



WWC Intervention Report

A summary of findings from a systematic review of the evidence



Children Identified With or At Risk for an Emotional Disturbance

December 2016

Functional Behavioral Assessment-based Interventions

Intervention Description¹

Functional behavioral assessment (FBA) is an individualized problem-solving process for addressing student problem behavior. An assessment is conducted to identify the purpose or function of a student's problem behavior. This assessment process involves collecting information about the environmental conditions that precede the problem behavior and the subsequent rewards that reinforce the behavior. The information that is gathered is then used to identify and implement individualized interventions aimed at reducing problem behaviors and increasing positive behaviors. Accordingly, the studies evaluating *FBA* examine different *FBA-based interventions* identified for each student. *FBA-based interventions* can be used to address diverse problem behaviors, such as disruptive and off-task behaviors, noncompliance, and inappropriate social interactions.

Research²

The What Works Clearinghouse (WWC) identified 17 studies of *FBA-based interventions* that both fall within the scope of the Children Identified With or At Risk for an Emotional Disturbance topic area and meet WWC pilot single-case design standards. No studies meet WWC group design standards. Seven studies meet pilot single-case design standards without reservations, and 10 studies meet pilot single-case design standards with reservations. Together, these single-case design studies included 39 children between 5 and 18 years old who are identified with or at risk for an emotional disturbance.³

Report Contents

Overview	p. 1
Intervention Information	p. 3
Research Summary	p. 4
Effectiveness Summary	p. 5
References	p. 6
Research Details for Each Study	p. 30
Outcome Measures for Each Domain	p. 55
Findings Included in the Rating for Each Outcome Domain	p. 58
Single-Case Design Findings in a Domain Not Included in the Effectiveness Rating	p. 63
Endnotes	p. 66
Rating Criteria	p. 68
Glossary of Terms	p. 70

This intervention report presents findings from a systematic review of *functional behavioral assessment-based interventions* conducted using the WWC Procedures and Standards Handbook, version 3.0, and the Children Identified With or At Risk for an Emotional Disturbance review protocol, version 3.0.

Threshold to include single-case design evidence in WWC effectiveness ratings

All single-case design experiments presented in the same research article are characterized as one study. Results from single-case design studies contribute to the WWC effectiveness rating for an outcome domain only if the studies with outcomes in that domain meet a set of threshold criteria, reflecting replication across different studies, research teams, and cases.

Specifically, these criteria are: (1) at least five studies that examine the intervention must meet WWC pilot single-case design standards without reservations or meet WWC pilot single-case design standards with reservations, and (2) the single-case design studies must be conducted by at least three different research teams with no overlapping authorship at three different institutions, and (3) the combined number of cases (i.e., participants, classrooms) must total at least 20.

For more information, please refer to the Pilot Single-Case Design standards in Appendix E of the WWC Procedures and Standards Handbook (version 3.0)

The results from single-case design studies only affect the WWC effectiveness rating for an outcome domain if the studies with outcomes in that domain collectively meet a set of threshold criteria. (See the box above for the rationale behind this threshold and a description of the criteria.)

The evidence from single-case design studies of *FBA-based interventions* on children identified with or at risk for an emotional disturbance reaches the required threshold to include single-case design evidence in the effectiveness ratings for two outcome domain(s)—school engagement and problem behavior. The evidence from the single-case design studies for *FBA-based interventions* does not reach the threshold to include single-case design evidence in the effectiveness ratings for one outcome domain—social-emotional competence.⁴ There were no studies that meet standards in the 13 other domains, so this intervention report does not report on the effectiveness of *FBA-based interventions* for those domains.⁵ (See the Effectiveness Summary on p. 5 for further description of all domains.)

Effectiveness

FBA-based interventions were found to have potentially positive effects on school engagement and potentially positive effects on problem behavior for children identified with or at risk for an emotional disturbance based on evidence from single-case design studies. The evidence from the single-case design studies for *FBA-based interventions* does not reach the threshold to include single-case design evidence in the effectiveness ratings for the social-emotional competence domain.

Table 1. Summary of findings from single-case design studies⁶

Outcome domain	Number of studies	Number of research teams	Number of cases ^a	Rating of effectiveness	Percentage of SCD experiments demonstrating a positive effect (#)	Percentage of SCD experiments demonstrating a negative effect (#)
School engagement	15	7	32	Potentially positive effects	74% (24/34)	0% (0/34)
Problem behavior	8	5	21	Potentially positive effects	68% (17/25)	0% (0/25)
Social-emotional competence	3	2	4	na	na	na

Table Notes: In single-case design research, a case, such as a student or classroom, is the unit of intervention administration and data analysis. An experiment is the examination of a single outcome measure repeatedly within and across different phases defined by the presence or absence of the intervention. There may be multiple experiments for a case if more than one outcome is examined, for example. All experiments within a research article comprise one single-case design study. For the social-emotional competence domain, the rating of effectiveness and percentage of single-case design experiments demonstrating a positive and negative effect are not applicable (na) because the studies with outcomes in this domain do not meet the threshold criteria to include single-case design evidence in the effectiveness ratings. SCD = single-case design.

^a In this intervention report, each case was a single student as opposed to a group of students, such as a classroom.

Intervention Information

Background

FBA is an individualized practice, based on operant conditioning that describes the relationship between antecedents (such as settings), behaviors, and consequences. Specific conditions or antecedents can be associated with a behavior, but they do not describe how that behavior is maintained. The operant learning perspective suggests that behaviors are maintained by the consequences or functions of the behavior, such as reinforcement (Skinner, 1953).⁷

FBA does not have a single developer that provides materials or guidance on carrying out the practice. Instead, *FBA* researchers have developed materials that other researchers and practitioners can use to gather information about the functional relationships between students' behaviors and their environments, which inform the development of *FBA-based interventions* for individual students. Researchers have developed interview protocols, survey instruments, and observational tools to gather information about the functional relationships between students' behaviors and their environments (Dunlap et al., 1993⁸; Kern, Dunlap, Clarke, & Childs, 1994⁹; O'Neill et al., 1997¹⁰). Guidance documents and tools to help organize *FBA* information and develop hypotheses are also available (Umbreit, Ferro, Liaupsin, & Lane, 2007¹¹).

Intervention details

FBA is used by researchers and school staff in school-based settings to identify the function of an individual student's problem behavior and select an intervention for that specific student. The focus when conducting *FBA* is on identifying student-specific social, affective, cognitive, and/or environmental factors associated with the occurrence (and non-occurrence) of specific behaviors. This broader perspective offers a better understanding of the function or purpose behind student behavior. Behavioral intervention plans based on an understanding of "why" a student misbehaves are extremely useful in addressing a wide range of problem behaviors.

FBA involves several processes and methods to collect and analyze data. **Indirect data collection** involves reviews of existing behavioral records; the use of behavioral checklists or rating scales; and interviews or surveys with teachers, students, and other adults to identify the problem behavior, the context in which the behavior occurs, and perspectives on why the behavior occurs. **Direct observation** involves observing the student in the natural environment to document the conditions that precede the behavior and the reinforcements for the behavior. **Summarizing data** involves developing an operational definition that summarizes the observed behavior; generating hypotheses about the behavior's function; identifying contextual factors and reinforcements that can be manipulated by teachers; and then selecting or developing an intervention procedure based on this information. **Functional analysis** involves testing the hypotheses by using interventions to manipulate the environmental context and the reinforcement for behaviors, and then examining how these affect the behavior. Functional analysis uses a rigorous, experimental testing approach, incorporating single-case designs, to evaluate how interventions affect behavior.

The studies in this report examine different *FBA-based interventions* identified for each student. The assessment process and resulting interventions are carried out and implemented with the individual student within the context of one-on-one teaching sessions, small groups, or a whole classroom. The Individuals with Disabilities Education Act (IDEA) requires the use of *FBA* and resulting *FBA-based interventions* to address behavioral problems that impede student learning in school settings. As a result, *FBA* is commonly used as part of the Individualized Education Program (IEP) development process after a child has been classified with an emotional disturbance.

Cost

Because *FBA-based interventions* are identified and selected based on an individual student's problem behavior, information is not available about the costs of teacher training or implementation of *FBA* and the resulting *FBA-based interventions*.

Research Summary

The WWC identified no eligible group design studies and 34 eligible single-case design studies that investigated the effects of *FBA-based interventions* on children identified with or at risk for an emotional disturbance. An additional 293 studies were identified but do not meet WWC eligibility criteria for review in this topic area. Citations for all 327 studies are in the References section, which begins on p. 6.

The WWC reviewed the 34 single-case design studies against pilot single-case design standards. Seven studies meet pilot single-case design standards without reservations, and 10 studies meet pilot single-case design standards with reservations. Those 17 studies are summarized in this report. The remaining 17 studies do not meet pilot single-case design standards.

Sixteen of the 17 studies that meet pilot single-case design standards with or without reservations have at least one outcome in a domain that reaches the threshold for including single-case design evidence in the effectiveness ratings. Details on these studies are described in Appendices A–C. The remaining study that meets WWC pilot single-case design standards with or without reservations only has outcomes in a domain that does not reach the threshold for including single-case design evidence in the effectiveness ratings in this report; more details on this study can be found in Appendix D.¹²

Table 2. Scope of reviewed research

Grades	K–12
Delivery method	Individual
Intervention type	Practice

Summary of studies meeting WWC pilot single-case design standards without reservations

Seven studies have experiments that meet WWC pilot single-case design standards without reservations.¹³ These experiments investigated the effects of *FBA-based interventions* on school engagement, problem behavior, and social-emotional competence outcomes. The experiments included children identified with or at risk for an emotional disturbance, ranging in age from 7 to 14 years old. Different *FBA-based interventions* were identified for each student and included approaches such as student self-monitoring, modifications to the proximity of peers and teachers, peer support, teacher attention, and modifications to assignments. Details on these studies are described in Appendices A–D.

Summary of studies meeting WWC pilot single-case design standards with reservations

Ten studies have experiments that meet WWC pilot single-case design standards with reservations. These experiments investigated the effects of *FBA-based interventions* on school engagement, problem behavior, and social-emotional competence outcomes. The experiments included children identified with or at risk for an emotional disturbance, ranging in age from 5 to 17 years old. Different *FBA-based interventions* were identified for each student, and included approaches such as teacher attention, modifications to the proximity of peers and teachers, reinforcement, and curricular modifications. Details on these studies are described in Appendices A–D.

Effectiveness Summary

The WWC review of *FBA-based interventions* for the Children Identified With or At Risk for an Emotional Disturbance topic area includes student outcomes in 16 domains: alphabetics, communication/language competencies, community, general reading achievement, math achievement, problem behavior, reading comprehension, reading fluency, school engagement, science achievement, self-care/daily living, self-determination, social-emotional competence, social studies achievement, vocational/occupational, and writing achievement.

The 17 studies of *FBA-based interventions* that meet WWC pilot single-case design standards reported findings in three of the 16 domains: (a) school engagement, (b) problem behavior, and (c) social-emotional competence. Effectiveness ratings of *FBA-based interventions* on children identified with or at risk for an emotional disturbance are presented for two of the three domains (school engagement and problem behavior). The findings from the social-emotional competence domain do not meet the threshold to include single-case design evidence in the effectiveness ratings in this report.¹² For a more detailed description of the rating of effectiveness for single-case design studies and extent of evidence criteria, see the WWC Rating Criteria on p. 67.

In each of these studies, *FBA* was used by researchers and school staff to identify the function of at least one student's problem behavior and select an intervention for each child. Accordingly, the *FBA-based interventions* for each student did vary.

Summary of effectiveness for the school engagement domain

Table 3. Rating of effectiveness for single-case design studies for the school engagement domain

Rating of effectiveness	Criteria met
Potentially positive effects <i>Evidence of a positive effect with no overriding contrary evidence.</i>	Across the 34 single-case design experiments for the <i>school engagement</i> domain, 25 experiments (74%) documented a positive effect and 0 experiments documented a negative effect.

Fifteen studies that meet WWC pilot single-case design standards with or without reservations reported findings in the school engagement domain. Author-reported findings for each study are reported in Appendix A. The results of the WWC's visual analysis of each single-case design experiment are reported in Appendix C. Across the 34 single-case design experiments, 25 experiments (74%) documented a positive effect, and no single-case design experiments documented a negative effect. This results in a rating of potentially positive effects for the school engagement domain.

Summary of effectiveness for the problem behavior domain

Table 4. Rating of effectiveness for single-case design studies for the problem behavior domain

Rating of effectiveness	Criteria met
Potentially positive effects <i>Evidence of a positive effect with no overriding contrary evidence.</i>	Across the 25 single-case design experiments for the <i>problem behavior</i> domain, 17 experiments (68%) documented a positive effect and 0 experiments documented a negative effect.

Eight studies that meet WWC pilot single-case design standards with or without reservations reported findings in the problem behavior domain. Author-reported findings for each study are reported in Appendix A. The results of the WWC's visual analysis of each single-case design experiment are reported in Appendix C. Across the 25 single-case design experiments, 17 experiments (68%) documented a positive effect, and no single-case design experiments documented a negative effect. This results in a rating of potentially positive effects for the problem behavior domain.

References

Studies that meet WWC pilot single-case design standards without reservations

- Christensen, L., Young, K. R., & Marchant, M. (2004). The effects of a peer-mediated positive behavior support program on socially appropriate classroom behavior. *Education and Treatment of Children, 27*(3), 199–234.
- Hagan-Burke, S., Gilmour, M. W., Gerow, S., & Crowder, W. C. (2015). Identifying academic demands that occasion problem behaviors for students with behavioral disorders: Illustrations at the elementary school level. *Behavior Modification, 39*(1), 215–241.
- Hansen, B. D., Wills, H. P., Kamps, D. M., & Greenwood, C. R. (2014). The effects of function-based self-management interventions on student behavior. *Journal of Emotional and Behavioral Disorders, 22*(3), 149–159. doi:10.1177/1063426613476345

Additional source:

- Hansen, B. D. (2011). The effects of function-based self-management interventions. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 72*(4-A), 1257.
- Kern, L., Childs, K. E., Dunlap, G., Clarke, S., & Falk, G. D. (1994). Using assessment-based curricular intervention to improve the classroom behavior of a student with emotional and behavioral challenges. *Journal of Applied Behavior Analysis, 27*(1), 7–19.
- Lane, K. L., Rogers, L. A., Parks, R. J., Weisenbach, J. L., Mau, A. C., Merwin, M. T., & Bergman, W. A. (2007a). Function-based interventions for students who are nonresponsive to primary and secondary prevention efforts. *Journal of Emotional and Behavioral Disorders, 15*(3), 169–183.
- Lane, K. L., Weisenbach, J. L., Phillips, A., & Wehby, J. H. (2007b). Designing, implementing, and evaluating function-based interventions using a systematic, feasible approach. *Behavioral Disorders, 32*(2), 122–139.
- Losinski, M. L., Maag, J. W., Katsiyannis, A., & Ryan, J. B. (2015). The use of structural behavioral assessment to develop interventions for secondary students exhibiting challenging behaviors. *Education and Treatment of Children, 38*(2), 1–26.

Additional source:

- Losinski, M. L. (2013). *Examining the use of structural analysis to develop interventions for students exhibiting challenging behaviors* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 1437005624)

Studies that meet WWC pilot single-case design standards with reservations

- Christensen, L., Renshaw, T. L., Caldarella, P., & Young, J. R. (2012). Training a general educator to use function-based support for students at risk for behavior disorders. *Education, 133*(2), 313–335.
- Clarke, S., Dunlap, G., Foster-Johnson, L., Childs, K. E., Wilson, D., White, R., & Vera, A. (1995). Improving the conduct of students with behavioral disorders by incorporating student interests into curricular activities. *Behavioral Disorders, 20*(4), 221–237.
- Davis, D. H., Fredrick, L. D., Alberto, P. A., & Gama, R. (2012). Functional communication training without extinction using concurrent schedules of differing magnitudes of reinforcement in classrooms. *Journal of Positive Behavior Interventions, 14*(3), 162–172. doi:10.1177/1098300711429597
- Dunlap, G., Foster-Johnson, L., Clarke, S., Kern, L., & Childs, K. E. (1995). Modifying activities to produce functional outcomes: Effects on the problem behaviors of students with disabilities. *Research and Practice for Persons with Severe Disabilities, 20*(4), 248–258.
- Dunlap, G., White, R., Vera, A., Wilson, D., & Panacek, L. (1996). The effects of multi-component, assessment-based curricular modifications on the classroom behavior of children with emotional and behavioral disorders. *Journal of Behavioral Education, 6*(4), 481–500.

Janney, D. M., Umbreit, J., Ferro, J. B., Liaupsin, C. J., & Lane, K. L. (2013). The effect of the extinction procedure in function-based intervention. *Journal of Positive Behavior Interventions*, *15*(2), 113–123. doi:10.1177/1098300712441973

Additional source:

Janney, D. M. (2009). *A component analysis of function-based intervention: the role of the extinction procedure*. (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3352975)

Kern, L., Delaney, B., Clarke, S., Dunlap, G., & Childs, K. (2001). Improving the classroom behavior of students with emotional and behavioral disorders using individualized curricular modifications. *Journal of Emotional and Behavioral Disorders*, *9*(4), 239–247.

Kern, L., Starosta, K. M., Bambara, L. M., Cook, C. R., & Gresham, F. R. (2007). Functional assessment-based intervention for selective mutism. *Behavioral Disorders*, *32*(2), 94–108.

Mustian, A. L. (2011). *The comparative effects of function-based versus nonfunction-based interventions on the social behavior of African American students*. Available from ProQuest Dissertations and Theses database. (UMI No. 757196704)

Nahgahgwon, K. N., Umbreit, J., Liaupsin, C. J., & Turton, A. M. (2010). Function-based planning for young children at risk for emotional and behavioral disorders. *Education and Treatment of Children*, *33*(4), 537–559.

Studies that do not meet WWC pilot single-case design standards¹⁴

Adams, P. N. (1997). Utilizing behavioral diagnostics to reduce disruptive behavior in public school settings with children and adolescents with severe emotional and behavioral disorders. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *58*(7-B), 3913. The study does not meet WWC evidence standards because the eligible outcomes do not meet WWC requirements.

Barreras, R. B. (2008). *An experimental analysis of the treatment validity of the social skills deficit model for at-risk adolescents*. Available from ProQuest Dissertations and Theses database. (UMI No. 3332602) The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.

Dunlap, G., Kern-Dunlap, L., Clarke, S., & Robbins, F. R. (1991). Functional assessment, curricular revision, and severe behavior problems. *Journal of Applied Behavior Analysis*, *24*(2), 387–397. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.

Dwyer, K., Rozewski, D., & Simonsen, B. (2012). A comparison of function-based replacement behaviors for escape-motivated students. *Journal of Emotional and Behavioral Disorders*, *20*, 115–125. The study does not meet WWC evidence standards because the measures of effectiveness cannot be attributed solely to the intervention.

Ellis, J., & Magee, S. K. (1999). Determination of environmental correlates of disruptive classroom behavior: Integration of functional analysis into public school assessment process. *Education and Treatment of Children*, *22*(3), 291–316. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.

Ervin, R. A., DuPaul, G. J., Kern, L., & Friman, P. C. (1998). Classroom-based functional and adjunctive assessments: Proactive approaches to intervention selection for adolescents with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis*, *31*(1), 65–78. The study does not meet WWC evidence standards because the eligible outcomes do not meet WWC requirements.

Glenn, J. H., & Waller, R. J. (2007). Reducing irresponsible talking out during class in a 7th grade student with an emotional/behavioral disorder. *TEACHING Exceptional Children Plus*, *3*(6), 2. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.

- Gunter, P. L., Jack, S. L., Shores, R. E., Carrell, D. E., & Flowers, J. (1993). Lag sequential analysis as a tool for functional analysis of student disruptive behavior in classrooms. *Journal of Emotional and Behavioral Disorders*, 1(3), 138–148. The study does not meet WWC evidence standards because the eligible outcomes do not meet WWC requirements.
- Kamps, D., Wendland, M., & Culpepper, M. (2006). Active teacher participation in functional behavior assessment for students with emotional and behavioral disorders risks in general education classrooms. *Behavioral Disorders*, 31(2), 128–146. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- Kamps, D. M., Ellis, C., Mancina, C., Wyble, J., Greene, L., & Harvey, D. (1995). Case studies using functional analysis for young children with behavior risks. *Education and Treatment of Children*, 18(3), 243–260. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- McCann Sawyer, L. (2003). *Linking functional behavioral assessment and self-monitoring to facilitate the inclusion of students with emotional and behavioral disorders* (Doctoral dissertation, Lehigh University). The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- Sams, S. E. (1999). The effects of functional intervention on the behavior of four students labeled ADHD. *Dissertation Abstracts International*, 60(04A), 107-1081. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- Stage, S. A., Jackson, H. G., Moscovitz, K., Erickson, M. J., Thurman, S. O., Jessee, W., & Olson, E. M. (2006). Using multimethod-multisource functional behavioral assessment for students with behavioral disabilities. *School Psychology Review*, 35(3), 451–471. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- Starosta, K. M. (2010). *A comparison of functional assessment- and non-functional assessment-based interventions for students with emotional and behavioral disorders*. Available from ProQuest Dissertations and Theses database. (UMI No. 3404118) The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- Waller, R. J., Albertini, C. L., & Waller, K. S. (2011). Self-monitoring of performance to promote accurate work completion: A functional based intervention for a 4th grade student presenting challenging behavior. *Advances in School Mental Health Promotion*, 4(1), 52–60. The study does not meet WWC evidence standards because the eligible outcomes do not meet WWC requirements.
- Watson, T. S., Dufrene, B., Weaver, A., Butler, T., & Meeks, C. (2005). Brief antecedent assessment and treatment of tics in the general education classroom: A preliminary investigation. *Behavior Modification*, 29(6), 839–857. doi:10.1177/0145445505279252 The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.
- Wright-Gallo, G. L., Higbee, T. S., Reagon, K. A., & Davey, B. J. (2006). Classroom-based functional analysis and intervention for students with emotional/behavioral disorders. *Education and Treatment of Children*, 29(3), 421–434. The study does not meet WWC evidence standards because there are insufficient data to evaluate the attempts to demonstrate an intervention effect.

Studies that are ineligible for review using the Children Identified With or At Risk for an Emotional Disturbance Evidence Review Protocol

- Anderson, C. M. (2000). Linking functional assessment with diagnostic classification: Development of functional assessment methodology. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 61(3-B), 1623. The study is ineligible for review because it is out of the scope of the protocol.

- Anderson, D. H., Fisher, A., Marchant, M., Young, K. R., & Smith, J. A. (2006). The cool card intervention: A positive support strategy for managing anger. *Beyond Behavior, 16*(1), 3–13. The study is ineligible for review because it does not use an eligible design.
- Arndorfer, R. E., & Miltenberger, R. G. (1993). Functional assessment and treatment of challenging behavior: A review with implications for early childhood. *Topics in Early Childhood Special Education, 13*(1), 82–105. The study is ineligible for review because it does not use an eligible design.
- Arter, P. S. (2007). The Positive Alternative Learning Supports program: Collaborating to improve student success. *TEACHING Exceptional Children, 40*(2), 38–46. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Artesani, A. J., & Mallar, L. (1998). Positive behavior supports in general education settings: Combining person-centered planning and functional analysis. *Intervention in School and Clinic, 34*(1), 33–38. The study is ineligible for review because it does not use an eligible design.
- Arvans, R. K., & LeBlanc, L. A. (2009). Functional assessment and treatment of migraine reports and school absences in an adolescent with Asperger's disorder. *Education and Treatment of Children, 32*(1), 151–166. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Asmus, J. M., Franzese, J. C., Conroy, M. A., & Dozier, C. L. (2003). Clarifying functional analysis outcomes for disruptive behaviors by controlling consequence delivery for stereotypy. *School Psychology Review, 32*(4), 624–630. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Bagnell, A., & Bostic, J. Q. (2004). Building positive behavior support systems in schools: Functional behavioral Assessment/Behavior psychology in the schools. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(9), 1179–1181. doi:10.1097/01.chi.0000132828.82347.70 The study is ineligible for review because it does not use an eligible design.
- Banda, D. R., Hart, S. L., & Kercood, S. (2012). Decreasing disruptive vocalizations of a student with high-functioning autism across three general education classrooms. *Preventing School Failure, 56*(2), 104–109. The study is ineligible for review because it is out of the scope of the protocol.
- Banda, D. R., McAfee, J. K., & Hart, S. L. (2009). Decreasing self-injurious behavior in a student with autism and Tourette syndrome through positive attention and extinction. *Child & Family Behavior Therapy, 31*(2), 144–156. doi:10.1080/07317100902910604 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Banda, D. R., & Sokolosky, S. (2012). Effectiveness of noncontingent attention to decrease attention-maintained disruptive behaviors in the general education classroom. *Child & Family Behavior Therapy, 34*(2), 130–140. doi: 10.1080/07317107.2012.684646 The study is ineligible for review because it is out of the scope of the protocol.
- Bayat, M., Mindes, G., & Covitt, S. (2010). What does RTI (response to intervention) look like in preschool? *Early Childhood Education Journal, 37*(6), 493–500. doi:10.1007/s10643-010-0372-6 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Beavers, G. A., Iwata, B. A., & Lerman, D. C. (2013). Thirty years of research on the functional analysis of problem behavior. *Journal of Applied Behavior Analysis, 46*(1), 1–21. doi:10.1002/jaba.30 The study is ineligible for review because it does not use an eligible design.
- Beavers, K. F., Kratochwill, T. R., & Braden, J. P. (2004). Treatment utility of functional versus empiric assessment within consultation for reading problems. *School Psychology Quarterly, 19*(1), 29–49. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Bellone, K., Dufrene, B., Tingstrom, D., Olmi, D., & Barry, C. (2014). Relative efficacy of behavioral interventions in preschool children attending Head Start. *Journal of Behavioral Education, 23*(3), 378–400. doi:10.1007/s10864-014-9196-6 The study is ineligible for review because it does not use a sample aligned with the protocol.

- Bergstrom, M. K. (2003). Efficacy of school-based teams conducting functional behavioral assessment in the general education environment. *Dissertation Abstracts International*, 64(06A), 139-1968. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Biniker, K. L., & Pindiprolu, S. S. (2008). Functional assessment based intervention plans in alternative educational settings in the USA: A case study. *Journal of the International Association of Special Education*, 9(1), 68–77. The study is ineligible for review because it does not use an eligible design.
- Blair, K. C., Fox, L., & Lentini, R. (2010). Use of positive behavior support to address the challenging behavior of young children within a community early childhood program. *Topics in Early Childhood Special Education*, 30(2), 68–79. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Blair, K. C., Lee, I., Cho, S., & Dunlap, G. (2011). Positive behavior support through family–school collaboration for young children with autism. *Topics in Early Childhood Special Education*, 31(1), 22–36. doi:10.1177/0271121410377510 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Blair, K. C., Umbreit, J., & Bos, C. S. (1999). Using functional assessment and children’s preferences to improve the behavior of young children with behavioral disorders. *Behavioral Disorders*, 24(2), 151–166. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Blood, E., & Neel, R. S. (2007). From FBA to implementation: A look at what is actually being delivered. *Education and Treatment of Children*, 30(4), 67–80. The study is ineligible for review because it does not use an eligible design.
- Bloom, S. E., Lambert, J. M., Dayton, E., & Samaha, A. L. (2013). Teacher-conducted trial-based functional analyses as the basis for intervention. *Journal of Applied Behavior Analysis*, 46(1), 208–218. doi:10.1002/jaba.21 The study is ineligible for review because it is out of the scope of the protocol.
- Bonfiglio, C. M., Daly III, E. J., Ervin, R. A., & Ward, P. (2002). Facilitating teacher inquiry through data-based behavioral consultation and functional assessment in a special education classroom. *Inquiry: Critical Thinking Across the Disciplines*, 21(4), 31–39. The study is ineligible for review because it does not use an eligible design.
- Boyajian, A. E., DuPaul, G. J., Handler, M. W., Eckert, T. L., & McGoey, K. E. (2001). The use of classroom-based brief functional analyses with preschoolers at-risk for attention deficit hyperactivity disorder. *School Psychology Review*, 30(2), 278–293. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Briere III, D. E., & Simonsen, B. (2011). Self-monitoring interventions for at-risk middle school students: The importance of considering function. *Behavioral Disorders*, 36(2), 129–140. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Broussard, C. D., & Northup, J. (1995). An approach to functional assessment and analysis of disruptive behavior in regular education classrooms. *School Psychology Quarterly*, 10(2), 151–164. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Broussard, C. D., & Northup, J. (1997). The use of functional analysis to develop peer interventions for disruptive classroom behavior. *School Psychology Quarterly*, 12(1), 65–76. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Brownell, K. (1995). *Functional assessment and analysis of behavior as a process for identifying an appropriate intervention for the challenging behavior of a preschool child*. (Doctoral dissertation, University of Utah, Department of Special Education). The study is ineligible for review because it does not use a sample aligned with the protocol.
- Burke, M. D. (2001). An examination of function-based instructional and antecedent interventions for elementary students with escape-maintained problem behaviors. *Dissertation Abstracts International*, 62(08A), 200-2725. The study is ineligible for review because it does not use a sample aligned with the protocol.

- Butler, L. R., & Luiselli, J. K. (2007). Escape-maintained problem behavior in a child with autism: Antecedent functional analysis and intervention evaluation of noncontingent escape and instructional fading. *Journal of Positive Behavior Interventions*, 9(4), 195–202. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Calderhead, W. J. (2003). Effects of interspersed math problems on the task engagement of middle school students. *Dissertation Abstracts International*, 64(11A), 86-4008. The study is ineligible for review because it does not use an eligible design.
- Cameron, M. (2006). Managing school discipline and implications for school social workers: A review of the literature. *Children & Schools*, 28(4), 219–227. The study is ineligible for review because it does not use an eligible design.
- Campbell, A., & Tincani, M. (2011). The Power Card strategy: Strength-based intervention to increase direction following of children with autism spectrum disorder. *Journal of Positive Behavior Interventions*, 13(4), 240–249. doi:10.1177/1098300711400608 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Carter, D. R., & Horner, R. H. (2007). Adding functional behavioral assessment to First Step to Success: A case study. *Journal of Positive Behavior Interventions*, 9(4), 229–238. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Additional source:**
- Carter, D. R., & Horner, R. H. (2009). Adding function-based behavioral support to First Step to Success: Integrating individualized and manualized practices. *Journal of Positive Behavior Interventions*, 11(1), 22–34. doi:10.1177/1098300708319125
- Cautilli, J., Harrington, N., Gillam, E. V., Denning, J., Helwig, I., Ettingoff, A., ... Angert, A. (2004). Do children with multiple patterns of problem behavior improve? The effectiveness of an intensive bio-behaviorally oriented school-based behavioral health program. *Journal of Early and Intensive Behavior Intervention*, 1(1), 74–93. <http://files.eric.ed.gov/fulltext/EJ848680.pdf>. The study is ineligible for review because it does not use an eligible design.
- Chait, A. M. (2003). Comparison of descriptive functional assessment instruments to experimental functional analyses for children with autism. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 63(9-B), 4354. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Chen, P. (2005). *The use of functional analysis to test the accuracy of teachers' hypothesized behavior functions based on differing amounts of information* (Master's thesis, University of Washington). The study is ineligible for review because it is out of the scope of the protocol.
- Chitiyo, M. S. (2005). Functional/structural analysis: A brief review of functional assessment studies conducted with people with challenging behaviours. *International Journal of Special Education*, 20(2), 102–110. <http://files.eric.ed.gov/fulltext/EJ846939.pdf>. The study is ineligible for review because it does not use an eligible design.
- Choi, H. (2000). The effects of functional assessment and treatment on problem behaviors of one student with autism. *Dissertation Abstracts International*, 61(11A), 169-4336. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Chorpita, B. F., Albano, A. M., Heimberg, R. G., & Barlow, D. H. (1996). A systematic replication of the prescriptive treatment of school refusal behavior in a single subject. *Journal of Behavior Therapy and Experimental Psychiatry*, 27, 281–290. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Cihak, D., Alberto, P. A., & Fredrick, L. D. (2007). Use of brief functional analysis and intervention evaluation in public settings. *Journal of Positive Behavior Interventions*, 9(2), 80–93. The study is ineligible for review it does not use an eligible design.
- Cipani, E. (2002). An historical view of the clinical and research base of functional analysis. *Teacher Educator*, 37(4), 231–253. The study is ineligible for review because it does not use an eligible design.

- Cohen Friedenthal, D. (2009). School personnel establishing functional communication training based on a functional analysis with autistic students in a public school setting to reduce problem behaviors. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 69(12-B), 7796. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Cole, T., Daniels, H., & Visser, J. (2012). *The Routledge International companion to emotional and behavioural difficulties*. London; New York, NY: Routledge. The study is ineligible for review because it does not use an eligible design.
- Colvin, G., & Scott, T. M. (2015). *Managing the cycle of acting-out behavior in the classroom* (Second edition ed.). Thousand Oaks, CA: Corwin. The study is ineligible for review because it does not use an eligible design.
- Conroy, M. A., Boyd, B. A., Asmus, J. M., & Madera, D. (2007). A functional approach for ameliorating social skills deficits in young children with autism spectrum disorders. *Infants & Young Children: An Interdisciplinary Journal of Special Care Practices*, 20(3), 242–254. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Conroy, M. A., & Stichter, J. P. (2003). The application of antecedents in the functional assessment process: Existing research, issues, and recommendations. *Journal of Special Education*, 37(1), 15–25. The study is ineligible for review because it does not use an eligible design.
- Cooper, L., Wacker, D. P., Sasso, G. M., Reimers, T. M., & Donn, L. K. (1990). Using parents as therapists to evaluate appropriate behavior of their children: Application to a tertiary diagnostic clinic. *Journal of Applied Behavior Analysis*, 23, 285–296. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Cooper, L. J., Wacker, D. P., Thursby, D., Plagmann, L. A., Harding, J., Millard, T., & Derby, M. (1992). Analysis of the effects of task preferences, task demands, and adult attention on child behavior in outpatient and classroom settings. *Journal of Applied Behavior Analysis*, 25, 823–840. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Cooper, T. L. (2004). *Conducting school-based functional behavioral assessments: A practitioner's guide* (book). *Intervention in School and Clinic*, 39(5), 315. The study is ineligible for review because it does not use an eligible design.
- Cowick, B. S. (1996). *Functional assessment: Development and evaluation of a comprehensive treatment program for youth with mild disabilities*. *Dissertation Abstracts International*, 57(08A), 138-3454. (AAG9703373) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Cullain, R. E. (2000). The effects of social stories on anxiety levels and excessive behavioral expressions of elementary school-aged children with autism. *Dissertation Abstracts International*, 62(07A), 157-2383. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Davey, B. J., & Lignugaris-Kraft, B. (2005). A practical approach to functional behavioral assessment in a public (state supported) school: Successes and limitations. *Emotional and Behavioural Difficulties*, 10(4), 255–268. The study is ineligible for review because it does not use an eligible design.
- Davis, C., & Fox, J. (2001). Functional behavioral assessment and students with autism spectrum disorders: Roots, now, and the future. *Focus on Autism and Other Developmental Disabilities*, 16(4), 202–204. The study is ineligible for review because it does not use an eligible design.
- Dolezal, D. N., & Kurtz, P. F. (2010). Evaluation of combined-antecedent variables on functional analysis results and treatment of problem behavior in a school setting. *Journal of Applied Behavior Analysis*, 43(2), 309–314. <http://files.eric.ed.gov/fulltext/EJ889222.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Dufrene, B. A., Doggett, R. A., Henington, C., & Watson, T. S. (2007). Functional assessment and intervention for disruptive classroom behaviors in preschool and Head Start classrooms. *Journal of Behavioral Education*, 16(4), 368–388. The study is ineligible for review because it does not use an eligible design.

- Dufrene, B. A., Harpole, L. L., Sterling, H. E., Perry, E. J., Burton, B., & Zoder-Martell, K. (2013). Functional analysis identified habit reversal components for the treatment of motor tics. *Child & Family Behavior Therapy, 35*(1), 41–62. doi:10.1080/07317107.2013.761036 The study is ineligible for review because it is out of the scope of the protocol.
- Dukes, C., Rosenberg, H., & Brady, M. (2008). Effects of training in functional behavior assessment. *International Journal of Special Education, 23*(1), 163–173. <http://files.eric.ed.gov/fulltext/EJ814386.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Dunlap, G., & Fox, L. (2011). Function-based interventions for children with challenging behavior. *Journal of Early Intervention, 33*(4), 333–343. doi:10.1177/1053815111429971 The study is ineligible for review because it does not use an eligible design.
- Dykeman, B. F. (2009). Response to intervention: The functional assessment of children returning to school with traumatic brain injury. *Education, 130*(2), 295–300. The study is ineligible for review because it does not use an eligible design.
- Emerson, E., Reeves, D., Thompson, S., Henderson, D., Robertson, J., & Howard, D. (1996). Time-based lag sequential analysis and the functional assessment of challenging behaviour. *Journal of Intellectual Disability Research, 40*, 260–274. The study is ineligible for review because it does not use a sample aligned with the protocol.
- ERIC/OSEP Special Project on Interagency Information Dissemination. (1999). Positive behavioral support. *Research Connections in Special Education, 4*, 1–9. The study is ineligible for review because it does not use an eligible design.
- Ervin, R. A., Kern, L., Clarke, S., DuPaul, G. J., Dunlap, G., & Friman, P. C. (2000). Evaluating assessment-based intervention strategies for students with ADHD and comorbid disorders within the natural classroom context. *Behavioral Disorders, 25*(4), 344–358. The study is ineligible for review because it is out of the scope of the protocol.
- Ervin, R. A., Radford, P. M., Bertsch, K., Piper, A. L., Ehrhardt, K. E., & Poling, A. (2001). A descriptive analysis and critique of the empirical literature on school-based functional assessment. *School Psychology Review, 30*(2), 193–210. The study is ineligible for review because it does not use an eligible design.
- Eschenauer, R., & Chen-Hayes, S. F. (2005). The transformative individual school counseling model: An accountability model for urban school counselors. *Professional School Counseling, 8*(3), 244–248. The study is ineligible for review because it does not use an eligible design.
- Farmer, T. W., & Xie, H. (2007). Aggression and school social dynamics: The good, the bad, and the ordinary. *Journal of School Psychology, 45*(5), 461–478. doi:10.1016/j.jsp.2007.06.008 The study is ineligible for review because it does not use an eligible design.
- Feeney, T. J. (2010). Structured flexibility: The use of context-sensitive self-regulatory scripts to support young persons with acquired brain injury and behavioral difficulties. *Journal of Head Trauma Rehabilitation, 25*(6), 416–425. doi:10.1097/HTR.0b013e3181fbc0a2 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Fettig, A., Schultz, T. R., & Sreckovic, M. A. (2015). Effects of coaching on the implementation of functional assessment-based parent intervention in reducing challenging behaviors. *Journal of Positive Behavior Interventions, 17*(3), 170–180. doi:10.1177/1098300714564164 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Filter, K., & Horner, R. (2009). Function-based academic interventions for problem behavior. *Education and Treatment of Children, 32*, 1-19. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Fisher, W. W., Rodriguez, N. M., & Owen, T. M. (2013). Functional assessment and treatment of perseverative speech about restricted topics in an adolescent with Asperger syndrome. *Journal of Applied Behavior Analy-*

- sis, 46(1), 307–311. doi:10.1002/jaba.19 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Flick, G. L. (2011). *Understanding and managing emotional and behavior disorders in the classroom*. Boston, MA: Pearson. The study is ineligible for review because it does not use an eligible design.
- Floyd, R. G., Phaneuf, R. L., & Wilczynski, S. M. (2005). Measurement properties of indirect assessment methods for functional behavioral assessment: A review of research. *School Psychology Review, 34*(1), 58–73. The study is ineligible for review because it does not use an eligible design.
- Fox, J. (1998). Functional behavioral assessment and technical assistance in applied settings. *Preventing School Failure: Alternative Education for Children and Youth, 43*(1), 4–5. The study is ineligible for review because it does not use an eligible design.
- Fox, J. J., & Conroy, M. A. (2000). FBA for children and youth with emotional-behavioral disorders: Where we should go in the twenty-first century. *Preventing School Failure, 44*(4), 140–141. The study is ineligible for review because it does not use an eligible design.
- Gable, R. A., Butler, C. J., Walker-Bolton, I., Tonelson, S. W., Quinn, M. M., & Fox, J. J. (2003). Safe and effective schooling for all students: Putting into practice the disciplinary provisions of the 1997 IDEA. *Preventing School Failure, 47*(2), 74–78. The study is ineligible for review because it does not use an eligible design.
- Gable, R. A., & Hendrickson, J. M. (2000). Strategies for maintaining positive behavior change stemming from functional behavioral assessment in schools. *Education and Treatment of Children, 23*(3), 286–297. The study is ineligible for review because it does not use an eligible design.
- Gage, N. A., Lewis, T. J., & Stichter, J. P. (2012). Functional behavioral assessment-based interventions for students with or at risk for emotional and/or behavioral disorders in school: A hierarchical linear modeling meta-analysis. *Behavioral Disorders, 37*(2), 55–77. The study is ineligible for review because it does not use an eligible design.
- Gale, C. M., Eikeseth, S., & Rudrud, E. (2011). Functional assessment and behavioural intervention for eating difficulties in children with autism: A study conducted in the natural environment using parents and ABA tutors as therapists. *Journal of Autism and Developmental Disorders, 41*(10), 1383–1396. doi:10.1007/s10803-010-1167-8 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Gann, C. J., Ferro, J. B., Umbreit, J., & Liaupsin, C. J. (2014). Effects of a comprehensive function-based intervention applied across multiple educational settings. *Remedial and Special Education, 35*(1), 50–60. doi:10.1177/0741932513501088 The study is ineligible for review because it is out of the scope of the protocol.
- Garbutt, N., & Furniss, F. (2007). Context sampling descriptive assessment: A pilot study of a further approach to functional assessment. *Journal of Applied Research in Intellectual Disabilities, 20*(2), 127–130. doi:10.1111/j.1468-3148.2006.00317.x The study is ineligible for review because it does not use a sample aligned with the protocol.
- Goh, A. E., & Bambara, L. M. (2012). Individualized positive behavior support in school settings: A meta-analysis. *Remedial and Special Education, 33*(5), 271–286. doi:10.1177/0741932510383990 The study is ineligible for review because it does not use an eligible design.
- Gomi, Y., & Noro, F. (2010). Function-based interventions for behavior problems of a student with a developmental disability: School-based treatment implementation. *The Japanese Journal of Special Education, 47*(6), 457–469. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Goodman, S. D. (1999). Improving special education teachers' use of data-based instruction (academic performance). *Dissertation Abstracts International, 60*(06B), 168-2930. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Grandy, S. E., & Peck, S. M. (1997). The use of functional assessment and self-management with a first-grader. *Child & Family Behavior Therapy, 19*(2), 29–43. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Grant, S. H., & Van Acker, R. (2002). *The challenges of gangs and youth violence in the schools. Fourth CCBD mini-library series: Addressing the diverse needs of children and youth with emotional/behavioral disorders—programs*

- that work*. Arlington, VA: Council for Exceptional Children. The study is ineligible for review because it does not use an eligible design.
- Greer, B. D., Neidert, P. L., Dozier, C. L., Payne, S. W., Zonneveld, K. L., & Harper, A. M. (2013). Functional analysis and treatment of problem behavior in early education classrooms. *Journal of Applied Behavior Analysis, 46*(1), 289–295. doi:10.1002/jaba.10 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Gresham, F. M., McIntyre, L. L., Olson-Tinker, H., Dolstra, L., McLaughlin, V., & Van, M. (2004). Relevance of functional behavioral assessment research for school-based interventions and positive behavioral support. *Research in Developmental Disabilities, 25*(1), 19–37. doi:10.1016/j.ridd.2003.04.003 The study is ineligible for review because it does not use an eligible design.
- Hammill Institute on Disabilities. (2009). *Systematic instruction in early childhood special education*. Austin, TX: Author. The study is ineligible for review because it does not use an eligible design.
- Hammill Institute on Disabilities. (2014). *Research to practice in early intervention*. Austin, TX: Author; Thousand Oaks, CA: SAGE Publications. The study is ineligible for review because it does not use an eligible design.
- Hammond, J. L., Iwata, B. A., Rooker, G. W., Fritz, J. N., & Bloom, S. E. (2013). Effects of fixed versus random condition sequencing during multielement functional analyses. *Journal of Applied Behavior Analysis, 46*(1), 22–30. doi:10.1002/jaba.7 The study is ineligible for review because it is out of the scope of the protocol.
- Hansen, B. D., & Wadsworth, J. P. (2015). Effects of an antecedent intervention on repetitive behaviors of a child with autism. *Child & Family Behavior Therapy, 37*(1), 51–62. doi:10.1080/07317107.2015.1000235 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hart, J. E. (2003). *African American learners and six-hour emotional disturbance: Investigating the roles of context, perception, and worldview in the overrepresentation phenomenon*. Available from ProQuest Dissertations and Theses database. (UMI No. 3103561) The study is ineligible for review because it does not use an eligible design.
- Hausman, N., Kahng, S., Farrell, E., & Mongeon, C. (2009). Idiosyncratic functions: Severe problem behavior maintained by access to ritualistic behaviors. *Education and Treatment of Children, 32*(1), 77–87. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hazel, C. (2005). Building positive behavior support systems in schools: Functional behavioral assessment. *Psychology in the Schools, 42*(2), 217–218. doi:10.1002/pits.20056 The study is ineligible for review because it does not use an eligible design.
- Heathfield, L. T. (1992). The effects of functional analysis assessment on the development of behavior support plans for individuals with developmental disabilities; 0171. *Dissertation Abstracts International, 53*(10A), 127-3478. (AAG9305208) The study is ineligible for review because it is out of the scope of the protocol.
- Heckaman, K., Alber, S., Hooper, S., & Heward, W. L. (1998). A comparison of least-to-most prompts and progressive time delay on the disruptive behavior of students with autism. *Journal of Behavioral Education, 8*(2), 171–201. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Heckaman, K., Conroy, M., Fox, J., & Chait, A. (2000). Functional assessment-based intervention research on students with or at risk for emotional and behavioral disorders in school settings. *Behavioral Disorders, 25*(3), 196–210. The study is ineligible for review because it does not use an eligible design.
- Heick, P. F. (2005). Integrating curriculum-based assessment within functional behavioral assessment: Examining the effects of instructional match on academic performance and classroom behavior during independent reading assignments. *Dissertation Abstracts International, 66*(03A), 123-879. (AAI3167056) The study is ineligible for review because it does not use an eligible design.
- Hoch, J., & Symons, F. J. (2007). Matching analysis of socially appropriate and destructive behavior in developmental disabilities. *Research in Developmental Disabilities: A Multidisciplinary Journal, 28*(3), 238–248. The study is ineligible for review because it does not use an eligible design.

- Hoff, K. E., Ervin, R. A., & Friman, P. C. (2005). Refining functional behavioral assessment: Analyzing the separate and combined effects of hypothesized controlling variables during ongoing classroom routines. *School Psychology Review*, 34(1), 45–57. The study is ineligible for review because it is out of the scope of the protocol.
- Howard, J. S., Sparkman, C. R., Cohen, H. G., Green, G., & Stanislaw, H. (2005). A comparison of intensive behavior analytic and eclectic treatments for young children with autism. *Research in Developmental Disabilities: A Multidisciplinary Journal*, 26(4), 359–383. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hughes, M. A. (2003). Self-operated auditory prompting systems with verbal prompt matched to function for the reduction of behavior in public community settings for students with moderate intellectual disabilities. *Dissertation Abstracts International*, 64(06A), 98-2042. (AAI3095174) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Hughes, M. A., Alberto, P. A., & Fredrick, L. L. (2006). Self-operated auditory prompting systems as a function-based intervention in public community settings. *Journal of Positive Behavior Interventions*, 8(4), 230–243. The study is ineligible for review because it is out of the scope of the protocol.
- Humphreys, T. G. (2003). *The effectiveness of a multi-gated teacher questionnaire in developing a functional hypothesis for problem behavior* (Doctoral dissertation, Utah State University). The study is ineligible for review because it is out of the scope of the protocol.
- Humphries, M. L., & Keenan, K. E. (2006). Theoretical, developmental & cultural orientations of school-based prevention programs for preschoolers. *Clinical Child and Family Psychology Review*, 9(2), 135–148. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Ingram, K., Lewis-Palmer, T., & Sugai, G. (2005). Function-based intervention planning: Comparing the effectiveness of FBA function-based and non-function-based intervention plans. *Journal of Positive Behavior Interventions*, 7(4), 224–236. The study is ineligible for review because it is out of the scope of the protocol.
- Johnson, J. C. (2007). An investigation of the perceptions of special education teachers concerning their role in writing and implementing the functional behavioral assessment process. *Dissertation Abstracts International*, 68(07A), 125-2895. (AAI3274694) The study is ineligible for review because it does not use an eligible design.
- Johnston, S. S., & O'Neill, R. E. (2001). Searching for effectiveness and efficiency in conducting functional assessments: A review and proposed process for teachers and other practitioners. *Focus on Autism and Other Developmental Disabilities*, 16(4), 205–214. The study is ineligible for review because it does not use an eligible design.
- Jones, A. S. (2008). *Effects of positive behavior support training on children's maladaptive behavior, parenting skills, and parental support of families with children with disabilities* (Doctoral dissertation, Brigham Young University). The study is ineligible for review because it does not use an eligible design.
- Jordan, N., Leon, S. C., Epstein, R. A., Durkin, E., Helgerson, J., & Lakin-Starr, B. L. (2009). Effect of organizational climate on youth outcomes in residential treatment. *Residential Treatment for Children & Youth*, 26(3), 194–208. The study is ineligible for review because it is out of the scope of the protocol.
- Kant, A. R., & March, R. E. (2004). Effective strategies for addressing challenging behavior in schools. *AASA Journal of Scholarship & Practice*, 1(3), 3–6. The study is ineligible for review because it does not use an eligible design.
- Kates-McElrath, K., Agnew, M., Axelrod, S., & Bloh, C. L. (2007). Identification of behavioral function in public schools and a clarification of terms. *Behavioral Interventions*, 22(1), 47–56. doi:10.1002/bin.230 The study is ineligible for review because it does not use an eligible design.
- Katsiyannis, A., Conroy, M., & Zhang, D. (2008). District-level administrators' perspectives on the implementation of functional behavior assessment in schools. *Behavioral Disorders*, 34(1), 14–26. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Kearney, C. A., & Silverman, W. K. (1990). A preliminary analysis of a functional model of assessment and treatment for school refusal behavior. *Behavior Modification*, 14(3), 340–366. The study is ineligible for review because it does not use an eligible design.

- Kemler, S. C. (2007). Training high school staff on functional behavioral assessment (FBA) and behavioral intervention plans (BIPs). *Dissertation Abstracts International*, 68(10A), 211-4254. (AAI3287777) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Kern, L., Gallagher, P., Starosta, K., Hickman, W., & George, M. (2006). Longitudinal outcomes of functional behavioral assessment-based intervention. *Journal of Positive Behavior Interventions*, 8(2), 67–78. The study is ineligible for review because it does not use an eligible design.
- Kern, L., Hilt, A. M., & Gresham, F. (2004). An evaluation of the functional behavioral assessment process used with students with or at risk for emotional and behavioral disorders. *Education and Treatment of Children*, 27(4), 440–452. The study is ineligible for review because it does not use an eligible design.
- Kircher, K. L. S. (2009). Functional behavioral assessment in schools: Teacher knowledge, perspectives, and discipline referral practices. *Dissertation Abstracts International*, 70(04A), 280-1242. (AAI3354430) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Kirk, J. F. (2009). A comparison of traditional and function-based token systems. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 69(12-A), 4686. The study is ineligible for review because it does not use an eligible design.
- Kodak, T., Fisher, W. W., Clements, A., Paden, A. R., & Dickes, N. R. (2011). Functional assessment of instructional variables: Linking assessment and treatment. *Research in Autism Spectrum Disorders*, 5(3), 1059–1077. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Kurtz, P. F., Chin, M. D., Rush, K. S., & Dixon, D. R. (2008). Treatment of challenging behavior exhibited by children with prenatal drug exposure. *Research in Developmental Disabilities*, 29(6), 582–594. doi:10.1016/j.ridd.2007.05.007 The study is ineligible for review because it does not use an eligible design.
- Lalli, J. S., Casey, S. D., & Kates, K. (1997). Noncontingent reinforcement as treatment for severe problem behavior: Some procedural variations. *Journal of Applied Behavior Analysis*, 30(1), 127–137. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Lane, K. L., Barton-Arwood, S. M., Spencer, J. L., & Kalberg, J. R. (2007). Teaching elementary school educators to design, implement, and evaluate functional assessment-based interventions: Successes and challenges. *Preventing School Failure*, 51(4), 35–46. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Lane, K. L., Eisner, S. L., Kretzer, J., Bruhn, A. L., Crnabori, M., Funke, L., ... Casey, A. (2009). Outcomes of functional assessment-based interventions for students with and at risk for emotional and behavioral disorders in a job-share setting. *Education and Treatment of Children*, 32(4), 573–604. The study is ineligible for review because it does not use an eligible design.
- Lane, K. L., Kalberg, J. R., & Shepcaro, J. C. (2009). An examination of the evidence base for function-based interventions for students with emotional and/or behavioral disorders attending middle and high schools. *Exceptional Children*, 75(3), 321–340. The study is ineligible for review because it does not use an eligible design.
- Lane, K. L., Smither, R., Huseman, R., Guffey, J., & Fox, J. (2007). A function-based intervention to decrease disruptive behavior and increase academic engagement. *Journal of Early and Intensive Behavior Intervention*, 3-4(4-1), 348–364. <http://files.eric.ed.gov/fulltext/EJ805537.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Lane, K. L., Umbreit, J., & Beebe-Frankenberger, M. (1999). A review of functional assessment research with students with or at-risk for emotional and behavioral disorders. *Journal of Positive Behavioral Interventions*, 1, 101–111. The study is ineligible for review because it does not use an eligible design.
- Lane, K. L., Weisenbach, J. L., Little, M. A., Phillips, A., & Wehby, J. (2006). Illustrations of function-based interventions implemented by general education teachers: Building capacity at the school site. *Education and Treatment of Children*, 29(4), 549–571. The study is ineligible for review because it does not use an eligible design.
- Lang, R., Davis, T., O'Reilly, M., Machalicek, W., Rispoli, M., Sigafoos, J., ... Regester, A. (2010). Functional analysis and treatment of elopement across two school settings. *Journal of Applied Behavior Analysis*, 43(1), 113–118.

- <http://files.eric.ed.gov/fulltext/EJ877525.pdf>, The study is ineligible for review because it is out of the scope of the protocol.
- Lee, D. L., & Axelrod, S. (2005). *Behavior modification: Basic principles. Third edition*. Austin: TX: PRO-ED, Inc. The study is ineligible for review because it does not use an eligible design.
- Lee, S. W., & Jamison, T. R. (2003). Including the FBA process in student assistance teams: An exploratory study of team communications and intervention selection. *Journal of Educational and Psychological Consultation, 14*(2), 209–239. The study is ineligible for review because it does not use a sample aligned with the protocol.
- LeGray, M. W., Dufrene, B. A., Mercer, S., Olmi, D. J., & Sterling, H. (2013). Differential reinforcement of alternative behavior in center-based classrooms: Evaluation of pre-teaching the alternative behavior. *Journal of Behavioral Education, 22*(2), 85–102. doi:10.1007/s10864-013-9170-8 The study is ineligible for review because it is out of the scope of the protocol.
- Lehardy, R. K., Lerman, D. C., Evans, L. M., O'Connor, A., & Lesage, D. L. (2013). A simplified methodology for identifying the function of elopement. *Journal of Applied Behavior Analysis, 46*(1), 256–270. doi:10.1002/jaba.22 The study is ineligible for review because it is out of the scope of the protocol.
- Levelle, J. A. (1998). Analog functional assessment in general education settings (disruptive behaviors, peer attention, treatment validation). *Dissertation Abstracts International, 60*(03B), 92-1291. (AAG9922093) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Lewis, T. J., & Sugai, G. (1996). Descriptive and experimental analysis of teacher and peer attention and the use of assessment-based intervention to improve prosocial behavior. *Journal of Behavioral Education, 6*(1), 7–24. The study is ineligible for review because it is out of the scope of the protocol.
- Lewis, T. J., & Sugai, G. (1996). Functional assessment of problem behavior: A pilot investigation on the comparative and interactive effects of teacher and peer social attention on students in general education settings. *School Psychology Quarterly, 11*(1), 1–19. The study is ineligible for review it does not use an eligible design.
- Lewis Palmer, T. L. (1999). Using functional assessment strategies in regular classroom settings with students at-risk for school failure. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 59*(12-A), 4369. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Liaupsin, C. J. (2002). The comprehensive evaluation of a self-instructional program on functional behavioral assessment. *Journal of Special Education Technology, 17*(3), 5–25. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Liaupsin, C. J., Umbreit, J., Ferro, J. B., Urso, A., & Upreti, G. (2006). Improving academic engagement through systematic, function-based intervention. *Education and Treatment of Children, 29*(4), 573–591. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Linehan, S. A. L. (1992). The effect of developmental versus functional assessment on educators' instructional planning decisions (developmental assessment, related services). *Dissertation Abstracts International, 53*(05A), 151-1479. (AAG9225116) The study is ineligible for review because it is out of the scope of the protocol.
- Liu-Gitz, L., & Banda, D. R. (2010). A replication of the RIRD strategy to decrease vocal stereotypy in a student with autism. *Behavioral Interventions, 25*(1), 77–87. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Lo, Y. (2003). Functional assessments and individualized intervention plans: Increasing the behavior adjustment of urban learners in general and special education settings. *Dissertation Abstracts International, 65*(03A), 336-891. (AAI3124363) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Lo, Y., & Cartledge, G. (2006). FBA and BIP: Increasing the behavior adjustment of African American boys in schools. *Behavioral Disorders, 31*(2), 147–161. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Loman, S. L., & Horner, R. H. (2014). Examining the efficacy of a basic functional behavioral assessment training package for school personnel. *Journal of Positive Behavior Interventions, 16*(1), 18–30. The study is ineligible for review because it is out of the scope of the protocol.

- Losinski, M., Maag, J. W., Katsiyannis, A., & Ennis, R. P. (2014). Examining the effects and quality of interventions based on the assessment of contextual variables: A meta-analysis. *Exceptional Children, 80*(4), 407–422. doi:10.1177/0014402914527243 The study is ineligible for review because it does not use an eligible design.
- Luiselli, J. K. (1996). Functional assessment and treatment of aggressive and destructive behaviors in a child victim of physical abuse. *Journal of Behavior Therapy and Experimental Psychiatry, 27*(1), 41–49. The study is ineligible for review because it does not use a sample aligned with the protocol.
- MacDonald, J. M., Ahearn, W. H., Parry-Cruwys, D., Bancroft, S., & Dube, W. V. (2013). Persistence during extinction: Examining the effects of continuous and intermittent reinforcement on problem behavior. *Journal of Applied Behavior Analysis, 46*(1), 333–338. doi:10.1002/jaba.3 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Machalicek, W., O'Reilly, M., Chan, J. M., Lang, R., Rispoli, M., Davis, T., ... Didden, R. (2009). Using videoconferencing to conduct functional analysis of challenging behavior and develop classroom behavioral support plans for students with autism. *Education and Training in Developmental Disabilities, 44*(2), 207–217. The study is ineligible for review because it does not use an eligible design.
- Machalicek, W., O'Reilly, M. F., Beretvas, N., Sigafos, J., & Lancioni, G. E. (2007). A review of interventions to reduce challenging behavior in school settings for students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 1*(3), 229–246. The study is ineligible for review because it does not use an eligible design.
- March, R. E. (1998). The effects of functional assessment strategies with middle school students who display chronic antisocial behavior. *Dissertation Abstracts International, 60*(02A), 161-389. The study is ineligible for review because it does not use a sample aligned with the protocol.
- March, R. E., & Horner, R. H. (2002). Feasibility and contributions of functional behavioral assessment in schools. *Journal of Emotional and Behavioral Disorders, 10*(3), 158–170. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Maynard, B. R., Tyson-McCrea, K., Pigott, T., & Kelly, M. (2011). *A systematic review and meta-analysis of indicated interventions to increase school attendance*. Evanstone, IL: Society for Research on Educational Effectiveness. <http://files.eric.ed.gov/fulltext/ED519156.pdf>. The study is ineligible for review because it does not use an eligible design.
- McCahill, J., Healy, O., Lydon, S., & Ramey, D. (2014). Training educational staff in functional behavioral assessment: A systematic review. *Journal of Developmental and Physical Disabilities, 26*(4), 479–505. doi:10.1007/s10882-014-9378-0 The study is ineligible for review because it does not use an eligible design.
- McComas, J. J., Hoch, H., & Mace, F. C. (2000). Functional analysis. In E. S. Shapiro & T. R. Kratochwill (Eds.), *Conducting school-based assessments of child and adolescent behavior* (pp. 78–120). New York, NY: Guilford Press. The study is ineligible for review because it does not use a sample aligned with the protocol.
- McConnell, M. E., Hilvitz, P. B., & Cox, C. J. (1998). Functional assessment: A systematic process for assessment and intervention in general and special education classrooms. *Intervention in School and Clinic, 34*(1), 10–20. The study is ineligible for review because it does not use a sample aligned with the protocol.
- McDougal, J., & Hiralall, A. S. (1998, April). *Bridging research into practice to intervene with young aggressive students in the public school setting: Evaluation of the behavior consultation team (BCT) project*. Paper presented at the Annual Convention of the National Association of School Psychologists, Orlando, FL. <http://files.eric.ed.gov/fulltext/ED421681.pdf>. The study is ineligible for review because it does not use an eligible design.
- McDougal, J. L., Nastasi, B. K., & Chafouleas, S. M. (2005). Bringing research into practice to intervene with young behaviorally challenging students in public school settings: Evaluation of the behavior consultation team (BCT) project. *Psychology in the Schools, 42*(5), 537–551. The study is ineligible for review because it does not use an eligible design.
- McGarrell, M., Healy, O., Leader, G., O'Connor, J., & Kenny, N. (2009). Six reports of children with autism spectrum disorder following intensive behavioral intervention using the preschool inventory of repertoires for kinder-

- garten (PIRK[R]). *Research in Autism Spectrum Disorders*, 3(3), 767–782. The study is ineligible for review because it does not use an eligible design.
- McIntosh, A. S. (2003). An analysis of early career California special education teachers' views on functional behavioral assessment. *Dissertation Abstracts International*, 64(03A), 96-859. The study is ineligible for review because it does not use an eligible design.
- McIntosh, K. (2005). Academic, behavioral, and functional predictors of chronic problem behavior in elementary grades. *Dissertation Abstracts International*, 66(07A), 117-2493. The study is ineligible for review because it does not use an eligible design.
- McIntosh, K. (2006). Academic, behavioral, and functional predictors of chronic problem behavior in elementary grades. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 66(7-A), 2493. The study is ineligible for review because it does not use an eligible design.
- McIntosh, K., Borgmeier, C., Anderson, C. M., Horner, R. H., Rodriguez, B. J., & Tobin, T. J. (2008). Technical adequacy of the Functional Assessment Checklist: Teachers and Staff (FACTS) FBA interview measure. *Journal of Positive Behavior Interventions*, 10(1), 33–45. The study is ineligible for review because it does not use an eligible design.
- McIntosh, K., Horner, R. H., Chard, D. J., Dickey, C. R., & Braun, D. H. (2008). Reading skills and function of problem behavior in typical school settings. *Journal of Special Education*, 42(3), 131–147. The study is ineligible for review because it does not use an eligible design.
- Mcloughlin, C. S. (2010). An exploratory case-study research report incorporating service learning. *New Horizons in Education*, 58(1), 53–64. <http://files.eric.ed.gov/fulltext/EJ893712.pdf>. The study is ineligible for review because it does not use an eligible design.
- Meyer, E. A., Hagopian, L. P., & Paclawskyj, T. R. (1999). A function-based treatment for school refusal behavior using shaping and fading. *Research in Developmental Disabilities*, 20(6), 401–410. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Meyer, K. A. (1996). The functional analysis and treatment of problem behavior exhibited by children in elementary schools. *Dissertation Abstracts International*, 57(08A), 114-3393. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Meyer, K. A. (1999). Functional analysis and treatment of problem behavior exhibited by elementary school children. *Journal of Applied Behavior Analysis*, 32(2), 229–232. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Miller, J. H. (2005). *Disruption in the preschool classroom: A functional assessment based approach* (Doctoral dissertation, Vanderbilt University). The study is ineligible for review because it does not use a sample aligned with the protocol.
- Moore, D. W., Anderson, A., & Kumar, K. (2005). Instructional adaptation in the management of escape-maintained behavior in a classroom. *Journal of Positive Behavior Interventions*, 7(4), 216–223. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Moore, T. R., Tervo, R. C., McComas, J. J., Rivard, P. F., & Symons, F. J. (2009). Longitudinal functional analysis of problem behavior during an atypical neuroleptic medication cross-over evaluation for an adolescent with developmental disabilities. *Education and Treatment of Children*, 32(1), 105–119. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Moreno, G. (2011). Addressing challenging behaviours in the general education setting: Conducting a teacher-based functional behavioural assessment (FBA). *Education*, 3-13, 39(4), 363–371. The study is ineligible for review because it does not use an eligible design.
- Moreno, G., Wong-Lo, M., & Bullock, L. M. (2014). Assisting students from diverse backgrounds with challenging behaviors: Incorporating a culturally attuned functional behavioral assessment in prereferral services. *Preventing School Failure: Alternative Education for Children and Youth*, 58(1), 58–68. The study is ineligible for review because it does not use a sample aligned with the protocol.

- Msall, M. E., Tremont, M. R., & Ottenbacher, K. J. (2001). Functional assessments of preschool children: Optimizing developmental and family supports in early intervention. *Infants and Young Children: An Interdisciplinary Journal of Special Care Practices*, 14(1), 46–66. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Mueller, M. M., & Ajamu, N. (2007). State of the science in the assessment and management of severe behavior problems in school settings: Behavior analytic consultation to schools. *International Journal of Behavioral Consultation and Therapy*, 3(2), 176–202. <http://files.eric.ed.gov/fulltext/EJ801197.pdf>. The study is ineligible for review because it does not use an eligible design.
- Mueller, M. M., & Kafka, C. (2006). Assessment and treatment of object mouthing in a public school classroom. *Behavioral Interventions*, 21(2), 137–154. doi:10.1002/bin.201 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Mueller, M. M., Sterling-Turner, H. E., & Moore, J. W. (2005). Towards developing a classroom-based functional analysis condition to assess escape-to-attention as a variable maintaining problem behavior. *School Psychology Review*, 34(3), 425–431. The study is ineligible for review because it does not use an eligible design.
- Mullen, C. M. (2001). Assessment of culturally and linguistically diverse students: A qualitative study of the assessment process in a multicultural environment. *Dissertation Abstracts International*, 62(01B), 94-597. (AAI3003080) The study is ineligible for review because it does not use an eligible design.
- Murdock, S. G., O'Neill, R. E., & Cunningham, E. (2005). A comparison of results and acceptability of functional behavioral assessment procedures with a group of middle school students with emotional/behavioral disorders (E/BD). *Journal of Behavioral Education*, 14(1), 5–18. The study is ineligible for review because it is out of the scope of the protocol.
- Murphy, C. P. (2010). An investigation of the relative effectiveness of function-based and non-function-based behavioral interventions. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 70(11-A), 4180. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Neef, N., & Northup, J. (2007). Attention deficit hyperactivity disorder. In P. Sturmey (Ed.), *Functional analysis in clinical treatment* (pp. 87–110). San Diego, CA: Academic Press. The study is ineligible for review because it does not use an eligible design.
- Neely, L., Rispoli, M., Gerow, S., & Ninci, J. (2015). Effects of antecedent exercise on academic engagement and stereotypy during instruction. *Behavior Modification*, 39(1), 98–116. doi:10.1177/0145445514552891 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Neilsen, S. L., & McEvoy, M. A. (2004). Functional behavioral assessment in early education settings. *Journal of Early Intervention*, 26(2), 115–131. The study is ineligible for review because it does not use an eligible design.
- Ness, J. B. (2004). Functional behavioral assessment: An empirically-based investigation of the possibility of a broadened cognitive science view. *Dissertation Abstracts International*, 66(02A), 126-490. (AAI3165925) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Newcomer, L. L. (2003). Functional assessment: An investigation of assessment reliability and treatment validity and the effectiveness of function-based interventions compared to non-functional interventions. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 63(12-A), 4274. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Newcomer, L. L., & Lewis, T. J. (2004). Functional behavioral assessment: An investigation of assessment reliability and effectiveness of function-based interventions. *Journal of Emotional and Behavioral Disorders*, 12(3), 168–181. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Nielsen, S. L. (2001). Extending positive behavioral support to young children with challenging behavior. *Dissertation Abstracts International*, 62(10A), 131-3347. The study is ineligible for review because it does not use a sample aligned with the protocol.

- Nordness, P. D., Swain, K. D., & Haverkost, A. (2012). A screening matrix for an initial line of inquiry. *Intervention in School and Clinic, 47*(4), 245–251. doi:10.1177/1053451211424597 The study is ineligible for review because it is out of the scope of the protocol.
- Northup, J., Broussard, C., Jones, K., George, T., Vollmer, T. R., & Herring, M. (1995). The differential effects of teacher and peer attention on the disruptive classroom behavior of three children with a diagnosis of attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis, 28*(2), 227–228. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Northup, J., Fusilier, I., Swanson, V., Huette, J., Bruce, T., Freeland, J., ... Edwards, S. (1999). Further analysis of the separate and interactive effects of methylphenidate and common classroom contingencies. *Journal of Applied Behavior Analysis, 32*(1), 35–50. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Northup, J., & Gulley, V. (2001). Some contributions of functional analysis to the assessment of behaviors associated with attention deficit hyperactivity disorder and the effects of stimulant medication. *School Psychology Review, 30*(2), 227. The study is ineligible for review because it does not use an eligible design.
- Northup, J., Wacker, D. P., Berg, W. K., Kelly, L., Sasso, G., & DeRaad, A. (1994). The treatment of severe behavior problems in school settings using a technical assistance model. *Journal of Applied Behavior Analysis, 27*(1), 33–47. The study is ineligible for review because it does not use an eligible design.
- Olympia, D., & Larsen, J. (2005). Functional behavioral assessment: An emerging component of best school practices for ADHD. *ADHD Report, 13*(5), 1–5. The study is ineligible for review because it does not use a sample aligned with the protocol.
- O'Neill, S., & Stephenson, J. (2009). Teacher involvement in the development of function-based behaviour intervention plans for students with challenging behaviour. *Australasian Journal of Special Education, 33*(1), 6–25. The study is ineligible for review because it does not use an eligible design.
- O'Reilly, M., Sigafoos, J., Lancioni, G., Edrisinha, C., & Andrews, A. (2005). An examination of the effects of a classroom activity schedule on levels of self-injury and engagement for a child with severe autism. *Journal of Autism and Developmental Disorders, 35*(3), 305–311. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Packenhams, M., Shute, R., & Reid, R. (2004). Truncated functional behavioral assessment procedure for children with disruptive classroom behaviors. *Education and Treatment of Children, 27*(1), 9–25. The study is ineligible for review because it is out of the scope of the protocol.
- Park, K. L. (2010). Using structural analysis in head start classrooms: Antecedent-based interventions for young children at risk for emotional and behavioral disorders. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 71*(3-A), 825. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Parker, M., Skinner, C., & Booher, J. (2010). Using functional behavioral assessment data to infer learning histories and guide interventions: A consultation case study. *International Journal of Behavioral Consultation and Therapy, 6*(1), 24–34. <http://files.eric.ed.gov/fulltext/EJ896233.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Patterson, S. T. (2009). The effects of teacher-student small talk on out-of-seat behavior. *Education and Treatment of Children, 32*(1), 167–174. The study is ineligible for review because it does not use an eligible design.
- Payne, L. D. (2006). Functional behavioral assessment: Basing intervention on function in school settings. *Dissertation Abstracts International, 67*(08A), 116-2941. (AAI3228803) The study is ineligible for review because it is out of the scope of the protocol.
- Payne, L. D., Scott, T. M., & Conroy, M. (2007). A school-based examination of the efficacy of function-based intervention. *Behavioral Disorders, 32*(3), 158–174. The study is ineligible for review because it is out of the scope of the protocol.

- Pearce, L. R. (2009). Helping children with emotional difficulties: A response to intervention investigation. *Rural Educator*, 30(2), 34–46. <http://files.eric.ed.gov/fulltext/EJ869307.pdf>. The study is ineligible for review because it does not use an eligible design.
- Peterson, S. M. P., Caniglia, C., & Royster, A. J. (2001). Application of choice-making intervention for a student with multiply maintained problem behavior. *Focus on Autism and Other Developmental Disabilities*, 16(4), 240–246. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Poole, V. Y., Dufrene, B. A., Sterling, H. E., Tingstrom, D. H., & Hardy, C. M. (2012). Classwide functional analysis and treatment of preschoolers' disruptive behavior. *Journal of Applied School Psychology*, 28(2), 155–174. doi:10.1080/15377903.2012.669744 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Post, M., Haymes, L., Storey, K., Loughrey, T., & Campbell, C. (2014). Understanding stalking behaviors by individuals with autism spectrum disorders and recommended prevention strategies for school settings. *Journal of Autism and Developmental Disorders*, 44(11), 2698–2706. doi:10.1007/s10803-012-1712-8 The study is ineligible for review because it is out of the scope of the protocol.
- Powers, K. V. (2005). Training teachers to problem solve effectively through the employment of basic functional behavioral assessment techniques in the classroom setting. *Dissertation Abstracts International*, 66(07A), 128-2547. (AAI3184340) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Pratola, A. (2005). An investigation of the perceptions of educational diagnosticians concerning their roles in the functional behavioral assessment process in high schools in four districts in Delaware. *Dissertation Abstracts International*, 65(12A), 222-4524. (AAI3156274) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Pratt, J. L. (2010). *Extending the functional behavioral assessment process: A methodology for test-driving interventions with varied choice dimensions to reduce escape-maintained behaviors displayed by youth with emotional and behavioral disorders* (Doctoral dissertation, University of Southern Maine). The study is ineligible for review because it does not use a sample aligned with the protocol.
- Preciado, J. A. (2006). Using a function-based approach to decrease problem behaviors and increase reading academic engagement for Latino English language learners. *Dissertation Abstracts International*, 67(10A), 136-3775. (AAI3238462) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Preciado, J. A., Horner, R. H., & Baker, S. K. (2009). Using a function-based approach to decrease problem behaviors and increase academic engagement for Latino English language learners. *Journal of Special Education*, 42(4), 227–240. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Pritchard, J., & Cole, T. (2009). Book reviews. *Emotional and Behavioural Difficulties*, 14(3), 251–254. doi:10.1080/13632750903073582 The study is ineligible for review because it does not use an eligible design.
- Queen, A. H., & Ehrenreich-May, J. (2014). Anxiety-disordered adolescents with and without a comorbid depressive disorder: Variations in clinical presentation and emotion regulation. *Journal of Emotional and Behavioral Disorders*, 22(3), 160–170. doi:10.1177/1063426613478175 The study is ineligible for review because it is out of the scope of the protocol.
- Quigley, S. P., Peterson, S. M., Frieder, J. E., Brower-Breitwieser, C., Mullins, S., Ivers, H., & Acker, N. (2013). Example of a function-based choice assessment for a student with “passive” problem behavior. *Journal of Evidence-Based Practices for Schools*, 14(1), 81–102. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Quinn, M. M. (2000). Functional behavioral assessment: The letter and the spirit of the law. *Preventing School Failure*, 44(4), 147–151. The study is ineligible for review because it does not use an eligible design.

- Reed, M. A. (2001). *Functional behavior assessment: Knowledge and skills of E/BD teachers in West Virginia*. (Doctoral dissertation, West Virginia University). The study is ineligible for review because it does not use an eligible design.
- Reeves, L. M. (2014). *The role of the replacement behavior in function-based interventions* (Doctoral dissertation, University of Arizona). The study is ineligible for review because it does not use a sample aligned with the protocol.
- Reid, R., & Nelson, J. R. (2002). The utility, acceptability, and practicality of functional behavioral assessment for students with high-incidence problem behaviors. *Remedial and Special Education, 23*(1), 15–23. The study is ineligible for review because it does not use an eligible design.
- Renshaw, T. L., Christensen, L., Marchant, M., & Anderson, T. (2008). Training elementary school general educators to implement function-based support. *Education and Treatment of Children, 31*(4), 495–521. The study is ineligible for review because it does not use an eligible design.
- Richman, D. M., Berg, W. K., Wacker, D. P., Stephens, T., Rankin, B., & Kilroy, J. (1997). Using pretreatment and posttreatment assessments to enhance and evaluate existing treatment packages. *Journal of Applied Behavior Analysis, 30*(4), 709–712. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Riney, S. S., & Bullock, L. M. (2012). Teachers' perspectives on student problematic behavior and social skills. *Emotional and Behavioural Difficulties, 17*(2), 195–211. doi:10.1080/13632752.2012.675136. The study is ineligible for review because it does not use an eligible design.
- Rispoli, M., Camargo, S., Machalicek, W., Lang, R., & Sigafoos, J. (2014). Functional communication training in the treatment of problem behavior maintained by access to rituals. *Journal of Applied Behavior Analysis, 47*(3), 580–593. doi:10.1002/jaba.130 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Roach, A. T. (2008). Intervention validity of assessments used in special education. *Assessment for Effective Intervention, 34*(1), 3–5. The study is ineligible for review because it does not use an eligible design.
- Roberts, M. L., Marshall, J., Nelson, J. R., & Albers, C. A. (2001). Curriculum-based assessment procedures embedded within functional behavioral assessments: Identifying escape-motivated behaviors in a general education classroom. *School Psychology Review, 30*(2), 264–277. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Rogers, E. L. (1998). Functional assessment in the home. *Preventing School Failure: Alternative Education for Children and Youth, 43*(1), 31–33. The study is ineligible for review because it does not use an eligible design.
- Rooker, G. W., Iwata, B. A., Harper, J. M., Fahmie, T. A., & Camp, E. M. (2011). False-positive tangible outcomes of functional analyses. *Journal of Applied Behavior Analysis, 44*(4), 737–745. doi:10.1901/jaba.2011.44-737 <http://files.eric.ed.gov/fulltext/EJ964429.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Roscoe, E. M., Rooker, G. W., Pence, S. T., & Longworth, L. J. (2009). Assessing the utility of a demand assessment for functional analysis. *Journal of Applied Behavior Analysis, 42*(4), 819–825. <http://files.eric.ed.gov/fulltext/EJ868597.pdf>. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Russell, D. L. (2006). Adding function-based behavioral support to first step to success. *Dissertation Abstracts International, 67*(10A), 170-3776. (AAI3238468) The study is ineligible for review because it does not use a sample aligned with the protocol.
- Sarno, J. M., Sterling, H. E., Mueller, M. M., Dufrene, B., Tingstrom, D. H., & Olmi, D. J. (2011). Escape-to-attention as a potential variable for maintaining problem behavior in the school setting. *School Psychology Review, 40*(1), 57–71. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Sasso, G. M., Conroy, M. A., Stichter, J. P., & Fox, J. J. (2001). Slowing down the bandwagon: The misapplication of functional assessment for students with emotional or behavioral disorders. *Behavioral Disorders, 26*(4), 282–296. The study is ineligible for review because it does not use an eligible design.

- Sasso, G. M., Reimers, T. M., Cooper, L. J., Wacker, D., Berg, W., Steege, M., ... Allaire, A. (1992). Use of descriptive and experimental analyses to identify the functional properties of aberrant behavior in school settings. *Journal of Applied Behavior Analysis, 25*(4), 809–821. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Schwartz, I. S., Boulware, G., McBride, B. J., & Sandall, S. R. (2001). Functional assessment strategies for young children with autism. *Focus on Autism and Other Developmental Disabilities, 16*(4), 222–227, 231. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Scott, T. M., Alter, P. J., & McQuillan, K. (2010). Functional behavior assessment in classroom settings: Scaling down to scale up. *Intervention in School and Clinic, 46*(2), 87–94. doi:10.1177/1053451210374986 The study is ineligible for review because it does not use an eligible design.
- Scott, T. M., Bucalos, A., Liaupsin, C., Nelson, C. M., Jolivet, K., & DeShea, L. (2004). Using functional behavior assessment in general education settings: Making a case for effectiveness and efficiency. *Behavioral Disorders, 29*(2), 189–201. The study is ineligible for review because it does not use an eligible design.
- Scott, T. M., DeSimone, C., Fowler, W., & Webb, E. (2000). Using functional assessment to develop interventions for challenging behaviors in the classroom: Three case studies. *Preventing School Failure, 44*(2), 51–56. The study is ineligible for review because it does not use an eligible design.
- Scott, T. M., Liaupsin, C., Nelson, C. M., & McIntyre, J. (2005). Team-based functional behavior assessment as a proactive public school process: A descriptive analysis of current barriers. *Journal of Behavioral Education, 14*(1), 57–71. The study is ineligible for review because it does not use an eligible design.
- Scott, T. M., McIntyre, J., Liaupsin, C., Nelson, C. M., Conroy, M., & Payne, L. D. (2005). An examination of the relation between functional behavior assessment and selected intervention strategies with school-based teams. *Journal of Positive Behavior Interventions, 7*(4), 205–215. The study is ineligible for review because it does not use an eligible design.
- Shumate, E. D., & Wills, H. P. (2010). Classroom-based functional analysis and intervention for disruptive and off-task behaviors. *Education and Treatment of Children, 33*(1), 23–48. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Silverman, M. K., Stratman, K. F., & Smith, R. O. (2000). Measuring assistive technology outcomes in schools using functional assessment. *Assessment for Effective Intervention, 25*(4), 307–325. The study is ineligible for review because it does not use an eligible design.
- Simmons, M., Arnold, M., & Carson, J. (1993). Instruction for effective teaching and behavior management. *Reading Improvement, 30*, 157–160. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Skinner, J. N., Veerkamp, M. B., Kamps, D. M., & Andra, P. R. (2009). Teacher and peer participation in functional analysis and intervention for a first grade student with attention deficit hyperactivity disorder. *Education and Treatment of Children, 32*(2), 243–266. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Slifer, K. J., & Amari, A. (2009). Behavior management for children and adolescents with acquired brain injury. *Developmental Disabilities Research Reviews, 15*(2), 144–151. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Smalley, K. A. (2002). Strategies and barriers in facilitating social supports with individuals who present challenging behaviors, as a means to produce behavioral change. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 63*(2-A), 559. The study is ineligible for review because it does not use an eligible design.
- Smith, C. (2011). The effectiveness of function-based classroom interventions using functional behavior assessments and an in-school suspension program. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 71*(10-A), 3621. The study is ineligible for review because it is out of the scope of the protocol.

- Snell, M. E., Voorhees, M. D., & Chen, L. (2005). Team involvement in assessment-based interventions with problem behavior: 1997–2002. *Journal of Positive Behavior Interventions*, 7(3), 140–152. The study is ineligible for review because it does not use an eligible design.
- Stage, S. A., Cheney, D., Lynass, L., Mielenz, C., & Flower, A. (2012). Three validity studies of the daily progress report in relationship to the Check, Connect, and Expect intervention. *Journal of Positive Behavior Interventions*, 14(3), 181–191. doi:10.1177/1098300712438942 The study is ineligible for review because it is out of the scope of the protocol.
- Stahr, B., Cushing, D., Lane, K., & Fox, J. (2006). Efficacy of a function-based intervention in decreasing off-task behavior exhibited by a student with ADHD. *Journal of Positive Behavior Interventions*, 8(4), 201–211. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Stainback, W., & Stainback, S. (1992). *Controversial issues confronting special education: Divergent perspectives*. Needham Heights, MA: Allyn and Bacon. The study is ineligible for review because it does not use an eligible design.
- Stoiber, K. C., & Gettinger, M. (2011). Functional assessment and positive support strategies for promoting resilience: Effects on teachers and high-risk children. *Psychology in the Schools*, 48(7), 686–706. doi:10.1002/pits.20587 The study is ineligible for review because it is out of the scope of the protocol.
- Stoiber, K. C., Gettinger, M., & Fitts, M. (2007). Functional assessment and positive support strategies: Case illustration of process and outcomes. *Early Childhood Services: An Interdisciplinary Journal of Effectiveness*, 1(3), 165–179. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Stoiber, K. C., & Vanderwood, M. L. (2008). Traditional assessment, consultation, and intervention practices: Urban school psychologists' use, importance, and competence ratings. *Journal of Educational and Psychological Consultation*, 18(3), 264–292. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Stokes, J. V., & Luiselli, J. K. (2010). Functional analysis and behavioral coaching intervention to improve tackling skills of a high school football athlete. *Journal of Clinical Sport Psychology*, 4(2), 150–157. The study is ineligible for review because it is out of the scope of the protocol.
- Storey, K., Lawry, J. R., Ashworth, R., Danko, C. D., & Strain, P. S. (1994). Functional analysis and intervention for disruptive behaviors of a kindergarten student. *Journal of Educational Research*, 87(6), 361–370. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Storm-Smith, C. A. (2006). A study of the present practices of public schools in southern California in the use of functional behavioral assessment and functional analysis assessment. *Dissertation Abstracts International*, 67(03A), 187-900. (AAI3212498) The study is ineligible for review because it is out of the scope of the protocol.
- Strickland-Cohen, M. K., & Horner, R. H. (2015). Typical school personnel developing and implementing basic behavior support plans. *Journal of Positive Behavior Interventions*, 17(2), 83–94. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Sturmey, P. (2001). The functional analysis checklist: Inter-rater and test-retest reliability. *Journal of Applied Research in Intellectual Disabilities*, 14(2), 141–146. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Sugai, G. M., & Horner, R. H. (2000). Special issue: Functional behavioral assessment. *Exceptionality: A Special Education Journal*, 8(3). The study is ineligible for review because it does not use an eligible design.
- Sutton, J. P., & Walker, S. C. (1999). A diagnostician's primer on functional behavioral assessment. *Diagnostique*, 25(1), 45–57. The study is ineligible for review because it does not use an eligible design.
- Swaggart, B. L. (1997). Factors that contribute to the type and the effectiveness of interventions designed to reduce the occurrence of self-injurious behavior in school-aged children and adults with developmental disabilities: A meta-analysis of single-case research. *Dissertation Abstracts International*, 58(11A), 566-4236. (AAG9817106) The study is ineligible for review because it does not use an eligible design.

- Swarts, L. (2001). The influence of research-based systems/strategies on alternative education program safety. *Dissertation Abstracts International*, 62(12A), 241-4020. (AAI3038766) The study is ineligible for review because it is out of the scope of the protocol.
- Swoszowski, N. C. (2010). Function-based responding to Check In/Check Out for students with emotional and behavioral disorders in a residential facility (Doctoral dissertation, Georgia State University). The study is ineligible for review because it does not use a sample aligned with the protocol.
- Tang, J., Patterson, T. G., & Kennedy, C. H. (2003). Identifying specific sensory modalities maintaining the stereotypy of students with multiple profound disabilities. *Research in Developmental Disabilities*, 24(6), 433-451. doi:10.1016/j.ridd.2003.02.001 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Tarbox, J., Wilke, A. E., Najdowski, A. C., Findel-Pyles, R. S., Balasanyan, S., Caveney, A. C....Tia, B. (2009). Comparing indirect, descriptive, and experimental functional assessments of challenging behavior in children with autism. *Journal of Developmental and Physical Disabilities*, 21(6), 493-514. doi:10.1007/s10882-009-9154-8 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Taylor, J., & Miller, M. (1997). When timeout works some of the time: The importance of treatment integrity and functional assessment. *School Psychology Quarterly*, 12(1), 4-22. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Taylor, J. C., & Carr, E. G. (1992). Severe problem behaviors related to social interaction. 1: Attention seeking and social avoidance. *Behavior Modification*, 16, 305-335. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Taylor, J. C., & Romanczyk, R. G. (1994). Generating hypotheses about the function of student problem behavior by observing teacher behavior. *Journal of Applied Behavior Analysis*, 27(2), 251-265. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Taylor, J. C., Sission, L. A., McKelvey, J. L., & Trefelner, M. F. (1993). Situation specificity in attention-seeking problem behavior. A case study. *Behavior Modification*, 17(4), 474-497. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Thoder, V. J., Hesky, J. G., & Cautilli, J. D. (2010). Using reliable change to calculate clinically significant progress in children with EBD: A BHRS program evaluation. *International Journal of Behavioral Consultation and Therapy*, 6(1), 45-66. <http://files.eric.ed.gov/fulltext/EJ896235.pdf>. The study is ineligible for review because it does not use an eligible design.
- Tincani, M. (2011). *Preventing challenging behavior in your classroom: Positive behavior support and effective classroom management*. Waco, TX: Prufrock Press. The study is ineligible for review because it does not use an eligible design.
- Turton, A. M., Umbreit, J., & Mathur, S. R. (2011). Systematic function-based intervention for adolescents with emotional and behavioral disorders in an alternative setting: Broadening the context. *Behavioral Disorders*, 36(2), 117-128. The study is ineligible for review because it is out of the scope of the protocol.
- Turton, A., & Rayner, S. (2007). Behaviour intervention for a student with Tourette's syndrome: A case study. *Emotional and Behavioural Difficulties*, 12(4), 333-348. The study is ineligible for review because it does not use an eligible design.
- Umbreit, J. (1995). Functional assessment and intervention in a regular classroom setting for the disruptive behavior of a student with attention deficit hyperactivity disorder. *Behavioral Disorders*, 20(4), 267-278. The study is ineligible for review because it is out of the scope of the protocol.
- Umbreit, J., & Blair, K. (1997). Using structural analysis to facilitate treatment of aggression and noncompliance in a young child at-risk for behavioral disorders. *Behavioral Disorders*, 22(2), 75-86. The study is ineligible for review because it does not use a sample aligned with the protocol.

- Umbreit, J., & Ferro, J. B. (2014). Function-based intervention: Accomplishments and future directions. *Remedial and Special Education, 36*(2), 89–32. doi:10.1177/0741932514555024 The study is ineligible for review because it does not use an eligible design.
- Umbreit, J., Lane, K. L., & Dejud, C. (2004). Improving classroom behavior by modifying task difficulty: Effects of increasing the difficulty of too-easy tasks. *Journal of Positive Behavior Interventions, 6*(1), 13–20. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Underwood, M. A., Umbreit, J., & Liaupsin, C. (2009). Efficacy of a systematic process for designing function-based interventions for adults in a community setting. *Education and Training in Developmental Disabilities, 44*(1), 25–38. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Valdebenito, S., Eisner, M., Farrington, D., Ttofi, M., & Sutherland, A. (2015). *School-based interventions for reducing disciplinary school exclusion: A systematic review*. Oslo, Norway: The Campbell Collaboration. The study is ineligible for review because it is out of the scope of the protocol.
- Van Laarhoven, T. R., Munk, D. D., Lynch, K., Bosma, J., & Rouse, J. (2007). A model for preparing special and general education preservice teachers for inclusive education. *Journal of Teacher Education, 58*(5), 440–455. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Vannest, K. J., Harrison, J. R., Temple-Harvey, K., Ramsey, L., & Parker, R. I. (2011). Improvement rate differences of academic interventions for students with emotional and behavioral disorders. *Remedial and Special Education, 32*(6), 521–534. The study is ineligible for review because it does not use an eligible design.
- Vaughn, B. J., Dunlap, G., Fox, L., Clarke, S., & Bucy, M. (1997). Parent-professional partnership in behavioral support: A case study of community-based intervention. *Journal of the Association for Persons with Severe Handicaps, 22*(4), 186–197. The study is ineligible for review because it does not use an eligible design.
- Vaughn, B. J., & Horner, R. H. (1997). Identifying instructional tasks that occasion problem behaviors and assessing the effects of student versus teacher choice among these tasks. *Journal of Applied Behavior Analysis, 30*(2), 299–312. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Vella, P. (2009). Training school-based professionals in functional behavioral assessment and behavior intervention planning. *Dissertation Abstracts International, 70*(04B), 95-2563. (AAI3357193) The study is ineligible for review because it is out of the scope of the protocol.
- Villalba, J. A., Latus, M., Hamilton, S., & Kendrick, C. (2005). School counselors' knowledge of functional behavioral assessments. *Behavioral Disorders, 30*(4), 449–455. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Virues-Ortega, J., Segui-Duran, D., Descalzo-Quero, A., Carnerero, J. J., & Martin, N. (2011). Caregivers' agreement and validity of indirect functional analysis: A cross cultural evaluation across multiple problem behavior topographies. *Journal of Autism and Developmental Disorders, 41*(1), 82–91. doi:10.1007/s10803-010-1022-y The study is ineligible for review because it is out of the scope of the protocol.
- Vollmer, T. R., Marcus, B. A., Ringdahl, J. E., & Roane, H. S. (1995). Progressing from brief assessments to extended experimental analyses in the evaluation of aberrant behavior. *Journal of Applied Behavior Analysis, 28*(4), 561–576. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Wadsworth, J. P., Hansen, B. D., & Wills, S. B. (2014). Increasing compliance in students with intellectual disabilities using functional behavioral assessment and self-monitoring. *Remedial and Special Education, 36*(4), 198–207. doi:10.1177/0741932514554102 The study is ineligible for review because it does not use a sample aligned with the protocol.
- Waguespack, A., Vaccaro, T., & Continere, L. (2006). Functional behavioral assessment and intervention with Emotional/Behaviorally disordered students: In pursuit of state of the art. *International Journal of Behavioral Consultation and Therapy, 2*(4), 463–474. <http://files.eric.ed.gov/fulltext/EJ804053.pdf>. The study is ineligible for review because it does not use an eligible design.

- Ward, S. M. (1998). Functional behavioral assessment: An evaluation of continuing education variables related to support staff use in school settings. *Dissertation Abstracts International*, 59(11A), 4060. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Watson, T. S., Ray, K. P., Turner, H. S., & Logan, P. (1999). Teacher-implemented functional analysis and treatment: A method for linking assessment to intervention. *School Psychology Review*, 28(2), 292. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Wehby, J. H., Tally, B. B., & Falk, K. B. (2004). Identifying the relation between the function of student problem behavior and teacher instructional behavior. *Assessment for Effective Intervention*, 30(1), 41–51. The study is ineligible for review because it does not use an eligible design.
- Whitford, D., Liaupsin, C., Umbreit, J., & Ferro, J. (2013). Implementation of a single comprehensive function-based intervention across multiple classrooms for a high school student. *Education and Treatment of Children*, 36, 147–167. The study is ineligible for review because it does not use a sample aligned with the protocol.
- Wiemer, I. L. (2002). A qualitative analysis of the implementation of the disciplinary mandates of the reauthorized individuals with disabilities education act in selected high schools in lake county, Illinois; *Dissertation Abstracts International*, 64(01A), 124-109.(AAI3077512) The study is ineligible for review because it does not use an eligible design.
- Wilbourn, T. L. A. (2008). *Functional behavioral assessments and academic escape-maintained maladaptive behaviors: A pilot study* (Master's thesis, Stephen F. Austin State University). The study is ineligible for review because it does not use an eligible design.
- Wolery, M. (1993). *Characteristics of quality intervention services*. Austin, TX: PRO-ED, Inc. The study is ineligible for review because it does not use an eligible design.
- Wong, S. W. (2005). Comparing outcomes of community-based outpatient clinic services versus school-based clinic services. *Dissertation Abstracts International*, 66(12B), 148-6940. (AAI3200225) The study is ineligible for review because it does not use an eligible design.
- Wood, B. K., Blair, K. C., & Ferro, J. B. (2009). Young children with challenging behavior. *Topics in Early Childhood Special Education*, 29(2), 68–78. The study is ineligible for review because it does not use an eligible design.
- Wood, B. K., Ferro, J. B., Umbreit, J., & Liaupsin, C. J. (2011). Addressing the challenging behavior of young children through systematic function-based intervention. *Topics in Early Childhood Special Education*, 30(4), 221–232. The study is ineligible for review because it does not use a sample aligned with the protocol.

Appendix A.1: Research details for Christensen et al. (2004)

Christensen, L., Young, K. R., & Marchant, M. (2004). The effects of a peer-mediated positive behavior support program on socially appropriate classroom behavior. *Education and Treatment of Children, 27*(3), 199–234.

Setting The study was conducted in an urban elementary school. The school's student population was 53% Caucasian, 40% Hispanic, and 7% other ethnicity; 67% of the students qualified for free or reduced-price lunch. Eduardo's intervention took place in a third-grade general education classroom with 23 students.¹⁵

Study sample The study sample included two 8-year-old boys, Eduardo and Justin, who were determined to be at risk for an emotional and behavioral disorder. Eduardo demonstrated high rates of disruptive and off-task behavior in the classroom. He had recently arrived at the school from Ecuador, but spoke English and no longer qualified for English as a second language services. He performed below grade level in math and reading and received daily tutoring in those subjects.

The experiment for Justin did not meet WWC pilot single-case design standards because it does not include at least three attempts to demonstrate an intervention effect at three different points in time; thus, this experiment is not described in this report or included in the ratings of effectiveness.

Intervention *Functional behavioral assessment (FBA)* procedures, including a teacher interview, observations conducted across different academic subject times, identification of problem behaviors and alternative positive behaviors, and a survey to identify potential reinforcers, determined that Eduardo's problem behavior was caused by the lack of attention he received in his classroom. Specifically, there was a low rate of reinforcement, especially attention-based reinforcement by the teacher and peers, for appropriate behavior. The study examined the effects of an individualized *FBA-based intervention* called Positive Behavior Support that was directly aligned to Eduardo's needs and included self-monitoring, peer and teacher support and attention, and reinforcement for appropriate behavior, using tokens and praise.

Comparison The study used a reversal-withdrawal design. During the baseline/withdrawal condition, there was no formal behavior management system in place in the classroom. Observations revealed that the teacher would occasionally praise students or call out to the class that they were doing well. Consequences for inappropriate behavior were inconsistent.

Outcomes and measurement The outcome was the percentage of intervals with socially-appropriate classroom behavior which falls under the school engagement domain. For a more detailed description of this outcome measure, see Appendix B.

Results from the one experiment with an outcome in the school engagement domain are presented in Appendix C.1.

Support for implementation	Eduardo's classroom teacher was trained by a behavior specialist, who presented an overview of the intervention plan and the role of the peer partner. The teacher also learned about the process for providing reinforcement and praise. Eduardo's teacher then trained the student pair (Eduardo and his peer) in her class, through two 1-hour sessions. A training checklist was used by the teacher to verify the mastery of items.
Maintenance	There was no maintenance phase.
Author-reported findings	The study authors found that the <i>FBA-based intervention</i> increased Eduardo's socially appropriate classroom behavior. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	Meets WWC Pilot Single-Case Design Standards Without Reservations.

Appendix A.2: Research details for Hagan-Burke et al. (2015)

Hagan-Burke, S., Gilmour, M. W., Gerow, S., & Crowder, W. C. (2015). Identifying academic demands that occasion problem behaviors for students with behavioral disorders: Illustrations at the elementary school level. *Behavior Modification, 39*(1), 215–241.

Setting	The study took place in a public elementary school in a suburban area. It was a Title I school with grades pre-K through fifth grade. At least 90% of students in the school received free or reduced-price lunch; the ethnicity of the school population was 71% African American, 20% Hispanic, 4% multi-racial, 3% Caucasian, and 2% Asian American. The intervention sessions took place in the participants' special education classrooms.
Study sample	Two students were referred to the school's behavior support team for problem behaviors that were associated with academic performance. The first student, Freddy, was a first-grade (age 7) Hispanic student with a behavior disorder and Attention Deficit Hyperactivity Disorder. Freddy spent approximately one-third of the school day in a special education classroom receiving social behavior support, along with academic support for reading and math. The second student, Clay, was a third-grade (age 9) African-American student with a behavior disorder. His special education services were provided 90 minutes per day and included social behavior support, along with academic support for reading, spelling, and math.
Intervention	<i>Functional behavioral assessment (FBA)</i> procedures for each student included interviewing the participants' teachers, examining records of discipline referrals, and conducting direct observations in the students' general and special education classrooms. After coding the direct observation data and identifying potential triggers, the researchers conducted a structural analysis for each participant to determine the contextual variables (e.g., classroom climate) associated with each student's behaviors.

The researchers determined that Freddy was most likely to exhibit decreased task engagement during circle time, when activities used a choral response format with fast-paced instruction, as opposed to an independent work setting, where his task engagement was higher. As a result, the *FBA-based intervention* that was developed used slow-paced instruction during circle time. The researchers held constant the choral group leader, the length of each session, and the approximate number of peers present. They asked the teacher to only praise or give affirmation statements to Freddy after each session had ended.

For Clay, the researchers examined his behavior across four content areas and determined that independent math work with unknown multiplication facts was associated with his decreased task engagement. The *FBA-based intervention* that was developed provided Clay with a worksheet consisting of multiplication problems using known facts. The length of sessions, number of problems per worksheet, and total number of digits per worksheet were controlled; order effects were controlled by counterbalancing conditions. The researchers made sure that the teacher was blind to which condition was in effect and asked the teacher to use the same interaction level and type as she typically would when Clay was engaged in independent academic work.

Comparison

The study used an alternating treatment design for both participants. Freddy's alternating treatment design compared the effect of using slow-paced instruction (*FBA-based intervention*) to fast-paced instruction (comparison). Clay's alternating treatment design compared the effect of using known multiplication problems (*FBA-based intervention*) with unknown multiplication problems (comparison). The *FBA* conducted prior to intervention documented that both participants engaged in high levels of baseline problem behavior during specific times in the academic day.

Outcomes and measurement

The outcome for both students was appropriate task engagement, which falls within the school engagement domain. For a more detailed description of this outcome measure, see Appendix B. The study also measured the percentage of math problems Clay solved correctly; this outcome is not eligible for review, as it does not pertain to the overall purpose of the study (i.e., examining the effect of *FBA* procedures in developing interventions to improve academic task engagement), but instead measures intervention fidelity.

Results from the two experiments with outcomes in the school engagement domain are presented in Appendix C.1.

Support for implementation

The researchers observed Freddy's teacher to document that she followed the correct pace. They also asked Freddy's teacher to follow a prescribed way to deliver praise, but they did not describe how they trained her. The researchers instructed Clay's teacher to maintain the same level of interactions she typically had with Clay during independent work across both conditions.

Maintenance

There was no maintenance phase.

Author-reported findings

The study authors found that the *FBA-based interventions* increased appropriate task engagement for Freddy and Clay. The results of WWC's corresponding visual analysis are presented in Appendix C.

WWC study rating

Meets WWC Pilot Single-Case Design Standards Without Reservations.¹⁶

Appendix A.3: Research details for Hansen et al. (2014)

Hansen, B. D., Wills, H. P., Kamps, D. M., & Greenwood, C. R. (2014). The effects of function-based self-management interventions. *Journal of Emotional and Behavioral Disorders*, 22(3), 149–159. doi:10.1177/1063476345

Setting The study took place in three classrooms in a school in a large urban area in the Midwest. The school had 460 students in grades 1–6 and served more than 72% economically disadvantaged students. Isaac was taught exclusively in a special education classroom with one or two adults, and Jeremiah and Ben were taught in general education classes, with paraprofessional support. The study intervention took place in the class where each student had the most behavior problems: math for Isaac and Ben, and writing for Jeremiah.

Study sample Three students were part of the study sample. Isaac was a 12-year-old Caucasian male who spoke English at home. He was in sixth grade but tested at least three grades below his age level and tested in the mild intellectual disability range (IQ = 67). He was in a school-based program for children with an emotional and behavioral disorder (EBD) and had been in the self-contained special education classroom since first grade, spending more than half of the day with one or two adults and no peers.

Jeremiah was a 7-year-old Caucasian male who spoke English at home. He was in second grade, tested slightly below grade level in all academic areas, and had average cognitive skills. He was in a school-based program for children with EBD, had a health impairment, and spent most of the day in a general education classroom with support from paraprofessionals.

Ben was a 9-year-old Caucasian male who spoke English at home. He was in third grade and had an IQ of 94. He was in a school-based program for children with EBD, and had previously been in a self-contained special education classroom under the category of developmental delay. He spent most of his day in a general education classroom with support from paraprofessionals.

Intervention *Functional behavioral assessment (FBA)* procedures for each student included interviewing the participants' teachers, examining records of discipline referrals, and conducting direct observations in the students' classrooms. *FBA* indicated that Isaac's and Ben's disruptive behaviors were maintained by escape from academic demands, and that Jeremiah was disruptive to obtain peer attention.

The *FBA-based intervention* for all three students, functional based self-management (FBSM), included a system of consequences and rewards. The student observed and recorded his own problem behavior and received consequences and/or rewards, depending on whether they met the goal they were monitoring. The rewards for appropriate behavior were "break tickets," which could be used for a 1-minute break from instruction or a 1-minute break with a friend. The consequences for negative behaviors were prompts for getting back on task. The *FBA-based intervention* also included self-monitoring (see summary in the comparison description).

Comparison The study used a reversal-withdrawal design for all three students. During the baseline/withdrawal condition, students used self-monitoring techniques. The teacher asked the student to set a goal for a 5-minute period. After 5 minutes had passed, the student would note whether he was on task. At the end of the lesson, the student tallied the number of times he was on task. Isaac and Ben's teachers could use prompts for on-task behavior; but all three teachers were told to limit attention to positive behaviors.

Outcomes and measurement	<p>The study included direct observations of on-task behavior, which falls in the school engagement domain, and disruptive behavior, which falls in the problem behavior domain. Observers were trained to use the Multiple Option Observation System for Experimental Studies (MOOSES; Tapp, Wehby, & Ellis, 1995)¹⁷ for recording of the behavioral measures. For a more detailed description of these outcome measures, see Appendix B.</p> <p>Results from the three experiments with outcomes in the school engagement domain are presented in Appendix C.1. Results from the three experiments with outcomes in the problem behavior domain are presented in Appendix C.2.</p>
Support for implementation	<p>The researchers trained the teachers on the self-monitoring component, provided a protocol, and trained teachers on how to use consequences for appropriate and disruptive behavior.</p>
Maintenance	<p>There was no maintenance phase.</p>
Author-reported findings	<p>The study authors found that <i>FBA-based interventions</i>—and more specifically, FBSM—led to increases in on-task behavior and substantial decreases in disruptive behavior for Isaac, Jeremiah, and Ben. The results of WWC’s corresponding visual analysis are presented in Appendix C.</p>
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards Without Reservations.¹⁸</p>

Appendix A.4: Research details for Kern et al. (1994)

Kern, L., Childs, K. E., Dunlap, G., Clarke, S., & Falk, G. D. (1994). Using assessment-based curricular intervention to improve the classroom behavior of a student with emotional and behavioral challenges. *Journal of Applied Behavior Analysis, 27*(1), 7–19.

Setting	<p>The study focused on one student but took place in three of his special education classrooms (spelling, English, and math). Each classroom had a teacher, aide, and about eight other students who were severely emotionally disturbed.</p>
Study sample	<p>The study focused on one student, Eddie, who was an 11-year-old male in fifth grade. He had high-average intelligence, performing at or above grade level in all subjects. He had problems with on-task behavior and frequently had disruptive behavior, including tantrums and occasional self-injury. His special education program served students described as severely emotionally disturbed.</p>
Intervention	<p><i>Functional behavioral assessment (FBA)</i> procedures included direct observations of Eddie throughout the school day, interviews with Eddie and his teachers, and standardized test results. Based on initial observations, the researchers hypothesized that Eddie’s problem behavior occurred when he was trying to escape academic tasks and expectations. Using the results from additional <i>FBA</i> observations conducted during academic sessions, researchers worked with teachers to select three curricular modifications. All of the teachers included shorter assignments and self-monitoring as the <i>FBA-based intervention</i>. In math, the intervention also included reducing the number of drills (they were replaced with problem-solving activities), and in English and spelling, the teachers allowed Eddie to complete some work in a mode other than handwriting.</p>

Comparison	The study used one multiple baseline design experiment across three subjects. The baseline condition consisted of normal classroom practice without self-monitoring. Students mostly completed independent work, although teachers would also sometimes lecture; a classroom-wide behavior management system was in place, and good behavior was rewarded with points that could be exchanged for prizes. Normal instruction included shortening required work for Eddie. His teachers believed that shortening work had reduced Eddie's tantrums, but he still did not complete his work.
Outcomes and measurement	<p>The study's outcome was on-task behavior, which falls in the school engagement domain. For a more detailed description of this outcome measure, see Appendix B.</p> <p>Results from the one experiment with an outcome in the school engagement domain are presented in Appendix C.1.</p>
Support for implementation	Not reported.
Maintenance	There was an 8-week follow-up phase, with four data points in each classroom. The procedures were the same as the intervention stage, except that self-monitoring was phased out, and Eddie was monitored for on-task behavior during 5-minute intervals, rather than the 1-minute intervals used in the intervention. The data patterns during the follow-up phase were similar to the patterns in the intervention phase in each classroom.
Author-reported findings	The study authors found that the <i>FBA-based intervention</i> increased Eddie's on-task behavior. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	Meets WWC Pilot Single-Case Design Standards Without Reservations.

Appendix A.5: Research details for Lane et al. (2007a)

Lane, K. L., Rogers, L. A., Parks, R. J., Weisenbach, J. L., Mau, A. C., Merwin, M. T., & Bergman, W. A. (2007a). Function-based interventions for students who are nonresponsive to primary and secondary prevention efforts: Illustrations at the elementary and middle school levels. *Journal of Emotional and Behavioral Disorders*, 15(3), 169–183.

Setting	The study took place in an eighth-grade science class in a rural Tennessee school district. The district subscribed to a full inclusion model, and the schools used a three-tiered model of Positive Behavior Support (PBS).
Study sample	Two students were part of the study sample. Aaron was a 14-year-old male in eighth grade who had antisocial behavior and was at risk for an emotional and behavioral disorder classification. In the classroom, Aaron was highly noncompliant and also demonstrated impaired relationships with peers, a negative attitude, many problem behaviors, and poor academic achievement. Aaron had received special education services since fourth grade for a learning disability in written expression.

The other student in the study sample was Claire; the authors used a changing criterion design to study the effects of *FBA* and the resulting *FBA-based intervention* on Claire's social-emotional outcome (classroom participation). This experiment meets WWC pilot single-case design standards without reservations; however, the social-emotional competence domain does not reach the threshold to include single-case design evidence in the effectiveness ratings in this report, so her experiment is not described in Appendix C. For a more detailed description of Claire's experiment, see Appendix D.¹²

Intervention

Functional behavioral assessment (FBA) procedures, including teacher and parent interviews, behavior rating scales completed by teachers, and direct observations, determined that Aaron engaged in noncompliance to increase teacher attention and escape assigned tasks. Aaron's *FBA-based intervention* involved providing him with a checklist of tasks to complete when responding to questions or assignments shown on the classroom work board. The teacher and special education aide in Aaron's classroom gave positive reinforcement only after Aaron had successfully completed the work board assignment and the checklist. When Aaron exhibited the target behavior, the teacher or assistant gave a verbal redirect lasting no longer than 2 seconds; all other attention was withheld until Aaron had completed his work board assignment and checklist.

Comparison

The study used a reversal-withdrawal design for Aaron. The baseline/withdrawal sessions took place in Aaron's classroom and consisted of regular classroom practices.

Outcomes and measurement

Aaron's outcome is the percentage of intervals in which he demonstrated compliance with the teacher, which falls under the school engagement domain. For a more detailed description of this outcome measure, see Appendix B.

The study also measured the social validity of the intervention via student and teacher ratings. These outcomes are not presented in the report because they do not fall under a domain specified in the protocol.

Results from the one experiment with an outcome in the school engagement domain are presented in Appendix C.1.

Support for implementation

Researchers provided Aaron's teacher with training about the specific components of the intervention, including the reinforcements, and how each of the components was to be implemented correctly. Aaron's teacher agreed to provide the checklist each day and sign the checklist following Aaron's completion of tasks.

Maintenance

For Aaron, maintenance data were collected 7 weeks after intervention completion. At that time, Aaron's teacher had discontinued the use of Aaron's checklist and restructured the work board activity for the entire class. She continued to give Aaron extra points for successful completion of work board assignments but did not give him opportunities to choose peers for group work and did not record whether she only gave him attention for compliant behavior. There was a downward trend in Aaron's compliance, and it was at a level similar to the withdrawal phase.

Author-reported findings

The study authors found that the *FBA-based intervention* increased Aaron's compliance with the teacher. The results of WWC's corresponding visual analysis are presented in Appendix C.

WWC study rating

Meets WWC Pilot Single-Case Design Standards Without Reservations.¹⁹

Appendix A.6: Research details for Lane et al. (2007b)

Lane, K. L., Weisenbach, J. L., Phillips, A., & Wehby, J. H. (2007). Designing, implementing, and evaluating function-based interventions using a systematic, feasible approach. *Behavioral Disorders, 32*(2), 122–139.

Setting The study took place in an inclusive public school in Tennessee. Charlie was in a first-grade classroom that was taught by a teacher who had 6 years of experience and a master's degree. Margaret was in a second-grade classroom that was taught by a first-year teacher with a bachelor's degree.

Study sample Two students were part of the study sample. Charlie was a 7-year-old student who was at risk for emotional and behavioral problems, according to his teacher's assessment on the Student Risk Screening Scale (SRSS). He did not receive special education services at the time of the study.

Another participant, Margaret, only had measured outcomes in the social-emotional competence domain. The social-emotional competence domain does not reach the threshold to include single-case design evidence in the effectiveness ratings in this report, so her experiment is not described in Appendix C. For a more detailed description of Margaret's experiment, see Appendix D.¹²

Intervention *Functional behavioral assessment (FBA)* procedures, including teacher and parent interviews, direct observations, and behavioral rating scales, suggested that Charlie engaged in off-task behavior to attract teacher and peer attention and escape from nonpreferred activities. The resulting *FBA-based interventions* involved: a) teaching the student a replacement behavior; b) restructuring the environment, if needed; or c) restructuring the contingencies surrounding the behavior. If Charlie succeeded in only demonstrating off-task behaviors that were within the daily limit (initially four, then increased to eight per day) and completed all of his assignments with 100% accuracy, he was allowed access to additional activities, such as a weekly trip to the library. Charlie's teacher would praise his positive behavior throughout the day, and send notes to his parents about his performance which allowed them to provide positive reinforcement at home. When Charlie engaged in off-task behavior, the teacher gave brief verbal redirection and placed a tally mark on the chalkboard.

Comparison The study used a reversal-withdrawal design for Charlie. During the baseline/withdrawal sessions, regular classroom practices were implemented in a 90-minute period in the morning. In that period, students were to complete three "center" assignments, while the teacher met with each reading group for 30 minutes. Students sat in groups of four and were allowed to talk quietly if they needed help completing the assignments. If a student exhibited negative behavior, the student had to "move their star" that was visible by the classroom; as the stars moved downward, privileges were lost.

Outcomes and measurement The outcome for Charlie was off-task behavior, which falls under the school engagement domain. For a more detailed description of this outcome measure, see Appendix B.

Results from the one experiment with an outcome in the school engagement domain are presented in Appendix C.1.

Support for implementation	The primary investigator trained the teacher to implement the intervention during 6 hours of staff development over the summer. The content focused on the principles of applied behavior analysis and how to design, implement, and evaluate a function-based intervention. During the course of the academic year, teachers had weekly contact (1 hour) with their project liaison to reinforce and re-teach the procedures addressed during the initial training.
Maintenance	There was no maintenance phase.
Author-reported findings	The study authors found that the <i>FBA-based intervention</i> decreased the level of off-task behavior for Charlie. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	Meets WWC Pilot Single-Case Design Standards Without Reservations. ²⁰

Appendix A.7: Research details for Losinski et al. (2015)

Losinski, M. L., Maag, J. W., Katsiyannis, A., & Ryan, J. B. (2015). The use of structural behavioral assessment to develop interventions for secondary students exhibiting challenging behaviors. *Education and Treatment of Children, 38*(2), 1–26.

Setting	The study took place in a rural, public middle school in the southeastern United States. The same reading and language arts teacher delivered the intervention to all four students in an eighth-grade general education classroom. Alexandra received instruction in one class, and the other three students (Brenda, Hannah, and Larry) were in the other class together. The intervention conditions were manipulated for these three students simultaneously.
Study sample	Four students were part of the study sample. Alexandra and Brenda were both 13-year-old Caucasian females. Hannah was a bi-racial (Caucasian and African-American) 13-year-old female, and Larry was a 14-year-old African-American male. None of the students received any special education or related services at the time of the study, but all four students were at high risk of future anti-social behaviors. Alexandra demonstrated excessive lying and problem behaviors and had a negative attitude that frequently disrupted the learning of others. Brenda exhibited disruptive behaviors and a negative attitude, failed to complete assignments, was often non-compliant, and had low-academic performance, despite previous participation in a program for gifted and talented students. Hannah was frequently aggressive with peers, had behavior problems, frequently lied, and had a negative attitude. Larry received poor grades, had a generally negative attitude, and was prone to behavior problems including lying and aggression towards peers. Alexandra, Hannah, and Larry were eligible to receive free or reduced-price school meals.

Intervention This study used alternating treatment design experiments to explore the effect of interventions based on structural behavior assessment, which is a type of *functional behavioral assessment (FBA)* that focuses on the relationships between contextual variables (e.g., classroom climate) and subsequent behaviors; assessments were used to form hypotheses and design individualized interventions that change contextual factors. The *FBA* included reviewing student records, conducting structured and unstructured interviews with teachers, and completing a rating scale. According to interviews, the students' disruptive behaviors were most likely to occur if students were sitting next to a preferred peer, and least likely to occur when engaged with the teacher. Based on these findings, two *FBA-based interventions* were developed for each student: (1) proximity to teacher (within eight feet of the student), and (2) separation from preferred peer (seated in a non-adjacent seat more than eight feet away). During the alternating treatment design experiments, three conditions (baseline, proximity to teacher, and separation from preferred peer) were each introduced once per day, over 5 consecutive days. The researcher prompted the teacher each time a condition was to change.

Comparison This study used alternating treatment design experiments for all four students. During the comparison condition, the teacher made no particular effort to stand near the sample students or separate them from preferred peers, so proximity was not controlled. Based on classroom recordings from baseline, it was clear that teachers and preferred peers were not routinely in close proximity of target students.

Outcomes and measurement The outcomes for all four students were academic engagement, which falls within the school engagement domain, and disruptive behavior, which falls within the problem behavior domain. For a more detailed description of these outcome measures, see Appendix B.

Results from the eight experiments with outcomes in the school engagement domain are presented in Appendix C.1. Results from the eight experiments with outcomes in the problem behavior domain are presented in Appendix C.2.

Support for implementation The students' regular classroom teacher conducted the instruction in both the baseline and intervention conditions. The researcher provided a preset device that discreetly prompted the teacher when it was time to change conditions. The researcher also developed a procedural reliability checklist to measure the fidelity of each intervention.

Maintenance There was no maintenance phase. The study included a third phase during which the intervention condition determined to work best (the separation from preferred peer condition) was continued. Overall, all four students demonstrated less disruptive behavior and higher levels of academic engagement during this phase, compared to baseline. For two students (Alexandra and Brenda), the patterns during this phase showed greater variability than during the intervention phase of the study; for the other two students, less variability was observed during this final phase.

Author-reported findings

The study authors found that both *FBA-based interventions*—peer separation and teacher proximity—were associated with some increases in academic engagement, but peer separation had a larger impact. The author findings varied by student. For Alexandra, the study authors found that both peer separation and teacher proximity were associated with an increase in academic engagement, but peer separation had a larger impact. For Brenda, the study authors found that peer separation was associated with an increase in academic engagement, but teacher proximity had no positive effect on academic engagement. For Hannah, the study authors found that peer separation and teacher proximity were both associated with an increase in academic engagement. For Larry, the study authors found that peer separation was associated with an increase in academic engagement, but that teacher proximity was associated with a slight decrease in academic engagement.

The study authors found that both *FBA-based interventions*—peer separation and teacher proximity—were associated with decreases in all four students' disruptive behavior, but peer separation had a larger impact. The author findings varied by student. For Alexandra, the study authors found that both peer separation and teacher proximity were associated with a decrease in disruptive behavior, but peer separation had a larger impact. For Brenda, the study authors found that both peer separation and teacher proximity were associated with a decrease in disruptive behavior. For Hannah, the study authors found that peer separation was associated with a large decrease in disruptive behavior, and teacher proximity was associated with a slight decrease in disruptive behavior. For Larry, the study authors found that peer separation was associated with a large decrease in disruptive behavior and teacher proximity was associated with a slight decrease in disruptive behavior.

The results of WWC's corresponding visual analysis are presented in Appendix C.

WWC study rating

Meets WWC Pilot Single-Case Design Standards Without Reservations.

Appendix A.8: Research details for Christensen et al. (2012)

Christensen, L., Renshaw, T. L., Caldarella, P., & Young, J. R. (2012). Training a general educator to use function-based support for students at risk for behavior disorders. *Education, 133*(2), 313–335.

Setting

The study took place in a Title I elementary school in a suburban area of Utah. Approximately 74% of the students in the school were Caucasian, 22% were Hispanic, and 4% identified as other ethnic groups. Both participants were taught in a general education classroom in by a fourth-grade teacher who had a bachelor's degree in elementary education.

Study sample

The study includes three students who were identified by their teacher as being at risk for behavioral disorders. Amy was a fourth-grade Caucasian female student who performed above grade level in reading and mathematics. José was a fourth-grade Puerto-Rican/Caucasian male student who performed at grade level in reading and mathematics. Both students were at risk for future academic difficulties because of frequent disengagement from academic tasks.

The single-case design experiment for an additional student, Cameron, does not meet WWC pilot single-case design standards because data are only presented for two phases; therefore, there is not an attempt to demonstrate the effect of the intervention three times. As a result, this experiment is not described in this report or included in the ratings of effectiveness.

Intervention	Following training provided by the research staff, the teacher carried out a <i>functional behavioral assessment (FBA)</i> , which included direct observations of the students. The teacher then developed <i>FBA-based interventions</i> for both students. Amy’s intervention involved self-management training, extra teacher attention, and the use of tokens she could exchange for extra reading time, if she stayed seated and worked on assigned material. José’s intervention involved giving him tokens that he could exchange for extra recess time, if he demonstrated on-task behavior while completing assigned material; the teacher reviewed expectations with José and explained that she would give him tokens if his self-management improved.
Comparison	The study used a reversal-withdrawal design for both students. During the baseline/withdrawal condition for each student, teachers taught their classes as usual.
Outcomes and measurement	<p>Amy’s outcome was off-task behavior and José’s outcome was on-task behavior; both outcomes fall under the school engagement domain. Amy and José’s teacher and three undergraduate students (referred to as “independent observers”) collected the observational data for all phases; the WWC visual analysis focused on the data collected by the independent observers. For a more detailed description of these outcome measures, see Appendix B.</p> <p>Christensen et al. (2012) also measured the teacher’s function-based support knowledge. This outcome is not presented in the report because it does not fall under a domain specified in the protocol.</p> <p>Results from the two experiments with outcomes in the school engagement domain are presented in Appendix C.1.</p>
Support for implementation	The teacher received <i>FBA</i> training which involved group instruction, independent readings, applied activities, and individual consultation. The group instruction was the main component of training and consisted of four 1-hour training sessions conducted after school. The teacher, upon completing initial training, served as the primary interventionist with continued support.
Maintenance	There was no maintenance phase for José. Amy’s teacher systematically reduced the intervention during two maintenance phases. Amy’s off-task behavior during these phases was similar to her behavior during the first and second intervention phases.
Author-reported findings	The study authors found that the <i>FBA-based interventions</i> decreased Amy’s off-task behavior and increased José’s on-task behavior. The results of WWC’s corresponding visual analysis are presented in Appendix C.
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards With Reservations.</p> <p>Reason for study rating: The experiments for Amy and José used reversal-withdrawal designs and there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.</p>

Appendix A.9: Research details for Clarke et al. (1995)

Clarke, S., Dunlap, G., Foster-Johnson, L., Childs, K. E., Wilson, D., White, R., & Vera, A. (1995). Improving the conduct of students with behavioral disorders by incorporating student interests into curricular activities. *Behavioral Disorders, 20*, 221–237.

Setting The study took place in two classrooms at a public elementary school. Ahmad was in a kindergarten classroom for students with severe emotional disturbance (SED). The classroom contained eight children and was staffed by a teacher and a full-time aide; Ahmad's study took place during language arts lessons. Juan and Shane were in a class for students who exhibited SED and included eight to nine children, a teacher, and an aide. Their grade-level was not reported.

Study sample Four students were part of the study sample. Ahmad was 5 years old and Juan and Shane were 11. All three students had been diagnosed as having an SED. Ahmad's teacher reported that his most problematic behaviors at school were aggression, noncompliance, property destruction, inability to maintain task engagement, and leaving his area without permission. Juan's disruptive behaviors included noise making, talking out, property destruction, excessive off-task behavior, and noncompliance. At the time of the study, Juan was taking Imipramine. In addition to SED, Shane was diagnosed with Attention Deficit Hyperactivity Disorder; he demonstrated excessive off-task behavior, an inability to complete assignments, property destruction, and noncompliance.

The single-case design experiments for an additional student, Arnold, are not eligible for this review because he did not have an emotional disturbance, but had instead received a diagnosis of autism. As a result, Arnold's single case design experiments are not described in this report or included in the ratings of effectiveness.

Intervention *Functional behavioral assessment (FBA)* procedures for each student included interviews with teachers, other adults, and students, followed by direct observations. Based on the results, researchers developed *FBA-based interventions* that involved incorporating students' interests in the curriculum. Ahmad's intervention involved replacing standard alphabet letter worksheet pictures with pictures of cars and motorcycles. Juan's intervention involved replacing the content of cursive sentences he was to copy from a handwriting workbook with content from Nintendo game booklets. The first phase of Shane's intervention was identical to Juan's, but later phases also involved presenting the assignments in smaller increments (one sentence at a time) and permitting him to copy directly onto the handwriting sheet.

Comparison The study used a reversal-withdrawal design for all three students. The baseline/withdrawal condition consisted of identical assignments as the intervention, without the curricular modifications. The classroom staff utilized their business-as-usual behavior management system throughout all phases of the study, whereby appropriate behavior was reinforced with tokens that were exchangeable for rewards on a weekly basis.

Outcomes and measurement	<p>The study measured students' desirable and disruptive behavior, which fall within the school engagement and problem behavior domains, respectively. For a more detailed description of these outcome measures, see Appendix B.</p> <p>The study also measured student productivity and social validity of the intervention via student and teacher intervention ratings. Student productivity is not presented in the report because the study authors did not provide visual analysis from the single-case designs, so these designs do not meet review requirements. Social validity does not fall under a domain specified in the protocol.</p> <p>Results from the three experiments with outcomes in the school engagement domain are presented in Appendix C.1. Results from the three experiments with outcomes in the problem behavior domain are presented in Appendix C.2.</p>
Support for implementation	Not reported.
Maintenance	There were no maintenance phases. The study did include weekly follow-up sessions for Juan and Shane, in which the intervention condition was used to assess the durability of effects. For both students, the follow-up data were more consistent with their intervention data than their baseline data.
Author-reported findings	The study authors reported that the <i>FBA-based interventions</i> increased desirable behavior and decreased disruptive behavior for Ahmad, Juan, and Shane. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards With Reservations.</p> <p>Reason for study rating: In each of the study's reversal-withdrawal experiments, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.</p>

Appendix A.10: Research details for Davis et al. (2012)

Davis, D. H., Fredrick, L. D., Alberto, P. A., & Gama, R. (2012). Functional communication training without extinction using concurrent schedules of differing magnitudes of reinforcement in classrooms. *Journal of Positive Behavior Interventions*, 14(3), 162–172. doi:10.1177/1098300711429597

Setting	Participants were enrolled in a public school program for students diagnosed with a severe emotional and behavior disorder (EBD). Students received instruction in their regular classrooms from their regular teacher. The intervention was administered during times the teachers identified as periods when the most inappropriate behaviors typically occurred.
----------------	---

Study sample

The study sample consisted of four individual students classified with a severe EBD and an intellectual disability (ID). Eli was 18 and receiving services for both diagnoses. His problem behaviors included leaving the classroom, turning over furniture, and displaying physical aggression toward staff. Mary was 8 and was receiving services for EBD, a moderate ID, cerebral palsy, and a feeding disorder. Her problem behavior was forcefully hitting others. Todd was 17 and receiving services for EBD, a moderate ID, autism, and limited speech. His problem behaviors included screaming, throwing, hitting, crying, yelling, refusing to move, and picking at the skin on his hands.

The study also reported outcomes for an additional student (Tony) with EBD; the response to an author query revealed that inter-assessor agreement data were not collected during his second baseline phase, so the experiment for this student does not meet WWC pilot single-case design standards. As a result, Tony's experiment is not described in this report or included in the ratings of effectiveness.

Intervention

Functional behavioral assessment (FBA) procedures for each student included interviews with teachers, followed by direct observations. Based on the results, researchers developed functional communication training interventions that trained students to request a short break for a preferred activity, instead of acting inappropriately. Following the first baseline phase, students were trained to place a break card in their teacher's hand to ask for a break. They would then receive the break and a reward. If the students did not place the break card in their teacher's hand or displayed inappropriate behavior within 5 seconds of the start of the session, the teacher physically prompted the students to place the break card in their hand. The students then received a break and a reward. Training ended when the students successfully placed the break card in their teacher's hand five consecutive times.

After training, the teacher placed the work and the break card on the student's desk and reminded the student that using the break card (referred to as an "alternative mand behavior" in the original study) would result in receiving a break and a reward. Students were then either rewarded with the activity of their choosing if they used the alternative behavior on which they were trained or penalized for inappropriate behavior by being removed from the task without getting to do a desired activity.

Each student's reward was based on his/her *FBA*. Eli's reward was playing puzzle games or listening to music with his headphones; Mary's reward was playing with plastic straws and eating pudding; and Todd's reward was sensory reinforcement including hand games and ear tickling. When the student displayed inappropriate behavior, the student received a 30-second break without a reward. Eli's second intervention phase included a 30-second delay in which he would receive reinforcement.

Comparison

The study used a reversal-withdrawal design for all three students. During the baseline/withdrawal condition, students did not have access to their break card, and negative reinforcement was used for inappropriate behavior. This involved removal from a task for a period of 30 seconds.

Outcomes and measurement

The study's two outcomes were time on task, which falls under the school engagement domain, and inappropriate behavior, which falls under the problem behavior domain. Time on task was not measured for Todd. For a more detailed description of these outcome measures, see Appendix B.

For Todd and Mary, there were two or fewer data points in one of the baseline phases for their outcome measures. These cases would typically not meet WWC pilot single-case design standards for a reversal-withdrawal design because of the lack of data points; however, the review protocol allows phases to be shortened if extended baseline phases pose serious ethical and procedural concerns. Because baseline phases for Todd and Mary were cut short due to self-injurious and aggressive behavior (described in the original study or confirmed by the authors), Todd and Mary's designs meet standards with reservations.

The study also measured the number of times the students gave the break card to their teacher; this outcome is ineligible for review because it is considered to be a part of the intervention (and as such, was only measured and relevant during the intervention phases). The study also measured the social validity of the intervention, which does not fall under a domain specified in the protocol.

Results from the two experiments with outcomes in the school engagement domain are presented in Appendix C.1. Results from the three experiments with outcomes in the problem behavior domain are presented in Appendix C.2.

Support for implementation

Teachers received training from the researchers before the *FBA* and implementation of the intervention. The training consisted of a review and practice of the procedures until they were performed with 100% accuracy. Researchers were also present during all study phases to provide support to teachers.

Maintenance

During additional maintenance phases for Eli and Mary, both students experienced gradual reduction of the reinforcement. Specifically, there was an increasing delay of when they would receive a reward for displaying the alternate behavior. Mary had a delay ranging from 5 to 20 seconds in five additional phases; two of these phases also included group instruction with a paraprofessional or substitute paraprofessional. Mary's inappropriate behavior during these phases was consistent with her intervention data, and her time on task increased dramatically during these additional phases. Eli had a thinning phase with a delay of 60 seconds that occurred after the ABAB design; both outcomes from the additional phases were consistent with his intervention data.

Author-reported findings

The study authors reported that the *FBA-based intervention* increased time on task for Eli, had no effect on Mary's time on task, and decreased inappropriate behaviors for Eli, Mary, and Todd. The results of WWC's corresponding visual analysis are presented in Appendix C.

WWC study rating

Meets WWC Pilot Single-Case Design Standards With Reservations.

Reason for study rating: In each of the study's reversal-withdrawal experiments, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.

Appendix A.11: Research details for Dunlap et al. (1995)

Dunlap, G., Foster-Johnson, L., Clarke, S., Kern, L., & Childs, K. E. (1995). *Modifying activities to produce functional outcomes: Effects on the problem behaviors of students with disabilities. Journal of the Association for Persons with Severe Handicaps, 20(4), 248–258.*

Setting	The study took place in a school in Florida. The sessions were conducted in a separate room by an aide who was familiar with the students. A behavior management system was in place in the classroom.
Study sample	<p>Three students were part of the study sample. Jill was 13 years old and had multiple disabilities, including severe emotional disturbance, mild mental retardation, schizophrenia, and attention deficit disorder.</p> <p>The study reported outcomes for two additional students, Jary and Natalie. The single-case design experiment for Jary is not eligible for this review because he was not diagnosed with an emotional disturbance, but was instead diagnosed as having autism and an intellectual disability. Natalie's study design did not meet WWC pilot single-case design standards because there were fewer than three data points in at least one phase of her reversal-withdrawal design experiment. As a result, their single case design experiments are not described in this report or included in the ratings of effectiveness.</p>
Intervention	<i>Functional behavioral assessment (FBA)</i> procedures included interviews with teachers, followed by direct observations. Based on the <i>FBA</i> , an intervention was developed that retained instructional objectives but modified curricular activities to better align with Jill's interests. The <i>FBA-based intervention</i> consisted of writing captions onto a blank sheet of lined paper that were related to photographs that she had taken earlier in the week. The instructional objective was to demonstrate the correct use of letter formation and spacing in handwriting.
Comparison	The study used a reversal-withdrawal design. Jill's baseline/withdrawal condition consisted of regular instruction and copying words from a handwriting book onto a blank sheet of lined paper.
Outcomes and measurement	<p>The study included on-task behavior, which falls into the school engagement domain, and the percentage of intervals in which the student displays problem behavior, which falls in the problem behavior domain. For a more detailed description of these outcome measures, see Appendix B.</p> <p>The study also measured student productivity, interest, and happiness. Student productivity is not presented in the report because the study authors did not provide visual analysis from the single-case design experiments, so these experiments do not meet review requirements. Interest and happiness do not fall under a domain specified in the protocol.</p> <p>Results from the one experiment with an outcome in the school engagement domain are presented in Appendix C.1. Results from the one experiment with an outcome in the problem behavior domain are presented in Appendix C.2.</p>
Support for implementation	Not reported.
Maintenance	There was no maintenance phase.

Author-reported findings

The study authors reported that the *FBA-based intervention* produced a small increase in Jill's on-task behavior when first introduced and a large increase in on-task behavior when the intervention was re-introduced. They also reported a small decrease in problem behavior when the *FBA-based intervention* was first introduced to Jill, extremely high levels of problem behavior when the intervention was withdrawn, and a large decrease in problem behavior when the intervention was re-introduced; they characterized these results as demonstrating improvement in Jill's behavior. The results of WWC's corresponding visual analysis are presented in Appendix C.

WWC study rating

Meets WWC Pilot Single-Case Design Standards With Reservations.

Reason for study rating: There were fewer than five data points in at least one phase for both of Jill's outcomes; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.

Appendix A.12: Research details for Dunlap et al. (1996)

Dunlap, G., White, R., Vera, A., Wilson, D., & Panacek, L. (1996). The effects of multi-component, assessment-based curricular modifications on the classroom behavior of children with emotional and behavioral disorders. *Journal of Behavioral Education, 6*(4), 481–500.

Setting

The study took place in classrooms serving students with an emotional and behavioral disorder (EBD) at a public elementary school in a large southeastern US city. Ann and Michael were in the same classroom, which was served by one teacher and one aide. Gizelle was in a different classroom that was also served by one teacher and one aide. The study was conducted during English classes for Michael and Gizelle and during handwriting sessions for Ann.

Study sample

Three students were part of the study sample. All three students had been labeled “severely emotionally disturbed” by officials in their school. Each student exhibited problem behaviors and lack of task engagement prior to the study. Michael and Ann were 7 years old, and Gizelle was 9 years old. Michael and Ann were in the same classroom, although Michael was considered second-grade status, while Ann was first-grade status. Gizelle was in the fourth grade.

Intervention

Functional behavioral assessment (FBA) procedures included a review of records; interviews with teachers, students, and parents; and classroom observations. Based on the *FBA*, a multi-component, curricular intervention was designed for each student.

The *FBA-based intervention* packages for all three students included elements of choice—Michael and Gizelle were allowed to choose from a menu of worksheets, and Ann was allowed to choose what words she would trace on a worksheet. Michael's intervention also included dividing each longer assignment into two shorter assignments, and the font size of all printed materials was increased. For Gizelle, worksheets were modified by highlighting certain words to draw attention to them, adding pictures to clarify instructions, and adjusting worksheets to a lower reading level that was more consistent with her ability level; longer assignments were also divided into two shorter assignments. Ann's intervention gave her the opportunity to select food items from a mock grocery store, after tracing food names on four different worksheets.

Comparison

The study used a reversal-withdrawal design for all three students. The baseline/withdrawal condition consisted of normal classroom activities without modifications.

Outcomes and measurement	<p>The study measured task engagement, which falls under the school engagement domain, and disruptive behavior, which falls under the problem behavior domain, for all three students. For a more detailed description of these outcome measures, see Appendix B.</p> <p>The study also measured students' performance-on-task and teacher attention; students' performance-on-task is not presented in this report because the study authors did not provide visual analysis from the single-case design experiments, so these experiments do not meet review requirements. Teacher attention does not fall under a domain specified in the protocol.</p> <p>Results from the three experiments with outcomes in the school engagement domain are presented in Appendix C.1. Results from the three experiments with outcomes in the problem behavior domain are presented in Appendix C.2.</p>
Support for implementation	Not reported.
Maintenance	There was no maintenance phase.
Author-reported findings	The study authors found that the <i>FBA-based intervention</i> increased the level of task engagement and decreased problem behavior for Michael, Gizelle, and Ann. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards With Reservations.</p> <p>Reason for study rating: In all three reversal-withdrawal experiments, and across both outcomes, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.</p>

Appendix A.13: Research details for Janney et al. (2013)

Janney, D. M., Umbreit, J., Ferro, J. B., Liaupsin, C. J., & Lane, K. L. (2013). The effect of the extinction procedure in function-based intervention. *Journal of Positive Behavior Interventions, 15*(2), 113–123. doi:10.1177/1098300712441973

Setting	The study took place in general education classrooms in one elementary school in the southwestern United States.
Study sample	The study sample included three male students, Hugo, Tomas, and Eric, all of whom were at risk for an emotional and behavioral disorder and below average in academic competence. Their teachers had sought help from the school's student behavior intervention team because of the students' behavior and academic problems. Hugo was 6 years old and in the first grade. Tomas was 7 years old and in the second grade. Eric was 8 years old and in the third grade.
Intervention	<i>Functional behavioral assessment (FBA)</i> procedures included reviews of student records, interviews with teachers and students, and direct observations. Results of the <i>FBA</i> suggested that Hugo displayed off-task behavior to obtain attention from his teacher. Tomas displayed off-task behavior when having difficulty with academic tasks; teacher and peer attention reinforced his off-task behavior. Eric engaged in off-task behavior during writing activities, especially when he was having difficulty; his off-task behavior was reinforced when he did not have to finish the task and when he received teacher attention.

Each student had slightly different intervention features. Hugo's *FBA-based intervention* included sitting close to the teacher, providing teacher attention if he was on task for 1 minute or longer, and redirecting off-task behavior once and then ignoring subsequent problem behaviors (referred to as extinction). Tomas's *FBA-based intervention* included using clear verbal instructions for transition behavior, providing teacher attention if he was on task for 1 minute or longer, and redirecting problem behavior once and then ignoring subsequent problem behaviors. For Eric, the *FBA-based intervention* involved sitting close to the teacher, offering small group instruction and shortened assignments, providing teacher attention if he was on task for 1 minute or longer, and redirecting behavior once and then ignoring subsequent off-task behaviors, as well as maintaining the given task until it was completed.

The WWC visual analyses for each student focuses only on the initial ABAB phases of the reversal-withdrawal design, which compared the baseline condition to the full *FBA-based intervention*, including the extinction procedure. However, the study also compared the *FBA-based intervention* to a partial intervention phase, without extinction. This comparison is not of interest for this review because it does not compare the effect of an *FBA-based intervention* to a non-*FBA-based intervention*.

Comparison

The study used a reversal-withdrawal design for all three students. The baseline/withdrawal condition consisted of normal practices in each classroom.

Outcomes and measurement

The outcome for all three students was on-task behavior, which falls in the school engagement domain. For a more detailed description of this outcome measure, see Appendix B.

Results from the three experiments with outcomes in the school engagement domain are presented in Appendix C.1.

Support for implementation

The research team gave teachers daily feedback on their implementation of the intervention. The primary observer also gave the teacher a signal to indicate that it was time for the teacher to give reinforcement for on-task behavior.

Maintenance

There was no maintenance phase. The study used an ABACB design for all three students, with a follow-up phase after the last intervention phase, in which the teachers continued to use the full intervention. Improvements in on-task behavior were generally maintained during the follow-up phase for all three students.

Author-reported findings

The study authors found that the *FBA-based interventions* increased on-task behavior for Hugo, Tomas, and Eric. The results of WWC's corresponding visual analysis are presented in Appendix C.

WWC study rating

Meets WWC Pilot Single-Case Design Standards With Reservations.

Reason for study rating: In all three reversal-withdrawal experiments, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.

Appendix A.14: Research details for Kern et al. (2001)

Kern, L., Delaney, B., Clarke, S., Dunlap, G., & Childs, K. (2001). Improving the classroom behavior of students with emotional and behavioral disorders using individualized curricular modifications. *Journal of Emotional and Behavioral Disorders, 9*(4), 239–247.

Setting The study took place at two public elementary schools in self-contained classrooms for students with emotional and behavioral disorders. Both classrooms had 8–10 students, a teacher, and a paraprofessional. The study sessions took place during a journal activity for Art and handwriting activities for Benjamin. All classroom management procedures, including a point system providing awards for different behaviors, remained constant across all phases of the study.

Study sample Two students were part of the study sample. Both students were 11 years old and in the fifth grade. Art was diagnosed as having an emotional disturbance. He had poor task engagement and peer relations and demonstrated disruptive behavior and frequent noncompliance. Benjamin was diagnosed as having an emotional and behavioral disorder and Attention Deficit Hyperactivity Disorder. He displayed frequent disruptive behaviors and poor task engagement and peer relations.

Intervention *Functional behavioral assessment (FBA)* procedures for both students included direct observations of students and structured interviews with teachers, other school staff, and students. Based on the *FBA*, researchers hypothesized that problem behavior would decrease and task engagement would increase for both students if they could complete their work in a preferred writing medium. It was also hypothesized that Benjamin's behavior would improve if his interests were incorporated into his tasks.

Art's *FBA-based intervention* involved using a preferred writing medium, a portable laptop computer, during journal assignments in which he could write about either a topic provided by the teacher or one of his own choosing. Benjamin's *FBA-based intervention* required him to neatly copy four to five sentences from a photocopied handwriting sheet onto a blank sheet of paper. In the intervention condition, the handwriting sheets consisted of copies of pages from a Sega Genesis game booklet.

For Benjamin, the study authors also examined another *FBA-based intervention* that involved giving him the choice of one of three media with which to complete his spelling assignments; the experiment used an ABACDC design for this comparison and does not meet WWC pilot single-case design standards because it did not include at least three attempts to demonstrate an intervention effect at three different points in time.

Comparison The study used a reversal-withdrawal design for both students. During the baseline/withdrawal condition, Art used traditional paper and pencil during journal assignments rather than a laptop. Art's journal assignment required that he write about either a topic provided by the teacher or one of his own choosing. He was required to complete this assignment in a composition notebook. Benjamin was assigned sentences from a handout including topics such as dinosaurs, funny poems, or the solar system for his writing assignments. His daily assignment was to neatly copy four to five sentences from a photocopied handwriting sheet onto a blank sheet of paper. In all other ways, the assignments were identical to those in the intervention condition.

Outcomes and measurement	<p>The study's eligible outcomes are task engagement, which falls under the school engagement domain, and disruptive behavior, which falls under the problem behavior domain. For a more detailed description of these outcome measures, see Appendix B.</p> <p>For Art, the study also examined a work productivity outcome—measured as the number of words written per minute—but this outcome does not fall under a domain specified in the protocol.</p> <p>Results from the two experiments with outcomes in the school engagement domain are presented in Appendix C.1. Results from the two experiments with outcomes in the problem behavior domain are presented in Appendix C.2.</p>
Support for implementation	Not reported.
Maintenance	There was no maintenance phase.
Author-reported findings	The study authors reported that the <i>FBA-based interventions</i> increased task engagement and decreased disruptive behavior for Art and Benjamin. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards With Reservations.</p> <p>Reason for study rating: For both students' reversal-withdrawal experiments, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.</p>

Appendix A.15: Research details for Mustian (2011)

Mustian, A. L. (2011). *The comparative effects of function-based versus nonfunction-based interventions on the social behavior of African American students*. Available from ProQuest Dissertations and Theses database. (UMI No. 3422674)

Setting	The study took place in two fifth-grade general education classrooms in an urban public elementary school in a metropolitan district in the southeastern United States. Teachers in both classrooms used a token economy system to encourage class participation and overall appropriate classroom behavior. The school population was 64% African American and 18% White, with Hispanic and other races making up the remainder. Approximately 86% of the students received free or reduced-priced lunch.
Study sample	Four students were part of the study sample. The study included two 11-year-old African-American male students (Todd and Alan) who were at risk for an emotional and behavioral disorder. Two additional students were dropped partway through their <i>functional behavioral assessments (FBAs)</i> due to minimal instances of problem behaviors. The author reported that both students had begun taking medication during the course of the <i>FBA</i> , which likely explains the diminishment of their problem behaviors. These students are not included in the WWC review of this study or included in the ratings of effectiveness, as graphical analysis of their outcome data was not presented.

Intervention	<p><i>FBA</i> procedures for both students included direct observations and interviews with teachers. The <i>FBA</i> process resulted in largely identical <i>FBA-based interventions</i> for both participants. A laminated schedule card was provided to each student during the intervention periods (a small group or whole class reading period). The student was trained to use the card as a reference, as well as a timed reminder system to record his behavior, leading to self-initiated breaks from the reading activity. Alan's desk was also relocated so he was in close proximity to his teacher and farther away from peers. Todd received ten sessions of the intervention, which were 40 minutes in length. Alan received seven total sessions of the intervention, which were 30 minutes in length.</p>
Comparison	<p>The study used a reversal-withdrawal design for both students. The baseline/withdrawal condition consisted of normal classroom practice, including encouragement and basic reminders to the whole class about on-task behavior. Students were prevented from taking breaks, as opposed to the break system used in the intervention.</p>
Outcomes and measurement	<p>The primary outcome measure was off-task problem behavior, which falls in the problem behavior domain. For a more detailed description of this outcome measure, see Appendix B. Mustian (2001) also measured self-management behavior; this outcome was measured during intervention phases only and thus does not meet WWC review requirements.</p> <p>Results from the two experiments with outcomes in the problem behavior domain are presented in Appendix C.2.</p>
Support for implementation	<p>Teachers received approximately 12 hours of training on <i>FBA</i> procedures. The training was divided into four modules. After completion of each module, teachers were required to complete that portion of the <i>FBA</i> with the students in the study. Once completed, the teachers worked with study personnel to craft a behavioral intervention plan for the students.</p>
Maintenance	<p>There was no maintenance phase.</p>
Author-reported findings	<p>The study author found that the <i>FBA-based interventions</i> decreased off-task problem behavior for Todd and Alan. The results of WWC's corresponding visual analysis are presented in Appendix C.</p>
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards With Reservations.</p> <p>Reason for study rating: For both students' reversal-withdrawal experiments, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), these experiments meet WWC pilot single-case design standards with reservations.</p>

Appendix A.16: Research details for Nahgahgwon et al. (2010)

Nahgahgwon, K. N., Umbreit, J., Liaupsin, C. J., & Turton, A. M. (2010). Function-based planning for young children at risk for emotional and behavioral disorders. *Education and Treatment of Children, 33*(4), 537–559.

Setting This study was conducted at an elementary school that served approximately 800 students in grades K–6 and included a total of 35 classrooms. A schoolwide discipline model was used to address the behavioral needs of students. Additional support, including a daily management system and replacement behavior training, was provided to students who continued to exhibit behavioral problems. The three students in this study were not responsive to these interventions, so they were identified to receive a *functional behavioral assessment (FBA)* and an individualized behavior intervention plan.

The study took place in each student’s general education classroom. Josh’s class had 30 students, and his teacher had 5 years of teaching experience. Zane’s class had 25 students, and his teacher had 4 years of teaching experience. Ian’s class had 30 students, and his teacher had 1 year of teaching experience. Observation sessions (for all conditions) occurred during the classroom activities that the students’ teachers had indicated were most likely to elicit problem behavior.

Study sample Three students were part of the study sample. All participants were considered at risk for an emotional and behavioral disorder due to ongoing behavioral problems that negatively affected their academic and social development. Josh was a 6-year-old Hispanic boy in first grade who had behavioral issues related to adaptability, hyperactivity, social skills, attention, and conduct problems. Zane was a 5-year-old Caucasian boy in full-day kindergarten who had issues in the areas of attention, adaptability, social skills, and hyperactivity. Ian was a 6-year-old Caucasian boy in full-day kindergarten who had behavioral issues in the areas of hyperactivity, attention, adaptability, social skills, and conduct problems. By the end of the study, Ian was given a diagnosis of emotional disability and speech/language impairment.

Intervention *FBA* procedures for each student included a review of school records, teacher and student interviews, and direct observation in the classroom. The results of the *FBA* suggested that Josh engaged in disruptive behavior to avoid activities that were difficult for him. Zane engaged in disruptive behavior to obtain attention from his teacher, especially when there was a long duration between opportunities to respond. Ian engaged in disruptive behavior to avoid difficult tasks and gain teacher attention and assistance.

As a result of the *FBA*, Josh was given smaller work units and a timer to prompt feedback on his work. He was also offered free time after completing some work and all appropriate requests for help were acknowledged by his teacher. When he demonstrated off-task behavior, he was redirected to the task. To increase Zane’s likelihood of being on task, the teacher provided a reminder of expected behavior to the whole class before instruction and as needed during instruction. His off-task behavior was ignored, but he was called on the first time he responded appropriately and was called on again up to three additional times as a means of reinforcing on-task behavior. Ian’s work was modified for his fluency level, and he received brief instructions at the start of each lesson. The teacher explained behavioral expectations to the whole class and repeated these individually to Ian. Reinforcement of on-task behavior included providing free time following task completion and providing periodic attention. Off-task behavior was addressed via redirection and maintaining the task demand.

Comparison	The study used one multiple baseline design experiment across three students. Baseline conditions were not explicitly described, other than mention of the schoolwide positive behavior supports.
Outcomes and measurement	<p>The primary outcome measure was on-task behavior, which falls in the school engagement domain. For a more detailed description of this outcome measure, see Appendix B.</p> <p>The study also measured students' office referrals and teacher reports of social validity of the intervention. The study authors did not provide visual analysis from single-case designs for these outcomes; thus, these designs do not meet review requirements, and these outcomes are not presented in the report. In addition, social validity does not fall under a domain specified in the protocol.</p> <p>Results from the one experiment with an outcome in the school engagement domain are presented in Appendix C.1.</p>
Support for implementation	This was not described, though intervention integrity data confirmed that all interventions were implemented with high levels of fidelity.
Maintenance	There was no maintenance phase.
Author-reported findings	The study authors found that the <i>FBA-based interventions</i> increased the level of on-task behavior for Josh, Zane, and Ian. The results of WWC's corresponding visual analysis are presented in Appendix C.
WWC study rating	<p>Meets WWC Pilot Single-Case Design Standards With Reservations.</p> <p>Reason for study rating: In the experiment that used a multiple baseline design across participants, there were fewer than five data points in at least one phase; because all phases had at least three data points (rather than five), this experiment meets WWC pilot single-case design standards with reservations.</p>

Appendix B: Outcome measures for each domain

School engagement	
<i>Academic engagement</i>	The percentage of 10-second intervals in which the student displayed academic engagement, which included attending to assigned materials and sitting or standing in the specified area. Academic engagement was measured by watching video recordings of 10-minute observation periods during class (as cited in Losinski et al., 2015).
<i>Appropriate task engagement</i>	The percentage of 10-second intervals in which the student displayed appropriate task engagement for the entire interval, with no problem behaviors observed. Appropriate task engagement for Freddy included looking at the teacher or class materials, raising a hand for permission to speak, limiting comments to the relevant topic, and attempting to respond. For Clay, appropriate task engagement included providing written responses to math problems (irrespective of accuracy) and looking at the teacher while directions were given (as cited in Hagan-Burke et al., 2015). ^a
<i>Compliance with teacher</i>	The percentage of 15-second intervals in which the student displayed compliant behavior for the entire interval. Compliant behavior was aligned with the assigned activity listed on the board, including pulling out binder, looking up at the board, copying the question on the board, looking at notes or textbook for the answer, and raising hand to request teacher’s attention. Each session typically lasted 5–10 minutes, from the time that class began to the time the teacher indicated that it was time to transition to a new activity (as cited in Lane et al., 2007a).
<i>Desirable behavior</i>	The percentage of 10-second intervals with observed desirable behavior. Data were collected in 15-second intervals, where 10 seconds were used for observations and 5 seconds were used for recording the information. Examples of desirable behavior were following teacher instructions; looking at the appropriate place, such as at materials or the teacher; or appropriate vocalizations. Nonoccurrence of desirable behavior was scored if the student failed to be engaged for a period exceeding 3 consecutive seconds. Sessions for Arnold and Ahmad lasted as long as it took for the student to complete the assigned task, with a limit of 15 minutes. Sessions for Juan and Shane, who were studied simultaneously, lasted for 7 minutes, with observations alternating every minute between the two students (as cited in Clarke et al., 1995).
<i>Off-task behavior</i>	Off-task behavior was measured in two studies, but the measurement and definition of the outcome varied: The percentage of 1-minute intervals, per session, in which the student displayed off-task behavior, such as walking around, reading when not assigned to do so, and not paying attention. All observation sessions lasted approximately 15 minutes (as cited in Christensen et al., 2012). ^a The rate of off-task behavior during a 60-minute observation session. The teacher collected data daily using event recording, and occurrences were converted to a rate. Off-task behavior included speaking to peers, teachers, or others without permission, and being out of the assigned area or involved in tasks other than those assigned by the teacher (as cited in Lane et al., 2007b).
<i>On-task behavior</i>	On-task behavior was measured in multiple studies, but the measurement and definition of the outcome varied: The percentage of 1-minute intervals, per session, in which the student displayed on-task behavior, such as working on assigned material. All observation sessions lasted approximately 15 minutes (as cited in Christensen et al., 2012). ^a The percentage of 10-second intervals with observed on-task behavior. Data were collected in 15-second intervals, where 10 seconds were used for observations and 5 seconds were used for recording the information. Examples of on-task behavior were following teacher instructions and looking at the appropriate place, such as at materials or the teacher (as cited in Dunlap et al., 1995 and Kern et al., 1994). The percentage of total session time that the student was observed to be on task. Examples of on-task behavior included attending to assigned materials, raising hand to request teacher’s attention, remaining in seat, and waiting for teacher instruction. The duration of on-task behavior was entered only after the behavior had occurred for at least 3 seconds (as cited in Hansen et al., 2014). ^a The percentage of 15-second intervals in which on-task behavior was observed and off-task behavior was not observed. Examples of on-task behavior included remaining in seat, looking at the teacher or class materials, and following teacher instructions. Off-task behavior included leaving seat during instruction, having conversations with the teacher that were not relevant to classwork, calling out responses without being called on, putting away supplies needed for the task, slumping in chair, using objects to make noise, and refusing to finish an assignment. Sessions lasted 10 minutes for Hugo and Tomas and 15 minutes for Eric (as cited in Janney et al., 2013). ^a The percentage of 30-second intervals in which on-task behavior was observed. Examples of on-task behavior included remaining in assigned seat or area and raising hand before asking for help (as cited in Nahgahwon et al., 2010).

<i>Socially-appropriate classroom behavior</i>	The percentage of 10-second intervals in which the student displayed socially-appropriate behavior for the entire interval. Socially-appropriate classroom behavior included paying attention, completing work, reading aloud, answering questions, appropriately obtaining teacher attention, and complying with instructions. The length of observation sessions ranged from 23 to 36 minutes (as cited in Christensen et al., 2004).
<i>Task engagement</i>	<p>Task engagement was measured in two studies, but the measurement and definition of the outcome varied: The percentage of 10-second intervals with observed task engagement. Data were collected in 15-second intervals, where 10 seconds were used for observations and 5 seconds were used for recording the information. Students were considered engaged if they were looking at assigned materials during independent work or were looking at the teacher during verbal instruction (as cited in Dunlap et al., 1996).</p> <p>The percentage of 10-second intervals (for Art) or 15-second intervals (for Benjamin) during which the student was engaged for 70% of the time, where engaged was defined as working on an assigned activity in accordance with the teacher's instructions. This included attending to materials during written or manipulative assignments or having eyes on the teacher during lecture or verbal instruction (as cited in Kern et al., 2001).^a</p>
<i>Time on task</i>	The percentage of time the student was on task and engaged in seatwork, during a 10–15 minute session (as cited in Davis et al., 2012). ^a
Problem behavior	
<i>Disruptive behavior</i>	<p>Disruptive behavior was measured in multiple studies, but the measurement and definition of the outcomes varied: The percentage of 10-second intervals with observed disruptive behavior. Data were collected in 15-second intervals, where 10 seconds were used for observations and 5 seconds were used for recording the information. Disruptive behavior was defined as any behavior that interfered with classroom activities, including aggression, talking without staff permission, vocal or nonvocal noise-making, leaving seat without permission, property destruction, and noncompliant behavior, which was defined as failing to follow instructions within 5 seconds (as cited in Clarke et al., 1995).</p> <p>The percentage of 10-second intervals with observed disruptive behavior. Data were collected in 15-second intervals, where 10 seconds were used for observations and 5 seconds were used for recording the information. Disruptive behavior was defined individually for each student, based on their prior behavior issues. For Michael, disruptive behavior included property destruction, speaking negatively to an adult, speaking without the teacher's permission, and not staying in his seat. For Gizelle, disruptive behaviors included property destruction, speaking negatively to an adult, and speaking without the teacher's permission. Ann's disruptive behaviors included aggression, not staying in her seat, not following instructions (after 5 seconds), speaking negatively to an adult, and property destruction (as cited in Dunlap et al., 1996).</p> <p>The frequency of disruptive behavior occurrences per minute. Examples of disruptive behavior included talking at inappropriate times and making noises with mouth, materials, or motor movements. At least 3 seconds without the disruptive behavior had to occur for two behaviors to be considered separate (as cited in Hansen et al., 2014).^a</p> <p>The frequency of disruptive behaviors per minute (for Benjamin) and the percentage of 10-second intervals with observed disruptive behavior (for Art). Disruptive behavior was defined as any occurrence of nonvocal noise, talking out when not related to the assigned task, vocalizing profanity or negative content, leaving the work area without permission, or exhibiting noncompliant behavior (as cited in Kern et al., 2001).^a</p> <p>The percentage of 10-second intervals in which the student displayed disruptive behavior, which included making inappropriate noises, pushing or touching others, and taking other students' belongings. Disruptive behavior was measured by watching video recordings of 10-minute observation periods during class (as cited in Losinski et al., 2015).</p>
<i>Inappropriate behavior</i>	The frequency of inappropriate behaviors during a 10–15 minute session. Inappropriate behavior was defined individually for each student. Todd's inappropriate behavior was defined as screaming, throwing, hitting, crying, yelling, refusing to move, and picking at the skin on his hands. Mary's inappropriate behavior was defined as forcefully hitting others. Eli's inappropriate behavior was defined as leaving the classroom, turning over furniture, and physical aggression toward staff (as cited in Davis et al., 2012). ^a

<i>Off-task problem behavior</i>	The percentage of off-task problem behaviors observed during 1-minute intervals. Percentages were calculated by dividing the number of intervals with occurrences of off-task behavior by the total number of intervals, multiplied by 100. Off-task behavior was defined individually for each student. Todd's off-task problem behavior was defined as playing with objects within reach, humming or singing aloud, talking to self or others about non-task related topics, and not looking at the teacher or instructional materials for 3 seconds or more. Alan's off-task problem behavior was defined as playing with hair or objects within reach, constant body movement, talking to self or others about non-task related topics, being out of seat, and not looking at the teacher or instructional materials for 3 seconds or more (as cited in Mustian, 2011). ^a
<i>Problem behavior</i>	The percentage of 10-second intervals with observed problem behavior. Data were collected in 15-second intervals, where 10 seconds were used for observations and 5 seconds were used for recording the information. Problem behaviors included aggressive behavior, inappropriate talk-outs and touching, noncompliance, and leaving classroom or running around (as cited in Dunlap et al., 1995).

^a The authors collected inter-assessor agreement (IAA) data in each phase and on at least 20% of all sessions, but it is not clear if IAA data were collected during 20% of the data points in each condition.

Appendix C: Single-case design findings included in the effectiveness ratings

Table C.1: Single-case design findings for the school engagement domain

Outcome measure	Study characteristics			WWC summary		
	Sample size (case)	Age(s)	Design type	Evidence level	Intervention effects	
					Total demonstrated	Total attempted
Christensen et al. (2012)^a						
<i>Off-task behavior (reduction)</i>	1 (Amy)	Grade 4	Reversal-withdrawal	No evidence	1	3
<i>On-task behavior</i>	1 (José)	Grade 4	Reversal-withdrawal	Strong (+)	3	3
Christensen et al. (2004)^b						
<i>Time on task</i>	1 (Eduardo)	8	Reversal-withdrawal	Strong (+)	3	3
Clarke et al. (1995)						
<i>Desirable behavior</i>	1 (Ahmad)	5	Reversal-withdrawal	Strong (+)	3	3
<i>Desirable behavior</i>	1 (Juan)	11	Reversal-withdrawal	No evidence	2	5
<i>Desirable behavior</i>	1 (Shane)	11	Reversal-withdrawal	Moderate (+)	4	5
Davis et al. (2012)^c						
<i>Time on task</i>	1 (Eli)	18	Reversal-withdrawal	No evidence	1	3
<i>Time on task</i>	1 (Mary)	8	Reversal-withdrawal	No evidence	0	3
Dunlap et al. (1995)^d						
<i>On-task behavior</i>	1 (Jill)	13	Reversal-withdrawal	No evidence	2	3
Dunlap et al. (1996)						
<i>Task engagement</i>	1 (Michael)	7	Reversal-withdrawal	Strong (+)	3	3
<i>Task engagement</i>	1 (Gizelle)	9	Reversal-withdrawal	Strong (+)	3	3
<i>Task engagement</i>	1 (Ann)	7	Reversal-withdrawal	Strong (+)	3	3
Hagan-Burke et al. (2015)^e						
<i>Appropriate task engagement</i>	1 (Freddy)	7	Alternating treatment	Strong (+)	13	13
<i>Appropriate task engagement</i>	1 (Clay)	9	Alternating treatment	Strong (+)	5	5
Hansen et al. (2014)^f						
<i>On-task behavior</i>	1 (Isaac)	12	Reversal-withdrawal	Strong (+)	3	3
<i>On-task behavior</i>	1 (Jeremiah)	7	Reversal-withdrawal	Strong (+)	3	3
<i>On-task behavior</i>	1 (Ben)	9	Reversal-withdrawal	Strong (+)	3	3
Janney et al. (2013)^g						
<i>On-task behavior</i>	1 (Hugo)	6	Reversal-withdrawal	Strong (+)	3	3
<i>On-task behavior</i>	1 (Tomas)	7	Reversal-withdrawal	Strong (+)	3	3
<i>On-task behavior</i>	1 (Eric)	8	Reversal-withdrawal	Strong (+)	3	3
Kern et al. (1994)						
<i>Disruptive behavior (reduction)</i>	1 (Eddie)	11	Multiple baseline	Strong (+)	3	3

Outcome measure	Study characteristics			WWC summary		
	Sample size (case)	Age(s)	Design type	Evidence level	Intervention effects	
					Total demonstrated	Total attempted
Kern et al. (2001)						
<i>Task engagement</i>	1 (Art)	11	Reversal-withdrawal	Strong (+)	3	3
<i>Task engagement</i>	1 (Benjamin)	11	Reversal-withdrawal	No evidence	2	3
Lane et al. (2007a)^h						
<i>Compliance with teacher</i>	1 (Aaron)	14	Reversal-withdrawal	Strong (+)	3	3
Lane et al. (2007b)ⁱ						
<i>Off-task behavior (reduction)</i>	1 (Charlie)	7	Reversal-withdrawal	Strong (+)	3	3
Losinski et al. (2015)^j						
<i>Academic engagement</i>	1 (Alexandra, Peer separation)	13	Alternating treatment	Strong (+)	8	8
<i>Academic engagement</i>	1 (Brenda, Peer separation)	13	Alternating treatment	Strong (+)	8	8
<i>Academic engagement</i>	1 (Hannah, Peer separation)	13	Alternating treatment	Moderate (+)	6	8
<i>Academic engagement</i>	1 (Larry, Peer separation)	14	Alternating treatment	Moderate (+)	7	8
<i>Academic engagement</i>	1 (Alexandra, Teacher proximity)	13	Alternating treatment	Strong (+)	5	5
<i>Academic engagement</i>	1 (Brenda, Teacher proximity)	13	Alternating treatment	No evidence	2	5
<i>Academic engagement</i>	1 (Hannah, Teacher proximity)	13	Alternating treatment	No evidence	3	5
<i>Academic engagement</i>	1 (Larry, Teacher proximity)	14	Alternating treatment	No evidence	2	5
Nahgahgwon et al. (2010)						
<i>On-task behavior</i>	3 (Josh, Zane, and Ian)	5–6	Multiple baseline	Strong (+)	3	3

Table Notes: The WWC does not calculate effect sizes for single-case design research. Characterizations of *Strong* and *Moderate* evidence, based on WWC visual analysis, indicate that the experiment demonstrated an effect of the intervention. Characterizations of *No evidence* indicate that the experiment did not provide at least three demonstrations of an intervention effect in the same direction. + = a positive (favorable) effect in the desired direction.

^a For Christensen et al. (2012), the students' ages were not reported.

^b For Christensen et al. (2004), a response to an author query confirmed that both figures in the original study were mislabeled. Figure 3 (ABAC) showed Justin's data and Figure 4 (ABAB) showed Eduardo's data. The study design for Justin does not meet WWC pilot single-case design standards, so his design is not described in this report or included in the ratings of effectiveness.

^c For Davis et al. (2012), the training phase is considered to be a part of the first functional communication training (FCT) intervention phase for the purposes of WWC visual analyses, as it was part of the *functional behavioral assessment (FBA)-based intervention*. After combining the training phase and first FCT phase into one phase, the visual analysis for each student/outcome focuses on the first four phases (ABAB). Mary had five additional phases following the ABAB design that are not included in the visual analysis. Eli also had an additional phase (after the ABAB design) with a 60-second delay that is not included in the visual analysis. These phase changes are not of interest for this review because they do not compare the effect of an *FBA-based intervention* to a non-*FBA-based intervention*, but rather compare two *FBA-based interventions*.

^d For Dunlap et al. (1995), WWC visual analysis focused only on the first four phases (ABAB) that met WWC standards with reservations; in the second intervention phase, visual analyses focused on the first four data points before the baseline probe point.

^e For Hagan-Burke et al. (2015) there were only four data points per condition for Clay, as opposed to five, so his design meets WWC pilot single-case design standards with reservations.

^f Hansen et al. (2014) used an ABCBCDC design for three students across two outcomes. The WWC visual analyses focused only on the BCBC phases of the reversal-withdrawal design (self-monitoring vs. *FBA-based intervention* plus self-monitoring [FBSM]). However, the study did provide data on additional phases: an initial baseline period, a phase of function-based consequences (FBC), and an additional FBSM phase. The design for the comparison between FBSM and FBC is not of interest for purposes of the WWC visual analyses because it does not compare the effect of an *FBA-based intervention* to a non-*FBA-based intervention*, but rather compares two *FBA-based interventions*. This comparison also does not meet WWC pilot single-case design standards because it has just two attempts to demonstrate an effect. For Ben, there were fewer than five data points in one phase, so his design meets WWC pilot single-case design standards with reservations.

^g Janney et al. (2013) used an ABACB design for all three students. The WWC’s visual analysis focused on the ABAB portion of the design; the CB phase change is not of interest for this review because it does not compare the effect of an *FBA-based intervention* to a non-*FBA-based intervention*.

^h In Lane et al. (2007a), there were fewer than five data points in one phase, so this design meets WWC pilot single-case design standards with reservations.

ⁱ For Lane et al. (2007b), phases B1 and B2 were combined to form the first intervention phase, for the purposes of WWC visual analyses, as the *FBA-based intervention* was used in both of these phases.

^j For Losinski et al. (2015), Hannah’s experiment for the comparison between the Teacher proximity and comparison conditions was characterized as providing *No evidence* following WWC visual analysis. The WWC Procedures and Standards Handbook (version 3.0) characterizes experiments as providing *Moderate evidence* when the experiment has at least three demonstrations of an effect and at least one demonstration of a non-effect. However, in the case of alternating treatment designs, the data must also demonstrate no clear effects in the opposite direction and an overall mean level difference for each condition in order to be characterized as providing *Moderate evidence*. Hannah’s experiment showed at least one effect in the opposite direction, so it was characterized as providing *No evidence*.

Table C.2: Single-case design findings for the problem behavior domain

Outcome measure	Study characteristics			WWC summary		
	Sample size (case)	Age(s)	Design type	Evidence level	Intervention effects	
					Total demonstrated	Total attempted
Clarke et al. (1995)						
<i>Disruptive behavior (reduction)</i>	1 (Ahmad)	5	Reversal-withdrawal	Strong (+)	3	3
<i>Disruptive behavior (reduction)</i>	1 (Juan)	11	Reversal-withdrawal	No evidence	0	5
<i>Disruptive behavior (reduction)</i>	1 (Shane)	11	Reversal-withdrawal	No evidence	1	5
Davis et al. (2012)^a						
<i>Inappropriate behavior (reduction)</i>	1 (Eli)	18	Reversal-withdrawal	Strong (+)	3	3
<i>Inappropriate behavior (reduction)</i>	1 (Mary)	8	Reversal-withdrawal	Strong (+)	3	3
<i>Inappropriate behavior (reduction)</i>	1 (Todd)	17	Reversal-withdrawal	Strong (+)	3	3
Dunlap et al. (1995)^b						
<i>Problem behavior (reduction)</i>	1 (Jill)	13	Reversal-withdrawal	No evidence	2	3
Dunlap et al. (1996)						
<i>Disruptive behavior (reduction)</i>	1 (Michael)	7	Reversal-withdrawal	Strong (+)	3	3
<i>Disruptive behavior (reduction)</i>	1 (Gizelle)	9	Reversal-withdrawal	Strong (+)	3	3
<i>Disruptive behavior (reduction)</i>	1 (Ann)	7	Reversal-withdrawal	Strong (+)	3	3

Outcome measure	Study characteristics			WWC summary		
	Sample size (case)	Age(s)	Design type	Evidence level	Intervention effects	
					Total demonstrated	Total attempted
Hansen et al. (2014)^c						
<i>Disruptive behavior (reduction)</i>	1 (Isaac)	12	Reversal-withdrawal	Strong (+)	3	3
<i>Disruptive behavior (reduction)</i>	1 (Jeremiah)	7	Reversal-withdrawal	Strong (+)	3	3
<i>Disruptive behavior (reduction)</i>	1 (Ben)	9	Reversal-withdrawal	No evidence	1	3
Kern et al. (2001)						
<i>Disruptive behavior (reduction)</i>	1 (Art)	11	Reversal-withdrawal	No evidence	0	3
<i>Disruptive behavior (reduction)</i>	1 (Benjamin)	11	Reversal-withdrawal	No evidence	2	3
Losinski et al. (2015)^d						
<i>Disruptive behavior (reduction)</i>	1 (Alexandra, Peer separation)	13	Alternating treatment	Strong (+)	8	8
<i>Disruptive behavior (reduction)</i>	1 (Brenda, Peer separation)	13	Alternating treatment	Strong (+)	8	8
<i>Disruptive behavior (reduction)</i>	1 (Hannah, Peer separation)	13	Alternating treatment	Moderate (+)	6	8
<i>Disruptive behavior (reduction)</i>	1 (Larry, Peer separation)	14	Alternating treatment	Moderate (+)	7	8
<i>Disruptive behavior (reduction)</i>	1 (Alexandra, Teacher proximity)	13	Alternating treatment	Moderate (+)	4	6
<i>Disruptive behavior (reduction)</i>	1 (Brenda, Teacher proximity)	13	Alternating treatment	Strong (+)	5	5
<i>Disruptive behavior (reduction)</i>	1 (Hannah, Teacher proximity)	13	Alternating treatment	No evidence	3	5
<i>Disruptive behavior (reduction)</i>	1 (Larry, Teacher proximity)	14	Alternating treatment	No evidence	3	5
Mustian (2001)^e						
<i>Off-task problem behavior (reduction)</i>	1 (Todd)	11	Reversal-withdrawal	Strong (+)	6	6
<i>Off-task problem behavior (reduction)</i>	1 (Alan)	11	Reversal-withdrawal	Strong (+)	3	3

Table Notes: The WWC does not calculate effect sizes for single-case design research. Characterizations of *Strong* and *Moderate* evidence, based on WWC visual analysis, indicate that the experiment demonstrated an effect of the intervention. Characterizations of *No evidence* indicate that the experiment did not provide at least three demonstrations of an intervention effect in the same direction. + = a positive (favorable) effect in the desired direction.

^a For Davis et al. (2012), the training phase is considered to be a part of the first functional communication training (FCT) intervention phase for the purposes of WWC visual analyses, as it was part of the *functional behavioral assessment (FBA)-based intervention*. After combining the training phase and first FCT phase into one phase, the visual analysis for each student/outcome focused on the first four phases (ABAB). Mary had five additional phases following the ABAB design that are not included in the visual analysis. Eli also had an additional phase (after the ABAB design) with a 60-second delay that is not included in the visual analysis. These phase changes are not of interest for this review because they do not compare the effect of an *FBA-based intervention* to a non-*FBA-based intervention*, but rather compare two *FBA-based interventions*.

^b For Dunlap et al. (1995), WWC visual analysis focused only on the first four phases (ABAB) that met WWC standards with reservations; in the second intervention phase, visual analyses focused on the first four data points before the baseline probe point.

^c Hansen et al. (2014) used an ABCBCDC design for three students across two outcomes. The WWC visual analyses focused only on the BCBC phases of the reversal-withdrawal design (self-monitoring vs. *FBA-based intervention* plus self-monitoring [FBSM]). However, the study did provide data on additional phases: an initial baseline period, a phase of function-based consequences (FBC), and an additional FBSM phase. The design for the comparison between FBSM and FBC is not of interest for purposes of the WWC visual analyses because it does not compare the effect of an *FBA-based intervention* to a non-*FBA-based intervention*, but rather compares two *FBA-based interventions*. This comparison would also not meet WWC pilot single-case design standards because it has just two attempts to demonstrate an effect. For Ben, there were fewer than five data points in one phase, so his design meets WWC pilot single-case design standards with reservations.

^d For Losinski et al. (2015), Hannah and Larry's experiments for the comparison between the Teacher proximity and comparison conditions were characterized as providing *No evidence* following WWC visual analysis. The WWC Procedures and Standards Handbook (version 3.0) characterizes experiments as providing *Moderate evidence* when the experiment has at least three demonstrations of an effect and at least one demonstration of a non-effect. However, in the case of alternating treatment designs, the data must also demonstrate no clear effects in the opposite direction and an overall mean level difference for each condition in order to be characterized as providing *Moderate evidence*. Both cases showed at least one effect in the opposite direction, so they were characterized as providing *No evidence*.

^e For Mustian (2001), the author used an ABABCBC design to examine the effect of both the *FBA-based* (B phase) and non-*FBA-based* (C phase) *interventions* on student behavior. The sequence of the interventions were modified for Alan, who received the non-*FBA-based intervention* (C phase) before the *FBA-based intervention* (B phase) (ACACBCB). The descriptions provided in the original study indicate little substantive difference between the non-*FBA-based intervention* and the baseline condition. Thus, for the purposes of the WWC visual analysis, Alan's baseline phases and non-*FBA-based intervention* phases are both treated as baseline phases, and compared to Alan's *FBA-based intervention* phases.

Appendix D: Single-case design findings in a domain not included in the effectiveness ratings¹²

Table D.1. Research details for single-case design studies with outcomes in the social-emotional competence domain

Study	Study sample, setting, comparison sessions, and intervention sessions
<p>Kern et al. (2007), Meets WWC Pilot Single-Case Design Standards With Reservations</p>	<p>This study included two children (Beatriz and Sean) with selective mutism. Beatriz also had an emotional/behavioral disorder, and Sean was at risk for an emotional disturbance. Beatriz was 13 years old and in the eighth grade. Sean was 11 years old and in the fourth grade. For Beatriz, the study took place during math, reading, and science in her special education classroom at an urban public middle school on the east coast. The study with Sean was conducted in his general education classroom in an urban public elementary school on the west coast, during language arts.</p> <p><i>Functional behavioral assessment (FBA)</i> procedures for both students included review of records, observations, and interviews of parents, school staff, case workers, and students. The <i>FBA-based interventions</i> for both students consisted of having teachers ask questions in a way that required a verbal response, asking questions that were easy to answer, and notifying the student at the beginning of class how many questions would be asked. As a reward for meeting the day's predetermined criterion, Sean could receive 5–10 minutes of extra recess time with a buddy. This reward was systematically faded. In addition, as part of an existing classwide reinforcement system, Sean also earned tickets that could be exchanged weekly for a prize from the class mystery box, if he met his daily criterion. Beatriz's intervention did not include a reward. During baseline, teachers implemented their regular procedures and did not ask questions that required vocal responses.</p> <p>For Beatriz and Sean, outcomes included independent and prompted vocal responses. Sean's spontaneous initiations were also measured. All three measures fall under the social-emotional competence domain. For a more detailed description of these outcome measures, see Appendix D, Table D.2. Maintenance data consisting of 1–2 data points were collected 2–4 weeks after the end of the intervention in each class for Beatriz and were collected 3 and 4 weeks after the end of Sean's intervention.</p> <p>In both students' changing criterion designs (across outcomes), there were fewer than five data points in at least one phase, so this study meets WWC pilot single-case design standards with reservations.</p>
<p>Lane et al. (2007a), Meets WWC Pilot Single-Case Design Standards Without Reservations</p>	<p>This study included one student (Claire) who had an outcome in the social-emotional competence domain. Claire was a 7-year-old first-grade student who had high levels of internalizing behavior and was at risk for emotional and behavioral disorder (EBD) classification. In the classroom, Claire seldom interacted with others, did not participate in class discussions, and struggled to respond to teacher questions. The study took place in a general education classroom at an elementary school in a rural Tennessee school district.</p> <p><i>FBA</i> procedures, including teacher and parent interviews, behavior rating scales completed by teachers, and direct observations, determined that Claire's nonparticipation typically occurred during instruction periods where students were asked to respond in front of their peers, and that Claire was anxious about providing wrong answers in front of her teacher and peers. Claire's <i>FBA-based intervention</i> involved Claire and her teacher setting a goal each morning for the number of times she would participate during each whole-class activity. Examples of participation and nonparticipation were modeled to Claire until she could identify the two behaviors and demonstrate them on her own. Claire was allowed a break from participation and from teacher and peer attention once she met her daily goal, but was no longer allowed to escape teacher and peer attention by displaying nonparticipation. The baseline condition consisted of regular classroom practices.</p> <p>Claire's outcome is the number of occurrences of participation during an academic task which falls under the social-emotional competence domain. For a more detailed description of this outcome measure, see Appendix D, Table D.2. Claire's teacher participated in an initial 6-hour training workshop that provided explicit instruction and examples of the <i>FBA</i> procedures, followed by 1-hr weekly follow-up meetings. Claire's teacher was also trained to implement reinforcement and elimination of nonparticipation. Maintenance data were collected 3 weeks following the completion of the intervention. During the maintenance phase, regular classroom practices were used to determine whether the behavior remained once the intervention was concluded and whether the maximum daily objective was achieved. The number of occurrences of participation remained high, with an increasing trend. For more information about this study, see Appendix A.5.</p>

Study	Study sample, setting, comparison sessions, and intervention sessions
<p>Lane et al. (2007b), Meets WWC Pilot Single-Case Design Standards Without Reservations²¹</p>	<p>This study included one student (Margaret) with an outcome in the social-emotional competence domain. Margaret was at risk for emotional or behavioral problems and was not receiving special education services at the time of the study. Her study took place in a second-grade classroom (22 students) at an inclusive public school in middle Tennessee.</p> <p>The results of the <i>FBA</i> suggested that Margaret engaged in negative social interactions to gain peer attention during seatwork. Her <i>FBA-based intervention</i> involved a self-monitoring checklist as well as a prompt card with examples of positive social comments to use during the class period. She was then paired with a peer assistant who tallied Margaret's positive and negative social behaviors. Margaret would set a daily goal of positive comments, and if she reached her goal at the end of the day, Margaret was allowed to serve as the teacher's assistant at the end of the day. Throughout the day, the teacher provided positive reinforcement when Margaret exhibited positive behavior, and only provided simple redirection when negative behavior was displayed. Margaret's study used a reversal-withdrawal design with four phases and fewer than five data points in one of the phases; because all phases have at least three data points (rather than five), the design meets WWC pilot single-case design standards with reservations. During the baseline/withdrawal sessions, regular classroom practices were implemented in a 90-minute period in the morning. In that period, students were to complete three "center" assignments, while the teacher met with each reading group for 30 minutes. Students sat in groups of four and were allowed to talk quietly if they needed help completing the assignments. If a student exhibited negative behavior, the student had to "move their star" that was visible by the classroom; as the stars moved downward, privileges were lost.</p> <p>The outcomes for Margaret were negative social interactions and positive social interactions, which fall under the social-emotional competence domain. For a more detailed description of these outcome measures, see Appendix D, Table D.2. For more information about this study, see Appendix A.6.</p>

Table D.2. Outcome measures in single-case design studies for the social-emotional competence domain

Social-emotional competence	
<i>Independent vocal responses</i>	The frequency of independent vocal responses to teacher questions observed during 5-minute intervals. An independent vocal response was defined as an appropriate vocal response provided within 30 seconds following the question, audible from a distance of five meters. Intervals spanned the length of the class period, which ranged from 30–50 minutes (as cited in Kern et al., 2007). ^a
<i>Negative social interactions</i>	The rate of negative social interactions observed during 30-minute observation sessions. Negative social interactions were defined as any behavior that was negative in voice or action toward peers, such as telling peers what to do when they had not asked or rolling eyes at peers. Data were collected two to three times a week using event recording, whereby the number of negative social interactions were tallied and converted to a rate (as cited in Lane et al., 2007b). ^a
<i>Participation during an academic task</i>	The number of times the student participated during a 30-minute observation session. Participation was defined as providing a verbal or non-verbal response to a teacher or a peer, such as verbally answering the teacher's questions, raising one's hand, or contributing information during a lesson. Examples of nonparticipation included keeping hands down and not speaking at all during a lesson (as cited in Lane et al., 2007a).
<i>Positive social interactions</i>	The rate of positive social interactions observed during 30-minute observation sessions. Positive social interactions were defined as any positive statement toward peers, such as praise statements or helpful comments. Data were collected two to three times a week using event recording, whereby the number of positive social interactions were tallied and converted to a rate (as cited in Lane et al., 2007b). ^a
<i>Prompted vocal responses</i>	The frequency of prompted vocal responses to teacher questions observed during 5-minute intervals. If the student did not provide a response to the teacher within 30 seconds of the question, the teacher issued a prompt by repeating the question, simplifying the question, or directing the student to verbally ask a peer for help with the answer. A prompted vocal response was defined as an appropriate vocal response provided within 30 seconds of a teacher prompt, audible from a distance of five meters. Responses did not need to be accurate to be counted. Intervals spanned the length of the class period, which ranged from 30–50 minutes (as cited in Kern et al., 2007). ^a
<i>Spontaneous initiations</i>	The frequency of spontaneous initiations observed during 5-minute intervals. A spontaneous initiation was defined as any spontaneous vocal utterance audible from a distance of five meters. Intervals spanned the length of the class period, which ranged from 30–50 minutes (as cited in Kern et al., 2007). ^a

^a The authors collected inter-assessor agreement (IAA) data in each phase and on at least 20% of all sessions, but it is not clear whether IAA data were collected during 20% of the data points in each condition.

Table D.3: Single-case design findings for the social-emotional competence domain

Outcome measure	Study characteristics			WWC summary
	Sample size (case)	Age(s)	Design type	Evidence level
Kern et al. (2007)^a				
<i>Independent vocal responses</i>	1 (Beatriz, math)	13	Changing criterion	Strong (+)
<i>Independent vocal responses</i>	1 (Beatriz, reading)	13	Changing criterion	Strong (+)
<i>Independent vocal responses</i>	1 (Beatriz, science)	13	Changing criterion	Strong (+)
<i>Prompted vocal responses</i>	1 (Beatriz, math)	13	Changing criterion	No evidence
<i>Prompted vocal responses</i>	1 (Beatriz, reading)	13	Changing criterion	No evidence
<i>Prompted vocal responses</i>	1 (Beatriz, science)	13	Changing criterion	No evidence
<i>Independent vocal responses</i>	1 (Sean, language arts)	11	Changing criterion	No evidence
<i>Prompted vocal responses</i>	1 (Sean, language arts)	11	Changing criterion	No evidence
<i>Spontaneous initiations</i>	1 (Sean, language arts)	11	Changing criterion	No evidence
Lane et al. (2007a)				
<i>Participation during an academic task</i>	1 (Claire)	7	Changing criterion	No evidence
Lane et al. (2007b)^b				
<i>Negative social interactions (reduction)</i>	1 (Margaret)	7	Reversal-withdrawal	Strong (+)
<i>Positive social interactions</i>	1 (Margaret)	7	Reversal-withdrawal	Strong (+)

Table Notes: The WWC does not calculate effect sizes for single-case design (SCD) research. Characterizations of *Strong* and *Moderate* evidence, based on WWC visual analysis indicate that the experiment demonstrated an effect of the intervention. Characterizations of *No evidence* indicate that the experiment did not provide at least three demonstrations of an intervention effect in the same direction. + = a positive (favorable) effect in the desired direction. The evidence from the SCD studies on *FBA* does not reach the threshold to include SCD evidence in the effectiveness ratings for the social-emotional competence domain.

^a In Kern et al. (2007), Beatriz’s changing criterion designs were nested within a multiple baseline design across classes, but the WWC review focuses separately on the three changing criterion designs instead of the multiple baseline design, as the study authors primarily discussed the results from the changing criterion design. The WWC rating would be the same regardless of which design was reviewed.

^b In Lane et al. (2007b), Margaret’s design had fewer than five data points in one phase, so her experiment meets WWC pilot single-case design standards with reservations.

Endnotes

¹ The descriptive information for this intervention was obtained from Gresham et al. (2001); Hanley et al. (2003); and Iwata et al. (1994). Further verification of the accuracy of the descriptive information for this intervention is beyond the scope of this review. Full citations: Gresham, F. M., Watson, T. S., & Skinner, C. H. (2001). Functional behavioral assessment: Principles, procedures, and future directions. *School Psychology Review, 30*(2), 156–172; Hanley, G. P., Iwata, B. A., & McCord, B. E. (2003). Functional analysis of problem behavior: A review. *Journal of Applied Behavior Analysis, 36*(2), 147–185; Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis, 27*(2), 197–209.

² The literature search reflects documents publicly available by December 2015. The studies in this report were reviewed using the Standards from the WWC Procedures and Standards Handbook (version 3.0), and the Children Identified With or At Risk for an Emotional Disturbance topic area review protocol (version 3.0). The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

³ All single-case design experiments within a research article comprise one single-case design study.

⁴ For the social-emotional competence domain, there are three studies (fewer than the five required), two different research teams with no overlapping authorship (fewer than the three required), and four cases (fewer than the 20 required).

⁵ Please see the Children Identified With or At Risk for an Emotional Disturbance review protocol (version 3.0) for a list of all the outcome domains.

⁶ For criteria used in the determination of the rating of effectiveness for single-case design studies, see the WWC Rating Criteria on p. 68.

⁷ Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Free Press.

⁸ Dunlap, G., Kern, L., dePerczel, M., Clarke, S., Wilson, D., Childs, K. E., White, R., & Falk, G. D. (1993). Functional analysis of classroom variables for students with emotional and behavioral challenges. *Behavioral Disorders, 18*, 275–291.

⁹ Kern, L., Dunlap, G., Clarke, S., & Childs, K. E. (1994). Student-assisted functional assessment interview. *Diagnostique, 19*(2-3), 29–39.

¹⁰ O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). *Functional assessment and program development for problem behavior: A practical handbook*. Pacific Grove, CA: Brooks/Cole Publishing.

¹¹ Umbreit, J., Ferro, J., Liaupsin, C., & Lane, K. (2007). *Functional behavioral assessment and function-based interventions: An effective, practical approach*. Upper Saddle River, NJ: Prentice-Hall.

¹² The results from single-case design studies are not used to report an intervention effectiveness rating for an outcome domain unless the studies collectively meet the threshold criteria described on p. 68. The evidence from the single-case design studies on *FBA* does not reach the threshold to include single-case design evidence in the effectiveness ratings for the social-emotional competence domain.

¹³ In single-case design research, a case, such as a student or classroom, is the unit of intervention administration and data analysis. A single-case design experiment is the examination of a single outcome measure repeatedly within and across different phases defined by the presence or absence of the intervention. There may be multiple experiments for a case if more than one outcome is examined, for example. All experiments within a research article comprise one single-case design study.

¹⁴ When there is more than one single-case design experiment in a publication that does not meet WWC pilot single-case design standards, the citation list reports the disposition code that applies to the majority of single-case designs in that publication. Some single-case designs within a given publication might not meet WWC pilot single-case design standards for reasons other than the one listed in the citation list.

¹⁵ Single-case design studies typically assign participants a pseudonym; we use the pseudonyms provided by study authors in this report so that WWC ratings can be easily mapped to the correct single-case design in the original study.

¹⁶ The experiment for one of the students (Clay), had only four data points per condition, so this experiment meets WWC pilot single-case design standards with reservations.

¹⁷ Tapp, J. T., Wehby, J. H., & Ellis, D. (1995). MOOSSES: A multi-option observation system for experimental studies. *Behavior Research Methods, Instruments, & Computers, 27*, 25–31.

¹⁸ The experiment for one of the students (Ben) used a reversal-withdrawal design with four phases and fewer than five data points in one phase; because all phases have at least three data points, the experiments for both of Ben's outcomes meet pilot single-case design standards with reservations.

¹⁹ The experiment for Aaron used a reversal-withdrawal design with four phases and fewer than five data points in two of the phases; because all phases have at least three data points, the experiment meets WWC pilot single-case design standards with reservations. The experiment used with the other student, Claire, meets WWC pilot single-case design standards without reservations; however, the social-emotional competence domain does not reach the threshold to include single-case design evidence in the effectiveness ratings in this report, so her experiment is described in Appendix D.

²⁰ The experiment for one of the students (Margaret) used a reversal-withdrawal design with four phases and fewer than five data points in one of the phases; because all phases had at least three data points (rather than five), this experiment meets WWC pilot single-case design standards with reservations.

²¹ Margaret's study used a reversal-withdrawal design with four phases and fewer than five data points in one of the phases; because all phases had at least three data points (rather than five), the design meets WWC pilot single-case design standards with reservations. The experiment used with the other student (Charlie), meets WWC pilot single-case design standards without reservations and is described in Appendix C.

Recommended Citation

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2016, December). *Children Identified With or At Risk for an Emotional Disturbance topic area intervention report: Functional Behavioral Assessment-based Interventions*. Retrieved from <http://whatworks.ed.gov>

WWC Rating Criteria

Criteria used to determine the rating of a study that includes single-case design experiments

Study rating	Criteria
Meets WWC pilot single-case design standards without reservations	A single-case design study that provides strong evidence for assessing an intervention's effectiveness.
Meets WWC pilot single-case design standards with reservations	A study that provides weaker evidence for assessing an intervention's effectiveness, such as a reversal-withdrawal design with three or four data points per phase.

Table Note: Any exceptions to this standard are specified in the topic area review protocol. For example, extreme self-injurious behavior might warrant a lower threshold of only one or two data points.

Criteria used to determine evidence of a causal relation in a single-case design experiment

Evidence level	Criteria
Strong evidence of a causal relationship	A single-case design study with at least three demonstrations of the intervention effect and no non-effects.
Moderate evidence of a causal relationship	A single-case design study with at least three demonstrations of the intervention effect and at least one non-effect.
No evidence of a causal relationship	A single-case design study with fewer than three demonstrations of the intervention effect.

Criteria used to determine whether the body of single-case design evidence for an intervention is substantive enough to summarize as evidence of intervention effectiveness for a given domain

Threshold to include single-case design evidence	Criteria
Threshold met	At least five studies examining the intervention meet WWC pilot single-case design standards without reservations or meet WWC pilot single-case design standards with reservations, AND The single-case design studies are conducted by at least three different research teams with no overlapping authorship at three different institutions, AND The combined number of cases (i.e., participants, classrooms, etc.) totals at least 20.

WWC Rating Criteria

Criteria used to determine the rating of effectiveness for an intervention based on single-case design research

Rating of effectiveness	Criteria
Positive effects	Across all single-case design experiments, at least 80% show positive effects, AND No single-case design experiment shows negative effects, AND At least one single-case design experiment meets WWC pilot single-case design standards without reservations.
Potentially positive effects	Across all the single-case design experiments, 51% to 79% show positive effects, AND No single-case design experiment shows negative effects.
Mixed effects	At least one single-case design experiment shows positive effects AND at least one single-case design experiment shows negative effects, OR At least one single-case design experiment shows positive or negative effects AND 50% or more show indeterminate effects.
Potentially negative effects	Across all the single-case design experiments, 51% to 79% show negative effects, AND No single-case design experiment shows positive effects.
Negative effects	Across all the single-case design experiments, at least 80% show negative effects, AND No single-case design experiment shows positive effects, AND At least one single-case design experiment meets WWC pilot single-case design standards without reservations.
No discernible effects	None of the single-case design experiments shows effects, either positive or negative.

Notes: A single-case design experiment has all of the design elements required to meet WWC standards with or without reservations (such as three attempts to demonstrate an effect) and is presented as one experiment in a study. The WWC characterizes all single-case design experiments in the same research article as one study, and thus one study can have multiple single-case design experiments. For example, a study could include three separate ABAB design experiments for one student (across three different eligible outcomes) or could include three separate ABAB design experiments for three separate eligible students. If a study presents data for more than one outcome, the WWC classifies the single-case design for each outcome as a separate experiment. The WWC visual analysis characterizations of *Strong* and *Moderate* evidence indicate that the design demonstrated an effect of the intervention. A visual analysis rating of *No evidence* indicates that the experiment did not provide at least three demonstrations of an intervention effect in the same direction.

Glossary of Terms

- Alternating treatment design** A single-case design experiment that repeatedly introduces and withdraws the intervention(s); each phase only lasts one or two sessions.
- Attrition** For group design research, attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study. For single-case design research, attrition can occur when an individual fails to complete all required phases of a study or the case is a group and individuals attrite from the group.
- Baseline** In a single-case design experiment, baseline is the condition when participants are not receiving the intervention.
- Case** A case is the unit of intervention administration and data analysis in a single-case design experiment. A case may be a single participant or a cluster of participants like a classroom.
- Clustering adjustment** In group design research, if intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
- Confounding factor** A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
- Design** The design of a study is the method by which intervention and comparison groups were assigned (group design) or the method by which a dependent variable was repeatedly and systematically measured before, during, and after the active manipulation of an independent variable (single-case design).
- Domain** A domain is a group of closely related outcomes.
- Effect size** The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across group design studies and outcomes.
- Eligibility** A determination of whether a study falls within the scope of a review protocol and uses a causal design.
- Equivalence** A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
- Extent of evidence** An indication of how much evidence from group design studies supports the findings. The criteria for the extent of evidence levels are given in the WWC Rating Criteria on p. 68.
- Fidelity** Fidelity indicates the extent to which the intervention, as implemented, replicates the intervention's design.
- Improvement index** Along a percentile distribution of individuals, the improvement index represents the gain or loss of the average individual due to the intervention, using findings from group design research. As the average individual starts at the 50th percentile, the measure ranges from -50 to +50.
- Intervention** An educational program, product, practice, or policy aimed at improving student outcomes.

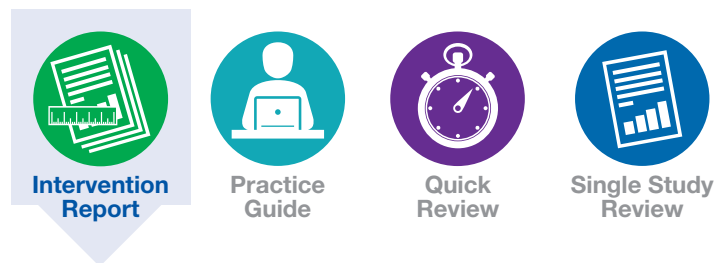
Glossary of Terms

- Intervention report** A summary of the findings of the highest-quality research on a given program, product, practice, or policy in education. The WWC searches for all research studies on an intervention, reviews each against design standards, and summarizes the findings of those that meet WWC design standards.
- Maintenance probes** In single-case design research, maintenance probes measure outcomes after the intervention has ended.
- Multiple baseline design** A single-case design that staggers the introduction of the intervention to different cases or to the same case over different settings.
- Multiple comparison adjustment** When a group design study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
- Multiple probe design** A variation on the multiple baseline single-case design that features intermittent pre-intervention data collection.
- Phase** In single-case design research, phases are the consecutive sessions when a case receives or does not receive the intervention.
- Quasi-experimental design (QED)** A quasi-experimental design (QED) is a research design in which study participants are assigned to intervention and comparison groups through a process that is not random.
- Randomized controlled trial (RCT)** A randomized controlled trial (RCT) is an experiment in which eligible study participants are randomly assigned to intervention and comparison groups.
- Rating of effectiveness** For group design research, the WWC rates the effectiveness of an intervention in each domain based on the quality of the research design and the magnitude, statistical significance, and consistency in findings. For single-case design research, the WWC rates the effectiveness of an intervention in each domain based on the quality of the research design and the consistency of demonstrated effects. The criteria for the ratings of effectiveness are given in the WWC Rating Criteria on p. 68.
- Reversal-withdrawal design** A single-case design that introduces the intervention twice and withdraws the intervention once (also known as an ABAB design). The design may be extended by adding additional baseline and/or intervention phases.
- Single-case design (SCD) experiment** A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.
- Standard deviation** The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample tend to be spread out over a large range of values.
- Statistical significance** Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ($p < .05$).

Glossary of Terms

- Substantively important** A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.
- Systematic review** A review of existing literature on a topic that is identified and reviewed using explicit methods. A WWC systematic review has five steps: 1) developing a review protocol; 2) searching the literature; 3) reviewing studies, including screening studies for eligibility, reviewing the methodological quality of each study, and reporting on high quality studies and their findings; 4) combining findings within and across studies; and, 5) summarizing the review.
- Threshold to include single-case design evidence** For single-case design studies to contribute to the evidence rating, there must be a sufficient combination of participants, authors, and studies that meet evidence standards. The criteria for the threshold to include single-case design evidence are given in the WWC Rating Criteria on p. 68.
- Visual analysis** A visual analysis reviews the pattern of outcome data in a single-case design experiment to determine whether a positive effect, negative effect, or no effect is demonstrated between the intervention and the outcome.

Please see the WWC Procedures and Standards Handbook (version 3.0) for additional details.



An **intervention report** summarizes the findings of high-quality research on a given program, practice, or policy in education. The WWC searches for all research studies on an intervention, reviews each against evidence standards, and summarizes the findings of those that meet standards.

This intervention report was prepared for the WWC by Mathematica Policy Research under contract ED-IES-13-C-0010.