Evidence-Based Practice Brief: Reinforcement

This evidence-based practice brief on reinforcement includes the following components:

- 1. Overview, which gives a quick summary of salient features of the practice, including what it is, who it can be used with, what skills it has been used with, settings for instruction, and additional literature documenting its use in practice
- 2. Positive Reinforcement: Steps for Implementation
- 3. Positive Reinforcement: Implementation Checklist
- 4. Negative Reinforcement: Steps for Implementation
- 5. Negative Reinforcement: Implementation Checklist
- 6. Token Economy: Steps for Implementation
- 7. Token Economy: Implementation Checklist
- 8. Evidence Base Summary, which details the NPDC-ASD criteria for inclusion as an evidence-based practice and the specific studies that met the criteria for this practice
- 9. Reinforcement Data Collection Sheets

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 (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) 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.

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 ontask 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.

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.
- 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.
- 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.

Additional References

Alberto, P. A., & Troutman, A. C. (1999). *Applied behavior analysis for teachers, 5th ed.* Upper Saddle River, NJ: Prentice Hall.

- 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.

Evidence Base for Reinforcement

The National Professional Development Center on ASD has adopted the following definition of evidence-based practices.

To be considered an evidence-based practice for individuals with ASD, efficacy must be established through peer-reviewed research in scientific journals using:

- randomized or quasi-experimental design studies. Two high quality experimental or quasi-experimental group design studies,
- *single-subject design studies.* Three different investigators or research groups must have conducted five high quality single subject design studies, or
- combination of evidence. One high quality randomized or quasi-experimental group design study and three high quality single subject design studies conducted by at least three different investigators or research groups (across the group and single subject design studies).

High quality randomized or quasi experimental design studies do not have critical design flaws that create confounds to the studies, and design features allow readers/consumers to rule out competing hypotheses for study findings. High quality in single subject design studies is reflected by a) the absence of critical design flaws that create confounds and b) the demonstration of experimental control at least three times in each study.

This definition and criteria are based on the following sources:

- Horner, R., Carr, E., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single subject research to identify evidence-based practice in special education. *Exceptional Children, 71,* 165-180.
- Nathan, P., & Gorman, J. M. (2002). *A guide to treatments that work.* NY: Oxford University Press.
- Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. D., Thompson, B., & Harris, K. (2004). *Quality indicators for research in special education and guidelines for evidence-based practices: Executive summary.* Arlington, VA: Council for Exceptional Children Division for Research.
- Rogers, S. J., & Vismara, L. A. (2008). Evidence based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology*, *37*(1), 8-38.

Using these criteria, the empirical studies referenced below provide documentation for supporting Differential Reinforcement as an evidence-based practice. 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.

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.
- 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.
- 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.

Steps for Implementation: Positive Reinforcement

Neitzel, J. (2009). *Steps for implementation: Positive 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 is an evidence-based practice used to increase appropriate behavior and teach new skills (e.g., replacement behavior in place of an interfering behavior). This document outlines the steps for implementing positive reinforcement with learners with ASD. *Positive reinforcement* is the contingent presentation of a stimulus (i.e., reinforcer) immediately following a learner's use of a target skill/behavior. This relationship between the use of a target skill/behavior and receiving reinforcement increases the future rate and/or probability that the learner will use the skill again.

When planning for and implementing positive reinforcement with learners with ASD, the following steps are recommended.

Step 1. Identifying the Target Skill/Behavior

In Step 1, teachers/practitioners identify a target skill/behavior for a learner with ASD that they would like to increase.

1. Teachers/practitioners define the target skill/behavior in observable and measurable terms.

Example: Sarah will stay seated during English class for 30 minutes.

Describing the target skill/behavior in measurable and observable terms allows teachers and other practitioners to collect accurate and reliable baseline data, deliver reinforcement when the learner uses the target skill/behavior correctly, and ensures that all staff members understand what the target skill/behavior looks like so that reinforcement can be delivered consistently across classes and activities.

Step 2. Collecting Baseline Data

Once the target skill/behavior is identified, teachers/practitioners collect baseline data to determine how often the learner with ASD is currently using the target skill/behavior.

- 1. Teachers/practitioners measure a learner's use of the target skill/behavior before implementing reinforcement by collecting one of the following:
 - a. *frequency data*. Frequency data measures how often a learner engages in a particular behavior. Two methods are used to collect frequency data: time sampling and event sampling. With *time sampling*, data on a particular behavior are collected after a certain amount of time (e.g., every five minutes). If a learner is engaging in

the behavior at that time, then teachers/practitioners record this on the data sheet. This sampling technique is best used to monitor high frequency behaviors such as engagement and parallel play. *Event sampling* is used to record every instance of the behavior and typically focuses on low frequency behaviors such as taking a toy from a peer, putting on a coat, and saying, "Hello" to a peer when coming into the classroom. Both sampling techniques are used to evaluate patterns of behavior over a period of days or weeks. Tables 1 and 2 provide examples of both frequency data collection methods.

Date				Before, during, or after				
	9:00	9:05	9:10	9:15	9:20	9:25	Total	reinforcement
7/26/08	X		X				2	Before
7/27/08	X	X					2	Before
7/28/08	X	X		X		X	4	Before
7/29/08		X	X	X		X	4	Before

Table 1. Example of Time Sampling Data Collection Sheet

Table 2. Example of Event Sampling Data Collection Sheet

Date	Takes toy from peer	Total	Before, during, or after reinforcement
7/26/08	X	1	Before
7/27/08	X	1	Before
7/28/08	X	1	Before
7/29/08	XXX	3	Before

b. duration data. Duration data are used to record how long a learner engages in a particular behavior. For example, a teacher might collect data on how long a learner with ASD stays in his seat or how long a young child stays engaged in parallel play. Table 3 provides an example duration data collection sheet. Blank data sheets are available in a separate document.

Table 3. Exa	mple of Duration	Data Collection	n Sheet for Playing	g with Peers
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Date	Start time	End Time	Total minutes	Setting/activity	Before, during, or after reinforcement
7/26/08	9:00	9:01	1	Free play	Before
7/27/08	9:05	9:06	1	Outside	Before
7/28/08	9:00	9:02	2	Small groups	Before
7/29/08	9:10	9:12	2	Large group	Before

Baseline data give teachers/practitioners a starting point from which they can evaluate whether the target skill/behavior increases as a result of reinforcement.

2. Teachers/practitioners collect baseline data for a minimum of four days or until a trend occurs before implementing reinforcement.

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A trend is generally used to evaluate intervention effects. Teachers/practitioners can begin implementing reinforcement when data indicate that the trend during baseline is stable; that is, there is no clear pattern to the learner's behavior. This is important because teachers/practitioners need to be able to determine whether the learner's use of the target skill is improving as a result of reinforcement. If a learner's use of the target skill is increasing during baseline without the use of reinforcement, then no intervention is needed. However, if there is no clear pattern to the learner's behavior, teachers/practitioners will be able to make clear decisions about the effectiveness of the intervention after it is implemented.

Trends typically are identified by viewing data points on a graph. The following are two examples of graphed baseline data. The first provides an example of a stable trend; whereas the other example illustrates a clear trend in the learner's use of the target skill. When analyzing these data, teachers/practitioners would only implement the intervention with the first example.



3. Teachers/practitioners collect baseline data in numerous settings and/or activities.

Collecting data in a variety of settings and/or activities provides valuable information about a learner's use of the target skill. For example, a learner may request more frequently during one activity than another. A different learner may consistently raise his hand during one class, but not another. These data provide teachers/practitioners with information about where and when reinforcement should be used to increase or strengthen a learner's use of a target skill. It often is useful to have more than one practitioner collect baseline data over the course of several days to compare findings. Also, by collecting data over the course of several days in multiple settings, teachers/practitioners can potentially recognize patterns of behavior. For example, does the learner use the target skill/behavior more often in one setting than another? This kind of information helps teachers/practitioners identify activities or settings in which reinforcement can be used to increase the target skill/behavior.

Step 3. Establishing Program Goals and Performance Criteria

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In Step 3, teachers/practitioners identify goals for the target skill/behavior and identify the criteria that will be used to evaluate whether positive reinforcement is effective.

1. Teachers/practitioners establish a program goal for each target skill/behavior that is age and developmentally appropriate for the learner with ASD.

The following are two examples of program goals for learners with ASD.

Example: Mike will say "hello" to three peers each time he enters a classroom.

Example: Sarah will stay seated in English class every day for 30 minutes.

Performance criteria also are established for each target skill/behavior so that teachers/practitioners can monitor learner progress and adjust reinforcement strategies as learners gain mastery of target skills/behaviors. The initial criterion should be easily attained so that learners can be successful without much effort and can acquire the identified reinforcer more easily. This also helps the learner establish a clear connection between the target skill/behavior and subsequent reinforcement. For example, a teacher might decide that an initial criterion for "staying seated in English class" is five minutes for three consecutive days. The teacher would then collect duration data to monitor learner progress. When the learner with ASD meets this criterion, the teacher gradually increases the amount of time that the learner is required to stay seated in English class until the program goal is acquired. As the learner with ASD gradually masters the target skill/behavior, the criteria are adjusted so that reinforcement is gradually faded.

2. Teachers/practitioners establish at least three different performance criteria for each program goal to monitor progress.

Table 4 outlines a program goal and performance criterion developed for a learner with ASD.

Program Goal: Sarah will stay seated in English for 30 minutes every day.						
Performance Criterion	Behavior					
Phase 1	Sarah will stay seated in English class for 5 minutes for three consecutive days.					
Phase 2	Sarah will stay seated in English class for 15 minutes for three consecutive days.					
Phase 3	Sarah will stay seated in English class for 30 minutes every day.					

Table 4. Example of Program Goal and Performance Criteria	а
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Step 4. Identifying Positive Reinforcers

In Step 4, teachers/practitioners identify positive reinforcers for learners with ASD. Positive reinforcers are anything that increases the likelihood that the target skill/behavior will be used in the future. This is important because learning will not take place unless reinforcers are motivating to the learner with ASD and are delivered effectively. Teachers/practitioners should keep in mind that many of the reinforcers often used with typically developing students may not be motivating to learners with ASD (e.g., social praise, high fives). It is essential that teachers/practitioners identify reinforcers for each learner with ASD so that they are sufficiently motivating and lead to an increase in the target skill/behavior.

Reinforcers are generally categorized as either primary or secondary. *Primary reinforcers* satisfy a physical need by making the individual feel good (e.g., food, liquids, sleep). *Secondary reinforcers* are objects or activities that individuals have grown to like, but do not need biologically. Potential reinforcers include the following:

• Social reinforcers are found in virtually any setting. Social reinforcers often must be taught to learners with ASD because they may not be inherently reinforcing.

EXAMPLES: Facial expressions (e.g., smiles), proximity (e.g., sitting next to teacher), words and phrases (e.g., "Good job!" "Way to go!"), seating arrangements (e.g., sitting alone, sitting next to favorite peer)

• *Material/activity reinforcers* can be motivating to learners with ASD; however, teachers/practitioners should vary these kinds of reinforcers with others so that learners do not grow tired of them.

EXAMPLES: Play activities, access to computer games, stickers, "cool" school supplies (e.g., Spiderman erasers)

• Tangible/edible reinforcers include objects that a learner with ASD can acquire.

EXAMPLES: Stickers, toys, magazines, pencils, candy, popcorn

• Sensory reinforcers often are motivating to learners with ASD. However, these types of reinforcers should be used only when (1) the teacher can control access to them, (2) the reinforcer is deemed acceptable and appropriate for the setting, and (3) no other reinforcer is as motivating to the learner with ASD.

EXAMPLES: Looking at a kaleidoscope, blowing bubbles, playing with a squishy ball, sitting in a rocking chair, rubbing hand lotion on hands

• *Natural reinforcers* are ordinary results of a behavior and occur naturally in the environment. These types of reinforcers naturally occur as a direct result of using the target behavior.

EXAMPLES: Receiving a good grade after studying, getting milk after asking for it, having more friends as a result of having good social skills, getting a break after asking for it

All of these reinforcers can be powerful tools to help learners acquire and maintain the use of target skills. With learners with ASD in particular, motivation can be a central concern for developing new skills. By using reinforcers such as these, teachers/practitioners increase the likelihood that learners with ASD will use target skills more consistently. The key is to identify reinforcers that are motivating for individual learners. If a learner with ASD is not motivated by a particular reinforcer, he will be less likely to use the target skill now and in the future.

The following activities can be used to identify reinforcers for individual learners with ASD.

1. Teachers/practitioners consider the age of the learner with ASD.

It is particularly important to take into account the learner's age when identifying potential reinforcers. For example, it would probably not be appropriate for a sixth grader with ASD to play with Thomas trains in an inclusive classroom. This kind of reinforcement might best be saved for times when the learner receives services in a resource room with other learners with ASD or other disabilities.

2. Teachers/practitioners consider the target skill/behavior and natural reinforcers that could be used to teach the skill.

This activity allows teacher/practitioners to identify potential reinforcers that naturally go with the target skill/behavior. For example, a learner with ASD might be given free time after engaging in a non-preferred task. Typically developing students often are allotted free time after completing an assignment in class; therefore, it seems logical that learners with ASD would be given the opportunity to choose a preferred activity after completing a difficult or challenging task. With a young child, a teacher might use a learner's favorite food at snack to reinforce requesting. Food, in this instance, is a natural reinforcer because it is typically included in this activity.

Natural reinforcers offer several advantages. First, they can be provided more easily than other reinforcers such as edibles (other than at meal times) and material reinforcers. Second, natural reinforcers are more likely to be available to the learner with ASD after the target skill/behavior has been learned. For instance, teachers often use praise after learners complete an assignment or activity correctly. Alternatively, typically developing peers may engage in more prolonged social interactions with learners with ASD as they use newly acquired skills appropriately during social activities. As learners acquire new skills, naturally occurring reinforcers (e.g., praise, prolonged social interactions, receiving something after asking for it) motivate learners with ASD to use the skills they have learned in a variety of situations and with many different individuals. Finally, natural reinforcers automatically occur on a contingent basis. For example, a teacher will not praise a learner for staying seated in class if he does not exhibit this behavior.

- 3. Teachers/practitioners observe the learner in natural settings and identify:
 - a. activities, objects, and foods that the learner selects when allowed free choice.
 - b. phrases and gestures that seem to produce a pleasant response (e.g., smiling, laughing, clapping) from the learner with ASD.
- 4. Teachers/practitioners identify potential reinforcers by asking the learner what he/she would like to work for (if appropriate).
- 5. Teachers/practitioners identify potential reinforcers by interviewing parents or other staff to identify reinforcers that have worked in the past.
- 6. Teachers/practitioners identify potential reinforcers by conducting a reinforcer sampling.

Reinforcer sampling helps teachers/practitioners identify activities and materials that are motivating to the learner and might be used to teach new skills. This type of procedure usually takes about five minutes and involves the steps listed below.

- Sit in front of the learner and hold up two items and say to the learner, "Pick one."
- Wait ten seconds for the learner to indicate his/her choice in whatever manner is appropriate to the learner (e.g., reaching, pointing, verbalizing, using a switch or augmentative communication device).
- Place the selected and non-selected objects in their appropriate containers (i.e., one to hold the learner's selections, one to hold the materials not selected).
- Continue the first three steps until half the objects presented are chosen (Mason & Egel, 1995).
- 7. Teachers/practitioners complete a reinforcer checklist to identify potential reinforcers for a learner with ASD.

Table 5 provides an example reinforcer sampling menu that may be used to identify reinforcers for individual learners with ASD.

Example: Elementary Reinforcer Menu							
Learner name:							
Target skill/behavior:	Date:						
Instructions: Ask individual learners to place a check ($$) next to at least eight items/activities they would like to earn. Read the list to non-readers and help them mark the items they select.							
1. Blow bubbles	7. Sit in rocking chair						

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 2. Ice cream	 8. Read/look at book
 3. Coloring/drawing	 9. Go to resource room
 4. Extra computer time	 10. Stickers
 5. Squishy ball	 11. Play dough
 6. Lollipop	 12. Time alone

Step 5. Creating a Reinforcer Menu

1. Teachers/practitioners create a menu of possible reinforcers listed by name (if the learner with ASD can read) or by picture (or real item) for an individual learner with ASD.

This task allows teachers/practitioners to organize potential reinforcers in an orderly manner. Potential reinforcers can be organized according to categories such as social reinforcers, activity reinforcers, and sensory reinforcers.

The following tables illustrate two different reinforcer menus that could be used with learners with ASD.

Table 6. Example of Picture Reinforcer Menu



Table 7. Example of Written Reinforcer Menu

If I stay in my seat for 10 minutes, I would like:								
Circle choice for this class								
Ten minutes of extra play time on the computer								
Extra recess time								
Puzzles								
Blow bubbles								
Erase the chalkboard								

Adapted from Aspy & Grossman (2007)

2. Teachers/practitioners allow the learner with ASD to select a desired object, activity, or food from the reinforcer menu before or after the activity/class begins.

Learners also can be given a "my choice" option on the reinforcer menu in which they are able to engage in desired activities after using the target skill/behavior. This is particularly useful in instances in which learners select a reinforcer before the activity, but change their minds after the activity is complete. Including this option on the reinforcer menu may combat potential problems that might arise in these situations.

Step 6. Selecting a Schedule of Reinforcement

In Step 6, teachers/practitioners establish a reinforcement program by selecting a schedule of reinforcement. Schedules of reinforcement refer to the frequency or timing of the delivery of reinforcement following a target skill/behavior. For example, a reinforcer can be delivered either on a continuous or on an intermittent schedule. A *continuous reinforcement schedule* is used when learners with ASD are reinforced each and every time they use the target skill/behavior. Continuous reinforcement schedules are best used when a learner is first learning a target skill/behavior and has not yet made a clear association between the target skill/behavior and the reinforcement.

1. Teachers/practitioners select continuous reinforcement when a learner with ASD is first learning the target skill/behavior.

Once a learner with ASD makes the association between the target skill/behavior and the reinforcement, an *intermittent schedule of reinforcement* can be employed. This is particularly important because learners can easily grow tired of a particular reinforcer and have difficulty generalizing and maintaining use of the target skill/behavior. With intermittent reinforcement, learners are reinforced after some occurrences of the target skill/behavior, but not each and every time they use it. Table 8 outlines two intermittent reinforcement schedules.

2. Teachers/practitioners select an intermittent reinforcement schedule when a learner with ASD has met the initial performance criterion for the target skill/behavior (see Step 3).

Type of	Description
Reinforcement	
Ratio reinforce- ment schedules	Reinforcement is provided after a specific number of correct responses, using either fixed or variable ratio reinforcement schedules. <i>Fixed</i> . Reinforcement is delivered after a specified number of correct responses. For example, when a learner raises his hand in class, the teacher calls on him every third time. <i>Variable</i> . A learner is reinforced based on an average number of correct responses. For example, if the average number of correct responses is three, a teacher might call on a learner after he raises his hand two times and then after he raises his hand four times.
Interval reinforce- ment schedules	Learners are reinforced after a period of time, using either fixed interval or variable interval reinforcement schedules. <i>Fixed.</i> A learner is reinforced following a specified amount of time (e.g., reinforcement is provided for every five minutes of staying seated). <i>Variable.</i> Reinforcement is provided after an average amount of time (e.g., a teacher might provide reinforcement on an average of every 5 minutes. Sometimes the amount of time between reinforcement will be longer than 5 minutes, and sometimes it will be shorter.

Table 8. Intermittent Reinforcement Schedules Used with Learners with ASD

Step 7. Implementing Continuous Reinforcement

When first teaching a behavior, teachers/practitioners often use continuous reinforcement.

1. Teachers/practitioners immediately deliver reinforcement each time the learner with ASD uses the target skill/behavior.

When teachers/practitioners provide reinforcement in this manner, learners with ASD begin to associate their behavior with the reinforcement quickly and efficiently.

2. Teachers/practitioners describe the target skill/behavior after the learner uses it correctly.

Example: A teacher might say, "You stayed in your seat for five minutes. Now you can play computer games."

3. Teachers/practitioners deliver identified reinforcers only when the learner with ASD uses the target skill/behavior.

The learner with ASD begins to associate the reinforcer with the target skill/behavior when it is delivered contingently. That is, learners do not have access to the reinforcer until the behavior is displayed. If learners with ASD have access to the identified reinforcer at other times, then it becomes less motivating to them, and they are less likely to use the target skill/behavior.

4. Teachers/practitioners provide small amounts of the identified reinforcer after the learner with ASD uses the target skill/behavior.

If the learner with ASD receives too much of the identified reinforcer then it becomes less motivating. For example, if a learner with ASD gains access to a preferred activity after completing a more challenging task, the teacher/practitioner should limit the amount of time the learner stays engaged in the activity.

5. When using activity or material reinforcers (e.g., tangible, activity, sensory), teachers/practitioners pair them with social reinforcement (e.g., praise, teacher attention).

Because many learners with ASD have not yet learned the value of social reinforcers, teachers/practitioners must teach them to like these types of reinforcers by initially pairing a social reinforcer with a secondary reinforcer. As learners with ASD become more motivated by social reinforcers, teachers/practitioners fade the use of other secondary reinforcers (e.g., edible, sensory).

6. When using primary reinforcers (e.g., food, drink), teachers/practitioners also deliver a secondary reinforcer (e.g., praise, sticker, computer time).

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EXAMPLE: A teacher might say, "Good job" when giving a learner with ASD playdough after completing five math problems.

The combined use of primary and secondary reinforcers is called pairing. When pairing is used, learners become less dependent upon primary reinforcers and learn the value of secondary reinforcers, particularly important for learners with ASD. Once learners with ASD become motivated by secondary reinforcers (e.g., praise, computer time), the use of primary reinforcers should be withdrawn.

Step 8. Preventing Satiation

In Step 8, teachers/practitioners focus on preventing satiation so that the identified reinforcers do not lose their effectiveness. Reinforcers often become less effective when the same reinforcement is used too frequently. It is also important to note that a particular reinforcer may be reinforcing one day and not the next day. Having a menu of reinforcers helps prevent satiation by providing a variety of reinforcers from which teachers/practitioners and learners with ASD can choose.

1. Teachers/practitioners vary reinforcers for a target skill/behavior or use different reinforcers for each target skill/behavior.

Example: A teacher uses two identified reinforcers during a teaching activity: stickers and verbal praise. The teacher alternates her use of the reinforcers so that the learner does not grow tired of one or the other.

Example: A teacher uses only edible reinforcers during snack when a child with ASD requests "more" and only activity reinforcers when trying to get the same child to increase time spent in a non-preferred activity.

2. Teachers/practitioners teach the target skill/behavior during several short instructional sessions.

Shorter instructional sessions decrease the chances of satiation. Several short instructional sessions should be implemented throughout the day during ongoing classroom routines and activities rather than one long instructional session.

Example: Requesting is the target of instruction during snack (using favorite foods), at circle time (requesting favorite song), and during free play (placing preferred toys out of reach).

3. Teachers/practitioners avoid using edible reinforcers. *If they must be used, teachers/practitioners use them minimally and offer a variety.*

Edible reinforcers should be used sparingly because they are primary reinforcers. Therefore, teachers/practitioners should focus on using edible reinforces only if other reinforcers have not been identified for a particular learner with ASD. When they are used they should be used

minimally (e.g., teachers/practitioners can use smaller portions so that learners "savor" their five M&M's) and are paired with other types of reinforcement (e.g., praise, pats on the back).

4. Teachers/practitioners shift from using primary to secondary reinforcers as soon as possible.

This is particularly important for learners with ASD because they often do not find secondary reinforcers such as stickers and praise motivating. However, when teachers pair the use of secondary reinforcers with primary reinforcers, learners with ASD are increasingly motivated by things other than food and liquids. As learners with ASD become increasingly motivated by secondary reinforcers, teachers/practitioners should gradually withdraw the use of primary reinforcers.

5. If satiation does occur, teachers/practitioners start using a different reinforcer.

Often times, teachers/practitioners can identify if satiation is occurring because learners with ASD stop using target skills that have been previously mastered. For example, a learner with ASD may stop raising his hand during class because he is no longer motivated by a reinforcer that he receives frequently. The solution to this may be as simple as choosing another reinforcer from the reinforcer menu. The important point is that the reinforcer must be motivating to the learner with ASD or increases in the target skill/behavior will not occur.

Step 9. Monitoring Learner Progress

In Step 9, teachers/practitioners monitor learner progress so that reinforcement can be gradually reduced to promote generalization and maintenance of skills. Progress monitoring data also are used to adjust the reinforcement plan when the target skill/behavior is not increasing.

1. Teachers/practitioners use progress monitoring data to determine the learner's mastery of the target skill/behavior.

The same data collection sheets that were used before the intervention began are used to monitor learner progress. By using the same data collection sheets, teachers/practitioners are able to track a learner's use of the target skill/behavior before and after positive reinforcement is implemented. The following data collection sheets provide examples of how teachers/practitioners can use these data sheets before, during, and after intervention.

Date				Before, during, or after				
	9:00	9:05	9:10	9:15	9:20	9:25	Total	reinforcement
7/26/08	X		X				2	Before
7/27/08	X	X					2	Before
7/28/08	X	X		X		X	4	Before
7/29/08		X	X	X		X	4	Before

Table 9. Example of Time Sampling Data Collection Sheet

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7/30/08	X	X	X	X	X		5	During
7/31/08	X		X	X	X	X	5	During
8/01/08	X	X	X	X	X	X	6	During

Table 10. Example of Event Sampling Data Collection Sheet

Date	Takes toy from peer	Total	Before, during, or after reinforcement
7/26/08	X	1	Before
7/27/08	X	1	Before
7/28/08	X	1	Before
7/29/08	XXX	3	Before
7/30/08	XX	2	During
7/31/08	XXX	3	During
8/01/08	XXXX	4	During

2. As learners with ASD meet performance criterion for a target skill/behavior, teachers/ practitioners move from a continuous reinforcement schedule to intermittent schedules of reinforcement (i.e., ratio, interval schedules).

Example: A learner with ASD has reached the criterion of "staying seated during English class for 30 minutes every day." The teacher decides that she will now provide reinforcement using a variable interval schedule of 10. Therefore, the teacher now reinforces the learner's behavior on average every 10 minutes. Sometimes, she will reinforce the learner's use of the target skill/behavior after 7 minutes. The next time, she may reinforce the learner staying seated after 13 minutes.

Fading of reinforcement schedules is beneficial in a number of ways. For example, when teachers/practitioners move from continuous to intermittent schedules of reinforcement, learners with ASD use the target skill/behavior more frequently and are able to maintain the use of the behavior over long periods of time. Furthermore, target skills/behaviors are increasingly reinforced in ways (e.g., teacher praise, attention) that are more readily available in natural environments such as the classroom and in the community.

3. Teachers/practitioners use progress monitoring data to adjust reinforcement strategies if the target skill/behavior is not increasing.

If a target skill/behavior is not increasing, teachers/practitioners must try to identify potential reasons for this. The following questions may be helpful during this problem-solving process.

- Is the target skill/behavior well defined? That is, is it observable and measurable?
- Are there too many reinforcers?
- Are there too few reinforcers?

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- Are the reinforcers motivating to the learner with ASD?
- Are all staff using reinforcement in a consistent manner?
- Is reinforcement occurring at a sufficient level to maintain the behavior?

References

The following sources were used to create the steps of implementing reinforcement with learners with ASD.

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Steps for Implementation: Token Economy Programs

Neitzel, J. (2009). *Steps for implementation: Token economy programs.* Chapel Hill, NC: The National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.

Step 1. Identifying the Target Skill/Behavior

In Step 1, teachers/practitioners identify a target skill/behavior for a learner with ASD that they would like to increase.

1. Teachers/practitioners define the target skill/behavior in observable and measurable terms.

The following are examples of target skills/behaviors that could be addressed using token economy programs.

Example: Sarah will raise her hand during English class to request/answer a question four out of five times for at least three days.

Describing the in measurable and observable terms allows teachers and other practitioners to collect accurate and reliable baseline data, distribute tokens when the learner uses the target skill/behavior correctly, and ensures that all staff members know what the target skill/behavior looks like so that tokens can be provided consistently across classes and activities. Furthermore, a clearly described target skill/behavior helps learners understand exactly what behavior is expected of them in certain settings and situations.

Step 2. Collecting Baseline Data

Once the target skill/behavior is identified, teachers/practitioners collect baseline data to determine how often the learner with ASD is currently using the target skill/behavior.

- 1. Teachers/practitioners measure a learner's use of the target skill/behavior before implementing a token economy program by collecting one of the following:
 - a. *frequency data*. Frequency data document how often a learner engages in a particular behavior. Two methods are used to collect frequency data: time sampling and event sampling. With *time sampling*, data on a particular behavior are collected after a certain amount of time (e.g., every 5 minutes). If a learner is engaging in the behavior at that time, then teachers/practitioners record this on the data sheet. This sampling technique is best used to monitor high frequency behaviors such as drooling and staying seated during class. *Event sampling* is used to record every instance of the behavior and typically focuses on low frequency behaviors such as taking a bite of food, hitting, and using the toilet. Both sampling techniques are used

to evaluate patterns of learners' behavior over a period of days or weeks. Tables 20 and 21 provide examples of both frequency data collection methods.

Table 20. Example of Time Sampling Data Collection Sheet

Date	Time						Before, during, or after	
	9:00	9:05	9:10	9:15	9:20	9:25	Total	reinforcement
7/26/08	X		X				2	Before
7/27/08	X	X					2	Before
7/28/08	X	X		X		X	4	Before
7/29/08		X	X	X		X	4	Before

Table 21. Example of Event Sampling Data Collection Sheet

Date	Takes toy from peer	Total	Before, during, or after reinforcement
7/26/08	X	1	Before
7/27/08	X	1	Before
7/28/08	X	1	Before
7/29/08	XXX	3	Before

b. *duration data*. Duration data are used to record how long a learner engages in a particular behavior. For example, a teacher might collect data on how long a learner with ASD stays in his seat or how long a young child stays engaged in parallel play. Table 22 provides an example of a duration data collection sheet.

Date	Start time	End Time	Total minutes	Setting/activity	Before, during, or after reinforcement
7/26/08	9:00	9:01	1	Englísh	Before
7/27/08	9:05	9:06	1	Math	Before
7/28/08	9:00	9:02	2	Science	Before
7/29/08	9:10	9:12	2	Resource room	Before

Table 22. Example of Duration Data Collection Sheet for Remaining in Seat

Baseline data give teachers/practitioners a starting point from which to evaluate whether the target skill/behavior increases as a result of a token economy program.

- 2. Teachers/practitioners collect baseline data for a minimum of four days before implementing a token economy program.
- 3. Teachers/practitioners collect baseline data in numerous settings and/or activities.

It often is useful to have more than one practitioner collect baseline data over the course of several days to compare findings. Also, by collecting data over the course of several days in multiple settings, teachers/practitioners can potentially recognize patterns of behavior. For example, does the learner use the target skill/behavior more often in one setting than another?

This kind of information helps teachers/practitioners identify activities or settings where a token economy program can be used to increase the target skill/behavior.

Step 3. Identifying Reinforcers

In Step 3, teachers/practitioners identify reinforcers for learners with ASD. Reinforcers are anything that increases the likelihood that the target skill/behavior will be used in the future. This is important because learning will not take place unless reinforcers are motivating to the learner with ASD. Teachers/practitioners should keep in mind that many of the reinforcers often used with typically developing students may not be motivating to learners with ASD (e.g., social praise, high fives). It is essential that teachers/practitioners identify reinforcers for each learner with ASD that are sufficiently motivating and lead to an increase in the target skill/behavior.

Potential reinforcers that can be used with a token economy program include the following:

- Activity reinforcers could include play activities, access to computer games, additional free time, and outings.
- *Tangible/edible reinforcers* include objects that a learner with ASD can acquire. Examples include stickers, toys, magazines, pencils, candy, and popcorn.
- Sensory reinforcers often are motivating to learners with ASD. However, these types of reinforcers should be used only when (1) the teacher can control access to them; (2) the reinforcer is deemed acceptable and appropriate for the setting; and (3) no other reinforcer is as motivating to the learner with ASD. Examples include looking at a kaleidoscope, blowing bubbles, playing with a squishy ball, sitting in a rocking chair, or rubbing hand lotion on hands.

The following activities can be used to identify reinforcers for individual learners with ASD.

1. Teachers/practitioners consider the age of the learner with ASD.

It is particularly important to take into account the learner's age when identifying potential reinforcers. For example, it would probably not be appropriate for a sixth grader with ASD to earn a Thomas train when he acquires enough tokens. This kind of reinforcer might best be saved for times when the learner receives services in a resource room with other learners with ASD or disabilities.

- 2. Teachers/practitioners observe the learner in natural settings and identify activities, objects, and foods that the learner selects when allowed free choice.
- 3. Teachers/practitioners identify potential reinforcers by asking the learner what he/she would like to work for (if appropriate).

- 4. Teachers/practitioners identify potential reinforcers by interviewing parents or other staff to identify reinforcers that have worked in the past.
- 5. Teachers/practitioners identify potential reinforcers by conducting a reinforcer sampling.

Reinforcer sampling helps teachers/practitioners identify activities and materials that are motivating to the learner and that might be used to teach new skills. This type of procedure usually takes about five minutes and involves the steps listed below.

- Sit in front of the learner and hold up two items and say to the learner, "Pick one."
- Wait 10 seconds for the learner to indicate his/her choice in whatever manner is appropriate (e.g., reaching, pointing, verbalizing, using a switch or augmentative communication device).
- Place the selected and non-selected objects in their appropriate containers (i.e., one to hold the learner's selections, one to hold the materials not selected).
- Continue the first three steps until half the objects presented are chosen (Mason & Egel, 1995).
- 6. Teachers/practitioners complete a reinforcer checklist to identify potential reinforcers for a learner with ASD.

The reinforce checklist can be used with children and youth with ASD across the age range to identify their least and most desirable reinforcers. Teachers/practitioners simply check "yes" or "no" next to a variety of reinforcers. Results can then be used to create a reinforcer menu. The following table provides an example reinforcer sampling menu that could be used to identify reinforcers for individual learners with ASD.

Table 23. Sample Reinforcer Menu Sampling								
	Example: Elementary Reinforcer Menu							
Learner r	name:							
Target sk	Target skill/behavior:							
Instructio they wou	Instructions: Ask individual learners to place a check (\checkmark) next to at least eight items/activities they would like to earn. Read the list to non-readers and help them mark the items they select.							
	1. Bubbles		7. New comic book					
	2. Ice cream		8. Spider man pencils					
	3. Coloring book		9. Pizza for lunch					
	4. Extra computer time		10. Stickers					
	5. Squishy ball		11. Playdough					
	6. Lollipop		12. Bookmark with string					

Step 4. Creating a Reinforcer Menu

1. Teachers/practitioners create a menu of possible reinforcers listed by name (if the learner with ASD can read) or by picture for an individual learner with ASD.

This task allows teachers/practitioners to organize potential reinforcers in an orderly manner. Potential reinforcers can be organized according to categories such as social reinforcers, activity reinforcers, and sensory reinforcers.

The following tables illustrate two different reinforcer menus that could be used with learners with ASD.

Table 24. Example of Picture Reinforcer Menu



Table 25. Example of Written Reinforcer Menu

If I earn 10 tokens, I would like:						
Circle choice for this class						
 Ten minutes of extra play time on th 	e computer					
 Extra recess time 						
New comic book						
Jar of bubbles						
Erase the chalkboard						

Adapted from Aspy and Grossman (2007)

Step 5. Establishing a Token Economy Program

In Step 5, teachers/practitioners identify the medium of exchange. That is, they determine what will serve as tokens for the program.

- 1. Teachers/practitioners identify tokens that are:
 - a. attractive,
 - b. easy to carry, and
 - c. easy to dispense.

Virtually anything that is visible and countable can be used as a token in this type of reinforcement program. Examples include poker chips, stickers, tally marks, pennies, marbles in a jar, pictures of the target skill/behavior on a Velcro board, and play money.

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2. The identified token is age and developmentally appropriate for the learner with ASD.

It is particularly important to take into account the learner's age and developmental level when identifying tokens. For example, it might be more appropriate to use a checklist or play money with a higher functioning learner with ASD. On the other hand, a teacher might use a chart where learners place pictures of the target skill/behavior on Velcro pieces each time he uses the target skill/behavior with learners who do not yet understand the concept of money.

- 3. Teachers/practitioners set up a system for exchanging tokens that includes:
 - a. "a bank" to keep track of tokens earned and spent,
 - b. a time and place for purchasing reinforcers from the reinforcer menu, and
 - c. the monetary value of each item on the reinforcer menu.

It is often useful to create a "store" in an area of the classroom that contains the "bank," the reinforcer menu, and the desired items. For example, a teacher could set up an area in the back corner of the classroom where a poster-sized reinforcer menu is hanging on the wall and displays the "business hours" (e.g., when tokens can be exchanged for an item on the reinforcer menu). A teacher might decide that learners can exchange tokens daily, weekly, or as soon as the designated number of tokens has been acquired. Again, this should be based upon a learner's age and developmental level. It is often beneficial to provide learners with frequent opportunities to purchase reinforcers at the beginning of the program to establish a clear understanding of how a token economy program works and to maintain motivation.

A small table in this area also may display the desired items and/or pictures of potential outings that the learner with ASD wants to work for. The teacher might also include the "price" next to each item on the reinforcer menu. The token value of each reinforcer should be based upon its monetary value or demand. For example, if the reinforcer is expensive (e.g., new computer game) or highly attractive (e.g., trip to pizza shop), the token value should be higher. When first setting up the program, it is important to balance the learner's demand for the item with his/her ability to acquire the skill quickly and efficiently. For instance, it would be wise to initially include a number of items on the reinforcer menu that can be easily acquired based upon the learner's current skills. As learners gain mastery of the target skill/behavior, more expensive and highly attractive items that might take some time to acquire can be added to the reinforcer menu.

Step 6. Implementing a Token Economy Program

- 1. Teachers/practitioners clearly describe to learners with ASD:
 - a. the target skill/behavior,
 - b. how the token economy program works, and
 - c. how many tokens are required before receiving an item from the reinforcer menu.

Teachers/practitioners clearly describe the behavior to learners with ASD in simple terms so that they know what is expected of them. Learners also must be told when and where the token

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economy program will be in effect. For instance, will it be used only in English class and the resource room? Or will it be used in all settings across the day (for learners who receive services in inclusive programs)?

2. Teachers/practitioners display the rules for earning and exchanging tokens.

This posting should include a clear description of the target skill/behavior, rules for appropriate behavior, and how tokens can be earned. Table 26 offers an example of a rules poster.

Table 26. Example of Rules Poster

I will stay in my seat for 5 minutes without talking during English class.

Classroom Rules

- 1. I will stay seated in my chair during English class.
- 2. I will not talk while the teacher is talking.
- 3. When the timer rings, I will get a chip.

It also might be necessary to engage in a role play with learners with ASD so that they more fully understand what is expected of them by going over the rules and acting out the sequence of engaging in the target skill/behavior, getting a token, and choosing an item from the reinforcer menu.

3. When first starting the token economy program, teachers/practitioners immediately provide a token to the learner with ASD each time the target skill/behavior is displayed.

Initially, teachers/practitioners use a continuous schedule of reinforcement in which each and every instance of the target skill/behavior is immediately rewarded with a token. This helps the learner with ASD establish a relationship between using the target skill/behavior and receiving a token.

4. Teachers/practitioners describe the target skill/behavior after the learner uses it correctly.

Example: A teacher might say, "You stayed in your seat for five minutes. Now you can get a token."

5. Teachers/practitioners pair giving the token to the learner with ASD with social reinforcement (e.g., praise, teacher attention).

Because many learners with ASD have not yet learned the value of social reinforcers, teachers/practitioners must teach them to like these types of reinforcers by initially pairing a

social reinforcer with the token. As learners with ASD become more motivated by social reinforcers, teachers/practitioners fade the use of the tokens.

6. Teachers/practitioners allow the learner with ASD to select a desired object, activity, or food from the reinforcer menu when the designated number of tokens has been acquired.

Learners also can be given a "my choice" option on the reinforcer menu in which they are able to engage in desired activities after using the target skill/behavior. This is particularly useful in instances in which learners often select a reinforcer before the activity, but change their minds after the activity is complete. Including this option on the reinforcer menu may combat potential problems that might arise in these situations.

7. Teachers/practitioners make adjustments to a learner's reinforcer menu to maintain motivation.

To maintain a learner's interest and motivation, teachers/practitioners periodically adjust prices and rotate items on the reinforcer menu to reflect a learner's acquisition of the target skill/behavior as well as demand for a particular item. For example, a learner might become less motivated by a lower priced item because he is able to gain access to it easily as he becomes more proficient at using the target skill/behavior. Therefore, a teacher might include some additional lower priced items or increase the price of all of the items so that the learner stays motivated to acquire some of the higher priced items.

8. Teachers/practitioners reward the target skill/behavior consistently across settings.

The success of the token economy program is dependent upon a number of factors including teacher/practitioner implementation. It is essential that all teachers/practitioners who have frequent contact with the learner with ASD be familiar with the token economy program and how to implement it in a variety of settings. This will ensure that learners are being reinforced appropriately and thus acquiring the target skill/behavior.

9. Teachers/practitioners fade the use of tokens as the learner starts using the target skill/behavior independently.

As learners with ASD begin to use the target skill/behavior more frequently, teachers/practitioners gradually decrease the availability of the tokens. This is done by not reinforcing each and every instance of the target skill/behavior. For example, a teacher might provide the learner with ASD with a token every third time he uses the target skill/behavior. The target skill/behavior is reinforced on other occasions by providing social reinforcement (e.g., verbal praise, pat on the back, high five).

Step 7. Monitoring Learner Progress

Changes in behavior are recorded daily on the same data collection sheets that were used during the baseline data collection phase. Progress monitoring data are used to measure a learner's acquisition of the target skill/behavior as well as the effectiveness of the token economy program.

- 1. Teachers/practitioners use progress monitoring data to determine the learner's mastery of the target skill/behavior.
- 2. Teachers/practitioners use progress monitoring data to adjust the program when problems arise or if the target skill/behavior is not increasing.

The same data collection sheets that were used before the intervention began are used to monitor learner progress. By using the same data collection sheets, teachers/practitioners are able to track a learner's use of the target skill/behavior before and after a token economy program is implemented. The following data collection sheets provide examples of how teachers/practitioners can use these data sheets before, during, and after intervention.

Date				Before, during, or after				
	9:00	9:05	9:10	9:15	9:20	9:25	Total	reinforcement
7/26/08	X		X				2	Before
7/27/08	X	X					2	Before
7/28/08	X	X		X		X	4	Before
7/29/08		X	X	X		X	4	Before
7/30/08	X	X	X	X	X		5	During
7/31/08	X		X	X	X	X	5	During
8/01/08	X	X	X	X	X	X	6	During

Table 27. Example of Time Sampling Data Collection Sheet

T-1-1- 00	—		0	D - 1 -		01
Table 28.	Example	DIEvent	Sampling	Data	Collection	Sneet

Date	Takes toy from peer	Total	Before, during, or after reinforcement
7/26/08	X	1	Before
7/27/08	X	1	Before
7/28/08	X	1	Before
7/29/08	XXX	3	Before
7/30/08	XX	2	During
7/31/08	XXX	3	During
8/01/08	XXXX	4	During

Table 29 displays a list of potential problems and solutions when using token economy programs.

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Problem	Description	Solution
Unequal pricing of reinforcers	This happens when reinforcers are priced too low allowing learners to earn many reinforcers in a short period of time. Alternatively, reinforcers can be priced too high, resulting in learners giving up.	Role play with learner to demonstrate the details of the program. For example, a teacher might role play how to "save" tokens to get a higher priced item.
Token hoarding	Learners may accumulate large numbers of tokens and assume that they do not have to use the target skill/behavior or behave appropriately until the tokens run out. Hoarding may also result in a learner purchasing a large number of reinforcers in one day.	 Place expiration dates on tokens Have a reinforcer sale in which all items are placed at a lower cost. This may decrease a learner's desire to hoard tokens.
Behavior deteriorates after fading tokens	May be a result of fading tokens too quickly	 Go back to a brief period of continuous reinforcement and then try a smaller ratio to fade tokens (e.g., every two or three hand raises to get a token) Provide praise when giving a token Immediately reward behavior with token Offer opportunities to exchange tokens more frequently at the beginning of the program

Table 29. Potential Problems and Solutions

References

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Steps for Implementation: Negative Reinforcement

Neitzel, J. (2009). *Steps for implementation: Negative 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 is an evidence-based practice used to increase appropriate behavior and teach new skills (e.g., replacement behavior in place of an interfering behavior). This document outlines the steps for implementing negative reinforcement with learners with ASD. *Negative reinforcement* is the removal of a stimulus (i.e., something that is aversive to the learner) after a learner with ASD uses a target skill/behavior or skill. When used effectively, negative reinforcement increases a learner's use and/or maintenance of the target skill/behavior (Alberto & Troutman, 1999; Zirpoli, 2005). *It is important to note that negative reinforcement is not the same as punishment. The difference between the two is that negative reinforcement is used to increase the target skill/behavior, whereas punishment is used to decrease a behavior.* Negative reinforcement is used to teach self-help skills and replacement behaviors to take the place of interfering behaviors (e.g., repetitive, stereotypical, disruptive). Negative reinforcement is often used only after other reinforcement strategies, such as positive reinforcement and differential reinforcement, have not been effective in increasing the target skill/behavior.

When planning for and implementing negative reinforcement with learners with ASD, the following steps are recommended.

Negative Reinforcement

Step 1. Identifying the Target skill/Behavior

In Step 1, teachers/practitioners identify a target skill/behavior for a learner with ASD that they would like to increase.

1. Teachers/practitioners define the target skill/behavior in observable and measurable terms.

The following are examples of target skills/behaviors that could be addressed using negative reinforcement.

Example: Taylor will take five bites of food at meals before leaving the table.

Describing the target skill/behavior in measurable and observable terms allows teachers and other practitioners to collect accurate and reliable baseline data, remove reinforcement when the learner uses the target skill/behavior correctly, and ensures that all staff members understand what the target skill/behavior looks like so that reinforcement can be removed consistently across classes and activities.

Step 2. Collecting Baseline Data

Once the target skill/behavior is identified, teachers/practitioners collect baseline data to determine how often the learner with ASD is currently using the target skill/behavior.

- 1. Teachers/practitioners measure a learner's use of the target skill/behavior before implementing negative reinforcement by collecting one of the following:
 - a. frequency data. Frequency data measures how often a learner engages in a particular behavior. Two methods are used to collect frequency data: time sampling and event sampling. With time sampling, data on a particular behavior are collected after a certain amount of time (e.g., every five minutes). If a learner is engaging in the behavior at that time, then teachers/practitioners record this on the data sheet. This sampling technique is best used to monitor high frequency behaviors such as drooling and staying seated during class. Event sampling is used to record every instance of the behavior and typically focuses on low frequency behaviors such as taking a bite of food, hitting, and using the toilet. Both sampling techniques are used to evaluate patterns of learners' behavior over a period of days or weeks. Tables 11 and 12 provide examples of both frequency data collection methods.

Date				Before, during, or after				
	9:00	9:05	9:10	9:15	9:20	9:25	Total	reinforcement
7/26/08	X		X				2	Before
7/27/08	X	X					2	Before
7/28/08	X	X		X		X	4	Before
7/29/08		X	X	X		X	4	Before

Table 11. Example of Time Sampling Data Collection Sheet

Table 12. Example of Event Sampling Data Collection Sheet

Date	Takes toy from peer	Total	Before, during, or after reinforcement
7/26/08	X	1	Before
7/27/08	X	1	Before
7/28/08	X	1	Before
7/29/08	XXX	3	Before

 b. duration data. Duration data are used to record how long a learner engages in a particular behavior. For example, a teacher might collect data on how long a learner with ASD stays in his seat or how long a young child stays engaged in parallel play. Table 9 provides an example of a duration data collection sheet.

Table 15. Example of Duration Data Concetton Oncettor Otaying on Task

Date	Start time	End Time	Total minutes	Setting/activity	Before, during, or after reinforcement
7/26/08	9:00	9:01	1	Reading	Before
7/27/08	9:05	9:06	1	Math	Before
7/28/08	9:00	9:02	2	Science	Before
7/29/08	9:10	9:12	2	Resource room	Before

Baseline data give teachers/practitioners a starting point from which they can evaluate whether the target skill/behavior increases as a result of negative reinforcement.

- 2. Teachers/practitioners collect baseline data for a minimum of four days before implementing negative reinforcement.
- 3. Teachers/practitioners collect baseline data in numerous settings and/or activities.

It often is useful to have more than one practitioner collect baseline data over the course of several days to compare findings. Also, by collecting data over the course of several days in multiple settings, teachers/practitioners can potentially recognize patterns of behavior. For example, does the learner use the target skill/behavior more often in one setting than another? This kind of information helps teachers/practitioners identify activities or settings where reinforcement can be used to increase the target skill/behavior.

Step 3. Establishing Program Goals and Performance Criteria

In Step 3, teachers/practitioners identify goals for the target skill/behavior and determine what criteria will be used to evaluate whether negative reinforcement is effective.

1. Teachers/practitioners establish a program goal for each target skill/behavior that is age and developmentally appropriate for the learner with ASD.

The following are examples of program goals for learners with ASD.

Example: Taylor will take five bites of food before leaving the table at meal times.

Example: Mike will trace his name five times each day without adult assistance.

Performance criteria also are established for each target skill/behavior so that teachers/practitioners can monitor learner progress and adjust/fade negative reinforcement as learners acquire target skills/behaviors. The initial criterion should be easily attained so that the learner is successful without much effort and acquires the identified reinforcer more easily. This also helps the learner establish a clear connection between the target skill/behavior and subsequent reinforcement. For example, a teacher might decide that an initial criterion for "taking five bites of food" is one bite of food for three consecutive days. The teacher would then collect frequency data to monitor learner progress. When the learner with ASD meets this criterion, the teacher gradually increases the number of bites the learner must take until the program goal is acquired.

2. Teachers/practitioners establish at least three different performance criteria for each program goal to monitor learner progress.

The following table outlines a program goal and performance criteria developed for a learner with ASD.

Program Goal: Taylor will take five bites of food before leaving the table at meal times.					
Performance Criterion	Behavior				
Phase 1	Taylor will take one bite of food before leaving the table for three consecutive days.				
Phase 2	Taylor will take two bites of food before leaving the table for three consecutive days.				
Phase 3	Taylor will take five bites of food before leaving the table every day.				

Table 14. Example of Program Goal and Performance Criteria

Step 4. Identifying Negative Reinforcers

In Step 4, teachers/practitioners identify activities, events, or items that are mildly aversive and can be used as negative reinforcers for learners with ASD. It is important to note that mildly aversive stimuli often occur naturally in the environment and do not cause harm to learners with ASD. For example, a learner with ASD may be bothered by bright lights in a classroom or a non-preferred activity. When using negative reinforcement, identification of mildly aversive stimuli for individual learners is imperative because learning will not take place unless they are motivated to use the target skill/behavior to get rid of the aversive stimulus that is serving as the negative reinforcer. When beginning a negative reinforcement program, teachers/practitioners conduct a negative reinforcement assessment of preferred and nonpreferred activities and items. Through this process, teachers/practitioners identify negative reinforcers that can be used during teaching activities.

- 1. Teachers/practitioners conduct a negative reinforcement assessment that identifies preferred/nonpreferred:
 - a. Activities, events, and
 - b. items.

To identify preferred and nonpreferred activities and items, teachers practitioners identify the types of activities that produce positive and negative reactions in the learner with ASD.

- 2. To identify preferred/nonpreferred activities, teachers/practitioners:
 - a. select a variety of daily activities that are demanding for the learner (e.g., washing hands, turning on water faucet, buttoning shirt, writing name, staying seated) and say to the learner, "(Learner's name), time to (activity)."
 - b. wait 15 seconds for the learner to initiate engagement in the activity.
 - c. repeat the instructions if the learner does not begin the activity, waiting an additional 15 seconds until the learner initiates the activity, makes evasive movements/negative vocalizations (e.g., turning away, physically resisting, crying, screaming, dropping to the floor, yelling), or engages in interfering behaviors (e.g., self-injury, aggression, disruption, trying to leave).
 - d. allow the learner to leave the activity if he/she makes evasive movements/negative vocalizations or engages in interfering behaviors.
- 3. To identify preferred/nonpreferred items, teachers/practitioners:
 - a. select a variety of classroom items and objects (e.g., computer, comic books, squishy ball, pencils) and say to the learner, "Here, <u>(learner's name)</u>" while handing the object to the learner.
 - b. wait 15 seconds for the learner to take the item.
 - c. repeat the instructions if the learner does not take the item, waiting an additional 15 second, until the learner takes the item, makes evasive movements/negative vocalizations (e.g., turning away, physically resisting, crying, screaming, dropping to

the floor, yelling), or engages in interfering behaviors (e.g., self-injury, aggression, disruption, trying to leave).

- d. take the item away if he/she makes evasive movements/negative vocalizations or engages in interfering behaviors.
- e. observe if the behavior decreases when the aversive event is removed.

Table 15 provides an example data collection sheet that can be used when conducting a negative reinforcement assessment.

Table 15. Example of I	Data Collection Sheet for	r Negative Reinforcemer	nt Assessments
		5	

Activity/Item	Positive Response	Negative Response
Asked to wash tables		Started screaming and pulling her hair
Offered a comic book	Smiled and took book	
Asked to sweep floor		Started yelling "No way"

With preferred activities/items, the learner initiates engagement with them without making evasive movements/negative vocalizations or engaging in interfering behaviors. On the other hand, if the learner engages in an interfering behavior or makes evasive movements/negative vocalizations with a particular activity/item, it would be identified as nonpreferred. Nonpreferred activities/items can then be used as potential negative reinforcers during teaching activities that focus on the learner's use of the target skill/behavior or skill (Reichle, Drager, & Davis, 2002; Zarcone, Crosland, Fisher, Worsdell, & Herman, 1999). Table 16 provides a list of potential items and activities that could be used during a negative reinforcement assessment.

	Activities	Items
•	Doing self-care tasks (e.g., brushing teeth, toileting)	Squishy ball
•	Doing school work (e.g., completing math problems, writing name, taking part in social skills group)	Pencil and paper
•	Doing work around the classroom (e.g., sweeping, erasing the board, handing out papers)	Play dough
•	Transitioning from one activity to another (e.g., going to gym class, walking the halls)	Computer
•	Work that requires a lot of steps or demands	Rocking chair
•	Remaining in seat for a long period	Comic books
•	Remaining in area that is noisy and/or crowded	Hand lotion

 Table 16. Potential Activities and Items for a Negative Reinforcement Assessment

Adapted from Zarcone, Crosland, Fisher, Worsdell, & Herman (1999)

Step 5. Selecting Instructions

When using negative reinforcement, teachers/practitioners select appropriate instructions that signal the learner with ASD to use the target skill/behavior.

- 1. Teachers/practitioners select one of the following types of instruction to begin the teaching activity:
 - *a. Pictorial.* Presenting the learner with a picture depicting the target skill (e.g., person sitting in his seat raising his hand),

Example of pictorial instruction



When using pictorial instructions, teachers/practitioners also verbally state the instructions for the learner with ASD. For example, the teacher would say, "Stay in seat. Raise hand." while presenting the learner with the picture card.

b. Written. Providing the learner with written instructions telling him to use the target skill/behavior, or

Example of written instruction

When you stay in your chair until you are finished, you can leave.

c. Verbal. Verbally telling the learner what is expected of him/her (e.g., staying seated until work is completed, taking a bite of food before leaving the table)

Example of verbal instruction: "You have to stay at the table until you take a bite."

Instructions should be clear, complete, specific, and aimed at learners' skill and interest levels. When providing instructions, teachers/practitioners also should ensure that the information conveys the following information: "If you want X, then you have to Y." In the written instruction above, for example, it essentially tells the learner with ASD than if he wants to leave his seat, he needs to finish his work. When learners understand that there is going to be a reinforcer for completing something unpleasant, they will be more likely to finish the task.

Step 6. Implementing Negative Reinforcement

In Step 6, teachers/practitioners implement negative reinforcement by providing the identified instructions to the learner with ASD while simultaneously delivering the negative reinforcer.

Teachers/practitioners do not remove the negative reinforcer until the learner with ASD uses the target skill or behavior.

- 1. Teachers/practitioners use one of the following types of instructions to cue the learner to use the target skill/behavior:
 - a. pictorial,
 - b. written, or
 - c. verbal.

Example: Teacher says to a learner with ASD, "You must stay in your seat until you finish five math problems" when the learner sits down in his chair at the beginning of individual work time.

Example: Teacher presents a picture showing a child taking a bite of food to the learner with ASD while saying, "Stay at table. Take a bite."

Example: Teacher hands a broom to the learner with ASD while saying, "No yelling. Ask for break."

2. Teachers/practitioners simultaneously deliver the identified negative reinforcer with the instructions.

Example: When a learner sits down in his seat for individualized instruction, the practitioner says, "You must stay in your seat until you finish five math problems."

In this instance, finishing five math problems is the target skill/behavior and the negative reinforcer is being allowed to leave after completing his work.

Example: A young child with ASD sits down at the table for snack time. The teacher says, "Stay at table. Take a bite" while pointing to the food on the learner's plate.

In this example, the target skill/behavior is to stay at the table and take a bite of the food. The negative reinforcer is being allowed to leave after eating snack.

Example: A teacher hands the learner with ASD a broom and says, "Sweep floor without yelling. Ask for break."

In this example, the target skill/behavior is to ask for a break. Getting a break after asking for it is the negative reinforcer.

3. If the learner uses the target skill/behavior, teachers/practitioners immediately remove the negative reinforcer.

Example: The learner with ASD raises her hand instead of talking out in class (target skill/behavior). At the end of the five minutes, the teacher removes the negative reinforcer (i.e., staying seated) and tells the learner she can take a break.

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Example: A young child with ASD takes a bite of food on his plate (target skill/behavior). As soon as the learner takes a bite, the teacher removes the negative reinforcer (i.e., sitting at the table) and says, "All done."

Example: The learner with ASD asks for a break (target skill/behavior) while sweeping the floor (negative reinforcer). The teacher immediately allows her to take a break.

4. If the learner with ASD does not use the target skill/behavior or engages in the interfering behavior, teachers/practitioners ignore the interfering behavior, repeat the instructions, and do *not* remove the identified negative reinforcer.

Example: A young child with ASD tries to leave the snack table without taking a bite of food. The teacher redirects the child back to his seat and repeats the instructions, "Stay at table. Take a bite."

Example: The learner with ASD tries to leave his seat before he has completed five math problems. The practitioner directs him back to his seat and says, "You must stay in your seat until you finish five math problems."

If the learner with ASD uses the target skill/behavior/behavior, teachers/practitioners immediately remove the negative reinforcer. If the learner with ASD does not use the target skill/behavior/behavior or begins engaging in an interfering behavior, teachers/practitioners repeat the instructions and do not remove the identified negative reinforcer until the learner with ASD uses the target skill/behavior/behavior. Extinction, another evidence-based strategy, is often used in conjunction with negative reinforcement when learners engage in interfering behavior while still placing demands on the learner with ASD to use the target skill/behavior. For example, a learner with ASD might start screaming while sweeping the floor instead of asking for a break. The teacher would repeat the instructions, "Sweep floor without yelling. Ask for break" while still requiring the learner with ASD to sweep the floor. The negative reinforce (i.e., sweeping the floor) is not removed until the learner uses the target skill/behavior (i.e., asking for a break). Please access the *Extinction Brief* to learn more about this practice and how to use it in classrooms and other settings.

Step 7. Monitoring Learner Progress

In Step 7, teachers/practitioners monitor learner progress so that negative reinforcement can be faded to promote generalization and maintenance of skills.

1. Teachers/practitioners use progress monitoring data to determine the learner's mastery of the target skill/behavior.

The same data collection sheets that were used to collect baseline data can be used to track learner progress.

2. As learners with ASD meet performance criteria for a target skill/behavior, teachers/practitioners fade the use of negative reinforcement.

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This is often accomplished by increasing the performance criteria for a target skill/behavior (see Step 3). For example, the teacher could gradually increase the amount of time that the learner sweeps the floor before a break is granted. Alternatively, a teacher could increase the number of bites of food the learner with ASD must take or the number of math problems that the learner with ASD must complete before being allowed to leave the table.

3. Teachers/practitioners use progress monitoring data to adjust reinforcement strategies if the target skill/behavior does not increase.

If a target skill/behavior is not increasing, teachers/practitioners must try to identify potential reasons for this. The following questions may be helpful during this problem-solving process.

- Is the target skill/behavior well defined? That is, is it observable and measurable?
- Are there too many reinforcers?
- Are there too few reinforcers?
- Are the reinforcers aversive enough that the learner with ASD wants to get rid of them?
- Are all staff using reinforcement in a consistent manner?

The same data collection sheets that were used before the intervention began are used to monitor learner progress. By using the same data collection sheets, teachers/practitioners are able to track a learner's use of the target skill/behavior before and after negative reinforcement is implemented. The following tables provide examples of how teachers/practitioners can use these data sheets before, during, and after intervention.

Date				Before, during, or after				
	9:00	9:05	9:10	9:15	9:20	9:25	Total	reinforcement
7/26/08	X		X				2	Before
7/27/08	X	X					2	Before
7/28/08	X	X		X		X	4	Before
7/29/08		X	X	X		X	4	Before
7/30/08	X	X	X	X	X		5	During
7/31/08	X		X	X	X	X	5	During
8/01/08	X	X	X	X	X	X	6	During

 Table 17. Example of Time Sampling Data Collection Sheet

Table 1	8. Exam	ple of Ev	ent Sam	pling Data	a Collection	Sheet

Date	Takes toy from peer	Total	Before, during, or after reinforcement
7/26/08	X	1	Before
7/27/08	X	1	Before
7/28/08	X	1	Before
7/29/08	XXX	3	Before
7/30/08	XX	2	During

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7/31/08	XXX	3	During
8/01/08	XXXX	4	During

Table 19. Example of Duration Data Collection Sheet for "Staying on Task"

Date	Start time	End Time	Total minutes	Setting/activity	Before, during, or after reinforcement
7/26/08	9:00	9:01	1	Reading	Before
7/27/08	9:05	9:06	1	Math	Before
7/28/08	9:00	9:02	2	Science	Before
7/29/08	9:10	9:12	2	Resource room	Before
7/30/08	9:10	9:14	4	Science	During
7/31/08	9:15	9:20	5	Resource room	During
8/01/08	9:05	9:10	5	Reading	During

References

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Implementation Checklist for Positive Reinforcement

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

Instructions: The Implementation Checklist includes each step in the process of implementing positive reinforcement. Please complete all of the requested information including the site and state, individual being observed, and the learner's initials. To assure that a practice is being implemented as intended, an observation is *always* preferable. This may not always be possible. Thus, items may be scored based on observations with the implementer, discussions and/or record review as appropriate. Within the table, record a 2 (implemented), 1 (partially implemented), 0 (did not implement), or NA (not applicable) next to each step observed to indicate to what extent the step was implemented/addressed during your observation. Use the last page of the checklist to record the target skill, your comments, whether others were present, and plans for next steps for each observation.

Site:	State:
Individual(s) Observed:	Loarpor's Initials:

Skills below can be implemented by a practitioner, parent, or other team member

	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Planning (St			- 6)						
			,						
Step 1. Identifying the Ta	raet								
Skill/Behavior				Sco	re**				
1. Define the target skill/beha	vior in observable								
and measurable terms.									
Step 2. Collecting Baselin	ne Data		1	1	1	1	1	1	1
1. Measure a learner's use of	f the target								
skill/behavior before imple	menting								
reinforcement by collecting	one of the								
following:									
Tonowing.									
a frequency data or									
a. Trequency data of									
h duration data									
b. duration data.									

** Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8
		Date								
		Observer's Initials								
2.	Collect baseline data for a n	ninimum of four								
da	ys before implementing rein	forcement.								
3.	Collect baseline data in num	nerous settings								
an	d/or activities.									
St	ep 3. Establishing Prog Performance Crite	ram Goals and ria				Sco	re**			
 Establish a program goal for each target skill/behavior that is age and developmentally appropriate for the learner with ASD. 										
2.	2. Establish at least three different performance criteria for each program goal to monitor learner progress.									
St	ep 4. Identifying Positiv	e Reinforcers								
1.	Consider the age of the lea	arner with ASD.								
2.	Consider the target skill/be reinforcers that could be us skill.	havior and natural sed to teach the								
3.	Observe the learner with A settings and identify:	SD in natural								
	a. activities, objects, and selects when allowed for	foods the learner ree choice.								
	 b. phrases and gestures t produce a pleasant res learner with ASD. 	hat seem to ponse from the								
4.	Identify potential reinforcer learner what he/she would appropriate).	s by asking the like to work for (if								
5.	Identify potential reinforcer parents and other staff to id that have worked in the par	s by interviewing dentify reinforcers st.								
6.	Identify potential reinforcer reinforcer sampling.									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8
		Date Observaria Initiale								
Ct.	en 4. Identifising Deciti	Observer's initials								
30	(cont.)	e Reinforcers				Sco	re**			
7.	Complete a reinforcer chec	klist to identify								
	potential reinforcers.									
St	Step 5. Creating a Reinforcer Menu			-		-			-	
1. Create a menu of possible reinforcers for a										
	learner with ASD listed by	name (if the								
	learner with ASD can read) or by picture.								
2.	Allow the learner with ASD	to select a								
	desired object, activity, or f	food from the								
	reinforcer menu before or a	after the activity								
	begins.									
Step 6 Selecting a Schedule of				l	[l	[[l	
	Reinforcement									
1.	Select continuous reinforce	ement when a								
	learner with ASD is first lea	arning a target								
	skill/behavior.									
2	Solact on intermittant rainf	orcomont								
۷.	schedule when a learner w	vith ASD has met								
	the initial performance crite	erion for the target								
	skill/behavior (see Step 3).	show of the target								
		Intervention (S	Step 7	7 – 8))					
St	ep 7. Implementing Cor	ntinuous								
	Reinforcement									
1.	Immediately deliver reinfor	cement each time								
	the learner with ASD uses	the target								
	skill/behavior.									
2 Describe the target skill/behavior after the										
	learner uses it correctly.									
3.	3. Deliver identified reinforcers only when the									
learner with ASD uses the target										
	skill/behavior.									
1			1	1	1	1	1	1	1	

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8
		Date Observorie Initiale								
Ct.	on 7 Implementing Cor									
30	ep 7. Implementing Cor Reinforcement (co	nnuous ant)				Sco	ro**			
4.	Provide small amounts of t reinforcer after the learner the target skill/behavior.	he identified with ASD uses								
5.	 Pair activity or material reinforcers (e.g., tangible, activity, sensory) with social reinforcement (e.g., praise). 									
6.	 When using primary reinforcers (e.g., food, drink), also deliver a secondary reinforcer (e.g., praise, sticker, computer time). 									
St	ep 8. Preventing Satiati	on								
1.	 Vary reinforcers for a target skill/behavior or use a different reinforcer for each target skill/behavior. 									
2.	Teach the target skill/beha several short instructional	vior during sessions.								
3.	Avoid using edible reinforc be used, teachers/practitio minimally and offer a varie	ers. If they must ners use ty.								
4.	Shift from using primary to reinforcers as soon as pos	secondary sible.								
5.	5. If satiation does occur, start using a different reinforcer.									
	Progress Monitoring (Step 9)									
Step 9. Monitoring Learner Progress										
1.	Use progress monitoring d the learner's mastery of the skill/behavior.	tode	diel	not im-		041 N/A			hla	

Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8
		Date								
		Observer's Initials								
St	Step 9. Monitoring Learner Progress									
	(cont.)	-				Sco	re**			
2.	As learners with ASD mee criterion for a target skill/be from a continuous reinforce intermittent schedules of re	t performance havior, move ement schedule to einforcement.								
3. Use progress monitoring data to adjust reinforcement strategies if the target skill/behavior is not increasing.										

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
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Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Dato	Obsorvor	Target Skill/Rehavior Comments and Plans for Next Stops
Date	Initials	Target Skill/Benavior, Comments, and Flans for Next Steps

Implementation Checklist for Token Economy Programs

Neitzel, J. (2009). *Implementation checklist for token economy programs*. Chapel Hill, NC: The National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, University of North Carolina.

Instructions: The Implementation Checklist includes each step for implementing token economy programs. Please complete all of the requested information including the site and state, individual being observed, and the learner's initials. To assure that a practice is being implemented as intended, an observation is *always* preferable. This may not always be possible. Thus, items may be scored based on observations with the implementer, discussions and/or record review as appropriate. Within the table, record a 2 (implemented), 1 (partially implemented), 0 (did not implement), or NA (not applicable) next to each step observed to indicate to what extent the step was implemented/addressed during your observation. Use the last page of the checklist to record the target skill, your comments, whether others were present, and plans for next steps for each observation.

Individual(s) Observed: _____ Learner's Initials: _____

Skills below can be implemented by a practitioner, parent, or other team member

		Observation	1	2	3	4	5	6	7	8
		Date								
		Observer's Initials								
		Planning (Ste	eps 1	- 5)						
St	ep 1. Identifying the Targ									
	Skill/Behavior					Sco	ore**			
1.	1. Define the target skill/behavior in observable									
	and measurable terms.									
Step 2. Collecting Baseline Data				•			•	•	•	•
1.	1. Measure a learner's use of the target									
	skill/behavior before impleme	enting a token								
	economy program by collect	ing one of the								
	following:	0								
	a. frequency data or									
	h duration data									
2	2 Collect baseline data for a minimum of four									
2.	days before implementing a token economy									
	program									
2	program.									
3.	3. Collect baseline data in numerous settings									
	and/or activities.									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation				
		Date				
		Observer's Initials				
St	ep 3. Identifying Reinfo	orcers				•
1.	Consider the age of the le	arner with ASD.				
2. Observe the learner in natural settings and identify activities, objects, and foods that the learner selects when allowed free choice.						
3. Identify potential reinforcers by asking the learner what he/she would like to work for (if appropriate).						
4. Identify potential reinforcers by interviewing parents and others to identify reinforcers that have worked in the past.						
5.	Identify potential reinforce reinforcer sampling.	rs by conducting a				
6.	Complete a reinforcer che potential reinforcers.	cklist to identify				
St	ep 4. Creating a Reinfo	rcer Menu				
1.	Create a menu of possible by name or by picture for learner with ASD.	e reinforcers listed an individual				
St	ep 5. Establishing a To System	ken Economy				
1.	Identify tokens that are:					
	a. attractive,					
	b. easy to carry, and					
	c. easy to dispense.					

** Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8
		Date								
		Observer's Initials								
Ste	ep 5. Establishing a To	oken Economy				500	ro**			
2	The identified token is a	ao ond				300				
Ζ.	dovelopmentally appropri	ye anu riata far tha								
	icamer with tob.									
3.	Set up a system for exch	anging tokens								
	that includes:									
	a. "a bank" to keep track	of tokens earned								
	and spent,									
	b. a time and place for p	ourchasing								
	reinforcers from the re	einforcer menu,								
	and									
	c. the monetary value of each item on the									
	reinforcer menu.	Intorvontio	n /C4	on 6)						
C+	on 6 Implementing a T	Takan		ep 0)	_	_	_	_	_	_
30	Economy Progra	m								
1.	Clearly describe to learne	ers with ASD:								
	a the target skill/behavi	or								
	a. The target shill/benavi	01,								
	b. how the token econor	ny program								
	works. and	ny program								
	,									
	c. how many tokens are	required before								
	receiving an item fron	n the reinforcer								
	menu.									
2.	Teachers/practitioners dis	splay the rules for								
earning and exchanging tokens.										
3. When first starting the token economy										
	program, immediately provide a token to									
	skill/bebayior is displayed	i une tre target								
	skiii/benavior is uispiayed									

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8
		Date								
•		Observer's Initials								
St	ep 6. Implementing a I	oken				_				
	Economy Program (co	ont.)		1	•	Sco	pre**	•		
4.	Describe the target skill/be	ehavior after the								
	learner uses it correctly.									
5	Pair aiving the taken to th	e learner with								
0.	ASD with social reinforcer	ment								
		nom.								
6.	Allow the learner with ASI	D to select a								
	desired object, activity, or	food from the								
	reinforcer menu when the	designated								
	number of tokens has bee	en acquired.								
7.	Make adjustments to a lea	arner's reinforcer								
	menu to maintain motivati	ion.								
0	Poward the target skill/be	bayior								
0.	consistently across setting	ne								
		yo.								
9.	Fade the use of tokens as	the learner								
	starts using the target skil	l/behavior								
	independently.									
		Progress Moni	toring	g (Ste	ep 7)					
St	ep 7. Monitoring Learn	er Progress		1	1	1	1	1		
1.	Use progress monitoring of	data to determine								
	the learner's mastery of th	ne target								
	skill/behavior.									
2	Use progress monitoring (data to adjust the								
2.	program if problems arise or if the target									
	skill/behavior is not increa	isina.								
		5								

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Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
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Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Data	Observer	Terret Skill/Debavier Commente and Diene for Nevt Stand
Date	Initials	Target Skill/Benavior, Comments, and Plans for Next Steps

Implementation Checklist for Negative Reinforcement

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

Instructions: The Implementation Checklist includes each step for implementing negative reinforcement. Please complete all of the requested information including the site and state, individual being observed, and the learner's initials. To assure that a practice is being implemented as intended, an observation is *always* preferable. This may not always be possible. Thus, items may be scored based on observations with the implementer, discussions and/or record review as appropriate. Within the table, record a 2 (implemented), 1 (partially implemented), 0 (did not implemented/addressed during your observation. Use the last page of the checklist to record the target skill, your comments, whether others were present, and plans for next steps for each observation.

Site:	_ State:
Individual(s) Observed:	Learner's Initials:

Skills below can be implemented by a practitioner, parent, or other team member

		Observation			3	4	5	6	7	8
		Observer's Initials								
		Planning (Ste	eps 1	- 5)						
St	ep 1. Identifying the Tai Skill/Behavior	Score**								
1.	Define the target skill/beha observable and measurabl									
St	ep 2. Collecting Baselin	e Data								
1.	Measure a learner's use of skill/behavior before impler reinforcement by collecting following: a. frequency data or b. duration data.									
2.	Collect baseline data for a days before implementing reinforcement.									
3.	Collect baseline data in nu and/or activities.									

		Observation	1	2	3	4	5	6	7	8
		Date								
		Observer's Initials								
St	ep 3. Establishing Prog									
	Performance Crite	ria			1	Sco	re**	1	1	
1.	Establish a program goal fo	or each target								
	skill/behavior that is age an	id .								
	developmentally appropriat	te for the learner								
	with ASD.									
2	Establish at least three diffe	araat								
Ζ.	Establish at least three diffe									
	to monitor learner progress	sh program goar								
	to mornior learner progress	•								
St	en 4 Identifving Negativ	ve Reinforcers								
1	Conduct a negative reinford	cement								
•••	assessment that identifies it	preferred and								
	non-preferred:									
	a. activities and									
	b. items.									
2.	To identify preferred/non-pi	referred								
	activities, observe the learn	ner with ASD in								
	natural settings and:									
					1	1	1	1		[
	a. select a variety of daily	activities (e.g.,								
	wasning nands, turning	on water faucet,								
	buttoning shirt, writing r	hame, staying								
	"(Learner's name), time	teamer,								
	(Learner 5 name), time	$\frac{1}{10}$								
	b. wait 15 seconds for the	learner to								
	initiate engagement in t	he activity.								
		,, ,								

** Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

			1	2	3	4	5	6	7	8		
			Date									
Ctor		A Jalayatifu du au Nia wati										
(cont.)					Score**							
(с.	repeat the instructions	if the learner									
		does not begin the activ	vity, waiting an									
		additional 15 seconds u	until the learner									
		movements/negative v	ocalizations									
		(e.g., turning away, phy	sically resisting,									
		crying, screaming, drop	ping to the floor,									
		yelling) or engages in ir	nterfering									
		benaviors, and										
C	d.	allow the learner to leave	ve the activity if									
		he/she makes evasive	ocalizations or									
		engages in interfering b	behaviors (e.g.,									
		self-injury, aggression,	disruption).									
3. Identify preferred/non-preferred items												
é	a. select a variety of classroom items and											
		objects (e.g., computer	, comic books,									
		squishy ball, pencils) ai	nd say to the									
ľ	э.	wait 15 seconds for the	learner to take									
C	с.	repeat the instructions	if the learner									
		additional 15 second u	ntil the learner									
		takes the item or make	s evasive									
		movements/negative vo	ocalizations									
		(e.g., turning away, phy	vsically resisting,									
		behaviors (e.g. self-ini	ury aggression)									
-	4											
	J.	evasive movements/ne	aative									
		vocalizations or engage	es in interfering									
		behaviors.	C C									
e	э.	observe if the behavior	decreases when									
		the aversive event is re	moved.									

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	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Step 5. Selecting Instr	Score**								
 Select one of the follow instruction to begin the a. pictorial, 									
D. whiteh, of									
c. verbal									
	Interventior	ı (Ste	ep 6)						
Step 6. Implementing Reinforcement	Negative		1	1					
 Use one of the followin instructions to cue the target skill/behavior: a. pictorial, b. written, or c. verbal 	g types of learner to use the								
2. Simultaneously deliver reinforcer with the inst	the identified auctions.								
3. If the learner uses the immediately remove th	target skill/behavior, e negative reinforcer.								
 If the learner with ASD target skill/behavior or interfering behavior, ig behavior, repeat instru remove the identified r 			0 7)						
		(Step							
Step 7. Monitoring Lea	arner Progress		I						
 Use progress monitoring the learner's mastery of skill/behavior. 	ng data to determine f the target								

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

		Observation	1	2	3	4	5	6	7	8		
		Date										
		Observer's Initials										
St	ep 7. Monitoring Learne	er Progress										
(cont.)				Score**								
2.	 As learners with ASD meet performance criteria for a target skill/behavior, fade the use of negative reinforcement. 											
3.	 Use progress monitoring data to adjust reinforcement strategies if the target skill/behavior does not increase. 											

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
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Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer	Target Skill/Behavior Comments and Plans for Next Steps
Date	Initials	Target Okin/Denavior, Comments, and Thans for Next Oteps
Date	Observer Initials	Target Skill/Behavior, Comments, and Plans for Next Steps

Data Collection Sheets for Reinforcement

Time Sampling

		Time			
Date				Total	Before, during, or after reinforcement

Event Sampling

Date	Target behavior:	Total	Before, during, or after reinforcement

Duration

Date	Start time	End Time	Total minutes	Before, during, or after reinforcement

Reinforcement: Data Collection Sheet National Professional Development Center on ASD 10/2010