



**The author(s) shown below used Federal funding provided by the U.S. Department of Justice to prepare the following resource:**

**Document Title:** Reading Intervention, Academic and Behavioral Outcomes for Adolescents: A Community Agency and University Partnership Project

**Author(s):** Janay B. Sander, Ph.D., Ruth E. Jones, Ed.D.

**Document Number:** 254457

**Date Received:** December 2019

**Award Number:** 2015-IJ-CX-0011

**This resource has not been published by the U.S. Department of Justice. This resource is being made publically available through the Office of Justice Programs' National Criminal Justice Reference Service.**

**Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.**

Grant number: 2015-IJ-CX-0011

Title of grant: Criminal Justice Researcher-Practitioner Placement Program: Reading Intervention, Academic and Behavioral Outcomes for Adolescents: A Community Agency and University Partnership Project

Location: Ball State University and Youth Opportunity Center, Muncie, Indiana

Grant period: January 1, 2016 – November 30, 2019

Principal Investigator: Janay B. Sander, Ph.D., Co-Principal Investigator: Ruth E. Jones, Ed.D., Ball State University

Statistical advisors and contributors: W. Holmes Finch, Ph.D. & Erik Nesson, Ph.D., Ball State University

Grant manager: Alan Spanbauer (email: [Alan.Spanbauer@usdoj.gov](mailto:Alan.Spanbauer@usdoj.gov))

### **Abstract**

There is an urgent need to improve the evidence base about literacy and youth outcomes in order to inform juvenile justice policies and services. This document summarizes the findings of a randomized control trial study of evidence-based reading interventions for struggling adolescent readers who were placed in a residential treatment facility due to mental health needs by a court system. Of the 245 individuals invited, 33% agreed to be screened for the study and 21% of those invited were enrolled (intervention  $n = 28$ ; control  $n = 25$ ). The intervention was effective in improving reading skills at 4-month post-test. There were no changes on social-emotional measures at post-test. Follow-up indicators included: grade point average, school attendance or completion, offense history, placement setting, and social-emotional symptoms. High attrition during the follow up period limits conclusions about long-term benefits of the reading intervention. Of participants who responded to follow-up requests from researchers, 22% of the intervention group, versus 4% of the control group, was placed at home and not in a treatment or correctional facility. This is potentially promising news about positive impact of the reading intervention and warrants further study due to the low response rate.

## Final Summary

### **Introduction**

Juvenile justice involved youth are at high risk for educational failure and are very likely to struggle with literacy (Blomberg, Bales & Piquero, 2012). Many of these adolescents have complex mental health concerns and may be placed in treatment by the courts (Cappon, L., & Vander Laenen, F., 2013). There are very few rigorous studies to inform the literature about improving reading skills with adolescents in corrections or court-affiliated treatment settings (Blomberg, et al., 2012; Mulcahy, Krezmien, Leone, Houchins & Baltodano, 2008). It is also unknown whether targeted academic interventions facilitate long-term success when combined with other treatments.

### **Research questions**

- (1) Does a targeted reading intervention produce gains in reading skills?
- (2) If the reading intervention improves reading skills, are there additional emotional or behavioral gains during treatment duration, such as lower symptoms?
- (3) Does participation in the intervention impact long-term success after discharge?

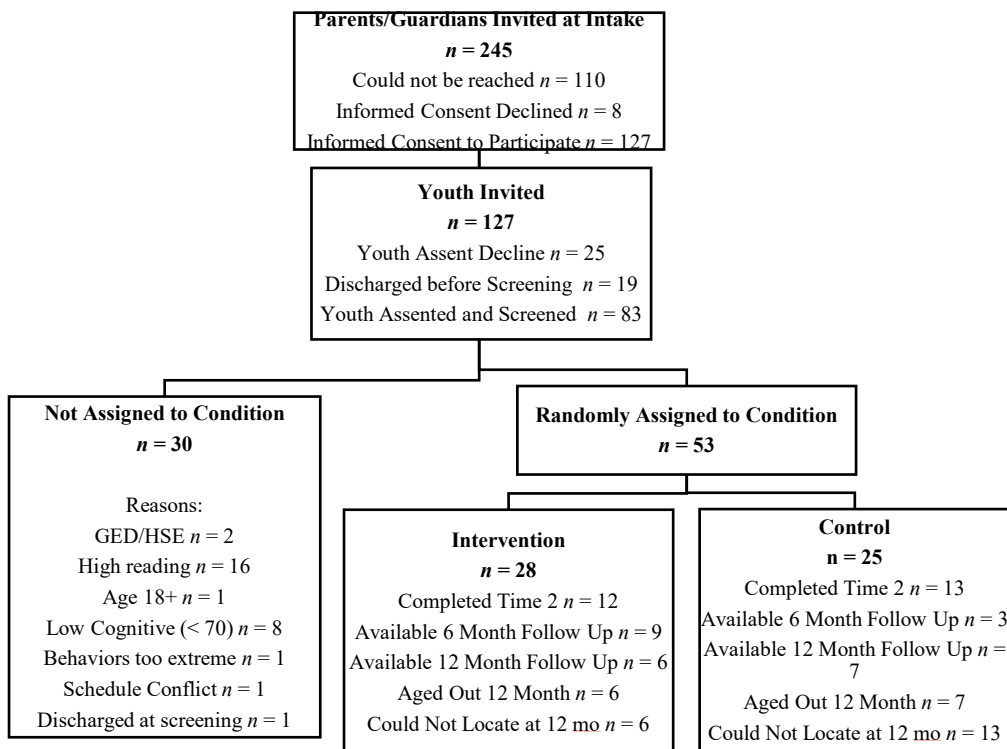
### **Method**

#### **Participants**

Of the youth who were screened for eligibility, 53 (44% female; 76% White, 20% Black/African American, 2% Latinx and 2% Biracial) qualified and agreed to participate in the study (See Figure 1 for enrollment). Participants were between ages 13 and 17 ( $M = 15.1$  years). Eligibility criteria included the following: participants must have been placed by the court system in residential treatment at the collaborating facility, be age 10-17 years old. Participants were required to have a clearly identified parent, legal guardian, or case manager with consent

authority to be included in this study. Youth who were wards of the state in custody of Department of Corrections were not eligible for the study. There was no minimum stay required for participation. Two additional criteria were required for participation: (1) If the youth demonstrated low reading skills, defined as one grade level below grade placement, or 15 points below the mean of 100 on a standardized reading measure, and (2) if the youth's cognitive abilities were measured above a standard score of 70, and they were not currently identified by their school as a student with cognitive/intellectual disabilities. The cognitive eligibility was in order to ensure the participant could likely benefit from the type of reading intervention offered as part of the study. From April 2016 through April 2018, all residents admitted to the residential facility were invited to participate. After active consent and assent the adolescent participants completed screening to ensure eligibility.

**Figure 1. Participant Enrollment and Data Available for Analysis**



## Measures

***Kaufman Test of Educational Achievement, 3<sup>rd</sup> edition*** (KTEA-3; Kaufman & Kaufman, 2014).

This is an individually administered standardized norm-referenced measure of academic achievement (used Letter & Word Recognition, Reading Comprehension and Reading Composite scores). The scores are based on a mean of 100 and standard deviation of 15 points.

***Behavioral Assessment Scale for Children-3*** (BASC-3; Reynolds & Kamphaus, 2015) is a questionnaire system designed to incorporate information from multiple raters. Youth Self Report of Personality (SRP), for adolescents between 12-21 years of age, was used in this study.

***Reading Progress Monthly via Aimsweb*** © (2012). All participants completed progress monitoring measures once per month using NCS Pearson Aimsweb © (2012) probes for reading fluency (Words Correct per Minute) and reading comprehension (Maze).

***Multidimensional Self-Concept Scale, Academic Competence*** (MSCS; Bracken, 1992). The complete scale includes six subscales, which measure competence or self-efficacy across these domains: Social, Competence, Affect, Academic, Family, and Physical. There are 25 items per scale, 150 items total, rated on a 4-point Likert scale. Only the score for Academic Competence (e.g., “I feel good about my classwork.”) was used in this study. The higher the score, the more positive the students’ self-concept, an indication of higher academic competency.

***Kaufman Assessment Battery for Children, 2<sup>nd</sup> edition*** (KABC-II; Kaufman & Kaufman, 2004).

The KABC-II is a cognitive ability test for children age 3 to 18. The Mental Processing Index was calculated for this study. This test is an individually administered standardized norm-referenced cognitive and mental processing assessment measure. Sequential processing, simultaneous processing, planning, learning, and knowledge are assessed. Scores are based on a mean of 100 and standard deviation of 15 points.

Information based on school records, parent completion of social-emotional symptom checklists, and juvenile probation office records were also included in the design and follow-up tracking process.

### **Procedures**

All probation (court)-placed residents placed at the residential treatment facility were invited to participate unless they were wards of the State. Facility staff worked closely with researchers to help researchers invite as many potential participants as possible. Researchers also contacted parents/guardians over the phone. The phone consent process included several steps to ensure compliance with ethical guidelines. All procedures were approved by the researchers' Institutional Review Board. After consent and assent, researchers administered the KTEA-3 and verified cognitive level eligibility. If eligible, the participant completed the BASC-3 and the MSCS. Participants were randomly assigned to condition if eligible. After 4.5 months, all participants completed post-test measures. Any participant who remained at the facility was invited to continue the research activities (intervention or monthly reading measures) for the duration of their stay. At discharge, researchers started the follow-up tracking clock, and at 6-months and 12-months researchers made attempts to gather school records, parent/home measures, and court records for any participant who enrolled in the study, even if they were discharged prior to 4.5 months post-test measures.

### **Intervention and Control Condition**

The intervention group participated in *Peer Assisted Learning Strategies* (PALS; Fuchs & Fuchs, 1998), combined with *SRA Corrective Reading* (Engelmann et al., 1999) 3 days per week at 60 minutes (25 minutes with each program plus a short transition break). The interventions were implemented by undergraduate students enrolled in the service-learning

course through the investigators' university. They were trained by and also supervised closely by the faculty investigators. Intervention group participants completed monthly Reading Progress Monthly assessments using Aimsweb.

**Fidelity checks.** Reading intervention fidelity checks were conducted on a weekly basis. Fidelity checks based on observations of the implementation of the *SRA Corrective Reading* (Strong et al., 2004) and PALS programs (Fuchs & Fuchs, 2006) were conducted by a graduate student research assistant who has been trained in both reading interventions and fidelity procedures. The fidelity rater conducted practice observations and reached interrater reliability with the PI and Co-PI at 95% before conducting independent fidelity ratings for the project. The steps for providing both interventions are straightforward, and fidelity of delivering the interventions was 100% for all fidelity checks conducted.

**Comparison condition education as usual.** All participants (intervention and control) received education as part of the residential treatment program. The intervention group received education as usual plus the intervention, and the control group only received education as usual. A typical school day was from 8:30am until 2:30pm (early August through end of May). All residents could participate in credit recovery programs, summer enrichment, and tutoring by staff at the facility. The research team communicated with the facility and the school on facility ground to document any specific evidence-based interventions that any resident received. The school at the facility provided routine individualized tutoring and small group instruction to all participants, but did not gather progress monitoring or incorporate any specific academic interventions or use formal intervention methods listed in resources such as the What Works Clearinghouse.

## Results

There were differences between groups in favor of intervention showing positive effects for Total Reading and Reading Comprehension at 4-month post-test (See Fig.2). Letter Word Identification was not statistically significant using means comparisons tests (Total Reading ( $F(1,22) = 13.8, p = .001, \text{partial } \eta^2 = .39$ ); Cohen's  $d = 1.60$ ; Reading Comprehension ( $F(1,22) = 8.4, p = .008, \text{partial } \eta^2 = .28$ ); Cohen's  $d = 1.34$ ; Letter Word Identification ( $F(1,23) = 1.1, p = .32, \text{partial } \eta^2 = .04$ ); Cohen's  $d = .45$ ). See Figure 2 for growth in standard scores on reading measures. The monthly progress probes visually showed the control group at higher fluency levels than the intervention group (see Figure 3). There were no differences between groups for BASC-3 index t-scores at post-test. Effect sizes were low (Internalizing Index Hedges  $g = -.09$ ) to moderate (Emotional Symptoms Index Hedges  $g = -.26$ ) in favor of the control group.

Figure 2. Growth in Standard Scores in KTEA-3 Reading by Group

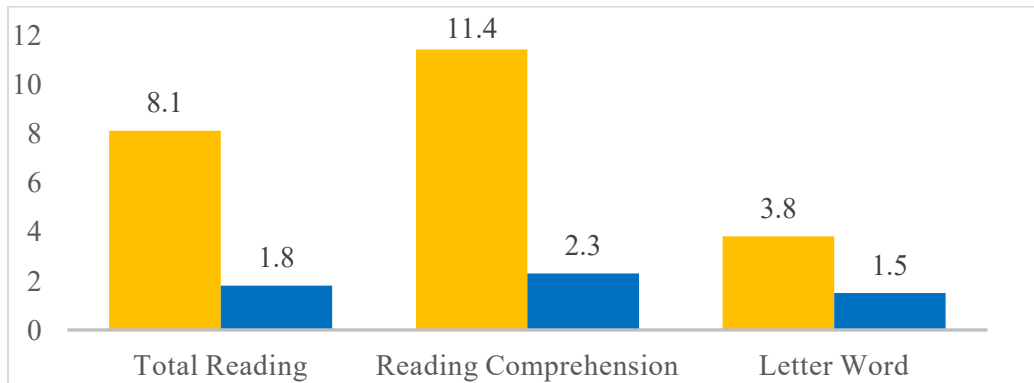
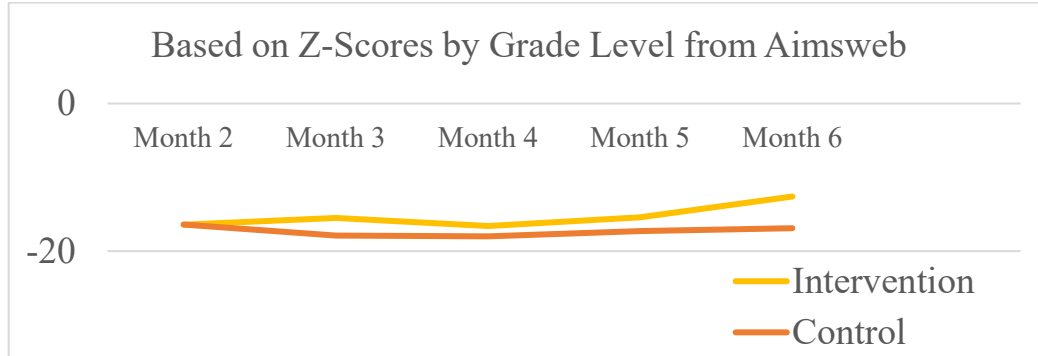




Figure 3. Reading Comprehension (MAZE) scores by group on monthly probes



Most of the participants were unavailable at follow up (74% of intervention group and 92% of control group). Of the participants who could be located, 22% of the intervention group and 4% of the control group were living at home, considered a successful outcome.

The follow-up indicators are not analyzed due to high attrition rate (control  $n = 6$ ; intervention  $n = 7$ ). The lack of available data was due to several common reasons, including: expired 18-month consent form due to longer length of stay at the facility than originally planned, lack of response from the parents to return forms to researchers with updated consent information, aging to 18+ for the adolescent and lack of approval for research with the youth participant to sign their own adult consent form, or incorrect name of information at the county probation office or the school listed on the informed consent due to the family relocating. Researchers tried various methods to locate participants, including phone calls at varying times of day, sending printed letters by mail to last known address, and asking probation offices for any new contact information if the consent form was still valid for that purpose. With such a low response rate, the follow-up information has limited inference value and further study is warranted before drawing conclusions or suggesting implications for court-related services.

## **Cost Effectiveness**

To estimate the cost-effectiveness of the reading intervention, we first transformed our dependent variables of interest into standard deviations. Next, we estimated difference in difference models to measure the change in outcomes before and after the treatment period among those in each group. There were no costs associated with the control group that were not also associated with the intervention group, thus we have removed any of these additional costs from our analysis. We calculate that the total cost of the intervention was \$4,518, which is found by summing the total costs for each component of the reading intervention package. To calculate the average cost of the intervention for each student, we divided the total cost of the intervention by the number of students in the intervention, 25, to generate an average cost of \$181 per student. Since many of the costs of the program are fixed and would not be incurred if additional students were added to the program, the cost of adding an additional student will be lower than the average cost of the program per student. Our estimated cost of adding an additional student to the program is \$142.

Following the analyses conducted earlier, we examined four outcomes: (1) the KTEA Total Reading score; (2) KTEA Reading Comprehension score; (3) KTEA Letter Word Identification score; and (4) the Multidimensional Self Concept Scale. We report the standardized intervention effects, the total and average intervention costs, and the marginal cost of adding an additional student to the intervention. Finally, we report cost-effectiveness ratios. The cost-effectiveness ratios measure the expected cost of improving each measure by one standard deviation.

We estimate that the intervention increased the KTEA Total Reading and Reading Comprehension scores by about 0.52 and 0.68 standard deviations, respectively. The estimated

effects for the Letter Word Identification and Multidimensional Self Concept Scale are much smaller and not statistically significant. As the reading intervention led to statistically significant improvements in the Total Reading and Reading Comprehension scores, we calculate cost-effectiveness ratios for these two outcomes. We estimate that it will cost \$350 to increase the KTEA Total Reading Score by one standard deviation, with the 95% confidence interval of the costs per standard deviation increase falling at \$223 to \$793 per standard deviation increase. For the KTEA Reading Comprehension Score, we estimate that it will cost \$350 to increase the Reading Comprehension Score by one standard deviation, with the 95% confidence interval of the costs per standard deviation increase falling at \$223 to \$793 per standard deviation increase.

### **Limitations**

There were several limitations to this study. First, despite having adequate resources to obtain consent and enroll participants in the study, researchers were able to contact 56% of the potential participants to seek consent. Secondly, 25% of the participants assigned to a group for the study turned 18 during the follow up time frame, which nullified the informed consent and made them unavailable for follow up. Lastly, of those participants who were assigned to conditions and were still minors, only 47% of them were still at the facility when time 2 post-test measures were administered. Most participants who were discharged prior to time 2 were unsuccessfully discharged (33% of sample). Due to the high proportion of unavailable data for a variety of reasons, it is difficult to draw clear conclusions about some of the outcomes in this study.

### **Discussion and Implications**

The most important finding of this study is the dramatic increase in reading skills after only 4 months for the intervention group. With small sample sizes the effect is noteworthy. The

intervention itself is readily available and requires minimal training. Court-based settings are encouraged to consider using the combination of SRA Corrective Reading and PALS for struggling adolescent readers who may otherwise not have access to evidence-based literacy interventions. The high attrition at follow up and the low number of potential participants who consented and assented to be included in the study is a barrier to drawing firm long-term conclusions. The long-term potential benefits, including emotional and behavioral, warrant ongoing and additional studies. Given the low risk of harm from a reading intervention, facilities are encouraged to adopt these specific long-standing evidence-based interventions and seek partnerships with researchers conducting academic interventions to facilitate further scientific knowledge about the needs and evidence-based interventions with potential to benefit court-placed adolescents.

### References

- Blomberg, T. G., Bales, W. D., & Piquero, A. R. (2012). Is educational achievement a turning point for incarcerated delinquents across race and sex?. *Journal of youth and adolescence*, 41(2), 202-216.
- Cappon, L., & Vander Laenen, F. (2013). Mental health in juvenile judges' decision-making: Review of literature. *International journal of law and psychiatry*, 36(1), 65-72.
- Engelmann, S., Meyer, L., Carnine, L., Becker, W., Eisele, J., & Johnson, G. (1999). *Corrective reading decoding level B: Decoding strategies*. Columbus, OH: Science Research Associates (SRA).
- Fuchs, D., & Fuchs, L. (1998). *Peer Assisted Learning Strategies (PALS)*.
- Kaufman, A. S. (2014). *Kaufman Test of Educational Achievement, (KTEA-3) technical & interpretive manual*. Bloomington, MN: Pearson.

Mulcahy, C. A., Krezmien, M. P., Leone, P. E., Houchins, D. E., & Baltodano, H. (2008).

Lessons learned: Barriers and solutions for conducting reading investigations in juvenile corrections settings. *Reading & Writing Quarterly*, 24(2), 239-252.

NCS Pearson, Inc. (2012). *aimsweb Technical Manual*. Bloomington, MN: NCS Pearson, Inc.

Reynolds, C. R., & Kamphaus, R. W. (2015). *Behavior assessment system for children—Third Edition (BASC-3)*. Bloomington, MN: Pearson.