

Sawyer, BST & Coaching
2013–2014 Wing Grant

The Effects of Behavioral Skills Training and Instructional Coaching on Teachers' Implementation of
Empirically Supported Procedures

Mary Sawyer

The Ohio State University

Acknowledgements

This research was funded by The Wing Institute.

Abstract

The purpose of this research was to use behavioral skills training and coaching to help new teachers engage in evidence based practice. Using these training and support procedures, the researcher guided three preservice teachers as they identified academic and behavioral classroom needs, consulted the research literature, selected empirically supported procedures, and adapted them to fit their classroom contexts. They were then supported in the implementation and progress monitoring of those procedures.

Two experiments utilized multiple baseline designs across skills to demonstrate functional relations between the professional development procedures and the teachers' implementation fidelity.

Research Goals

The purpose of this study was to determine the effects of behavioral skills training (BST) and coaching on new special educators' implementation fidelity of empirically supported procedures (ESPs). Criteria for ESP included a minimum of three peer-reviewed sources of evidence (i.e., experimental research designs, meta-analyses, empirical literature reviews); one resource was required to demonstrate the ESP's effectiveness with a similar population, one resource had to evidence the ESP's efficacy in addressing a similar issue (e.g., science vocabulary, on-task behavior), and one resource must have shown the ESP's implementation in a similar setting (e.g., special education classroom, resource room). ESPs were academic or behavioral interventions, and preference was given to ESPs with more extensive literature support and empirical evidence and those with better contextual fit (i.e., considered acceptable and feasible by participants and mentor teachers, addressed relevant IEP goals and objectives). Two experiments were conducted using slightly different procedures with three preservice teachers. The first study took place during the autumn semester of 2013, and the second occurred during the spring semester of 2014.

Experiment 1

Participants and Setting

Katie was an undergraduate senior completing her final student teaching practicum in a special education program at a large Midwestern university. Katie's practicum placement was in a classroom for students with moderate to intensive disabilities at a public high school in an urban school district. ESPs were implemented with Katie's third period science class. In this class were six students, and four of the students did not have vocal verbal behavior. BST and coaching sessions were conducted before or after school, or on the weekends in an empty classroom or local coffee shop.

The first author served as the trainer and coach. She was a board certified behavior analyst (BCBA) currently enrolled in a doctoral program for special education with an emphasis on applied behavior analysis (ABA). She held master's degrees in special education and ABA and had eight years of

experience working with students with and without special needs. She had one year of experience supervising student teachers and five years of experience training parents and teachers.

Dependent Variables and Data Collection

Data were collected, on average, three times weekly from 9:15–10:05 during third period science class. The dependent variable was the fidelity with which the teacher implemented the ESPs. Procedural fidelity was measured using task analyses of the ESPs and calculated as a percentage by dividing the number of steps implemented accurately by the number of steps that should have been implemented during the observation and multiplying by 100. A total of four ESPs were targeted.

The Beeper System. This momentary time sampling procedure was selected to increase on-task behavior. It involved public posting of student on-task behavior at 5-min intervals and was implemented with the whole class throughout the period. The teacher monitored progress by recording percentage of intervals on task for each student each day.

Constant time delay. This method of explicit instruction was used to teach vocabulary to the four nonverbal students. It was implemented at end of the period at a table in the back of the classroom. The teacher recorded each student's correctly and incorrectly identified vocabulary terms each day to use as progress monitoring data.

Direct instruction lesson plan. This lesson plan format was used to facilitate explicit instruction during science with 1-3 primary learning objectives, embedded teacher input statements, and questions for evoking active student responding. The lesson plan was written in advance and implemented with the whole class.

Evoking active student responding (ASR). This procedure for soliciting and responding to student responses involved a 5-step sequence: (a) teacher question, (b) wait time, (c) signal, (d) student response, and (e) affirmative or corrective feedback. It was used with the whole class during new content instruction. The teacher identified 1-3 primary learning objectives for each lesson and recorded the number of primary learning objectives mastered by each student each session, evidenced by correct individual ASR.

Table 1.

Empirically supported treatments used in Experiment 1 and their qualifying evidence.

	Similar Student Population	Similar Student Outcome	Similar Setting
Beeper System	Matson & Boisjoli, 2009 (lit review supporting use with students with ID and/or autism)	Riley, McKeivitt, Shriver, & Allen, 2011 (increasing on-task, decreasing off-task)	Wolf, Giles, & Hall, 1968 (special education classroom)
Constant Time Delay	Hua, Woods-Groves, Kaldenberg, & Scheidecker, 2013 (young adults with ID); Walker, 2008 (students with autism); Schuster, Gast, Wolery, & Gultinan, 1988 (adolescents with MR)	Hua et al., 2013 (expository vocabulary and reading comprehension); Hughes & Fredrick, 2006 (targeted vocabulary)	Hua et al., 2013 (small group, 4 students); Schuster et al., 1988 (small group/one-on-one)
Direct instruction lesson plan	Knight, Spooner, Browder, Smith, & Wood, 2013 (secondary students with ASD and ID); Riggs, Collins, Kleinert, & Knight, 2013 (high school students with moderate-severe disabilities)	Knight, Smith, Spooner, & Browder, 2012 (science vocab); Knight et al., 2013 (science concepts)	Ledford, Lane, Elam, & Wolery, 2012 (small groups of 2-10 students); Riggs et al., 2013 (high school self-contained classroom)
Evoking ASR	Berrong, Schuster, Morse, & Collins, 2007 (students with moderate to severe disabilities)	Christle & Schuster, 2003 (student participation, academic achievement, and on-task behavior)	Haydon, Marsicano, & Scott, 2013 (whole-group instruction)

Procedures

Phase 1: Enroll Teacher. The teacher was interviewed to identify areas to target based on both teacher and student needs. Prebaseline observations were conducted to confirm these needs. Then, the first author identified ESPs to target each of the four issues and created a procedural checklist for each one.

Phase 2: Suggest Practices (Baseline 1). Prior to collecting baseline data, Katie was told the names of the ESPs to implement. No instructions or explanations were provided, and Katie was simply told, “Try your best.”

Phase 3: Written Instructions (Baseline 2). After establishing low levels of fidelity during Baseline 1, written instructions (i.e., the procedural checklists) for the ESPs were provided. Katie was again told, “Try your best” to implement the ESPs using the written instructions.

Phase 4: BST. Instructions, modeling, role-play, & feedback were implemented in a staggered fashion across ESPs. Following BST, observations and data collection resumed.

Phase 5: Coaching. If procedural fidelity was below 90% fidelity across two consecutive sessions, coaching procedures (i.e., a combination of graphical and verbal feedback along with BST procedures, problem-solving, and goal-setting) were conducted.

Phase 6: Post-coaching. Regular observations continued until the end of the semester. Coaching would have been reinstated contingent on fidelity falling below 90% across two consecutive sessions, but this was not necessary.

Results

Figure 1 displays the results. Procedural fidelity was low across ESPs throughout both baseline conditions. BST was effective in increasing fidelity with all four ESPs. Coaching was only needed for one ESP, and it was in increasing and stabilizing higher levels of fidelity for that one. The preservice teacher rated the ESPs and the BST and coaching procedures highly socially valid, and she even taught other teachers in the school how to implement the Beeper System and how to evoke and respond to ASR.

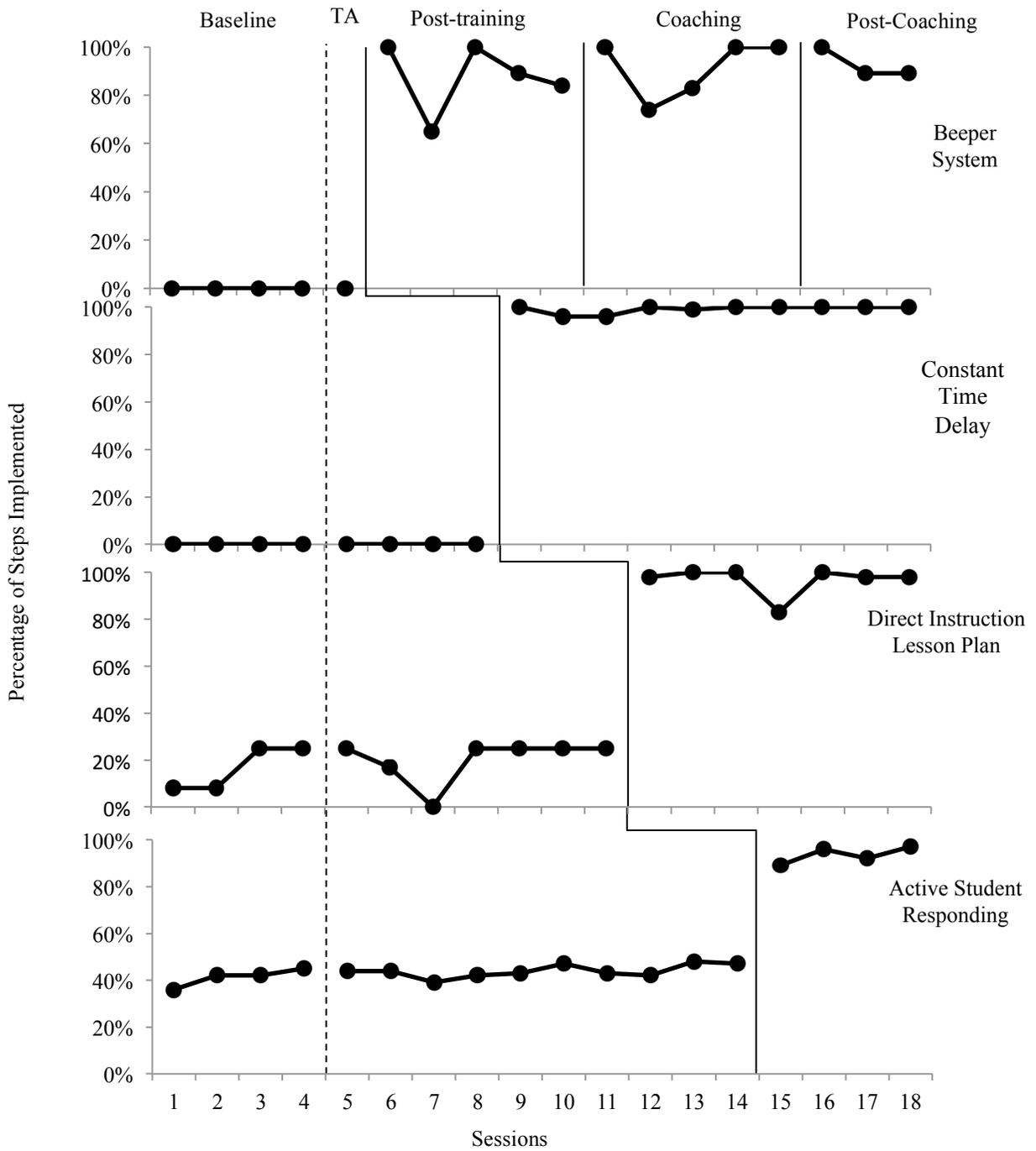


Figure 1. Procedural fidelity with ESPs.

Experiment 2

Participants and Setting

Sammy and Heather were both undergraduate seniors completing their final student teaching practica in a special education program at a large Midwestern university. Both student teachers were working toward licensure as intervention specialists for students with mild to moderate disabilities, and both teachers' practicum placements were at public middle schools in suburban school districts. Sammy implemented ESPs with her first period supplemental class. In this class were seven male students with disabilities including ADHD, ODD, EBD, and SLD. Heather implemented ESPs with her third period language arts group. The students in this group were two females and two males with disabilities including ADHD and SLD. They spent the first half of the period in an inclusive setting with 19 other students, and they were pulled out for small group instruction during the second half of the period. Initial interviews, planning, and coaching sessions were conducted before or after school, or on the weekends in an empty classroom or local coffee shop. As in Experiment 1, the first author served as the coach.

Dependent Variables and Data Collection

Data were collected, on average, three times weekly for each teacher. Observation sessions for Sammy were from 8:05–8:55 during first period, seventh grade supplemental class. Heather's observation sessions were from 9:50–11:00 during third period, fifth grade language arts class. The dependent variable was the fidelity with which the teachers implemented the ESPs. Procedural fidelity was measured using task analyses of the ESPs and calculated as a percentage by dividing the number of steps implemented accurately by the number of steps that should have been implemented during the observation and multiplying by 100. A total of three ESPs were targeted for Sammy, and a total of five ESPs were targeted for Heather.

Student-Teacher Game (Sammy and Heather). This momentary time sampling procedure was selected to increase on-task behavior. Sammy implemented the game with the whole class throughout the period using 5-min intervals. Heather implemented it with her small group privately during the inclusion

class using 2-min intervals and publicly during small group instruction using 5-min intervals. The teachers monitored progress by recording percentage of intervals on task for each student each day.

SAFMEDS (Sammy and Heather). This strategy for increasing vocabulary and fluency was used by Sammy with a small group of students and by Heather with her four students during small group instruction. The students used standard celeration charts to record their correct and incorrect responses, and the teachers recorded each student's progress daily.

Organizational Checklist (Sammy). This strategy for improving organizational skills was implemented by Sammy classwide at the beginning of each supplemental period. Students earned points for meeting each criterion outlined on the checklist: (a) being in seat on time, (b) having homework completed and ready to turn in for each class, (c) having up-to-date agenda, and (d) completing self-monitoring chart. Points were exchangeable for a variety of backup reinforcers, and the teacher collected data on the number of points earned daily.

Check-In Check-Out (CICO) Procedure (Heather). This strategy for increasing on-task and organizational behaviors was implemented as a Tier 3 intervention with one of Heather's students. The student could earn points during each class period throughout the day, and Heather served as his CICO coach who he reported to at the end of the language arts period each day. When the student met his weekly goal, he could exchange those points for a backup reinforcer. The teacher collected data on the number of points earned daily.

Repeated Readings (Heather). This strategy for increasing fluency and comprehension was implemented as a Tier 3 by Heather with one student during small group instruction. The student read a passage for three, one-minute timings. The teacher used an error correction procedure and provided praise for incorrect and correct responses after each timing, and the teacher recorded the number of words read correct per minute (WRCPM) for each timing.

Self-Questioning Journals (Heather). This strategy for increasing comprehension and improving writing was implemented by Heather with all four of her students during small group instruction. The students wrote responses to questions in their journals as they read in order to self-

monitor comprehension. The teacher evaluated responses to comprehension questions and writing samples and collected data on student progress.

Table 1.

Empirically supported treatments used in Experiment 1 and their qualifying evidence.

	Similar Student population	Similar Student Outcome	Similar Setting
Student-Teacher/Good Behavior Game (Sammy & Heather)	Theodore, Bray, Kehle, & Jenson, 2001 (adolescents with SED); Poduska, Kellam, Wang, Brown, Ialongo, & Toyinbo, 2008 (students with EBD); Chafouleas, Hagermoser-Sanetti, Haffery, & Fallon, 2012 (middle school students); Sutherland, Wehby, & Copeland, 2000 (5th grade students with EBD)	Poduska, et al., 2008 (reducing disruptive behavior, increasing on-task behavior); Riley, McKeivitt, Shriver, & Allen, 2011 (increasing on-task, decreasing off-task); Sutherland et al., 2000 (on-task behavior)	Riley, et al., 2011 (gen ed classroom); Flower, McKenna, Muething, Bryant, & Bryant, 2014 (secondary school special ed resource classroom);
SAFMEDS (Sammy & Heather)	Byrnes, Macfarlane, Young, & West, 1990 (secondary students with LD and behavior disorders)	Heward, 1997 (reading fluency); Meindl, Ivy, Miller, Neef, & Williamson, 2013 (fluent responding)	Byrnes et al., 1990 (special education resource room); Heward, 1997 (classroom)
Check-in Check-out (Heather)	Simonsen, Myers, & Briere III, 2011 (adolescents with behavior problems)	Campbell & Anderson, 2011 (reduce problem behavior, increase academic engagement)	Simonsen et al., 2011 (urban middle school); Hawken & Horner, 2003 (middle school)
Organizational checklist (Sammy)	Gureasko-Moore, DuPaul, & White, 2006 (7th grade males with ADHD); Snyder & Bambara, 1997 (7th & 8th grade students with LD)	Gureasko-Moore et al., 2006 (organizational skills—prepared for class and completed assignments); Langberg et al., 2012 (organizational skills)	Langberg, Epstein, Beck, Girio-Herrera, & Vaughn, 2012 (middle school)
Repeated readings (Heather)	Therrein, 2004 (meta-analysis, supporting use with students with LD), Alber-Morgan, Ramp, Anderson, & Martin, 2007 (middle school with behavior problems)	Nelson, Alber, & Gordy, 2004 (reading accuracy and proficiency)	Chard, Vaughn, & Tyler, 2002 (lit review, supporting use with small groups), Alber-Morgan et al., 2007 (middle school)
Self-questioning (Heather)	Taylor, Alber, & Walker, 2002 (3rd & 5th grade students with LD);	Crabtree, Alber-Morgan, & Konrad, 2010 (reading comprehension/narrative story elements)	Berkeley, Marshak, Mastropieri, & Scruggs, 2010 (inclusive middle school classrooms)

Procedures (Adapted from Jim Knight’s instructional coaching model)

Phase 1: Enroll teacher. The teachers were interviewed to identify areas to target based on both teacher and student needs. Prebaseline observations were conducted to confirm these needs. Upon confirmation, the coach instructed the teacher to try to find ESPs to target the areas selected, and the coach also independently sought ESPs.

Phase 2: Collaborative planning. The coach met with both teachers individually to engage in collaborative planning. The teacher and coach reviewed potential ESPs that they had each identified and determined which ones to use. They located at least three evidences providing empirical support for each ESP. Together they created task analyses of the steps for each ESP, adapting it from the literature as needed to suit their classroom contexts.

Phase 3: Baseline. After task analyses had been created for each ESP, baseline data collection began. No coaching or feedback was provided at this time.

Phase 4: Coaching. Coaching was introduced in a staggered fashion across ESPs. Coaching sessions were conducted with Sammy immediately before first period science class (i.e., prior to the subsequent observation). Coaching sessions were conducted with Heather after school on the day prior to the subsequent observation sessions. Coaching involved the collaborative exploration of data from the prior observation, a review of the ESP procedural checklist, affirmative and corrective feedback, problem solving of barriers to implementation, and goal-setting. The teacher and coach also role-played missed steps. Coaching sessions were 10 min in duration, on average.

Phase 6: Maintenance. Post-coaching maintenance data were collected for Sammy at one and two weeks following the last coaching session. No feedback was provided following maintenance observations.

Results

Figures 2 and 3 display the results. Coaching was effective in achieving high, stable levels of fidelity with ESPs across both teachers. Heather did not need coaching on the self-questioning ESP as she achieved 100% fidelity consistently in baseline; therefore, the self-questioning data are not depicted on

her graph (Figure 3). Maintenance data were collected at one and two weeks post-intervention for Sammy, and high levels of fidelity maintained across skills.

Discussion

This research demonstrated the effectiveness of BST and coaching procedures in increasing three preservice teachers' procedural fidelity with ESPs in their student teaching practicum placements. Progress monitoring data indicated that the ESPs produced desirable student outcomes, and the procedures were rated highly socially valid across participants. These methods offer a promising approach for improving new special educators' engagement in evidence based practice.

There are several limitations to this research. First, student outcome data are not reported, and conclusions regarding the effectiveness of the ESPs in achieving their intended effects are not warranted. The teachers did all report positive student outcomes, however. Second, generalization data were not collected; therefore, it is unclear whether the ESP implementation transferred to other classes or settings. Additionally, maintenance data were only collected for one participant, and these data only reflect short-term (up to two weeks) maintenance. It is unclear whether high levels of fidelity would have persisted in the long-term across participants.

Future research should examine the variables that influence the different levels of training and support that are required by different teachers. These variables may include the number of ESPs a teacher is to implement in a given situation, the number of students in the class, the complexity of the ESPs, available classroom supports, and the teacher's amount of experience. In addition, future investigations may explore the training and coaching of teachers to engage in evidence based practice as a problem solving model. A skillset that includes the ability to identify, adapt, implement, and progress monitor ESPs may be more useful than skill in implementing select ESPs to teachers who are faced with making instructional decisions throughout each day.

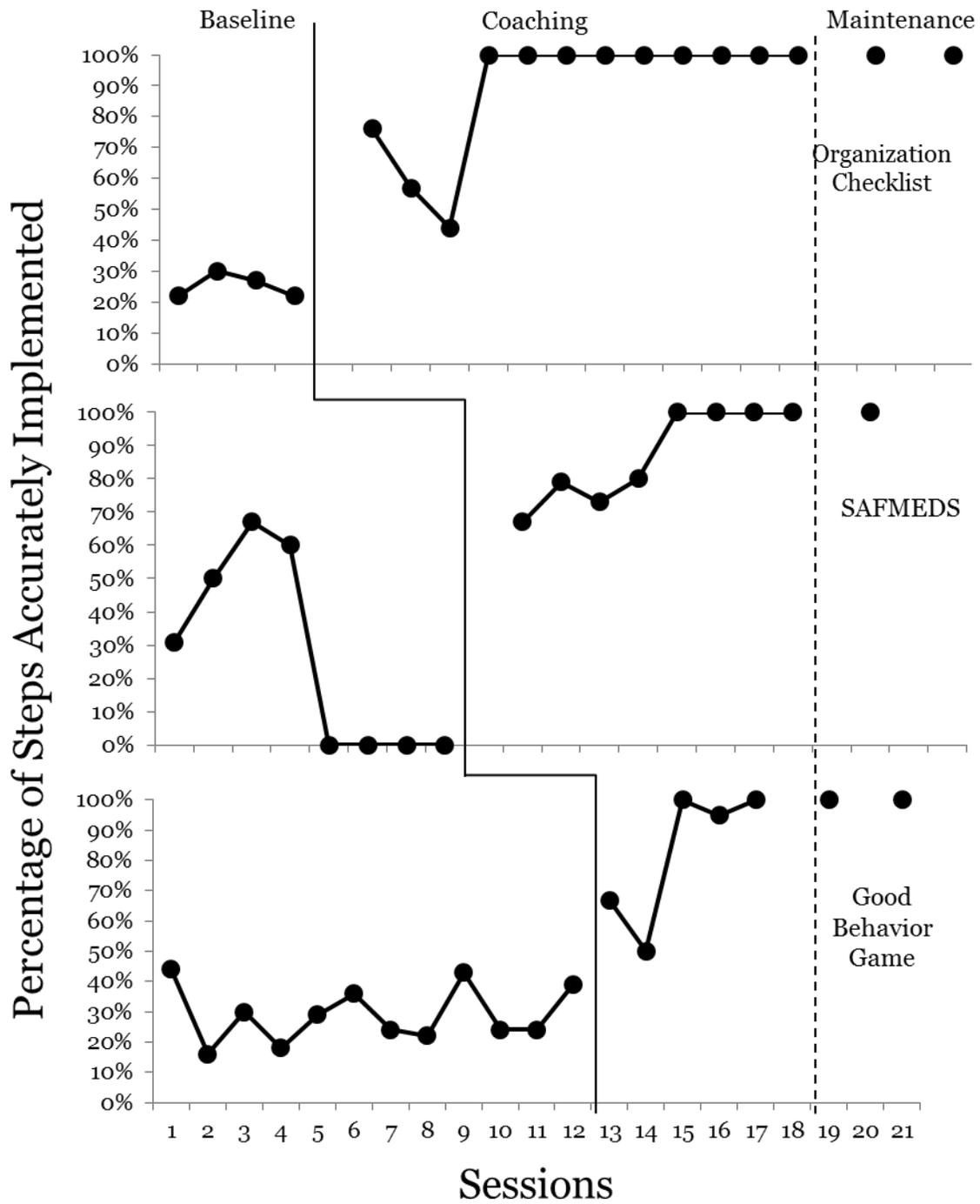


Figure 2. Sammy's procedural fidelity with ESPs.

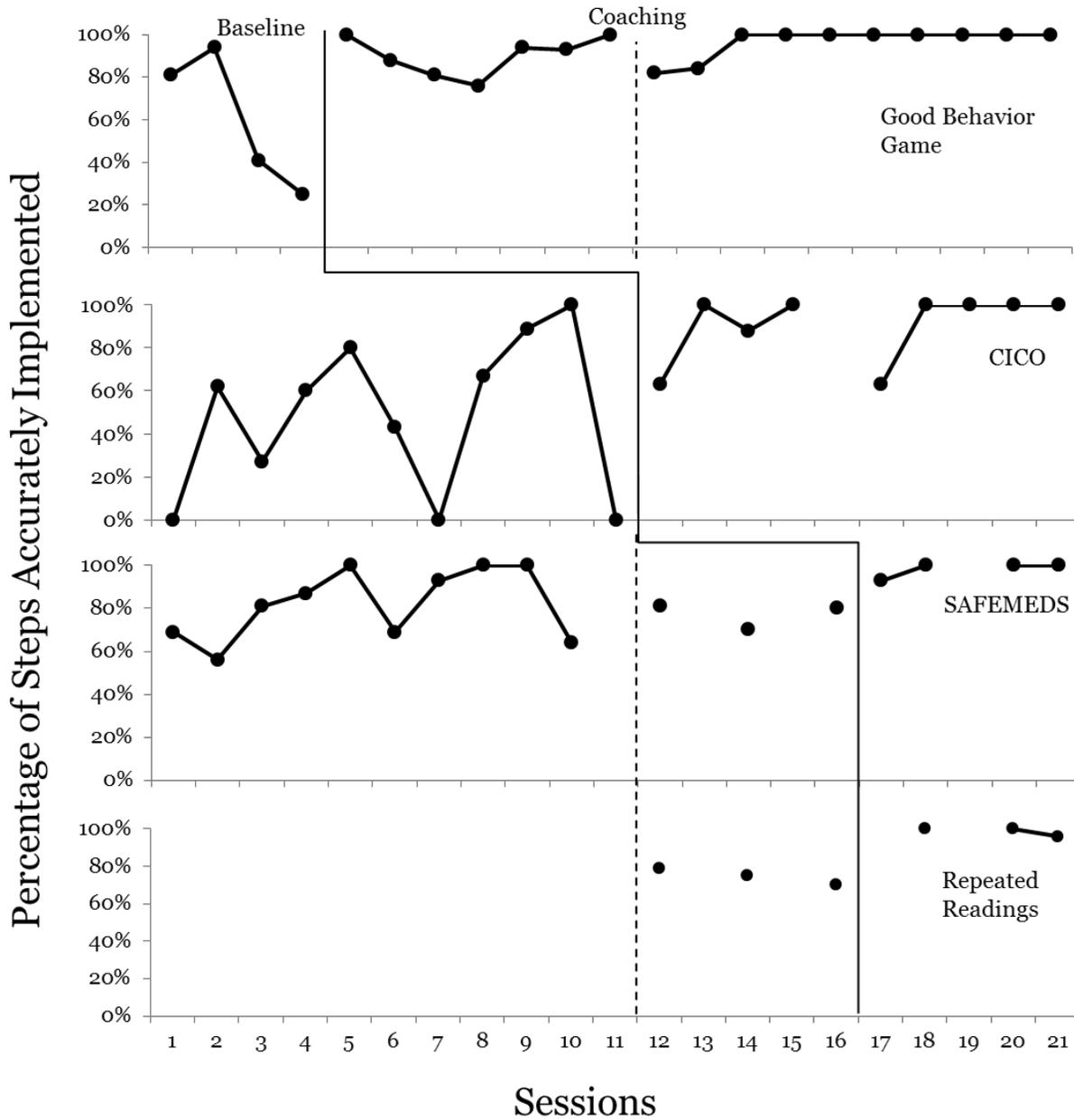


Figure 3. Heather's procedural fidelity with ESPs.

References

- Alber-Morgan, S. R., Ramp, E. M., Anderson, L. L., & Martin, C. M. (2007). Effects of repeated readings, error correction, and performance feedback on the fluency and comprehension of middle school students with behavior problems. *The Journal of Special Education, 41*, 17–30.
- Berkeley, S., Marshak, L., Mastropieri, M. A., & Scruggs, T. E. (2010). Improving student comprehension of social studies text: A self-questioning strategy for inclusive middle school classes. *Remedial and Special Education, 32*, 105–113.
- Berrong, A., K., Schuster, J. W., Morse, T. E., & Collins, B. C. (2007). The effects of response cards on active participation and social behavior of students with moderate and severe disabilities. *Journal of Developmental and Physical Disabilities, 19*, 187–199.
- Byrnes, M. E., Macfarlane, C. A., Young, K. R., & West, R. P. (1990). Using precision teaching to teach minimum competency test skills. *TEACHING Exceptional Children, 58–61*.
- Campbell, A., & Anderson, C. (2011). Check-in/check-out: A systematic evaluation and component analysis. *Journal of Applied Behavior Analysis, 44*, 315–326.
- Chafouleas, S. M., Hagermoser-Sanetti, L.M., Jaffery, R., & Fallon, L. M. (2012). An evaluation of a classwide intervention package involving self-management and a group contingency on classroom behavior of middle school students. *Journal of Behavioral Education, 21*, 34–57.
- Chard, D. J., Vaughn, S., & Tyler, B.J. (2002). A synthesis of research on effective interventions for building reading fluency with elementary students with learning disabilities. *Journal of Learning Disabilities, 35*, 386–406.
- Christle, C. A., & Schuster, J. W. (2003). The effects of using response cards on student participant, academic achievement, and on-task behavior during whole-class, math instruction. *Journal of Behavioral Education, 12*, 147–165.
- Cipani, E. (2008). *Classroom management for all teachers*. Upper Saddle River, NJ: Pearson.

- Detrich, R., Slocum, T. A., & Spencer, T. D. (2013). Evidence-based education and best available evidence: Decision-making under conditions of uncertainty. *Advances in Learning and Behavioral Disabilities, 26*, 21–44.
- Flower, A., McKenna, J., Muething, C. S., Bryant, D. P., & Bryant, B. R. (2014). Effects of the good behavior game on classwide off-task behavior in a high school basic algebra resource classroom. *Behavior Modification, 38*, 45–68.
- Gureasko-Moore, S., DuPaul, G. J., & White, G. P. (2006). The effects of self-management in general education classrooms on the organizational skills of adolescents with ADHD. *Behavior Modification, 30*, 159–183.
- Hawken, L. S., & Horner, R. H. (2003). Evaluation of a targeted intervention with a schoolwide system of behavior support. *Journal of Behavioral Education, 12*, 225–240.
- Haydon, T., Marsicano, R., & Scott, T. M. (2013). A comparison of choral and individual responding: A review of the literature. *Preventing School Failure: Alternative Education for Children and Youth, 57*, 181–188.
- Heward, W. L. (1997). Four validated instructional strategies. *Behavior and Social Issues, 7*, 43–51.
- Hua, Y., Woods-Groves, S., Kaldenberg, E. R., & Scheidecker, B. J. (2013). Effects of vocabulary instruction using constant time delay on expository reading of young adults with intellectual disability. *Focus on Autism and Other Developmental Disabilities, 28*, 89–100.
- Hughes, T. A., & Fredrick, L. D. (2006). Teaching vocabulary with students with learning disabilities using classwide peer tutoring and constant time delay. *Journal of Behavioral Education, 15*, 1–23.
- Knight, J. K. (2004). *Instructional coaching: A partnership approach to improving instruction*. Thousand Oaks, CA: Corwin.
- Knight, J., & Cornett, J. (2013). Studying the impact of instructional coaching. *Instructional Coaching, Kansas Coaching Project*. Retrieved from: <http://instructionalcoach.org>

- Knight, V. F., Smith, B. R., Spooner, F., & Browder, D. (2012). Using explicit instruction to teach science descriptors to students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 42*, 378–389.
- Knight, V. F., Spooner, F., Browder, D. M., Smith, B. R., & Wood, C. L. (2013). Using systematic instruction and graphic organizers to teach science concepts to students with autism spectrum disorders and intellectual disability. *Focus on Autism and Other Developmental Disabilities, 28*, 115–126.
- Langberg, J. M., Epsetin, J. N., Becker, S. P., Girio-Herrera, E., & Vaughn, A. J. (2012). Evaluation of the Homework, Organization, and Planning (HOPS) intervention for middle school students with attention deficit hyperactivity disorder as implemented by school mental health providers. *School Psychology Review, 41*, 342–364.
- Ledford, J. R., Lane, J. D., Elam, K. L., & Wolery, M. (2012). Using response-prompting procedures during small-group direct instruction: Outcomes and procedural variations. *American Journal of Intellectual Disabilities, 117*, 413–434.
- Matson, J. L., & Boisjoli, J. A. (2009). The token economy for children with intellectual disability and/or autism: A review. *Research in Developmental Disabilities, 30*, 240–248.
- Meindl, J. N., Ivy, J. W., Miller, N., Neef, N. A., & Williamson, R. L. (2013). An examination of stimulus control in fluency-based strategies: SAFMEDS and generalization. *Journal of Behavioral Education, 22*, 229–252.
- Nelson, J. S., Alber, S. R., & Gordy, A. (2004). Effects of systematic error correction and repeated readings on the reading accuracy and proficiency of second graders with disabilities. *Education and Treatment of Children, 27*, 186–198.
- Poduska, J. M., Kellam, S. G., Wang, W., Brown, C. H., Ialongo, N. S., & Toyinbo, P. (2008). Impact of the Good Behavior Game, a universal classroom-based behavior intervention, on young adult service use for problems with emotions, behavior, or drugs or alcohol. *Drug and Alcohol Dependence, 95*, 29–44.

- Riggs, L., Collins, B. C., Kleinert, H., & Knight, V. (2013). Teaching principles of heredity to high school students with moderate and severe disabilities. *Research and Practice for Persons with Severe Disabilities, 38*, 30-43.
- Riley, J. L., McKeivitt, B. C., Shriver, M. D., & Allen, K. D. (2011). Increasing on-task behavior using teacher attention delivered on a fixed-time schedule. *Journal of Behavioral Education, 20*, 149–162.
- Schuster, J. W., Gast, D. L., Wolery, M., & Gultinan, S. (1988). The effectiveness of a constant time-delay procedure to teach chained responses to adolescents with mental retardation. *Journal of Applied Behavior Analysis, 21*, 169–178.
- Simonsen, B., Myers, D., & Briere III., D. E. (2011). Comparing a behavioral check-in/check-out (CICO) intervention to standard practice in an urban middle school setting using an experimental group design. *Journal of Positive Behavior Interventions, 13*, 31–48.
- Snyder, M. C., & Bambara, L. M. (1997). Teaching secondary students with learning disabilities to self-manage classroom survival skills. *Journal of Learning Disabilities, 30*, 534–543.
- Sutherland, K. S., Wehby, J. H., & Copeland, S. R. (2000). Effects of varying rates of behavior-specific praise on the on-task behavior of students with EBD. *Journal of Emotional and Behavioral Disorders, 8*, 2–8, 26.
- Theodore, L. A., Bray, M. A., Kehle, T. J., & Jenson, W. R. (2001). Randomization of group contingencies and reinforcers to reduce classroom disruptive behavior. *Journal of School Psychology, 38*, 267–277.
- Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special Education, 25*, 252–261.
- Walker, G. (2008). Constant and progressive time delay procedures for teaching children with autism: A literature review. *Journal of Autism and Developmental Disorders, 38*, 261–275.
- Wolf, M. M., Giles, D. K., & Hall, R. V. (1968). Experiments with token reinforcement in a remedial classroom. *Behaviour Research and Therapy, 6*, 51–64.