

Evidence-base

The National Clearinghouse on Autism Evidence and Practice has adopted the following criteria to determine if a practice is evidence-based. The 2020 EBP report (Steinbrenner et al., 2020) provides more information about the systematic review process.

Efficacy must be established through high-quality, peer-reviewed research in scientific journals using:

- At least 2 randomized or quasi-experimental group design studies, or
- At least 5 single subject/case design studies, or a
- Combination of evidence of 1 randomized or quasi-experimental group design study and 3 single subject/case design studies

OVERVIEW:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), antecedent-based interventions are a focused intervention that meets evidence-based practice criteria with 47 single case design and 2 group design studies. Antecedent-based interventions has been effective for early intervention (0-2 years), preschoolers (3-5 years), elementary school learners (6-11 years), middle school learners (12-14 years), high schoolers (15-18 years), and young adults (19-22 years) on the spectrum. Studies included in the 2020 EBP report (Steinbrenner et al., 2020) detail how antecedent-based interventions can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, behavior, communication, mental health, play, school-readiness, and social.

In the table below, the instructional outcomes identified by the evidence base are shown by age of participants.

Age	Academic	Adaptive	Behavior	Comm- unication	Mental Health	Play	School- readiness	Social
0-2		Yes	Yes	Yes		Yes		
3-5	Yes	Yes	Yes	Yes		Yes	Yes	Yes
6-11	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12-14		Yes	Yes	Yes	Yes		Yes	Yes
15-18	Yes	Yes	Yes	Yes	Yes			
19-22			Yes					Yes

EARLY INTERVENTION (0-2 YEARS):

- * Delemere, E., & Dounavi, K. (2017). Parent-implemented bedtime fading and positive routines for children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 48, 1002-1019. <https://doi.org/10.1007/s10803-017-3398-4>
- * Jocelyn, L. J., Casiro, O. G., Beattie, D., Bow, J., & Kneisz, J. (1998). Treatment of children with autism: A randomized controlled trial to evaluate a caregiver-based intervention program in community day-care centers. *Journal of Developmental & Behavioral Pediatrics*, 19(5), 326-334. <https://doi.org/10.1097/00004703-199810000-00002>
- Reinhartsen, D. B., Garfinkle, A. N., & Wolery, M. (2002). Engagement with toys in two-year-old children with autism: Teacher selection versus child choice. *Research and Practice for Persons with Severe Disabilities*, 27(3), 175-187. <https://doi.org/10.2511/rpsd.27.3.175>

PRESCHOOL (3-5 YEARS):

- * Albert, K. M., Carbone, V. J., Murray, D. D., Hagerty, M., & Sweeney-Kerwin, E. J. (2012). Increasing the mand repertoire of children with autism through the use of an interrupted chain procedure. *Behavior Analysis in Practice*, 5(2), 65-76. <https://doi.org/10.1007/bf03391825>
- * Cale, S. I., Carr, E. G., Blakeley-Smith, A., & Owen-DeSchryver, J. S. (2009). Context-based assessment and intervention for problem behavior in children with autism spectrum disorder. *Behavior Modification*, 33(6), 707-742. <https://doi.org/10.1177/0145445509340775>
- * Delemere, E., & Dounavi, K. (2017). Parent-implemented bedtime fading and positive routines for children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 48, 1002-1019. <https://doi.org/10.1007/s10803-017-3398-4>
- Dunlap, G., & Plienias, A. J. (1991). The influence of task size on the unsupervised task performance of students with developmental disabilities. *Education and Treatment of Children*, 14(2), 85-95.
- * Eilers, H. J., & Hayes, S. C. (2015). Exposure and response prevention therapy with cognitive defusion exercises to reduce repetitive and restrictive behaviors displayed by children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 19, 18-31. <https://doi.org/10.1016/j.rasd.2014.12.014>
- * Jocelyn, L. J., Casiro, O. G., Beattie, D., Bow, J., & Kneisz, J. (1998). Treatment of children with autism: A randomized controlled trial to evaluate a caregiver-based intervention program in community day-care centers. *Journal of Developmental & Behavioral Pediatrics*, 19(5), 326-334. <https://doi.org/10.1097/00004703-199810000-00002>
- * Jung, S., & Sainato, D. M. (2015). Teaching games to young children with autism spectrum disorder using special interests and video modelling. *Journal of Intellectual and Developmental Disability*, 40(2), 198-212. <https://doi.org/10.3109/13668250.2015.1027674>
- Koegel, L. K., Koegel, R. L., Frea, W., & Green-Hopkins, I. (2003). Priming as a method of coordinating educational services for students with autism. *Language, Speech, and Hearing Services in Schools*, 34(3), 228-235. [https://doi.org/10.1044/0161-1461\(2003/019\)](https://doi.org/10.1044/0161-1461(2003/019))
- Kuo, N., & Plavnick, J. B. (2015). Using an antecedent art intervention to improve the behavior of a child with Autism. *Art Therapy*, 32(2), 54-59. <https://doi.org/10.1080/07421656.2015.1028312>
- * Lanovaz, M. J., Sladeczek, I. E., & Rapp, J. T. (2011). Effects of music on vocal stereotypy in children with autism. *Journal of Applied Behavior Analysis*, 44(3), 647-651. <https://doi.org/10.1901/jaba.2011.44-647>
- LeBlanc, L. A., Carr, J. E., Crossett, S. E., Bennett, C. M., & Detweiler, D. D. (2005). Intensive outpatient behavioral treatment of primary urinary incontinence of children with autism. *Focus on Autism and Other Developmental Disabilities*, 20(2), 98-105. <https://doi.org/10.1177/10883576050200020601>
- * O'Reilly, M., Fragale, C., Gainey, S., Kang, S., Koch, H., Shubert, J., Zein, F. E., Longino, D., Chung, M., Xu, Z., White, P., Lang, R., Davis, T., Rispoli, M., Lancioni, G., Didden, R., Healy, O., Kagohara, D., van der Meer, L., & Sigafos, J. (2012). Examination of an antecedent communication intervention to reduce tangibly maintained challenging behavior: A controlled analog analysis. *Research in Developmental Disabilities*, 33(5), 1462-1468. <https://doi.org/10.1016/j.ridd.2012.03.017>
- Rakap, S., & Balicki, S. (2017). Using embedded instruction to teach functional skills to a preschool child with autism. *International Journal of Developmental Disabilities*, 63(1), 17-26. <https://doi.org/10.1080/20473869.2015.1109801>
- * Rapp, J. T., Vollmer, T. R., Peter, C., Dozier, C. L., & Cotnoir, N. M. (2004). Analysis of response allocation in individuals with multiple forms of stereotyped behavior. *Journal of Applied Behavior Analysis*, 37(4), 481-501. <https://doi.org/10.1901/jaba.2004.37-481>

- * Rispoli, M. J., O'Reilly, M. F., Sigafoos, J., Lang, R., Kang, S., Lancioni, G., & Parker, R. (2011). Effects of pre-session satiation on challenging behavior and academic engagement for children with autism during classroom instruction. *Education and Training in Autism and Developmental Disabilities*, 46(4), 607-618.
- * **Rispoli, M., Lang, R., Neely, L., Camargo, S., Hutchins, N., Davenport, K., & Goodwyn, F. (2013). A comparison of within- and across-activity choices for reducing challenging behavior in children with autism spectrum disorders. *Journal of Behavioral Education*, 22(1), 66-83. <https://doi.org/10.1007/s10864-012-9164-y>**
- * Rispoli, M., O'Reilly, M., Lang, R., Machalicek, W., Davis, T., Lancioni, G., & Sigafoos, J. (2011). Effects of motivating operations on problem and academic behavior in classrooms. *Journal of Applied Behavior Analysis*, 44(1), 187-192. <https://doi.org/10.1901/jaba.2011.44-187>
- * **Saylor, S., Sidener, T. M., Reeve, S. A., Fetherston, A., & Progar, P. R. (2012). Effects of three types of noncontingent auditory stimulation on vocal stereotypy in children with autism. *Journal of Applied Behavior Analysis*, 45(1), 185-190. <https://doi.org/10.1901/jaba.2012.45-185>**
- Sellers, T. P., Bloom, S. E., Samaha, A. L., Dayton, E., Lambert, J. M., & Keyl-Austin, A. A. (2013). Evaluation of some components of choice making. *Journal of Applied Behavior Analysis*, 46(2), 455-464. <https://doi.org/10.1002/jaba.46>**
- * Taylor, B. A., Hoch, H., Potter, B., Rodriguez, A., Spinnato, D., & Kalaigian, M. (2005). Manipulating establishing operations to promote initiations toward peers in children with autism. *Research in Developmental Disabilities*, 26(4), 385-392. <https://doi.org/10.1016/j.ridd.2004.11.003>

ELEMENTARY SCHOOL (6-11 YEARS):

- Adcock, J., & Cuvo, A. J. (2009). Enhancing learning for children with autism spectrum disorders in regular education by instructional modifications. *Research in Autism Spectrum Disorders*, 3(2), 319-328. <https://doi.org/10.1016/j.rasd.2008.07.004>
- * **Albert, K. M., Carbone, V. J., Murray, D. D., Hagerty, M., & Sweeney-Kerwin, E. J. (2012). Increasing the mand repertoire of children with autism through the use of an interrupted chain procedure. *Behavior Analysis in Practice*, 5(2), 65-76. <https://doi.org/10.1007/bf03391825>**
- * Cale, S. I., Carr, E. G., Blakeley-Smith, A., & Owen-DeSchryver, J. S. (2009). Context-based assessment and intervention for problem behavior in children with autism spectrum disorder. *Behavior Modification*, 33(6), 707-742. <https://doi.org/10.1177/0145445509340775>
- Davis, T. N., Dacus, S., Strickland, E., Machalicek, W., & Coviello, L. (2013). Reduction of automatically maintained self-injurious behavior utilizing noncontingent matched stimuli. *Developmental Neurorehabilitation*, 16(3), 166-171.
- * **Delemere, E., & Dounavi, K. (2017). Parent-implemented bedtime fading and positive routines for children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 48, 1002-1019. <https://doi.org/10.1007/s10803-017-3398-4>**
- Dudley, L. L., Johnson, C., & Barnes, R. S. (2002). Decreasing rumination using a starchy food satiation procedure. *Behavioral Interventions*, 17(1), 21-29. <https://doi.org/10.1002/bin.104>
- Dyer, K., Dunlap, G., & Winterling, V. (1990). Effects of choice making on the serious problem behaviors of students with severe handicaps. *Journal of Applied Behavior Analysis*, 23(4), 515-524. <https://doi.org/10.1901/jaba.1990.23-515>
- * **Eilers, H. J., & Hayes, S. C. (2015). Exposure and response prevention therapy with cognitive defusion exercises to reduce repetitive and restrictive behaviors displayed by children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 19, 18-31. <https://doi.org/10.1016/j.rasd.2014.12.014>**
- * **Enloe, K. A., & Rapp, J. T. (2014). Effects of noncontingent social interaction on immediate and subsequent engagement in vocal and motor stereotypy in children with autism. *Behavior Modification*, 38(3), 374-391. <https://doi.org/10.1177/0145445513514081>**
- * Graff, R. B., & Green, G. (2004). Two methods for teaching simple visual discriminations to learners with severe disabilities. *Research in Developmental Disabilities*, 25(3), 295-307. <https://doi.org/10.1016/j.ridd.2003.08.002>
- Hagopian, L. P., & Toole, L. M. (2009). Effects of response blocking and competing stimuli on stereotypic behavior. *Behavioral Interventions*, 24(2), 117-125. <https://doi.org/10.1002/bin.278>
- Haley, J. L., Heick, P. F., & Luiselli, J. K. (2010). Use of an antecedent intervention to decrease vocal stereotypy of a student with autism in the general education classroom. *Child & Family Behavior Therapy*, 32(4), 311-321. <https://doi.org/10.1080/07317107.2010.515527>

- * Isong, I. A., Rao, S. R., Holifield, C., Iannuzzi, D., Hanson, E., Ware, J., & Nelson, L. P. (2014). Addressing dental fear in children with autism spectrum disorders: A randomized controlled pilot study using electronic screen media. *Clinical Pediatrics*, 53(3), 230-237. <https://doi.org/10.1177/0009922813517169>
- * Jung, S., & Sainato, D. M. (2015). Teaching games to young children with autism spectrum disorder using special interests and video modelling. *Journal of Intellectual and Developmental Disability*, 40(2), 198-212. <https://doi.org/10.3109/13668250.2015.1027674>
- Kelly, A. N., Axe, J. B., Allen, R. F., & Maguire, R. W. (2015). Effects of pre-session pairing on the challenging behavior and academic responding of children with autism. *Behavioral Interventions*, 30(2), 135-156. <https://doi.org/10.1002/bin.1408>
- Kliebert, M. L., & Tiger, J. H. (2011). Direct and distal effects of noncontingent juice on rumination exhibited by a child with autism. *Journal of Applied Behavior Analysis*, 44(4), 955-959. <https://doi.org/10.1901/jaba.2011.44-955>
- Ladd, M. V., Luiselli, J. K., & Baker, L. (2009). Continuous access to competing stimulation as intervention for self-injurious skin picking in a child with autism. *Child & Family Behavior Therapy*, 31(1), 54-60. <https://doi.org/10.1080/07317100802701400>
- * Lanovaz, M. J., Sladeczek, I. E., & Rapp, J. T. (2011). Effects of music on vocal stereotypy in children with autism. *Journal of Applied Behavior Analysis*, 44(3), 647-651. <https://doi.org/10.1901/jaba.2011.44-647>
- * O'Reilly, M., Fragale, C., Gaaney, S., Kang, S., Koch, H., Shubert, J., Zein, F. E., Longino, D., Chung, M., Xu, Z., White, P., Lang, R., Davis, T., Rispoli, M., Lancioni, G., Didden, R., Healy, O., Kagohara, D., van der Meer, L., & Sigafoos, J. (2012). Examination of an antecedent communication intervention to reduce tangibly maintained challenging behavior: A controlled analog analysis. *Research in Developmental Disabilities*, 33(5), 1462-1468. <https://doi.org/10.1016/j.ridd.2012.03.017>
- * Rapp, J. T., Vollmer, T. R., Peter, C., Dozier, C. L., & Cotnoir, N. M. (2004). Analysis of response allocation in individuals with multiple forms of stereotyped behavior. *Journal of Applied Behavior Analysis*, 37(4), 481-501. <https://doi.org/10.1901/jaba.2004.37-481>
- * Rispoli, M. J., O'Reilly, M. F., Sigafoos, J., Lang, R., Kang, S., Lancioni, G., & Parker, R. (2011). Effects of pre-session satiation on challenging behavior and academic engagement for children with autism during classroom instruction. *Education and Training in Autism and Developmental Disabilities*, 46(4), 607-618.
- * Rispoli, M., Lang, R., Neely, L., Camargo, S., Hutchins, N., Davenport, K., & Goodwyn, F. (2013). A comparison of within- and across-activity choices for reducing challenging behavior in children with autism spectrum disorders. *Journal of Behavioral Education*, 22(1), 66-83. <https://doi.org/10.1007/s10864-012-9164-y>
- * Rispoli, M., O'Reilly, M., Lang, R., Machalicek, W., Davis, T., Lancioni, G., & Sigafoos, J. (2011). Effects of motivating operations on problem and academic behavior in classrooms. *Journal of Applied Behavior Analysis*, 44(1), 187-192. <https://doi.org/10.1901/jaba.2011.44-187>
- Roane, H. S., Kelly, M. L., & Fisher, W. W. (2003). The effects of noncontingent access to food on the rate of object mouthing across three settings. *Journal of Applied Behavior Analysis*, 36(4), 579-582. <https://doi.org/10.1901/jaba.2003.36-579>
- Rosenberg, N., Congdon, M., Schwartz, I., & Ramps, D. (2015). Use of say-do correspondence training to increase generalization of social interaction skills at recess for children with Autism Spectrum Disorder. *Education and Training in Autism and Developmental Disabilities*, 50(2), 213-222.
- * Saylor, S., Sidener, T. M., Reeve, S. A., Fetherston, A., & Progar, P. R. (2012). Effects of three types of noncontingent auditory stimulation on vocal stereotypy in children with autism. *Journal of Applied Behavior Analysis*, 45(1), 185-190. <https://doi.org/10.1901/jaba.2012.45-185>
- * Smith, C. E., Carr, E. G., & Moskowitz, L. J. (2016). Fatigue as a biological setting event for severe problem behavior in autism spectrum disorder. *Research in Autism Spectrum Disorders*, 23, 131-144. <https://doi.org/10.1016/j.rasd.2015.12.003>
- Stichter, J. P., Randolph, J. K., Kay, D., & Gage, N. (2009). The use of structural analysis to develop antecedent-based interventions for students with autism. *Journal of Autism and Developmental Disorders*, 39(6), 883-896. <https://doi.org/10.1007/s10803-009-0693-8>
- * Taylor, B. A., Hoch, H., Potter, B., Rodriguez, A., Spinnato, D., & Kalaigian, M. (2005). Manipulating establishing operations to promote initiations toward peers in children with autism. *Research in Developmental Disabilities*, 26(4), 385-392. <https://doi.org/10.1016/j.ridd.2004.11.003>
- Vasquez, S., Brewer, A., Leon, Y., & Vasquez, J. (2017). The effects of advance notice on problem behavior occasioned by interruptions of an ongoing activity in a young girl with autism. *Behavior Analysis in Practice*, 10(4), 417-421. <https://doi.org/10.1007/s40617-017-0187-7>

MIDDLE SCHOOL (12-14 YEARS):

- Ahearn, W. H. (2003). Using simultaneous presentation to increase vegetable consumption in a mildly selective child with autism. *Journal of Applied Behavior Analysis*, 36(3), 361-365. <https://doi.org/10.1901/jaba.2003.36-361>
- Banda, D. R., McAfee, J. K., & Hart, S. L. (2012). Decreasing self-injurious behavior and fading self-restraint in a student with autism and Tourette syndrome. *Behavioral Interventions*, 27(3), 164-174. <https://doi.org/10.1002/bin.1344>**
- 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. <https://doi.org/10.1177/10983007070090040201>
- Clay, C. J., Clohisy, A. M., Ball, A. M., Haider, A. F., Schmitz, B. A., & Kahng, S. (2017). Further evaluation of presentation format of competing stimuli for treatment of automatically maintained challenging behavior. *Behavior Modification*, 42(3), 382-397. <https://doi.org/10.1177/0145445517740322>**
- * Enloe, K. A., & Rapp, J. T. (2014). Effects of noncontingent social interaction on immediate and subsequent engagement in vocal and motor stereotypy in children with autism. *Behavior Modification*, 38(3), 374-391. <https://doi.org/10.1177/0145445513514081>
- * Graff, R. B., & Green, G. (2004). Two methods for teaching simple visual discriminations to learners with severe disabilities. *Research in Developmental Disabilities*, 25(3), 295-307. <https://doi.org/10.1016/j.ridd.2003.08.002>
- * Isong, I. A., Rao, S. R., Holifield, C., Iannuzzi, D., Hanson, E., Ware, J., & Nelson, L. P. (2014). Addressing dental fear in children with autism spectrum disorders: A randomized controlled pilot study using electronic screen media. *Clinical Pediatrics*, 53(3), 230-237. <https://doi.org/10.1177/0009922813517169>
- Mason, S. A., & Newsom, C. D. (1990). The application of sensory change to reduce stereotyped behavior. *Research in Developmental Disabilities*, 11(3), 257-271. [https://doi.org/10.1016/0891-4222\(90\)90012-W](https://doi.org/10.1016/0891-4222(90)90012-W)
- * Smith, C. E., Carr, E. G., & Moskowitz, L. J. (2016). Fatigue as a biological setting event for severe problem behavior in autism spectrum disorder. *Research in Autism Spectrum Disorders*, 23, 131-144. <https://doi.org/10.1016/j.rasd.2015.12.003>
- * Taylor, B. A., Hoch, H., Potter, B., Rodriguez, A., Spinnato, D., & Kalaigian, M. (2005). Manipulating establishing operations to promote initiations toward peers in children with autism. *Research in Developmental Disabilities*, 26(4), 385-392. <https://doi.org/10.1016/j.ridd.2004.11.003>
- Tiger, J. H., Fisher, W. W., Toussaint, K. A., & Kodak, T. (2009). Progressing from initially ambiguous functional analyses: Three case examples. *Research in Developmental Disabilities*, 30(5), 910-926. <https://doi.org/10.1016/j.ridd.2009.01.005>

HIGH SCHOOL (15-18 YEARS):

- Barahona, C., DuBard, M., Luiselli, J. K., & Kesterson, J. (2013). School-based feeding intervention to increase variety and quantity of foods consumed by an adolescent with autism. *Clinical Practice in Pediatric Psychology*, 1(4), 361-368. <https://doi.org/10.1037/cpp0000035>**
- * Isong, I. A., Rao, S. R., Holifield, C., Iannuzzi, D., Hanson, E., Ware, J., & Nelson, L. P. (2014). Addressing dental fear in children with autism spectrum disorders: A randomized controlled pilot study using electronic screen media. *Clinical Pediatrics*, 53(3), 230-237. <https://doi.org/10.1177/0009922813517169>
- Koegel, L. K., Koegel, R. L., Frea, W., & Green-Hopkins, I. (2003). Priming as a method of coordinating educational services for students with autism. *Language, Speech, and Hearing Services in Schools*, 34(3), 228-235. [https://doi.org/10.1044/0161-1461\(2003\)019](https://doi.org/10.1044/0161-1461(2003)019)
- * Mason, S. A., & Newsom, C. D. (1990). The application of sensory change to reduce stereotyped behavior. *Research in Developmental Disabilities*, 11(3), 257-271. [https://doi.org/10.1016/0891-4222\(90\)90012-W](https://doi.org/10.1016/0891-4222(90)90012-W)
- Sigafoos, J., Green, V. A., Payne, D., O'Reilly, M. F., & Lancioni, G. E. (2009). A classroom-based antecedent intervention reduces obsessive-repetitive behavior in an adolescent with autism. *Clinical Case Studies*, 8(1), 3-13. <https://doi.org/10.1177/1534650108327475>
- * Tiger, J. H., Fisher, W. W., Toussaint, K. A., & Kodak, T. (2009). Progressing from initially ambiguous functional analyses: Three case examples. *Research in Developmental Disabilities*, 30(5), 910-926. <https://doi.org/10.1016/j.ridd.2009.01.005>
- Walpole, C. W., Roscoe, E. M., & Dube, W. V. (2007). Use of a differential observing response to expand restricted stimulus control. *Journal of Applied Behavior Analysis*, 40(4), 707-712. <https://doi.org/10.1901/jaba.2007.707-712>



YOUNG ADULT (19-22 YEARS):

Kennedy, C. H. (1994). Manipulating antecedent conditions to alter the stimulus control of problem behavior. *Journal of Applied Behavior Analysis*, 27(1), 161-170. <https://doi.org/10.1901/jaba.1994.27-161>

Notes: * denotes the study has participants in at least two age ranges
Bold denotes new studies since 2011 (2012 till 2017)