

Social Skills Training

Program Description¹

Social skills training is not a specific curriculum, but rather a collection of practices that use a behavioral approach for teaching preschool children age-appropriate social skills and competencies, including communication, problem solving, decision making, self-management, and peer relations. *Social skills training* can occur in both regular and special education classrooms.

A variety of *social skills training* approaches and curricula are available. For example, teachers may use a structured approach to explain to students how to enact a desired behavior by providing examples and reinforcing targeted behaviors through questions, answers, and other feedback. An example of a more nuanced approach (often referred to as “incidental teaching”) is when teachers respond to student-generated utterances, interactions, and behavior to encourage the desired social skills (such as rewarding positive play).

Research²

The What Works Clearinghouse (WWC) identified three studies of *social skills training* that both fall within the scope of the Early Childhood Education Interventions for Children with Disabilities topic area and meet WWC evidence standards. All three of these studies meet standards without reservations and together, they included 135 children with disabilities in early education settings in the United States. Although this report presents information about all three studies and their findings, the WWC’s summary ratings of the evidence of effectiveness of the intervention are based on only two of the studies, that, together, included 103 children in their samples. The third study, which had a sample of 32 children, did not provide sufficient information to support calculation of effect sizes and statistical significance, which are used in determining the WWC’s overall evidence ratings.

The WWC considers the extent of evidence for *social skills training* on children with disabilities in early education settings to be small for two outcome domains—(a) cognition and (b) social-emotional development and behavior. There were no studies that meet standards in the five other domains, so we do not report on the effectiveness of *social skills training* for those domains in this intervention report. (See the Effectiveness Summary on p. 5 for further description of all domains.)

Effectiveness

Social skills training was found to have no discernible effects on cognition and positive effects on social-emotional development and behavior for children with disabilities in early education settings.

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Table 1. Summary of findings³

Outcome domain	Rating of effectiveness	Improvement index (percentile points)		Number of studies	Number of students	Extent of evidence
		Average	Range			
Cognition	No discernible effects	+7	na	1	65	Small
Social-emotional development and behavior	Positive effects	+18	-18 to +44	2	103	Small

na = not applicable

Program Information

Background

Social skills training does not have a single developer responsible for providing information or materials. The interventions described in this report were developed by various study authors and are not available for distribution through a common developer. However, many online resources are available for readers interested in using *social skills training* practices. The following sites provide a general overview of *social skills training* methods:

- Behavior Advisor: Teaching Social Skills: <http://www.behavioradvisor.com/SocialSkills.html>
- Social Skills Training Project: <http://www.socialskillstrainingproject.com/>
- Social Work Podcast: <http://socialworkpodcast.blogspot.com/2010/06/social-skills-training-interview-with.html>

Program details

Teachers can use *social skills training* practices with individual children, in small-group settings, or with whole classes. Regardless of the setting, *social skills training* practices are intended to promote positive interactions among children and between children and their teachers. In order to implement the *social skills training* approach, teachers use modeling, role-playing, and specific instruction on social skills. Then, children typically practice the skills and receive positive reinforcement for engaging in appropriate social behavior. Training and practice activities typically occur for up to one hour each day. The duration of an intervention can vary from a few days to several weeks. More detailed practices for specific *social skills training* programs are presented in Appendices A.1 to A.3.

Cost

Some published *social skills training* programs are freely available to the public. The WWC was unable to identify information about the costs of implementing the intervention (e.g., for teacher training and support).

Research Summary

The WWC identified 46 studies that investigated the effects of *social skills training* on children with disabilities in early education settings.

The WWC reviewed three of those studies against group design evidence standards. All three of those studies (Ferentino, 1991; Guglielmo & Tryon, 2001; Leblanc & Matson, 1995) are randomized controlled trials that meet WWC group design evidence standards without reservations and are summarized in this report.

The WWC reviewed three additional studies against the pilot single-case design standards. All three studies do not meet WWC pilot single-case design standards. The remaining 40 studies do not meet WWC eligibility screens for review in this topic area. (Citations for all 46 studies are in the References section, which begins on p. 7).

Table 2. Scope of reviewed research

Grade	Preschool
Delivery method	Whole class
Program type	Practice
Studies reviewed	46
Group design studies that meet WWC evidence standards	
• without reservations	3 studies
• with reservations	0 studies

Summary of studies meeting WWC evidence standards without reservations

Ferentino (1991) randomly assigned classrooms to one of three conditions, two of which included a *social skills training* curriculum called “My Friends and Me” and one of which was a wait-list control condition. This WWC report focuses on the 32 children in four classrooms that were assigned to a school-based implementation of the *social skills training* intervention and the 33 children in four classrooms that were assigned to the wait-list control condition and did not receive the intervention during the study period.⁴

Guglielmo and Tryon (2001) randomly assigned a total of nine classrooms to receive various combinations of *social skills training* using the “Taking Part: Introducing Social Skills to Children” curriculum. This WWC report focuses on a subset of six classrooms included in the study. Nineteen children in three classrooms received the *social skills training* intervention, supplemented by a reinforcement of target behaviors. Nineteen children in three other classrooms received the reinforcement of target behaviors without *social skills training* and serve as the comparison group to determine the effect of *social skills training* in this WWC report.⁵

LeBlanc and Matson (1995) randomly assigned six classrooms to receive an unnamed *social skills training* curriculum or to a business-as-usual comparison condition. Sixteen children in three of the classrooms received *social skills training*, and 16 children in the other three classrooms did not.

Summary of studies meeting WWC evidence standards with reservations

No studies of *social skills training* meet WWC evidence standards with reservations.

Effectiveness Summary

The WWC reviews of evidence for the Early Childhood Education Interventions for Children with Disabilities topic area addresses student outcomes in seven domains: (a) cognition, (b) communication/language competencies, (c) literacy, (d) mathematics achievement, (e) social-emotional development and behavior, (f) functional abilities, and (g) physical well-being. The three studies of *social skills training* that meet WWC evidence standards reported findings in two of the seven domains: (a) cognition and (b) social-emotional development and behavior. The findings below present the authors’ estimates and WWC-calculated estimates of the size and statistical significance of the effects of *social skills training* on children with disabilities in early education settings.⁶ For a more detailed description of the rating of effectiveness and extent of evidence criteria, see the WWC Rating Criteria on p. 26.

Summary of effectiveness for the cognition domain

One study reported findings in the cognition domain.

Ferentino (1991) reported findings that were not statistically significant or the one measure assessed in this outcome domain, and the WWC confirmed this calculation. The direction of this effect favored the *social skills training* group but was not large enough to be considered substantively important by WWC criteria. In this study, the effect was classified as indeterminate.

Thus, for the cognition domain, one study reported findings that were not statistically significant or substantively important. This results in a rating of no discernible effects, with a small extent of evidence.

Table 3. Rating of Effectiveness and extent of evidence for the cognition domain

Rating of effectiveness	Criteria met
No discernible effects <i>None of the studies shows a statistically significant or substantively important effect, either positive or negative.</i>	In the one study that reported findings, the estimated impact of the intervention on outcomes in the <i>cognition domain</i> was neither statistically significant nor large enough to be substantively important.
Extent of evidence	Criteria met
Small	One study that included 65 children in one school reported evidence of effectiveness in the <i>cognition domain</i> .

Summary of effectiveness for the social-emotional development and behavior domain

Three studies reported findings in the social-emotional development and behavior domain.

Ferentino (1991) analyzed five measures in this outcome domain. The study reported a statistically significant positive effect for one measure, which was confirmed by the WWC. The results for the other four outcomes were not statistically significant. According to WWC criteria, this study shows a statistically significant positive effect for social-emotional development and behavior.⁷

Guglielmo and Tryon (2001) examined impacts on two outcomes in this domain. For both outcomes, the estimated effects were positive. One of the findings was statistically significant and the other was not, but was large enough to be considered substantively important. According to WWC criteria, this study shows a statistically significant positive effect for social-emotional development and behavior.

LeBlanc and Matson (1995) analyzed two outcomes in this domain and found a statistically significant positive effect favoring the intervention on one outcome but no significant difference between the groups on the other outcome. However, there was insufficient information for the WWC to calculate effect sizes or to verify the signifi-

cance tests conducted by the authors. As a result, the information from this study does not contribute to the rating of the evidence of effectiveness for this WWC report.

Thus, for the social-emotional development and behavior domain, there are two studies with statistically significant positive effects, one study failing to show evidence of an effect (positive or negative), and no studies showing a statistically significant or substantively important negative effect. This results in a rating of positive effects, with a small extent of evidence.

Table 4. Rating of effectiveness and extent of evidence for the social-emotional development and behavior domain

Rating of effectiveness	Criteria met
Positive effects <i>Strong evidence of a positive effect with no overriding contrary evidence.</i>	The review of <i>social skills training</i> in the <i>social-emotional development and behavior domain</i> had two studies showing statistically significant positive effects and no studies showing statistically significant or substantively important negative effects.
Extent of evidence	Criteria met
Small	The review of <i>social skills training</i> in the <i>social-emotional development and behavior domain</i> was based on two studies that included two schools and 103 children.

References

Studies that meet WWC standards without reservations

- Ferentino, S. C. (1991). Teaching social skills to preschool children in a special education program. *Dissertation Abstracts International*, 52(08B), 223-4490.
- Guglielmo, H. M., & Tryon, G. S. (2001). Social skill training in an integrated preschool program. *School Psychology Quarterly*, 16(2), 158–175.
- LeBlanc, L. A., & Matson, J. L. (1995). A social skills training program for preschoolers with developmental delays: Generalization and social validity. *Behavior Modification*, 19(2), 234–246.

Studies that do not meet WWC standards

- Lewis, T. J. (1994). A comparative analysis of the effects of social skill training and teacher-directed contingencies on social behavior of preschool children with disabilities. *Journal of Behavioral Education*, 4(3), 267–281. The study does not meet WWC pilot single-case design standards because it does not have at least three attempts to demonstrate an intervention effect at three different points in time.
- Macy, M. G., & Bricker, D. D. (2007). Embedding individualized social goals into routine activities in inclusive early childhood classrooms. *Early Child Development & Care*, 177(2), 107–120. The study does not meet WWC pilot single-case design standards because it does not have at least three attempts to demonstrate an intervention effect at three different points in time.
- McConnell, S. R., Sisson, L. A., Cort, C. A., & Strain, P. S. (1991). Effects of social skills training and contingency management on reciprocal interaction of preschool children with behavioral handicaps. *Journal of Special Education*, 24(4), 473–495. The study does not meet WWC pilot single-case design standards because it does not have at least three attempts to demonstrate an intervention effect at three different points in time.

Studies that are ineligible for review using the Early Childhood Education Interventions for Children with Disabilities Evidence Review Protocol

- Algozzine, B., Algozzine, K., & McClanahan, T. (2010). Preschool behavior support. In B. Algozzine, A. P. Daunic, & S. W. Smith (Eds.), *Preventing problem behaviors: Schoolwide programs and classroom practices* (2nd ed., pp. 13–32). Thousand Oaks, CA: Corwin Press. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- Antia, S. D., & Kreimeyer, K. H. (1996). Social interaction and acceptance of deaf or hard-of-hearing children and their peers: A comparison of social-skills and familiarity-based interventions. *Volta Review*, 98(4), 157–180. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Antia, S. D., Kreimeyer, K. H., & Eldredge, N. (1994). Promoting social interaction between young children with hearing impairments and their peers. *Exceptional Children*, 60(3), 262–275. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Bernard-Opitz, V., Sriram, N., & Nakhoda-Sapuan, S. (2001). Enhancing social problem solving in children with autism and normal children through computer-assisted instruction. *Journal of Autism and Developmental Disorders*, 31(4), 377–384. The study is ineligible for review because it does not take place in the geographic area specified in the protocol.

- Carpenter, E. M. (2002). A curriculum-based approach for social-cognitive skills training: An intervention targeting aggression in Head Start preschoolers. *Dissertation Abstracts International Section B: The Sciences and Engineering*, 63(6-B), 3001. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Cirrin, F. M., Schooling, T. L., Nelson, N. W., Diehl, S. F., Flynn, P. F., Staskowski, M., ...Adamczyk, D. F. (2010). Evidence-based systematic review: Effects of different service delivery models on communication outcomes for elementary school-age children. *Language, Speech, and Hearing Services in Schools*, 41(3), 233–264. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- Coplan, R. J., Schneider, B. H., Matheson, A., & Graham, A. (2010). 'Play skills' for shy children: Development of a social skills facilitated play early intervention program for extremely inhibited preschoolers. *Infant and Child Development*, 19(3), 223–237. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Fenning, R. M., Baker, B. L., & Juvonen, J. (2011). Emotion discourse, social cognition, and social skills in children with and without developmental delays. *Child Development*, 82(2), 717–731. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.
- Girolametto, L. E. (1988). Improving the social-conversational skills of developmentally disabled children: An intervention study. *Journal of Speech and Hearing Disorders*, 53(2), 156–167. The study is ineligible for review because it does not occur within the time frame specified in the protocol.
- Gorham, M., Barnes-Holmes, Y., Barnes-Holmes, D., & Berens, N. (2009). Derived comparative and transitive relations in young children with and without autism. *Psychological Record*, 59(2), 221–246. The study is ineligible for review because it does not take place in the geographic area specified in the protocol.
- Gunn, B., Feil, E., Seeley, J., Severson, H., & Walker, H. (2006). Promoting school success: Developing social skills and early literacy in Head Start classrooms. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 9(1), 1–11. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% children with identified disabilities or more than 50% students with autism.
- Haring, T. G., & Lovinger, L. (1989). Promoting social interaction through teaching generalized play initiation responses to preschool children with autism. *Journal of the Association for Persons with Severe Handicaps*, 14(1), 58–67. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Harvey, R. (2003). Value adding? Improving the effectiveness of social skills training programs. *Australian Journal of Psychology*, 55(3), 184–189. The study is ineligible for review because it does not take place in the geographic area specified in the protocol.
- Hoch, J. D. (2008). The role of emotion and stress in predicting response to relaxation and social skills interventions in an early childhood therapeutic preschool program. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 68(11-A), 4605. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Houston, F. (1998). Combined interventions: Using social skills training and peer-mediated interventions in an integrated group setting to facilitate the development of social skills in students with autism. *Dissertation Abstracts International*, 60(03B), 92-1330. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.

- Hundert, J., & Houghton, A. (1992). Promoting social interaction of children with disabilities in integrated preschools: A failure to generalize. *Exceptional Children*, 58(4), 311–320. The study is ineligible for review because it does not take place in the geographic area specified in the protocol.
- Hurley, J. J., Wehby, J. H., & Feurer, I. D. (2010). The social validity assessment of social competence intervention behavior goals. *Topics in Early Childhood Special Education*, 30(2), 112–124. The study is ineligible for review because it does not disaggregate findings for the age or grade range specified in the protocol.
- Hyatt, K. J., & Filler, J. W. (2007). A comparison of the effects of two social skill training approaches on teacher and child behavior. *Journal of Research in Childhood Education*, 22(1), 85–96. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Johnson, J. L. (2001). Preventing conduct problems and increasing social competence in high-risk preschoolers. *Dissertation Abstracts International Section B: The Sciences and Engineering*, 62(2-B), 1085. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Kalyva, E., & Avramidis, E. (2005). Improving communication between children with autism and their peers through the “circle of friends”: A small-scale intervention study. *Journal of Applied Research in Intellectual Disabilities*, 18(3), 253–261. The study is ineligible for review because it does not take place in the geographic area specified in the protocol.
- Kamps, D. M., & Ellis, C. (1995). Peer-inclusive social skills groups for young children with behavioral risks. *Preventing School Failure*, 39(4), 10. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Kamps, D. M., Tankersley, M., & Ellis, C. (2000). Social skills interventions for young at-risk students: A 2-year follow-up study. *Behavioral Disorders*, 25(4), 310–324. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.
- Kazdin, A. E., Bass, D., Siegel, T., & Thomas, C. (1989). Cognitive-behavioral therapy and relationship therapy in the treatment of children referred for antisocial behavior. *Journal of Consulting and Clinical Psychology*, 57(4), 522–535. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.
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- Kroeger, K. A., Schultz, J. R., & Newsom, C. (2007). A comparison of two group-delivered social skills programs for young children with autism. *Journal of Autism and Developmental Disorders*, 37(5), 808–817. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Leaf, J. B., Dotson, W. H., Oppeneheim, M. L., Sheldon, J. B., & Sherman, J. A. (2010). The effectiveness of a group teaching interaction procedure for teaching social skills to young children with a pervasive developmental disorder. *Research in Autism Spectrum Disorders*, 4(2), 186–198. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Lefler, E., Hartung, C., Scambler, D., Page, M., Sullivan, M., Armendariz, M., ... Warner, C. (2009). Effects of a social skills intervention administered in mixed diagnostic groups for children with peer relationship problems. *NHSA Dialog: A Research-to-Practice Journal for the Early Intervention Field*, 12(1), 18–32. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.

- Leon-Guerrero, R. S. (2006). The use of visually enhanced social skills curriculum to teach prosocial skills to young children with autism spectrum disorder. *Dissertation Abstracts International*, 67(06A), 1-2114. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Macklem, G. L. (2011). *Evidence-based school mental health services: Affect education, emotion regulation training, and cognitive behavioral therapy*. New York: Springer. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- McCabe, P. C., & Altamura, M. (2011). Empirically valid strategies to improve social and emotional competence of preschool children. *Psychology in the Schools*, 48(5), 513–540. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- Nelson, C. B. (2004). Keys to play: A strategy to increase the social interactions of young children with autism and their typically developing peers. *Dissertation Abstracts International*, 64(12A), 142-4422. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Peterson, C. A., & McConnell, S. R. (1996). Factors related to intervention integrity and child outcome in social skills interventions. *Journal of Early Intervention*, 20(2), 146–164. The study is ineligible for review because it does not examine an intervention implemented in a way that falls within the scope of the review.
- Richardson, D. L. (2009). Evaluation of interpersonal problem-solving skills program for preschool and elementary children. *Dissertation Abstracts International*, 70(05B), 223-3207. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.
- Shepherd, E. J. (2009). Intervening to promote social skill usage in Head Start preschoolers: A single-group design evaluation of effectiveness. *Dissertation Abstracts International Section B: The Sciences and Engineering*, 69(9-B), 5793. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Storey, K., & Danko, C. (1994). Generalization of social skills intervention for preschoolers with social delays. *Education and Treatment of Children*, 17(1), 29–51. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.
- Storey, K., Danko, C. D., Strain, P. S., & Smith, D. J. (1992). A follow-up of social skills instruction for preschoolers with developmental delays. *Education & Treatment of Children*, 15(2), 125–139. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Strain, P., Kohler, F., Storey, K., & Danko, C. (1994). Teaching preschoolers with autism to self-monitor their social interactions: An analysis of results in home and school settings. *Journal of Emotional and Behavioral Disorders*, 2(2), 78–88. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Tsao, L., & Odom, S. (2006). Sibling-mediated social interaction intervention for young children with autism. *Topics in Early Childhood Special Education*, 26(2), 106–123. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample either includes less than 50% students with identified disabilities or more than 50% students with autism.
- Turan, Y. (2004). Promoting social responsiveness for young children with disabilities by enhancing the reinforcing value of social interactions. *Dissertation Abstracts International*, 65(11A), 125-4160. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample is not within the specified age or grade range.
- Vaughn, S., Kim, A., Sloan, C. V. M., Hughes, M. T., Elbaum, B., & Sridhar, D. (2003). Social skills interventions for young children with disabilities: A synthesis of group design studies. *Remedial and Special Education*, 24(1), 2–15. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Appendix A.1: Research details for Ferentino (1991)

Ferentino, S. C. (1991). Teaching social skills to preschool children in a special education program. *Dissertation Abstracts International*, 52(08B), 223-4490.

Table A1. Summary of findings

Meets WWC evidence standards without reservations

Outcome domain	Sample size	Study findings	
		Average improvement index (percentile points)	Statistically significant
Cognition	8 classrooms/65 children	+7	No
Social-emotional development and behavior	8 classrooms/65 children	+9	Yes

Setting The study was conducted in a special education school in a suburban metropolitan area of the northeastern United States.

Study sample The eligibility criteria for this study included (a) the ability of the child to function in a class of eight to nine children and (b) parental consent to participate. Given these eligibility criteria, 100 participants in 12 classrooms were eligible from a population of 177 preschool children in a special education school. There were two other children in the school intervention group (S) that were dropped from the study as outliers. Nearly all participants had speech and language impairments; 25% had various other primary disabilities.

The 12 classrooms in the study were randomly assigned to one of three conditions:

- (a) Four classrooms (n = 32 children) were assigned to a *social skills training* program to be administered in the school (S),
- (b) Four classrooms (n = 33 children) were assigned to a *social skills training* program that would be implemented in both the school and at home (S + H), and
- (c) Four classrooms (n = 33 children) were assigned to a waiting-list comparison group (C).

For the purpose of this WWC report, the evidence of the *social skills training* program is identified by comparing the school-only group (S) against the waiting-list comparison group (C). Additional comparisons of the remaining groups are presented in Appendices D.2 and D.3.

Intervention group The classrooms receiving the *social skills training* program (both the S and the S + H groups) used the “My Friends and Me” curriculum. The program uses group activities and materials intended to enhance the personal identity and social development of preschool children. The following materials are included: an activity manual; hand puppets; magnets in geometric, human, and doll shapes; activity pictures of a classroom, a city, a single-family home, and a shopping center; an illustrated story book; song cards and recorded songs; an activity board and liquid-chalk pens; and 30 take-home activity sheets (for the school and at-home group). In the school-only group, children participated in 30 half-hour sessions conducted by their teacher over the course of four months. In the school and at-home group, children participated in 15 half-hour sessions conducted by their teacher and 15 additional sessions at home conducted by their parents.

Comparison group

Children in the comparison group (C) participated in special arts and crafts projects for the 30 half-hour sessions. These children may have received incidental *social skills training*.

Outcomes and measurement

The primary outcomes in this study were in the cognition and socio-emotional development and behavior domains.

One outcome was assessed in the cognition domain:

- (a) the Comprehension subtest of the Wechsler Preschool and Primary Scale of Intelligence–Revised (WPPSI-R).

Five outcomes were assessed in the socio-emotional development and behavior domain:

- (a) Vineland Adaptive Behavior Scales Classroom Edition–Socialization domain (VABS-C);
- (b) Vineland Adaptive Behavior Scales Interview Edition, Survey Form–Socialization domain (VABS-I);
- (c) the Child Behavior Checklist for Ages 4–16 and 2–3, teachers’ ratings (CBCLT 4–16; CBCLT 2–3);
- (d) the Child Behavior Checklist for Ages 4–16 and 2–3, parents’ ratings (CBCLP 4–16; CBCLP 2–3);
- (e) the Face Recognition subtest of the Kaufman Assessment Battery for Children (K-ABC).

For a more detailed description of these outcome measures, see Appendix B.⁸

Support for implementation

Two workshops were held to train teachers and parents (for the school and at-home group) on the “My Friends and Me” intervention.

Appendix A.2: Research details for Guglielmo and Tryon (2001)

Guglielmo, H. M., & Tryon, G. S. (2001). Social skill training in an integrated preschool program. *School Psychology Quarterly, 16*(2), 158–175.

Table A2. Summary of findings

Meets WWC evidence standards without reservations

Outcome domain	Sample size	Study findings	
		Average improvement index (percentile points)	Statistically significant
Social-emotional development and behavior	6 classrooms/38 children	+26	Yes

Setting The study was conducted in a publicly-funded, privately-operated preschool in New York state.

Study sample A total of nine integrated classrooms containing 58 children with developmental delays who qualified for special education participated in this study.⁹ Three intact classrooms were randomly assigned to each of three arms in this study (and the analysis was conducted on the eligible sample of students with developmental delays). Group A (n = 19 eligible children) received *social skills training* supplemented by classroom reinforcement of target behaviors. Group B (n = 19 eligible children) did not receive *social skills training* but did receive classroom reinforcement of target behaviors. Group C (n = 20 eligible children) did not receive either *social skills training* or classroom reinforcement of target behaviors. For the purpose of this WWC report, the evidence of the *social skills training* program is identified by comparing the children in the *social skills training* supplemented by classroom reinforcement group (Group A) against the children who did not receive *social skills training* but did receive classroom reinforcement of target behaviors (Group B).¹⁰ Additional contrasts for Group A against Group C are presented in Appendix D.3.

Intervention group Children in the three classrooms in Group A received *social skills training* using the “Taking Part: Introducing Social Skills to Children” program, coupled with classroom reinforcement of the behaviors targeted by the training: “sharing” and “being in a group.” During *social skills training*, children with developmental delays were instructed on how to join a group and to share with peers. Instructors modeled the activities for the children using puppets and a short skit. Following this activity, children practiced the sharing skills with their peers. Children were given specific instructions on behaviors in which to engage, including establishing eye contact, tapping children on the shoulder as a means to gain attention, and asking to play with others. Children in Groups A and B received classroom reinforcement of target behaviors, which included continuous verbal acknowledgment of positive behaviors and tangible rewards. The intervention lasted for approximately 20 to 30 minutes each day for a total of eight days.¹¹

Comparison group Children in the comparison group (C) did not receive any *social skills training* but did receive classroom reinforcement of target behaviors.

Outcomes and measurement

There were two primary outcomes in this study in the social-emotional development and behavior domain. The frequency of each of the two “sharing” and “being in a group” behaviors was assessed through direct observations of children. For a more detailed description of these outcome measures, see Appendix B.

Support for implementation

A scripted example lesson plan for *social skills training* was presented as an appendix in the study. The first author taught two one-hour training sessions on modeling and role-playing for classroom reinforcement of target behaviors to the teachers and teacher assistants.

Appendix A.3: Research details for LeBlanc and Matson (1995)

LeBlanc, L. A., & Matson, J. L. (1995). A social skills training program for preschoolers with developmental delays: Generalization and social validity. *Behavior Modification*, 19(2), 234–246.

Table A3. Summary of findings

Meets WWC evidence standards without reservations

Outcome domain	Sample size	Study findings	
		Average improvement index (percentile points)	Statistically significant
Social-emotional development and behavior	6 classrooms/32 children	na	na

na = not applicable

Setting The study was conducted in a preschool for children with developmental disabilities.

Study sample Thirty-two children in six classrooms participated in this study. The children had mild to moderate developmental delays, and many also were physically handicapped. Six intact classrooms of children were randomly assigned to one of two conditions. Children in classrooms assigned to the intervention group (n = 16 children) received *social skills training*, while children in classrooms assigned to the comparison group (n = 16 children) received the business-as-usual classroom experience.

Intervention group Children in the intervention group received two one-hour sessions of *social skills training* each week, for a total of 12 sessions over six weeks. The activities in the training were designed to promote social skills and social play. Each session was broken into two phases. During Phase 1 (approximately 15 minutes), children were instructed on target behaviors, including greeting, asking to see a toy, initiating play, and showing a toy. Therapists modeled the target behavior using a puppet, the children modeled the behavior following this initial presentation with a puppet, and then the children modeled the behavior with another child. During Phase 2 (approximately 45 minutes), children engaged in play and received verbal and edible reinforcements for engaging in the target behavior. Children who engaged in inappropriate behaviors were prompted to perform an opposite positive behavior. For example, if a child inappropriately took a toy, the corresponding opposite positive behavior was to return the toy and to ask to see it. If the child refused to conduct the opposite positive behavior, they were placed in a one-minute time-out.

Comparison group Children in the comparison group participated in regular classroom activities and received a reward for participating in the data collection for the study. They did not receive any *social skills training* or reinforcement of target behaviors.

Outcomes and measurement The study examined two outcomes in the socio-emotional development and behavior domain. The frequency of “appropriate” and “inappropriate” behaviors was assessed through direct observations of children during a semi-structured play session at pretest and at posttest.¹² For a more detailed description of these outcome measures, see Appendix B.

Support for implementation The staff that implemented the intervention was comprised of therapists and assistant therapists. No information was provided about training.

Appendix B: Outcome measures for each domain

Cognition	
<i>Comprehension subtest of the Wechsler Preschool and Primary Scale of Intelligence–Revised (WPPSI-R)</i>	This subtest is part of the Verbal Scale on the WPPSI-R. This test assesses intellectual functioning of children between the ages of 3 and 7. Questions about real-life situations (requiring social judgment and reasoning) are read to the child, and responses are coded for the quality of the answer and the degree of generalization presented (as cited in Ferentino, 1991).
Social-emotional development and behavior	
<i>Child Behavior Checklist for Ages 4–16 and 2–3, parents’ ratings (CBCLP 4–16; CBCLP 2–3)</i>	This instrument captures parent reports of child behavioral problems as well as competencies. The instrument assesses both internalizing behaviors (such as depression) and externalizing behaviors (such as aggression) (as cited in Ferentino, 1991).
<i>Child Behavior Checklist for Ages 4–16 and 2–3, teachers’ ratings (CBCLT 4–16; CBCLT 2–3)</i>	This instrument captures teacher reports of child behavioral problems as well as competencies. The instrument assesses both internalizing behaviors (such as depression) and externalizing behaviors (such as aggression) (as cited in Ferentino, 1991).
<i>Face Recognition subtest of the Kaufman Assessment Battery for Children (K-ABC)</i>	This assessment requires children to look at one or two faces and then carefully identify that same face in a group photograph that shows the faces in different poses (as cited in Ferentino, 1991).
<i>Frequency of “appropriate” behaviors</i>	Five-minute observation segments were sampled from semi-structured play sessions that occurred during pretest and posttest assessment periods. The count of the appropriate social behaviors “such as saying ‘hi’, asking to play, smiling, etc.” (p. 241) served as the outcome of interest in the LeBlanc and Matson (1995) study.
<i>Frequency of “being in a group” behaviors</i>	During three 20-minute observation periods, the frequencies of target behaviors were recorded in 15-second blocks for each participant in the study. The number of times that a participant remained in close proximity of one other student during this period serves as an outcome of interest for the Guglielmo and Tryon (2001) study.
<i>Frequency of “inappropriate” behaviors</i>	Five-minute observation segments were sampled from semi-structured play sessions that occurred during pretest and posttest assessment periods. The count of the inappropriate social behaviors “such as aggression, crying, bullying, etc.” (p. 241) served as the outcome of interest in the LeBlanc and Matson (1995) study.
<i>Frequency of “sharing” behaviors</i>	During three 20-minute observation periods, the frequencies of target behaviors were recorded in 15-second blocks for each participant in the study. The number of times that a participant jointly used a toy or materials with another student during this period serves as an outcome of interest for the Guglielmo and Tryon (2001) study.
<i>Socialization domain of the Vineland Adaptive Behavior Scales, Classroom Edition (VABS-C)</i>	This assessment is made up of the three subdomain assessments: Coping Skills, Interpersonal Relationships, and Play and Leisure Time, all administered via a questionnaire to the student’s teacher. The scores on these subscales are combined to produce an overall Socialization domain score (as rated by the teacher) (as cited in Ferentino, 1991).
<i>Coping Skills subdomain of the Socialization domain of the VABS-C</i>	This subdomain assessment contains 18 items targeting impulse control, responsibility, and manners (as cited in Ferentino, 1991).
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-C</i>	This subdomain assessment contains 17 items targeting appropriately expressing emotions (as cited in Ferentino, 1991).
<i>Play and Leisure Time subdomain of the Socialization domain of the VABS-C</i>	This subdomain assessment contains 18 items targeting sharing, playing with others, and cooperating (as cited in Ferentino, 1991).
<i>Socialization domain of the Vineland Adaptive Behavior Scales, Interview Edition (VABS-I)</i>	This assessment is made up of the three subdomain assessments: Coping Skills, Interpersonal Relationships, and Play and Leisure Time, typically administered via interview with the student’s parent. The scores on these subscales are combined to produce an overall Socialization domain score (as rated by the parent). In the Ferentino (1991) study, the parent data were obtained via a mailed questionnaire.
<i>Coping Skills subdomain of the Socialization domain of the VABS-I</i>	This subdomain assessment contains 18 items targeting impulse control, responsibility, and manners (as cited in Ferentino, 1991).
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-I</i>	This subdomain assessment contains 28 items targeting appropriately expressing emotions (as cited in Ferentino, 1991).

Appendix C.1: Findings included in the rating for the cognition domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Ferentino, 1991^a								
<i>Comprehension subtest of the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-R)</i>	Preschoolers	8 classrooms/ 65 children	9.35 (2.43)	8.76 (3.61)	0.59	0.19	+7	0.14
Domain average for cognition (Ferentino, 1991)						0.19	+7	Not statistically significant
Domain average for cognition across all studies						0.19	+7	na

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study’s domain average was determined by the WWC. na = not applicable.

^a For Ferentino (1991), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The p-value presented here was reported in the original study. The evidence of the *social skills training* program is identified by comparing the school-only group (S) against the waiting-list comparison group (C). Additional contrasts for all groups are presented in Appendix D.2. The WWC calculated the *social skills training* group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information.

Appendix C.2: Findings included in the rating for the social-emotional development and behavior domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Ferentino, 1991^a								
<i>Child Behavior Checklist for Ages 4–16 and 2–3, parents’ ratings (CBCLP 4–16; CBCLP 2–3)</i>	Preschoolers	8 classrooms/ 65 children	49.13 (11.17)	47.55 (13.01)	1.58	0.13	+5	0.18
<i>Child Behavior Checklist for Ages 4–16 and 2–3, teachers’ ratings (CBCLT 4–16; CBCLT 2–3)</i>	Preschoolers	8 classrooms/ 65 children	43.75 (9.77)	45.79 (11.63)	-2.04	-0.19	-7	0.96
<i>Face Recognition subtest of the Kaufman Assessment Battery for Children (K-ABC)</i>	Preschoolers	8 classrooms/ 65 children	9.73 (2.56)	11.06 (2.94)	-1.33	-0.48	-18	0.26
<i>Socialization domain of the Vineland Adaptive Behavior Scales, Classroom Edition (VABS-C)</i>	Preschoolers	8 classrooms/ 65 children	50.44 (14.49)	32.58 (7.73)	17.86	1.53	+44	0.00
<i>Socialization domain of the Vineland Adaptive Behavior Scales, Interview Edition (VABS-I)</i>	Preschoolers	8 classrooms/ 65 children	65.76 (23.46)	62.05 (21.93)	3.71	0.16	+6	0.81
Domain average for social-emotional development and behavior (Ferentino, 1991)						0.23	+9	Statistically significant
Guglielmo & Tryon, 2001^b								
<i>Frequency of “being in a group” behaviors</i>	Preschoolers	6 classrooms/ 38 children	10.65 (4.19)	9.58 (3.22)	1.07	0.28	+11	> 0.05
<i>Frequency of “sharing” behaviors</i>	Preschoolers	6 classrooms/ 38 children	5.69 (2.55)	2.76 (2.55)	2.93	1.12	+37	< 0.05
Domain average for social-emotional development and behavior (Guglielmo & Tryon, 2001)						0.70	+26	Statistically significant
LeBlanc & Matson, 1995^c								
<i>Frequency of “appropriate” social behaviors</i>	Preschoolers	6 classrooms/ 32 children	nr	nr	nr	na	na	na
<i>Frequency of “inappropriate” social behaviors</i>	Preschoolers	6 classrooms/ 32 children	nr	nr	nr	na	na	na
Domain average for social-emotional development and behavior (LeBlanc & Matson, 1995)						na	na	na
Domain average for social-emotional development and behavior across all studies						0.47	+18	na

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of each study’s domain average was determined by the WWC. na = not applicable. nr = not reported.

^a For Ferentino (1991), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The p-values presented here were reported in the original study. The evidence of the *social skills training* program is identified by comparing the school-only group (S) against the waiting-list comparison group (C). Additional contrasts for all groups are presented in Appendix D.2. The WWC calculated the *social skills training* group mean by adding the difference-in-

differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information.

^b For Guglielmo and Tryon (2001), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The *p*-values presented here were reported in the original study. The evidence of the *social skills training* program is identified by comparing the children in the *social skills training* supplemented by classroom reinforcement (Group A) against the children not receiving *social skills training* but receiving classroom reinforcement of target behaviors (Group B). By comparing Group A against Group B, the effects of classroom reinforcement are differenced out of the comparison, and therefore, the observed differences in outcomes can be attributed to *social skills training*. Additional contrasts for Group A against the no-intervention comparison group (Group C) are presented in Appendix D.3. The WWC calculated the *social skills training* group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information.

^c For LeBlanc and Matson (1995), insufficient information was provided to calculate effect sizes and statistical significance. The authors did report F-test statistics from an analysis of covariance (ANCOVA) for each outcome, but the authors' description of the model suggests that the analysis was actually a repeated-measures analysis of variance (ANOVA). Given the uncertainty in the actual analytic model performed, we do not compute effect sizes from the reported statistics. As a result, this study does not contribute information to the domain average for socio-emotional development and behavior. The authors also presented results from a generalization assessment 7–10 days after the posttest; however, these contrasts were not considered eligible to meet WWC standards with or without reservations.

Appendix D.1: Summary of subscale findings for the social-emotional development and behavior domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Ferentino, 1991^a								
<i>Coping Skills subdomain of the Socialization domain of the VABS-C</i>	Preschoolers	8 classrooms/ 65 children	51.72 (11.01)	30.12 (7.36)	21.60	2.29	+49	0.00
<i>Coping Skills subdomain of the Socialization domain of the VABS-I</i>	Preschoolers	8 classrooms/ 65 children	67.73 (19.07)	68.33 (16.29)	-0.60	-0.03	-1	0.12
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-C</i>	Preschoolers	8 classrooms/ 65 children	55.61 (32.08)	28.94 (10.77)	26.67	1.11	+37	0.00
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-I</i>	Preschoolers	8 classrooms/ 65 children	73.32 (35.74)	62.81 (36.13)	10.51	0.29	+11	0.69
<i>Play and Leisure Time subdomain of the Socialization domain of the VABS-C</i>	Preschoolers	8 classrooms/ 65 children	45.58 (10.97)	41.06 (9.30)	4.52	0.44	+17	0.07

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. VABS-C = Vineland Adaptive Behavior Scales, Classroom Edition. VABS-I = Vineland Adaptive Behavior Scales, Interview Edition.

^a For Ferentino (1991), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The p-values presented here were reported in the original study. The evidence of the *social skills training* program is identified by comparing the school-only group (S) against the waiting-list comparison group (C). Additional contrasts for all groups are presented in Appendix D.3. The WWC calculated the *social skills training* group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information.

Appendix D.2: Summary of alternate contrasts for the cognition domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Ferentino, 1991^a								
<i>Comprehension subtest of the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-R)</i>	School (S) vs. School + Home (S + H)	8 classrooms/65 children	10.35 (2.43)	9.88 (3.35)	0.47	0.16	+6	0.43
<i>Comprehension subtest of the WPPSI-R</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/66 children	8.88 (3.35)	8.76 (3.61)	0.12	0.03	+1	0.48

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention.

^a For Ferentino (1991), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The p-values presented here were reported in the original study. The evidence of the *social skills training* program is identified by comparing the school-only group (S) against the waiting-list comparison group (C) and is included in Appendix C.1. The WWC calculated the *social skills training* group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information. This appendix contains the alternate contrasts possible in this design.

Appendix D.3: Summary of alternate contrasts for the social-emotional development and behavior domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Ferentino, 1991^a								
<i>Child Behavior Checklist for Ages 4–16 and 2–3, parents’ ratings (CBCLP 4–16; CBCLP 2–3)</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	56.57 (11.17)	55.46 (11.25)	1.11	0.10	+4	0.87
<i>Child Behavior Checklist for Ages 4–16 and 2–3, teachers’ ratings (CBCLT 4–16; CBCLT 2–3)</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	42.51 (9.77)	44.52 (9.12)	–2.01	–0.21	–8	0.83
<i>Face Recognition subtest of the Kaufman Assessment Battery for Children (K-ABC)</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	8.94 (2.56)	10.33 (2.92)	–1.39	–0.50	–19	0.58
<i>Socialization domain of the Vineland Adaptive Behavior Scales, Classroom Edition (VABS-C)</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	53.38 (14.49)	48.39 (14.52)	4.99	0.34	+13	0.30
<i>Socialization domain of the Vineland Adaptive Behavior Scales, Interview Edition (VABS-I)</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	64.56 (23.46)	55.27 (16.34)	9.29	0.46	+18	0.39
<i>CBCLP 4–16; CBCLP 2–3</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	48.02 (11.25)	47.55 (13.01)	0.47	0.04	+2	0.13
<i>CBCLT 4–16; CBCLT 2–3</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	45.76 (9.12)	45.79 (11.63)	–0.03	0.00	0	0.79
<i>Face Recognition subtest of the K-ABC</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	11.12 (2.92)	11.06 (2.94)	0.06	0.02	+1	0.57
<i>Socialization domain of the VABS-C</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	45.45 (14.52)	32.58 (7.73)	12.87	1.09	+36	0.00
<i>Socialization domain of the VABS-I</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	56.47 (16.34)	62.05 (21.93)	–5.58	–0.29	–11	0.27
<i>Coping Skills subdomain of the Socialization domain of the VABS-C</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	57.90 (11.01)	48.70 (13.49)	9.20	0.74	+27	0.06
<i>Coping Skills subdomain of the Socialization domain of the VABS-I</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	68.76 (19.07)	64.12 (13.67)	4.64	0.28	+11	0.61
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-C</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	59.73 (32.08)	51.79 (27.63)	7.94	0.26	+10	0.21
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-I</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	72.96 (35.74)	58.35 (23.07)	14.61	0.48	+18	0.17

<i>Play and Leisure Time subdomain of the Socialization domain of the VABS-C</i>	School (S) vs. School + Home (S + H)	8 classrooms/ 65 children	42.79 (10.97)	47.73 (14.48)	-4.94	-0.38	-15	0.32
<i>Coping Skills subdomain of the Socialization domain of the VABS-C</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	42.52 (13.49)	30.12 (7.36)	12.40	1.13	+37	0.00
<i>Coping Skills subdomain of the Socialization domain of the VABS-I</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	63.09 (13.67)	68.33 (16.29)	-5.24	-0.34	-13	0.28
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-C</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	47.67 (27.63)	28.94 (10.77)	18.73	0.88	+31	0.00
<i>Interpersonal Relationships subdomain of the Socialization domain of the VABS-I</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	58.71 (23.07)	62.81 (36.13)	-4.10	-0.13	-5	0.35
<i>Play and Leisure Time subdomain of the Socialization domain of the VABS-C</i>	School + Home (S + H) vs. Comparison (C)	8 classrooms/ 66 children	50.52 (14.48)	41.06 (9.30)	9.46	0.77	+28	0.01
Guglielmo & Tryon, 2001^b								
<i>Frequency of “being in a group” behaviors</i>	Training and classroom (Group A) vs. Comparison (Group C)	6 classrooms/ 39 children	9.19 (4.19)	2.75 (1.91)	6.44	1.95	+47	< 0.05
<i>Frequency of “sharing” behaviors</i>	Training and classroom (Group A) vs. Comparison (Group C)	6 classrooms/ 39 children	4.98 (2.55)	2.68 (2.33)	2.30	0.92	+32	< 0.05

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention.

^a For Ferentino (1991), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The *p*-values presented here were reported in the original study. The evidence of the *social skills training* program is identified by comparing the school-only group (S) against the waiting-list comparison group (C) and is shown in Appendix C.2. The WWC calculated the *social skills training* group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information. This appendix contains the alternate contrasts possible in this design.

^b For Guglielmo and Tryon (2001), corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The *p*-values presented here were reported in the original study. The evidence of the *social skills training* program is identified by comparing the children in the *social skills training* supplemented by classroom reinforcement (Group A) against the children not receiving *social skills training* but receiving classroom reinforcement of target behaviors (Group B) and is shown in Appendix C.2. By comparing Group A against Group B, the effects of classroom reinforcement are differenced out of the comparison, and therefore, the observed differences in outcomes can be attributed to *social skills training*. The WWC calculated the *social skills training* group mean by adding the difference-in-differences adjusted estimate of the average impact of the program (i.e., difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttests means. Please see the *WWC Handbook* for more information. This appendix contains the alternate contrasts possible in this design.

Endnotes

¹ *Social skills training* does not have a single developer or official description. The descriptive information for this program was adapted from publicly available sources: descriptions of this practice (see the websites listed under Program Information) and research articles (Ferentino, 1991; Guglielmo & Tryon, 2001; LeBlanc & Matson, 1995). Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review. The literature search reflects documents publicly available by August 2011.

² The studies in this report were reviewed using WWC Evidence Standards, version 2.1, as described in the Early Childhood Education Interventions for Children with Disabilities review protocol, version 2.1. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

³ For criteria used in the determination of the rating of effectiveness and extent of evidence, see the WWC Rating Criteria on p. 26. These improvement index numbers show the average and range of student-level improvement indices for all findings across the studies. The WWC review of interventions for Early Childhood Education Interventions for Children with Disabilities addresses student outcomes in seven domains: cognition, communication/language competencies, literacy, mathematics achievement, social-emotional development and behavior, functional abilities, and physical well-being. Table 1 includes results only for cognition and social-emotional development and behavior, as these were the only domains for which outcomes were assessed in the three studies that meet evidence standards.

⁴ A third arm of the study (four classrooms, $n = 33$ children) supplemented the classroom-based implementation with an at-home additional element of training. Contrasts against this arm of the intervention are presented in Appendices D.2 and D.3.

⁵ A third arm of the study (three classrooms, $n = 20$ children) did not receive any intervention at all. Contrasts that compare the group receiving *social skills training* supplemented by a reinforcement of targeted behaviors against this no-intervention arm are included in Appendix D.3.

⁶ The level of statistical significance was reported by the study authors or, when necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For the formulas the WWC used to calculate the statistical significance, see WWC Procedures and Standards Handbook, Appendix C for clustering and WWC Procedures and Standards Handbook, Appendix D for multiple comparisons. In the cases of Ferentino (1991) and Guglielmo and Tryon (2001), corrections for clustering and multiple comparisons were needed, so the significance levels may differ from those reported in the original studies. For LeBlanc and Matson (1995), insufficient information was provided to calculate effect sizes and statistical significance. The authors did report F-test statistics from an analysis of covariance (ANCOVA) for each outcome, but the authors' description of the model suggests that the analysis was actually a repeated-measures analysis of variance (ANOVA). Given the uncertainty in the actual analytic model performed, we do not compute effect sizes from the reported statistics, and thus, the evidence from this study is not incorporated into the effectiveness ratings.

⁷ According to the WWC Procedures and Standards Handbook, Appendix G, Ferentino (1991) is characterized as having statistically significant positive effects because it meets the following criteria: "Univariate statistical tests are reported for each outcome measure, and the effect for at least one measure within the domain is positive and statistically significant, and no effects are negative and statistically significant, accounting for clustering and multiple comparisons." There was one substantively important negative effect found in this study, but because it was not statistically significant, the study is determined to have a statistically significant positive effect.

⁸ The authors also reported results for three subtests (Coping Skills, Interpersonal Relationships, and Play and Leisure Time) of the Vineland Adaptive Behavior Scales (the subtest scores are pooled to generate the Socialization domain score). These results are presented in Appendix D.1. The results from the Vineland Adaptive Behavior Scales Interview Edition, Survey Form, Socialization domain (VABS-I)–Play and Leisure Time subdomain scale are not included in this WWC report, as this subdomain was not shown to be sufficiently reliable to meet WWC standards. In addition, the authors presented results for sociometric scales and rankings of children (based on peer and teacher nomination); however, these outcomes do not align with the domains used in this topic area and are not included in the intervention report. For further details about the outcomes included in the Early Childhood Education Interventions for Children with Disabilities topic review, please see the Early Childhood Education Interventions for Children with Disabilities Review Protocol.

⁹ Originally, 69 children were assigned to one of the three intervention conditions, but the number assigned to each was not reported. For the purpose of assessing the study's rating, it was assumed that an equal number of children ($n = 23$) were assigned to each intervention condition.

¹⁰ By comparing Group A against Group B, the effects of classroom reinforcement are effectively removed from the comparison, and therefore, the observed differences in outcomes can be attributed to *social skills training*.

¹¹ After eight days of the intervention, children in Group A stopped receiving *social skills training*, and children in Group B began receiving the *social skills training* intervention and were assessed following this crossover. In order to obtain an uncontaminated estimate of the effect of *social skills training*, impacts presented in this WWC report include only contrasts assessed after the initial eight days of intervention (prior to the intervention crossover and subsequent follow-up assessment).

¹² In addition to the posttest assessment, the authors also conducted a generalization assessment. While overall attrition for this contrast was presented, it was unclear if there was differential attrition across the two intervention groups, which would have resulted in a high attrition rate for this contrast. Under the conservative assumption that there was high differential attrition, these contrasts are unable to meet evidence standards (as the inferential tests did not adjust for baseline differences), and as such, they are not included in the report.

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WWC Rating Criteria

Criteria used to determine the rating of a study

Study rating	Criteria
Meets WWC evidence standards without reservations	A study that provides strong evidence for an intervention's effectiveness, such as a well-implemented RCT.
Meets WWC evidence standards with reservations	A study that provides weaker evidence for an intervention's effectiveness, such as a QED or an RCT with high attrition that has established equivalence of the analytic samples.

Criteria used to determine the rating of effectiveness for an intervention

Rating of effectiveness	Criteria
Positive effects	Two or more studies show statistically significant positive effects, at least one of which met WWC evidence standards for a strong design, AND No studies show statistically significant or substantively important negative effects.
Potentially positive effects	At least one study shows a statistically significant or substantively important positive effect, AND No studies show a statistically significant or substantively important negative effect AND fewer or the same number of studies show indeterminate effects than show statistically significant or substantively important positive effects.
Mixed effects	At least one study shows a statistically significant or substantively important positive effect AND at least one study shows a statistically significant or substantively important negative effect, but no more such studies than the number showing a statistically significant or substantively important positive effect, OR At least one study shows a statistically significant or substantively important effect AND more studies show an indeterminate effect than show a statistically significant or substantively important effect.
Potentially negative effects	One study shows a statistically significant or substantively important negative effect and no studies show a statistically significant or substantively important positive effect, OR Two or more studies show statistically significant or substantively important negative effects, at least one study shows a statistically significant or substantively important positive effect, and more studies show statistically significant or substantively important negative effects than show statistically significant or substantively important positive effects.
Negative effects	Two or more studies show statistically significant negative effects, at least one of which met WWC evidence standards for a strong design, AND No studies show statistically significant or substantively important positive effects.
No discernible effects	None of the studies shows a statistically significant or substantively important effect, either positive or negative.

Criteria used to determine the extent of evidence for an intervention

Extent of evidence	Criteria
Medium to large	The domain includes more than one study, AND The domain includes more than one school, AND The domain findings are based on a total sample size of at least 350 students, OR, assuming 25 students in a class, a total of at least 14 classrooms across studies.
Small	The domain includes only one study, OR The domain includes only one school, OR The domain findings are based on a total sample size of fewer than 350 students, AND, assuming 25 students in a class, a total of fewer than 14 classrooms across studies.

Glossary of Terms

Attrition	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.
Clustering adjustment	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.
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 studies and outcomes.
Eligibility	A study is eligible for review and inclusion in this report if it falls within the scope of the review protocol and uses either an experimental or matched comparison group 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 supports the findings. The criteria for the extent of evidence levels are given in the WWC Rating Criteria on p. 26.
Improvement index	Along a percentile distribution of students, the improvement index represents the gain or loss of the average student due to the intervention. As the average student starts at the 50th percentile, the measure ranges from -50 to +50.
Multiple comparison adjustment	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
Quasi-experimental design (QED)	A quasi-experimental design (QED) is a research design in which subjects 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 investigators randomly assign eligible participants into intervention and comparison groups.
Rating of effectiveness	The WWC rates the effects of an intervention in each domain based on the quality of the research design and the magnitude, statistical significance, and consistency in findings. The criteria for the ratings of effectiveness are given in the WWC Rating Criteria on p. 26.
Single-case design	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% ($p < 0.05$).
Substantively important	A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.

Please see the [WWC Procedures and Standards Handbook \(version 2.1\)](#) for additional details.