the school year indicated no significant difference. By the end of the school year, students eligible for FRL scored significantly lower than students not eligible for FRL. Without accounting for the usage of CARP, the achievement gap widened by SES (when defined as FRL eligibility). These findings support the need to further investigate the role that CARPs play for narrowing the reading achievement gap (Kuder, 2017; Stevens, Walker, & Vaughn, 2017).

Interrelationship Between Students' Level, Usage, and Demographic Data

Students at or below the 20th percentile (those most academically disadvantaged, n = 5,042) who used the CARP in school for over 900 minutes (on average, 30 mins a week for 30 weeks) scored higher in comparison to those who used the CARP for less than 900 minutes or used it for assessment only purposes. In general, the finding supports the usage of supplemental CARP with those in the lower quartile in reading. Analysis of the results of home usage of the CARP indicated that male students at or below the 20th percentile made gains of almost 27 points from the beginning to the end of the school year if they used the home component for more than 900 minutes (which equaled 30 minutes per week over a period of 30 weeks). Not only did the gap between male and female students (at or below the 20th percentile) shrink, in fact, males outperformed the females in reading achievement over the course of third grade if they used the home component for more than 900 minutes. Moreover, students who were FRL eligible gained, on average, around 27 points when they used the home component for more than 900 minutes, indicating the need for extra remediation to have greater gains in reading achievement. Home usage of the CARP made a difference in achievement for all students, especially for male students (d = 1.69) and FRL-eligible students (d = 1.84). Overall, future efforts should focus on improving home access to technologies for all students, especially those in the greatest need of academic remediation in reading.

Limitations and Implications for Future Research

A limitation of the study concerns the lack of evidence of consistent implementation. The study did not examine how teachers implemented the CARP (Luo et al., 2017). While the study examined students' usage of

the program, teachers' implementation is equally crucial regarding the program's effectiveness and students' successful development of reading skills (Carlson & Francis, 2002). Therefore, future studies may evaluate the implementation and fidelity of the CARP, teacher training, and professional development, as these variables may provide crucial insights to the effectiveness of programs. In addition, not identifying other risk factors regarding students' academic achievement mitigates the interpretation of the results. Other factors not included in this study, such as students' attitudes and motivation, can be crucial predictors of educational achievement (Ohrtman & Preston, 2014) and should be considered in other studies. Overall, the present study provided evidence supporting the use of a CARP for third-grade students in school and home settings.

In summary, the purpose of this study was to investigate third-grade students' reading achievement, accounting for academic level, usage of the CARP, gender, and FRL eligibility. The CARP appeared to be an effective tool to contribute to students' improved academic reading achievement. To narrow educational inequalities and increase students' educational opportunities, further research could examine methods that support students at risk of reading failure who are in the most need of extensive reading instruction through CARP. Additional research examining the effectiveness and implementation of CARP could inform effective CARP practices. A recommendation for professional development and teacher preparation programs includes discussing the benefits and implementation of computer-adaptive environments for reading instruction to improve achievement of all students, especially those students at the lowest achieving levels, in the quest for improving achievement inequalities.

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Book Review: *Where's the Wisdom in Service-Learning?*

Reviewed by Dorothy Seabrook

Where's the Wisdom in Service-Learning?
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Robert Shumer, PhD, has compiled 12 battle-tested examples of service-learning in *Where's the Wisdom in Service-Learning?* which includes his own journey. As an Army veteran and government employee, I have spent time over the past 20 years trying to find a niche within military-affiliated human service models to replicate the experience of service-learning. Though it may have been a challenge for military models, neatly tucked into Shumer's project is great wisdom and descriptive journeys of seasoned professionals.

Service-learning may be considered a relative term, but so can wisdom. In academia, faculty's sphere of influence and span of control would tend to revolve around classroom participation, grading of assignments, and end-of-course evaluation of knowledge attained, yet a successful experiential opportunity could significantly add to the spectrum of education and learning, human services, research and development, and leadership (Eyler & Giles, 1999), such as the wisdom described in Shuler's book. *Where's the Wisdom in Service-Learning?* not only serves as a useful historical tool, many of the works also offer recommendations for the next generation. However, many of the authors implied future generations would need to value service for the movement to survive. As an example, No Child Left Behind, which began with the best of intentions, lost its essence and value as a result of the bureaucratic process. Bureaucratic changes in funding or criteria can impact proven strategies due to shifts in political visions and fiscal projections.

Shumer's offering the purpose of the book in the Preface manages the expectation of readers that his is a reflective work versus academic or research project. Additionally, the questions posed by Giles and Stanton in the Foreword lead readers through their own reflective journey of pedagogy, terms of reference, and cultural and global implications. The Foreword is followed by the anecdotal delivery of experiences and reflections, which offers credibility in transitioning from philosophy and theory to application.

It was helpful for Shumer, along with Stanton and Giles, two other service-learning pioneers, to begin the first chapter of the book with the history and shared understanding of service-learning, to include Dewey's role in establishing the connection between education and experience. Shumer and the other authors continue by describing service-learning as a movement and as a community-based model of selfless service. One wonders if a society influenced by technology would be receptive to a process that requires introspective reasoning and ability to implement the process without a clear and specific intrinsic motivating factor.

Whether service-learning is considered a creative or an evaluative process, the opportunity exists to influence decision-making and offer meaningful discussions about service-learning. Nothing quite compares to the benefit of reflecting on a service-learning project by connecting the experience with the course material (Gomez, 2016). The researcher-posited service-learning opportunities provide more breadth through experiential learning than completing a form to document hours of an internship or through writing a capstone paper (Gomez, 2016).

Contributors to *Where's the Wisdom in Services-Learning?* offer chronological attestation to journeys filled with untitled and unassuming service-learning activities, while others fit neatly within the service-learning framework. This book offers four themes related to service learning: serve, learn, community, and teacher preparation. The wisdom provided in these chapters demonstrates there is not one clear path to service-learning. For example, John Duley's position is that wisdom stems from "living for the common good" (p. 34) while William Ramsay's memories and perspectives of service-learning offer a framework for two-way communication and the long-term benefits of the interaction. Ramsay lays claim to coining the phrase service-learning during his time at Oak Ridge Associated Universities. Giles and Eyler (1994) credit Ramsay and Robert Sigmon for the term and for the deliberate emphasis on service and learning as a combined element for effective learning, while Gomez (2016) expounds on the reciprocity of the relationship between students and the community.

Robert Sigmon's contribution to the book weaves 50 years of work into a web of personal stories and reflections of development, service-based experiential learning, and evolution of service-learning as a movement. Sigmon's "wisdom" encourages involving the community in the development and planning efforts to establish the partnerships needed for successful programming and experiences. These valuable lessons learned are similar to Timothy Stanton's thought-provoking questions at the conclusion of the next chapter that focuses on the

criticality of taking the appropriate stance to ensure continued progress. His experiences and gained wisdom may have been the result of a very different path than Sigmon's or Ramsay's, but Stanton's reflection adds another layer to this critical work for the future of service-learning.

Jane Permaul takes a different approach in presenting the wisdom in service-learning. She describes quotes by Confucius and Aristotle as the first notable acknowledgements of the theory of service-learning and also introduces the need for research, evaluation, and further development of the construct to support its growth. In contrast, James Kielsmeier introduces the need to reinstate Federal funding to support the valuable experience gained in service-learning. Kielsmeier describes implementing English language tutoring in 1966 while in South Korea, which I can attest was still in place when I served in a southern city of South Korea in 1988. The success and longevity of this service-learning project solidifies the effects and benefits to the student/benefactor, faculty/respective institutions, and communities.

Terry Pickeral presents wisdom from the perspective of how service-learning has transitioned, reflections, and looking forward. My takeaway is in Pickeral's insistence that teacher preparation, accountability, leadership, and sustainability are key elements of ensuring relevant and adaptable service-learning efforts. Similarly, Shumer added his journey and concludes with advice to educators that service-learning must be nurtured and funded while being creative and meaningful to students and the community. Cathryn Kaye's experience is not outside the spectrum of the other contributors; however, her focus contributes to guiding future generations. She offers the abbreviated guide to "The Five Stages of Service Learning" (p. 151), which codifies common language and processes for service-learning that can be replicated now and in the future, regardless of the context. This model is most helpful for sustainability of the service-learning movement. Demonstration and reflection are part of the model's continuum; however, accountability is absent. Every action taken requires some measure of success, failure, lessons learned, and best practices to be effective, particularly when there are resources expended on the effort. It is worth noting that this review only focuses on the information provided in this book; therefore, there is no specific critique of the associated or implied tasks of the model.

Bobby Hackett reported that his wisdom stemmed from two experiences early in his life that he was able to apply across all other paradigms. Similar to Kay, the framework of the "Community Engagement Models" (p. 167) can be replicated across campuses and communities through projects that would be meaningful for that locale. Themes of serve, learn, and community are most obvious in this construct, which could be operationalized to support the service-learning movement and research projects. *Where's the Wisdom in Service-Learning?* closes with Chapter 12, provided by Shumer himself, who started teaching in 1969. His contribution is closely aligned with Giles and Eyler's (1994) philosophy of service-learning, and it is timely in codifying and confirming the theory of service-learning.

This book provides a clear historical perspective and offers solid questions to challenge the future trajectory and existence of service-learning. Each contributor describes valuable experiences to establish balance in the field of service-learning. It is rare to garner such wisdom in one collective piece that maps out the road to a current position or movement. The chronological and descriptive perspectives found in the personal and professional journeys of veterans of the service-learning movement answered many of the questions posed by Giles and Eyler (1994) regarding theory development and testing.

I was surprised that I did not find information directly related to how service-learning might address current systemic issues related to poverty, discrimination, homelessness, treatment of people of color, mental health, and LBGTQ. Although arguments were not presented directly that tied social ills that would be prime for future service-learning human service projects to lessen stereotypes, the authors provided a comprehensive roadmap that would challenge students' or community organization staffs' logic of people's deficiencies and the need to self-examine their own motives, thoughts, and beliefs. Gomez (2016) also argued self-critique is a missing element of service-learning, which requires aspiring teachers to critically assess their service to and view of others, particularly students, which was understated in the contribution. An understanding of cultural humility within the construct of service-learning in communities is a way of tying students to what they may face after matriculation through their academic journey. Service-learning is frequently a part of academic rigor for some institutions, but there is still a great need to focus on societal issues as part of the community support landscape, particularly when universities are near urban communities or within a stone's throw of rural communities.

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Reviewer

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The Journal of At-Risk Issues

Call for Manuscripts

The Journal of At-Risk Issues (JARI) (ISSN1098-1608) is published by the National Dropout Prevention Center. The mission of the Center is to provide information and services to those engaged in helping young people in at-risk situations. The journal is nationally refereed, currently published twice per year, and abstracted in ERIC.

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Manuscripts should be original works not previously published nor concurrently submitted for publication to other journals. Manuscripts should be written clearly and concisely for a diverse audience, especially educational professionals in K-12 and higher education. Topics appropriate for *The Journal of At-Risk Issues* include, but are not limited to, research and practice, dropout prevention strategies, school restructuring, social and cultural reform, family issues, tracking, youth in at-risk situations, literacy, school violence, alternative education, cooperative learning, learning styles, community involvement in education, and dropout recovery.

Research reports describe original studies that have applied applications. Group designs, single-subject designs, qualitative methods, mixed methods design, and other appropriate strategies are welcome. Review articles provide qualitative and/or quantitative syntheses of published and unpublished research and other information that yields important perspectives about at-risk populations. Such articles should stress applied implications.

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Manuscripts should follow the guidelines of the *Publication Manual of the American Psychological Association* (6th ed.). Manuscripts should not exceed 25 typed, double-spaced, consecutively numbered pages, including all cited references and illustrative materials. Submitted manuscripts that do not follow APA referencing will be returned to the author without editorial review. Tables should be typed in APA format. Placement of any illustrative materials (tables, charts, figures, graphs, etc.) should be clearly indicated within the main document text. All such illustrative materials should be included in the submitted document, following the reference section. Charts, figures, graphs, etc., should also be sent as separate, clearly labeled jpeg or pdf documents, at least 300 dpi resolution.

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