

PIVOTAL RESPONSE TRAINING

CHARACTERISTICS OVERVIEW CHART

Verbal Skills	Grade Levels	Cognitive Level	Areas Addressed
<input checked="" type="checkbox"/> Nonverbal	<input checked="" type="checkbox"/> PK	<input checked="" type="checkbox"/> Classic	<input checked="" type="checkbox"/> (Pre)Academic/Cognitive/Academic
<input checked="" type="checkbox"/> Mixed	<input checked="" type="checkbox"/> Elementary	<input checked="" type="checkbox"/> High	<input checked="" type="checkbox"/> Adaptive Behavior/Daily Living
<input checked="" type="checkbox"/> Verbal	<input checked="" type="checkbox"/> Middle/High	Functioning	<input checked="" type="checkbox"/> Behavior
			<input checked="" type="checkbox"/> Communication/Speech
			<input checked="" type="checkbox"/> Social/Emotional

BRIEF INTRODUCTION

Pivotal response training (PRT) is a naturalistic child- and family-centered intervention that has been used to promote appropriate social interactions and communicative skills in children with autism (AU) (Humphries, 2003). PRT is based on applied behavior analysis (ABA). It excludes negative interactions, reduces dependence on artificial prompts, and emphasizes inclusive settings and natural prompts.

DESCRIPTION AND STEPS

Koegel, Koegel, Harrower, and Carter (1999) identified four pivotal areas of primary focus for PRT, including (a) responding to multiple cues and stimuli, (b) improving child motivation, (c) increasing self-management capacity, and (d) increasing self-initiations. Each of those four areas will be discussed below.

The first pivotal area, responding to multiple cues and stimuli, focuses on teaching children to be responsive to multiple cues in the hope that they will generalize the skill to various settings, such as home, school, and community, and facilitate learning. Children with autism often respond to a limited range of components and irrelevant cues in their environments, called “stimulus overselectivity” (Lovaas, Schreibman, Koegel, & Rehm, 1971; Matthews, Shute, & Rees, 2001). Therefore, instructions must contain more than one cue to which the child must attend. Lessons involving multiple cues give children directions that involve more than one descriptor. Teachers

can focus on a number of stimuli each time and ensure that the selected stimuli stand out against other stimuli in the environment. An example would be asking the child to sort toy cars into colored baskets. If the child is asked to put the toy car into the red basket while there are other baskets in different colors, the child has to respond to colors and make a correct differentiation.

The second pivotal area is improving child motivation. Improving motivation is associated with increasing responsiveness to environmental stimuli, decreasing response latency, and changing emotions (Koegel, Koegel, & Carter, 1999). Lack of motivation is a major characteristic of children with AU and has been shown to interfere with everyday learning and social interactions.

Schreibman, Kaneko, and Koegel (1991) suggested ways to improve child motivation:

- *Provide the child the opportunity to choose materials, topics, and toys during the teaching session.* Children tend to have a greater sense of engagement in learning activities if they are allowed to make choices.
- *Use natural and direct reinforcers.* Since such reinforcers are inherent in the consequences of the task the child is engaging in, the child would be more attentive to desired behaviors and be motivated to complete tasks.
- *Intersperse previously learned tasks with new acquisition tasks.* In this manner, the child may maintain the level of competence and at the same time gain new skills based upon what has been learned. A strong possibility of completing tasks results in high motivation and increasing responses.
- *Reinforce any clear and goal-directed attempts made by the child.* The child is more motivated to attend tasks if he or she receives encouragement when making an attempt to respond.

The third pivotal area is increasing self-management capacity, which involves teaching children to be aware of their inappropriate behavior, to collect data on those behaviors, and to reinforce themselves or to request reward from others. The goals of teaching a child self-management

skills are to enable him to (a) internalize the self-monitoring device, (b) foster behavioral management responsibility, and (c) use self-administered rewards.

Koegel, Koegel, and Suratt (1992) suggested the following steps to teach self-management:

- *Step 1: Identify the desired behavior.* The teacher and the child identify a desired behavior they will work on. Perhaps a socially valid behavior needs to be taught or an inappropriate behavior needs to be reduced. The desired behavior has to be measurable and objective.
- *Step 2: Identify reinforcers.* The teacher helps the child choose rewards that are reinforcing to him. In order to improve self-management capacity, it is recommended that internal reinforcement be paired with external rewards.
- *Step 3: Select a self-monitoring device.* The teacher decides on a method of collecting data that is appropriate for the child.
- *Step 4: Teach to self-monitor.* The teacher teaches the child how to monitor the occurrence or absence of the desired behavior using the selected self-monitoring device.
- *Step 5: Generalize.* The teacher collects data to see whether the child can generalize the self-management procedures into real-life situations.

An example of incorporating these procedures is to use self-management strategies to modulate feelings. The teacher can start by assisting a child in identifying the feelings the child experiences when angry. Worksheets or visual reminders, such as feeling thermometers, may be used as self-monitoring devices. Then the child is taught how to use the monitoring device independently. For the reinforcements, the child can earn extra time doing his favorite activity to calm down the anger emotion.

The fourth pivotal area focuses on increasing self-initiations. It involves teaching children to make initiations as a result of natural cues in the environment. Specifically, self-initiation training primarily consists of teaching children to spontaneously ask questions to gain information (Koegel et al., 1999). Self-initiating questions include wh-questions, assistance-seeking questions, and information-seeking questions.

The adult can start with having the child engage in his preferred activity and then create a teaching situation where these self-initiating questions occur. The child may need to be prompted and reinforced to ask questions at the beginning. It is a good idea to incorporate child-preferred activities or materials into the teaching process and prompt the child to initiate questions. Gradually, the prompts are faded after the child is able to generalize the skills across settings.

Although PRT focuses primarily on early intervention, it is suitable for individuals with autism across a range of ages. When implementing this intervention, children have to show an interest in objects and demonstrate imitation skills (Humphries, 2003). PRT can be incorporated into inclusive settings; therefore, it should be implemented by those who work with the child on a regular basis and know the child best, such as general and special education teachers, therapists, parents, or other professionals.

BRIEF EXAMPLE

Adam was diagnosed with autism when he was 2 years old. His parents participated in an intensive parent education program on PRT. Using Adams' special interest in cars, his parents taught him to ask for cars using pictures and words and how to play with cars. In addition, they created a car play area so that Adam could play quietly with his cars. They worked with Adam to teach him to go to the car play area when he was upset to calm. Adam began to understand that car play would help him calm. He initiated taking one of his cars to bed to help him relax to sleep.

SUMMARY

PRT is a naturalistic intervention for children with autism and their families that focuses on communication, social, and academic development. As such, it targets the core areas (e.g., motivation for social-communication interactions) of autism to normalize child development. Family involvement is critical to help not only the child with autism but also family members.

Families are considered essential team members to implement PRT in the child’s natural settings, including home, school, and community.

RESEARCH TABLE

Number of Studies	Ages (year)	Sample Size	Area(s) Addressed	Outcome
20*	2-16	301	Adaptive functioning, joint attention, stereotypic behavior, self-management, responsiveness to verbal initiations, self-initiation, social behaviors, adaptive behaviors, symbolic play skills, toy play	+

*Note. See also adult-mediated social skills interventions for additional studies.

STUDIES CITED IN RESEARCH TABLE

1. Coolican, J., Smith, I.M., Bryson, S.E. (2010). Brief parent training in pivotal response treatment for preschoolers with autism. *Journal of Child Psychology and Psychiatry*, 51(12), 1321-1330.
This study reports on the evaluation of a brief (6 total hours) training program for parents in the use of PRT techniques with their children with ASD. 8 families with a newly diagnosed child with ASD who were on a waiting list to receive early intensive intervention services participated. Both child functional ability and parent fidelity in implementing PRT procedures were measured in a non-concurrent multiple-baseline across families design. While only moderate improvements in child functioning were seen, parents generally maintained high fidelity in using the procedures, with 5 of 8 having over 60% accuracy at 4-month follow-up. The moderate gains should be interpreted as encouraging given that parents were able to improve their child’s ability levels while waiting for more comprehensive services to become available.
2. Nefdt, N., Koegel, R., Singer, G., Gerber, M. (2010). The use of self-directed learning program to provide introductory training in pivotal response treatment to parents of children with autism. *Journal of Positive Behavior Interventions*, 12(1), 23-32.
This study reported the effects of a self-directed program to teach PRT skills to parents on both parent ability to correctly implement procedures and functional vocalizations of their children with ASD using a randomized clinical trial design. 13 parents in the experimental condition showed increased ability to correctly implement PRT procedures and their children showed significantly increased numbers of functional verbalizations relative to the no-treatment control group.
3. Smith, I.M., Koegel, R.L., Koegel, L.K., Openden, D.A., Fossum, K.L., Bryson, S.E. (2010). Effectiveness of a novel community-based early intervention model for children with

autistic spectrum disorder. *American Journal on Intellectual and Developmental Disabilities*, 115(6), 504-523.

This study reports an analysis of the outcomes for two cohorts of children with ASD (45 total) who received early intensive behavioral treatment based on PRT delivered by trained providers and parents. After 12 months of intervention children showed significant improvements in social communication and IQ, and significant decreases in rates of problem behavior. Children with higher entering IQs tended to show greater gains following treatment and a reduction in autism symptoms not seen in children with lower-IQs.

4. Baker-Ericzén, M. K., Stahmer, A. C., & Burns, A. (2007). Child demographics associated with outcomes in a community-based pivotal response training program. *Journal of Positive Behavior Interventions*, 9, 52-60.

The study assessed (a) the effectiveness of a community-based parent education pivotal response training intervention and (b) whether specific child variables are associated with outcomes. A total of 158 families having children with autism aged 2 to 9 participated. Results indicated that all of the children showed significant improvements in adaptive functioning. Children under the age of 3 showed the least impairment at intake and the most improvement post-intervention.

5. Jones, E. A., Carr, E. G., & Feeley, K. M. (2006). Multiple effects of joint attention intervention for children with autism. *Behavior Modification*, 30, 782-834.

The results of a series of three studies were described. In the first study, preschool teachers demonstrated the effectiveness of discrete trial instruction and PRT strategies to teach joint attention to five children with autism aged 2 to 3. In the second study, parents of two of the five children also taught joint attention at home and in the community. The third study indicated that several additional dependent measures demonstrated collateral improvements in expressive language and social-communicative characteristics that were socially validated by parent raters. Findings underscore the importance of addressing different forms of joint attention, the need to extend intervention to naturalistic contexts and joint attention partners, the pivotal nature of joint attention, and exploring whether the intervention adequately addresses both the form and social function of joint attention.

6. Sigafoos, J., O'Reilly, M., Ma, C. H., Edrisinha, C., Cannella, H., & Lancioni, G. E. (2006). Effects of embedded instruction versus discrete-trial training on self-injury, correct responding, and mood in a child with autism. *Journal of Intellectual & Developmental Disability*, 31, 196-203.

This study compared embedded instruction with discrete-trial training for a 12-year-old boy with autism. Instructional sessions designed to teach adaptive behaviors were conducted under two conditions: (a) during embedded instruction, learning trials were inserted into ongoing activities at a rate of approximately 1.5 per minute; (b) during discrete-trial training, instructional opportunities were incorporated into structured sessions at a rate of four per minute. The results suggested that although discrete-trial training can be highly effective, it may be preferable to start with embedded instruction when the child presents with self-injurious escape behaviors.

7. Sherer, M. R., & Schreibman, L. (2005). Individual behavioral profiles and predictors of treatment effectiveness for children with autism. *Journal of Consulting and Clinical Psychology, 73*, 525-538.
Six students with mild and severe autism (ages 3 to 5 years) participated in a study that used PRT to increase toy contact, social behavior, and play behavior. Students were grouped as predicted nonresponders and predicted responders. Predicted responders demonstrated gains in all areas following PRT and generalized to novel settings and stimuli. Nonresponders did not.
8. Koegel, L. K., Koegel, R. I., Shoshan, Y., & McNeerney, E. (1999). Pivotal response intervention II: Preliminary long-term outcome data. *Journal of the Association for Persons with Severe Handicaps, 24*, 186-198.
The purpose of the study was to assess whether self-initiations were associated with highly favorable post-intervention outcomes. Ten children with autism aged 2 to 3 years participated in Phases 1 and 2. In the first phase, archival data were analyzed for six children. Results indicated that the children who had highly favorable outcomes exhibited more spontaneous self-initiation at pre-intervention. In the second phase, the study assessed whether a series of self-initiations could be taught to children with autism who demonstrated few or no spontaneous self-initiations at pre-intervention, and whether this intervention would result in highly favorable post-intervention outcomes. Results indicated that these children learned a variety of self-initiations and had extremely favorable outcomes.
9. Pierce, K., & Schreibman, L. (1997a). Multiple peer use of pivotal response training social behaviors of classmates with autism: Results from trained and untrained peers. *Journal of Applied Behavior Analysis, 30*, 157-160.
Two boys aged 7 and 8 with autism and eight typical peers participated in a study designed to replicate an earlier finding of successful social-skills intervention for children with autism using peer-implemented PRT and to assess the effects of using multiple peer trainers on generalization of treatment effects. During training, peers were taught PRT using didactic instruction, modeling, role-play, and feedback. Results showed that the boys with autism engaged in increased levels of social behavior as a result of peer interactions using PRT.
10. Pierce, K., & Schreibman, L. (1997b). Using peer trainers to promote social behavior in autism: Are they effective at enhancing multiple social modalities? *Focus on Autism and Other Developmental Disabilities, 12*, 207-218.
The study explored potential changes in social behaviors after two children with autism were exposed to a naturalistic, peer-implemented social skills intervention. The two children with autism, aged 7 and 8, and eight typical peers were videotaped during 10-minute play sessions before, during, and after PRT. Results showed that both the frequency and quality of the language used increased from baseline to post-treatment. Social conversation among the participants also increased. These findings suggest that peers can help in the intervention and individualization of treatment of children with AU efficiently and effectively.

11. Pierce, K., & Schreibman, L. (1995). Increasing complex social behaviors in children with autism: Effects of peer-implemented pivotal response training. *Journal of Applied Behavior Analysis, 28*, 285-295.
The study involved teaching two 10-year-old boys with autism to engage in a variety of complex social behaviors using peer-implemented pivotal response training. In addition, typical peers were taught to implement PRT strategies by modeling, role-playing, and didactic instruction. After training, peers implemented the procedures in the absence of direct supervision in a classroom environment. After the intervention, both children with autism maintained prolonged interactions with the peer, initiated play and conversations, and increased engagement in language and joint attention behaviors. In addition, teachers reported positive changes in social behavior, with the largest increases in peer-preferred social behavior. Further, these effects showed generality and maintenance.
12. Stahmer, A. C. (1995). Teaching symbolic play skills to children with autism using pivotal response training. *Journal of Autism and Developmental Disorders, 25*, 123-141.
Seven boys with autism aged 4 to 7 participated in a study that investigated the use of PRT to teach symbolic play skills. The participants' behaviors were compared with those of language-matched controls. Generalization and maintenance measures were also obtained across settings, toys, and play partners. Results showed that the seven boys significantly increased their symbolic play behaviors after the training. Six of the boys were able to generalize the symbolic play behaviors to new toys. The complexity of symbolic play and interaction skills also improved after the training.
13. Thorp, D. M., Stahmer, A. C., & Schreibman, L. (1995). Effects of sociodramatic play training on children with autism. *Journal of Autism and Developmental Disorders, 25*, 265-282.
The study assessed the effects of teaching sociodramatic play to three boys with autism aged 5 to 9 using a variation of PRT. Measures of play skills, social behavior, and language skills were obtained before and after treatment and at a three-month follow-up session. Positive changes were observed in play, language, and social skills. In addition, these changes were generalized across toys and settings, although little generalization to other play partners occurred.
14. Koegel, R. L. & Frea, W. D. (1993). Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis, 26*, 369-377.
Acquisition of individual social communicative behaviors and generalization across other social behaviors using pivotal response training was measured in two children with autism (ages 13 and 16). The results showed that the children's treated social behaviors improved rapidly and that there were generalized changes in untreated social behaviors.
15. Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis, 25*, 341-353.
The study assessed whether self-management could be used as a technique to produce extended improvements in responsiveness to verbal initiations from others in community, home, and school settings without the presence of a treatment provider. Four children with

autism aged 6 to 11 participated in the study. Results indicated positive outcomes whereby children learned to self-manage responsively to others across multiple community settings. In addition, disruptive behaviors decreased without the need for special intervention.

16. Schreibman, L., Kaneko, W. M., & Koegel, R. L. (1991). Positive affect of parents of autistic children: A comparison across two teaching techniques. *Behavior Therapy, 22*, 479-490. The study compared the impact of instruction on 19 children with autism across two parent training techniques, individual target behavior and pivotal response training. One hundred and twenty undergraduates who served as judges were asked to rate the positive effect of the parents working in one-on-one training sessions with their children. Parents who implemented the PRT procedure were rated as exhibiting a significantly more positive affect than those who implemented the individual target behavior procedure. The results also supported the notion that the interactions inherent in the PRT procedures may represent more natural parent-child interactions and are more pleasant for the parents to conduct than the highly structured interactions associated with the individual target behavior form of treatment.
17. Koegel, R. L., & Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis, 23*, 119-127. The study evaluated whether four children with autism could learn to use a self-management treatment package to reduce their stereotypic behavior. Four children, aged 9 to 13, participated. Results indicated that all children learned to use self-management procedures to greatly reduce levels of stereotypic behavior. Moreover, improvement occurred for extended periods of time in new settings.
18. Koegel, R. L., Dyer, K., & Bell, L. K. (1987). The influence of child preferred activities on autistic children's speech behavior. *Journal of Applied Behavioral Analysis, 20*, 243-252. Activities that included child-preferred activities were compared with adult-preferred activities in decreasing social avoidance for 10 children (ages 4 to 13). Results revealed a negative correlation between appropriate child-preferred activities and social avoidance.

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RESOURCES AND MATERIALS

- Association for Science in Autism Treatment:
<http://www.asatonline.org/intervention/procedures/pivotal.htm>
This is a link to the Association for Science in Autism Treatment's fact sheet on PRT.
- Autism Internet Modules: Pivotal Response Training:
<http://www.autisminternetmodules.org/>
- Autism Web Course: Pivotal Response Module:
http://cdd.unm.edu/swan/autism_course/modules/behavior/pri/index.htm
- How to Teach Pivotal Behaviors to Children with Autism: A Training Manual:
<http://www.users.qwest.net/~tbharris/prt.htm>

This 38-page manual is informative and thorough.

- Koegel, R. L., & Koegel, L. K. (2006). *Pivotal response treatments for autism: Communication, social, and academic development*. Baltimore: Paul H. Brookes Publishing Company.
This book describes in detail how to use PRT.
- National Professional Development Center on Autism Spectrum Disorders: Evidence-Based Practices Brief: Pivotal Response Training (PRT).
<http://autismpdc.fpg.unc.edu/content/pivotal-response-training>
This site gives instructions on how to use the intervention and the evidence base behind it.

GENERAL RESOURCES

- Autism Internet Modules (AIM) www.autisminternetmodules.org. The Autism Internet Modules were developed with one aim in mind: to make comprehensive, up-to-date, and usable information on autism accessible and applicable to educators, other professionals, and families who support individuals with autism spectrum disorders (ASD). Written by experts from across the U.S., all online modules are free, and are designed to promote understanding of, respect for, and equality of persons with ASD.
- The Autism Web Course: http://cdd.unm.edu/swan/autism_course/about/index.htm. This web course was developed out of materials from the Interactive Collaborative Autism Network (ICAN). The Autism Programs at the University of New Mexico has updated and added information to this web course.
 - Characteristics
 - Assessment
 - Academic Interventions
 - Behavioral Interventions
 - Communication Interventions
 - Environmental Interventions
 - Social Interventions
 - Family Support Suggestions
- Indiana Resource Center for Autism (IRCA) <http://www.iidc.indiana.edu/irca/fmain1.html>. The Indiana Resource Center for Autism staff's efforts are focused on providing communities, organizations, agencies, and families with the knowledge and skills to support children and adults in typical early intervention, school, community, work, and home settings.
 - IRCA Articles: <http://www.iidc.indiana.edu/index.php?pageId=273>
- Texas Statewide Leadership for Autism www.txautism.net. The Texas Statewide Leadership for Autism in conjunction with the network of Texas Education Service center with a grant from the Texas Education Agency has developed a series of free online courses in autism. Please check the training page, www.txautism.net/training.html, for update lists

of courses, course numbers and registration information. Current courses include the following:

- Asperger Syndrome 101
- Augmentative and Alternative Communication and the Autism Spectrum
- Autism for the General Education Teacher
- Autism 101: Top Ten Pieces to the Puzzle
- Classroom Organization: The Power of Structure for Individuals with ASD
- Communication: The Power of Communication for Individuals with ASD
- Futures Planning for Students with Autism Spectrum Disorder
- Navigating the Social Maze: Supports and Interventions for Individuals with ASD
- Solving the Behavior Puzzle: Making Connections for Individuals with ASD