Module: Reinforcement

Overview of Reinforcement

Neitzel, J. (2009). *Overview of reinforcement.* Chapel Hill, NC: The National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

Reinforcement describes a relationship between learner behavior and a consequence that follows the behavior. This relationship is only considered reinforcement if the consequence increases the probability that a behavior will occur in the future, or at least be maintained. For example, children learn to ask for something politely if they want to receive it in return. The ultimate goal of reinforcement is to help learners with ASD learn new skills and maintain their use over time in a variety of settings with many different individuals. As such, teachers and other practitioners must identify the appropriate reinforcers that motivate individual learners with ASD.

Reinforcement is a fundamental practice that is almost always used with other evidence-based practices such as prompting, time delay, functional communication training, and differential reinforcement of other behaviors. As a practice, reinforcement is either positive or negative. *Positive reinforcement* refers to the presentation of a reinforcer after a learner uses a target skill/behavior. Positive reinforcers can be either primary (e.g., food, liquids, comfort) or secondary (e.g., verbal praise, highly preferred activities, stickers, toys, edibles). Primary reinforcers are often naturally reinforcing to learners with ASD; however, the value of secondary reinforcers must be learned by pairing primary reinforcers with other types of reinforcement (e.g., pairing “Good job” with getting a sticker). Positive reinforcement is generally the strategy that teachers/practitioners use first when trying to teach new skills (e.g., teaching a replacement behavior for an interfering behavior) or to increase appropriate behaviors.

A token economy program is another type of positive reinforcement strategy that can be used effectively with learners with ASD. *Token economy programs* are referred to as such because they are based upon a monetary system in which tokens are used to acquire a desired reinforcer. For example, learners with ASD receive tokens when they use a target skill/behavior appropriately. When learners acquire a certain number of tokens, they can be exchanged for objects or activities that are reinforcing to individual learners with ASD.

Negative reinforcement, on the other hand, refers to the removal of an object or activity the learner with ASD finds aversive such as washing tables or staying seated. When the learner with ASD uses the identified target skill/behavior (e.g., requesting a break, raising hand, taking a bite of food), the aversive object or activity is removed. The goal of negative reinforcement is to remove the aversive stimulus so that the learner’s use of the target skill/behavior will increase.

Reinforcement is most effective when it is individualized for a particular learner with ASD and when it is presented in response to a learner’s use of a target skill/behavior. The goal of this evidence-based practice is to increase skills while gradually fading reinforcement strategies to promote maintenance and generalization.

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Evidence

Reinforcement meets evidence-based practice criteria from the National Professional Development Center on ASD, with ten single-subject design studies demonstrating its effectiveness in attaining academic, adaptive behavior, language/communication, and self-help goals and in reducing interfering behaviors (e.g., repetitive, disruptive). Reinforcement has been shown to be effective at the preschool, elementary, and middle/high school levels.

With what ages is reinforcement effective?

Reinforcement can be used effectively with children and youth with ASD, regardless of cognitive level and/or expressive communicative abilities. The evidence base shows that reinforcement is an effective practice that can be used with learners with ASD ranging from 3 to 22 years of age.

What skills or intervention goals can be addressed with reinforcement?

Reinforcement can be used to teach a variety of skills such as learning toilet training, expanding speech production, decreasing interfering behaviors (e.g., drooling, disruptive), increasing on-task behavior, and increasing physical activity.

In what settings can reinforcement be effectively used?

The evidence-based studies were conducted mainly in clinic-based settings or in one-to-one teaching sessions with learners with ASD. While the research did not demonstrate the use of reinforcement in more naturalistic settings such as during ongoing classroom routines and activities in homes or in community-based settings, it might be effectively used in these settings as well.

Evidence Base

The studies cited in this section document that this practice meets the NPDC on ASD's criteria for an evidence-based practice. This list is not exhaustive; other quality studies may exist that were not included.

Preschool

Cicero, F. R., & Pfadt, A. (2002). Investigation of a reinforcement-based toilet training procedure for children with autism. *Research in Developmental Disabilities, 23*, 319-331.

Higbee, T. S., Carr, J. E., & Patel, M. R. (2002). The effects of interpolated reinforcement on resistance to extinction in children diagnosed with autism: A preliminary investigation. *Research in Developmental Disabilities, 23*, 61-78.

Koegel, R. L., O'Dell, M., & Dunlap, G. (1988). Producing speech use in nonverbal autistic children by reinforcing attempts. *Journal of Autism and Developmental Disorders, 18*(4), 525-538.

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Elementary

Cicero, F. R., & Pfadt, A. (2002). Investigation of a reinforcement-based toilet training procedure for children with autism. *Research in Developmental Disabilities, 23*, 319-331.

Grindle, C. F., & Remington, B. (2005). Teaching children with autism when reward is delayed. The effects of two kinds of marking stimuli. *Journal of Autism and Developmental Disorders, 35*(6), 839-850.

Higbee, T. S., Carr, J. E., & Patel, M. R. (2002). The effects of interpolated reinforcement on resistance to extinction in children diagnosed with autism: A preliminary investigation. *Research in Developmental Disabilities, 23*, 61-78.

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Pelios, L. V., MacDuff, G. S., & Axelrod, S. (2003). The effects of a treatment package in establishing independent academic work skills in children with autism. *Education and Treatment of Children, 26*(1), 1-21.

Sidener, T. M., Shabani, D. B., Carr, J. E., & Roland, J. P. (2006). An evaluation of strategies to maintain mands at practical levels. *Research in Developmental Disabilities, 27*, 632-644.

Middle/High School

Kay, S., Harchik, A. E., & Luiselli, J. K. (2006). Elimination of drooling by an adolescent student with autism attending public high school. *Journal of Positive Behavior Interventions, 8*(1), 24-28.

Kern, L., Carberry, N., & Haidara, C. (1997). Analysis and intervention with two topographies of challenging behavior exhibited by a young woman with autism. *Research in Developmental Disabilities, 18*(4), 275-287.

Lee, R., & Sturmey, P. (2006). The effects of lag schedules and preferred materials on variable responding in students with autism. *Journal of Autism and Developmental Disorders, 36*(3), 421-428.

Todd, T., & Reid, G. (2006). Increasing physical activity in individuals with autism. *Focus on Autism and Other Developmental Disabilities, 21*(3), 167-176.

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Aspy, R., & Grossman, B. G. (2007). *The ziggurat model: A framework for designing comprehensive interventions for individuals with high-functioning autism and asperger syndrome*. Shawnee Mission, KS: Autism Asperger Publishing Company.

Atkinson, P. R., Jenson, W. R., Rovner, L., Cameron, S., Van Wagenen, L., &. Petersen, B.P. (1984). Brief report: Validation of the autism reinforcer checklist for children. *Journal of Autism and Developmental Disorders, 14*(4), 429-433.

Henry, S., & Smith Myles, B. (2007). *The comprehensive autism planning system (CAPS) for individuals with asperger syndrome, autism, and related disabilities: Integrating best practices throughout the student's day*. Shawnee Mission, KS: Autism Asperger Publishing Company.

Scheuermann, B., & Webber, J. (2002). *Autism: Teaching does make a difference*. Belmont, CA: Wadsworth/Thomson Learning.

Zirpoli, T. J. (2005). *Behavior management: Applications for teachers, 4th ed*. Upper Saddle River, NJ: Pearson Prentice Hall.