Chapter 6
Behavioral Terms and Principles

Abstract Many evidence-based interventions for addressing challenging behavior in young children utilize behavioral strategies. This chapter outlines key behavioral principles (e.g., reinforcement, punishment, schedules of reinforcement and punishment, extinction, imitation, shaping) that can be used to prevent and intervene with problem behaviors in young children.

Keywords Reinforcement (positive and negative) • Schedules of reinforcement • Punishment • Extinction • Imitation/modeling • Shaping • Time out • Social stories

There are a number of interventions designed for parents and providers to help young children exhibiting challenging behaviors. Many are behaviorally based, with the goal of increasing desired behaviors and reducing maladaptive behaviors. Behavioral principles incorporated into each of these programs have been shown to be effective in decreasing challenging behaviors and increasing desired behaviors. A solid understanding of behavioral principles will help professionals understand behavior and decide which intervention strategies are likely to be the most effective in modifying behavior. In addition, learning the common terminology will facilitate communication between professionals and caregivers. This chapter will describe the basic principles of behavior, including how behaviors are learned and maintained. Specifically, this chapter will outline the following behavioral principles:

- Reinforcement (positive and negative)
- Punishment
- Schedules of reinforcement and punishment
- Extinction
- Imitation/Modeling
- Shaping

Reinforcement

Reinforcement occurs when the consequences following a behavior increase the likelihood that the behavior will reoccur in the future. It is important to point out that reinforcement in the technical sense refers to anything that results in an increase in behavior. The reinforcement does not have to be something the adult believes will be reinforcing to the child. For example, a child may be reinforced for hitting their parent by the parent yelling at the child. Even though the parent intends their yelling to be a punishment, whether or not it is reinforcement is dependent on the effect it has on the child's behavior. If the child continues to hit after the parent has yelled at their child, the yelling is likely serving as reinforcement to the child.

Immediate reinforcement has the greatest effect on influencing a child's behavior. Research suggests that even a delay of 1 min before presenting the reinforcer may inadvertently reinforce another behavior (Malott & Suarez, 2004). This concept becomes very important to understand in instances when children have very brief occurrences of desired behavior, such as eye contact or communication. If reinforcement does not occur immediately a child may not understand what behavior is being reinforced.

Unconditioned reinforcers refer to those reinforcers which do not have to be learned and function similarly for all people. These reinforcers include food, water, warmth, and touch. Conditioned or learned reinforcers are those which become powerful through association with other reinforcers, and after the association is made, can function as a reinforcer. Learned reinforcers include tokens, money, points, etc., and can be used to shape desired behaviors. Reinforcers may also be classified as edible (snacks or bits of food), sensory (vibration or lights), tangible (trinkets or stickers), activity (play or special events), or social (attention; Cooper, Heron, & Heward, 2007). Attention is one of the key reinforcers for behavior in young children, and includes behaviors such as looking, smiling, patting, or praising. Reinforcers are as unique as people are. Therefore, it is useful to find out what children like before developing any intervention plan. Parents and caregivers can often tell you what their child likes the best, and in some cases, children can tell you. In the case of very young or nonverbal children, pictures can be used to help them choose reinforcers.

Parental attention (proximity, eye contact, words) can be a powerful reinforcer for young children, and can be used to strengthen many behaviors: the good, the bad, and the ugly. For example, if caregivers comfort a child when he has a tantrum, lay down with a child who repeatedly gets out of bed, or laugh when a child passes gas, their attention will reinforce the very behavior which the caregiver possibly does not want to see their child repeat. On the other hand, when caregivers praise a child for waiting her turn, compliment the child for sharing her toy, or notice when the child speaks in an inside voice, the attention will reinforce these behaviors which are more desirable, and increase the likelihood that the child will repeat the behavior in the future.

There are two types of reinforcement: positive reinforcement and negative reinforcement. *Both* lead to an increase of the behavior in the future. The "positive" refers to presenting or adding something following a behavior. An example of positive reinforcement is praising a child after she goes to the potty. Praise becomes a reinforcer for going the potty, and will increase the likelihood that the child will go to the potty in the future. Both positive and negative reinforcement are said to "strengthen the behavior," making the behavior more likely to occur in the future.

"Negative" refers to withdrawing or removing something aversive following a behavior, which reinforces the behavior. An example of negative reinforcement is turning off a vacuum to stop a child from screaming. Turning off the vacuum can be said to be negative reinforcement, because it may increase the child's screaming in the future to avoid aversive noises. Negative reinforcement provides the person with a sense of relief, making it more likely for the person to repeat the behavior under similar conditions in the future. Negative reinforcement is often confused with punishment, as both terms are associated with aversive conditions. However, negative reinforcement leads to an increase of future behavior (child's screaming stops mom's vacuuming, thereby teaching child that screaming stops the aversive noise), while punishment results in a decrease of behavior (mom spanks child to stop the child's screaming). Punishment will be discussed in more depth later in this chapter.

Negative reinforcement within parent–child interactions creates a response pattern that can lead to the development of oppositional and aggressive behavior. Patterson and his colleagues (1975, 1989) coined the term coercive process to describe such parent–child interactions in which attention is rarely provided for desired behavior, aversive exchanges increase, and discipline is inconsistent and becomes harsher over time. In the early stages of the coercive process, a parent may say to her child "no candy today" while in the grocery checkout line. The child whines, cries, and starts yelling, and mother feels everyone in the store looking at her and is embarrassed. Ultimately, the parent gives in, and allows the child to have the candy, avoiding any more embarrassment. In the end, reinforcement operates for both the child and parent. The child is reinforced for disruptive behavior by getting the candy, and the parent is relieved that everyone stops looking at her. When these interactions occur over time, the parent will become harsher towards the child, and the child will become even less compliant. A child may become quite adept at this pattern of behavior, and will interact like this with other adults such as teachers and coaches, as well as with peers.

Punishment

Punishment refers to any event that weakens a behavior, and reduces the likelihood that a behavior will occur in the future. Just as with reinforcement, punishment can be thought of as positive or negative, depending upon the change within the environment. An example of positive punishment is spanking a child following misbehavior. An example of negative punishment is time out following misbehavior,

Table 6.1 Relationship between reinforcement and punishment

Effect on behavior	Present a stimulus following the behavior	Withdraw a stimulus following a behavior
Strengthens behavior	Positive reinforcement	Negative reinforcement
	Reinforcement by adding a consequence	*Reinforcement by removing a consequence*
	Example: giving attention for sharing with another child	Example: turning off a loud appliance after a child screams
Weakens behavior	Positive punishment	Negative punishment
	Punishment by presenting a consequence	*Punishment by removing a consequence*
	Example: spanking a child is the consequence for stealing a toy	Example: aggression results in loss of attention

because a child is removed from the opportunity to receive attention. Similar to reinforcement, punishment is more effective in producing behavior change when it occurs immediately.

Like reinforcement, there are many types of punishment. What works best in suppressing the behavior depends to a great degree upon the individual's history, and the immediacy and intensity of the punisher. According to Cooper et al. (2007), when punishment is used, it should occur immediately and consistently after the problem behavior, and be supplemented by reinforcement of the desired behavior.

Punishers can include time out, loss of privileges, verbal reprimands, and anything else that follows a behavior and weakens it. What is important to remember about punishment is that sometimes punishment is effective in stopping an unwanted behavior. Used sparingly, saying "no" firmly to a young child may reduce unwanted behavior. However, punishment must be used selectively and carefully, in order to minimize undesired side effects. For example, caregivers who depend upon punishment (verbal reprimands, spanking, and time out) for discipline may find that they must become firmer and harsher to achieve the desired effects. In addition, punishment may stop a behavior, but does not teach the child the desired behavior. Therefore, whenever punishment is used as part of an intervention plan, it should *always* be paired with some strategy to encourage the desired behavior. Lastly, frequent use of punishment can create bad feelings between the caregiver and the child, and damage their relationship. Table 6.1 below displays the relationship between reinforcement and punishment.

Schedules of Reinforcement

Schedules of reinforcement (and punishment) refer to the timing of the event (reinforcer or punisher) following the behavior, and are important to consider when teaching children new skills and maintaining established behaviors. There are four basic schedules of reinforcement: Fixed interval, fixed ratio, variable ratio, and

variable interval, as well as more complicated schedules which are beyond the scope of this text. Interval schedules occur when the fact that the reinforcement or punishment is based on time, while ratio schedules are based on the number of responses needed for reinforcement. Fixed schedules are consistent, while variable schedules are unpredictable. With these definitions in mind, a variety of different scheduling types can be constructed. Fixed interval schedules are when the time requirement for reinforcement remains constant. Variable interval means that the timing of the reinforcement is random. Fixed ratio refers to a set number of responses which must occur before reinforcement. Variable ratio indicates that reinforcement will occur after a random number of behaviors.

There are different effects upon behavior and learning, depending upon the schedule of reinforcement. Continuous reinforcement (or reinforcement provided for each behavior) is more effective when teaching new behaviors, while intermittent reinforcement helps to make behaviors more durable and long-lasting. Interval schedules tend to produce low to moderate rates of response (Cooper et al., 2007). Fixed interval schedules often result in a pattern of response that picks up as the reinforcement is anticipated, and then drops off following reinforcement (imagine how productive that last few minutes are when a child has been asked to clean up all toys in 5 min). Fixed and variable ratio schedules often produce high rates of responding. Variable ratio schedules tend to produce a more consistent response than fixed ratio. In other words, if you don't know how many times you need to do something (e.g., how many stickers a child needs to earn) before being reinforced, you may be more likely to continue to respond at a steady rate.

Time Out

Time out is a form of punishment, which is used to reduce problem behavior by removal of the opportunity to receive attention or access to positive reinforcers for a specific amount of time. Time out is an effective disciplinary method for children between the ages of 3–12 years old, however time out is not recommended for use with younger or older children (McMahon & Forehand, 2003). The programs *Helping the Noncompliant Child* (McMahon & Forehand, 2003) and *Parent Child Interaction Therapy* (Eyberg, Nelson, & Boggs, 2008) have both designed specific time out sequences that parents and early childhood professionals can follow. Below we have provided some guidelines to follow when implementing time out.

Setting Up Time Out

Step 1: Decide which behaviors will result in time out. A rule of thumb is to use time out only for the most serious behaviors, including aggression and repeated noncompliance.

Step 2: Decide where time out will take place. The ideal time out locations are *boring spots* where the child cannot damage items and there is nothing of interest. Good places often include a hallway or the dining room. Time out places should never be scary (i.e., closets, bathrooms, rooms without lights).

Step 3: Make sure parents understand that they are NOT to engage with their child in any way during time out. We recommend the use of a timer to eliminate parent reinforcement.

Step 4: Teach the child about time out: why he must go there, where it will be, what behavior is expected, how long time out will last, and what happens after time out is over. If other children are in the home, make sure they understand that when someone is in time out they should be ignored.

Using Time Out

Time out typically works well for noncompliance or aggression. The following procedures should be followed immediately after observing aggression or after a second prompt to comply with an adult request is not followed. Early childhood professionals can teach parents and other caregivers these steps, and they may also use them in their own practice. Several other specific versions of a timeout sequence can be seen from Zisser and Eyberg (2010), or McMahon and Forehand (2003).

1. The caregiver should escort the child to the time out area.
2. The caregiver should give the child a brief explanation for why the child is being placed in time out ("You are going to timeout because you hit your brother") and a clear instruction for what they are to do ("Please sit quietly on the mat until I tell you that you can get up").
3. The caregiver should avoid arguing or discussing anything further with the child here, and should turn their attention away from the child.
4. The caregiver should keep track of the time that the child is in time out and follow the rules that they have set with the child in advance (e.g., that the child must be quiet while in time out, how long they need to stay there).
5. Based on what the offense was that landed the child in time out, the caregiver should address the child at the end of the time out by referring back to the issue (e.g., "are you ready to clean up your toys?" "are you ready to tell your brother you are sorry?").
6. If the child agrees and subsequently follows through, the child can return to playing.
7. If the child does not stay in the time out area, the caregiver should return the child to the time out area, reset the timer, and give the child a clear command to stay in the time out area until they say they can get up. This is repeated until child successfully completes time out.

Options for Younger Children

Since time out is generally used with children 3 or older, a modified or softened version of time out can be used with children under age 3. This procedure is more commonly used for children under 3 years old who have acted aggressively (not as frequently with noncompliance). After observing an aggressive act, a parent should:

1. Remove the child from the person they were aggressive with (to another part of the room or to another room).
2. Remove attention from the child who was aggressive but remain with them.
3. Wait until the child has calmed down before talking to them.
4. If appropriate and the child has the verbal skills, the child can be reintroduced back to the area and apologize to the child who received the aggression.
5. Play then returns to normal with praise for appropriate behaviors.

This adapted form of time out keeps other children safe and does not have expectations that are above and beyond a toddler's limits of ability (sit in the chair, stay by yourself). It can also prevent the child from developing poor strategies socially since aggressive behavior is not allowed to "pay off" because the child is removed from playmates and toys.

Extinction

Extinction refers to a process by which behavior is reduced or eliminated, because it is no longer being reinforced. Extinction involves systematically ignoring unwanted behavior that is maintained by attention, which gradually eliminates the behavior. If parental attention is thought to be maintaining the problem behavior, the caregiver can consistently ignore the child when he is engaging in the behavior, and it will eventually go away. This is referred to as "planned ignoring."

Problem behavior often gets worse before it gets better, which is referred to as an "extinction burst," and in the case of attention, the child's behavior may actually escalate to gain the parent's attention. Thus, the early childhood professional must provide fair warning that despite their hard efforts to ignore challenging behavior, their child's behavior is likely to get more difficult at first, and they must not give in to these demands. Caregivers can be informed that more challenging behavior may be a sign that the intervention is working. Consistency is key in any intervention to modify or extinguish unwanted behavior through planned ignoring. As with other punishments, positive reinforcement for desired behaviors helps children learn what behaviors are acceptable and which are not.

A related concept that uses extinction is the concept of differential attention. Differential attention combines extinction with reinforcement to quickly change a child's behavior. To use differential attention, a caregiver ignores all unwanted behaviors and provides praise and attention for behaviors that are desired. An

example would be when a child is playing in an inappropriate way (i.e., drawing and talking about poop being in the toilet), a parent using differential attention would ignore this behavior. As soon as the child begins to talk about or draw more appropriate objects (i.e., alligators in a lake) the parent would provide attention to the child, possibly saying, "What a great alligator! I love how you used so many colors to make him!"

One note for using extinction, planned ignoring, or differential attention is that these strategies should never be used with clearly aggressive behaviors. Aggressive behaviors should be addressed through redirection and sparing use of punishment.

Extinction: Differential Attention

Every time 5-year-old Lisa and her mother go to the grocery store, Lisa whines through the entire trip until her mother gives in and buys her candy. Lisa's mother cannot stand the whining and is embarrassed when other people look at her ill-behaved child. Lisa's mother decides to use differential attention to stop this behavior.

On the next visit, Lisa begins pleading for candy shortly after they enter the store. Lisa's mother ignores her behavior, and Lisa begins to whine louder and louder. Soon, Lisa is screaming and pulling things off the shelves as they go through the aisles. Lisa's mother calmly removes her child's hands for the shelf and guides her out of the store to their car. Lisa's mother was ready for the extinction burst, and she stays with her plan of ignoring Lisa's inappropriate behavior. She does not give in and buy Lisa candy.

Lisa's behavior is less disruptive the next time they go shopping, although she still whines, her mother continues to ignore her, and goes about shopping. Whenever Lisa does something positive, her mother praises her. After two more visits, Lisa has stopped whining, and is able to enjoy the shopping trip.

Imitation/Modeling

Imitation refers to the process of learning new behaviors through the observation of others. From the earliest stages of development, babies watch their caregivers and begin to imitate their behaviors. Just as with other behaviors, reinforcement strengthens the modeled behavior. Research has documented that modeling behaviors depends upon many variables, including how closely the child identifies with the model, how powerful the model appears to be, and whether the model is reinforced for the behavior (Bandura, 1977). Children with autism or other developmental disabilities may have difficulty naturally imitating others; however, they may be taught to do so, thus modeling can be used to teach new behaviors (Garfinkle & Schwartz, 2002).

Since caregivers are so influential to their children, they must be very careful not to model inappropriate behaviors, because their child is likely to behave in a similar fashion. For example, if a parent drops a cup, and then uses inappropriate language in front of a child, the child might also do the same. If the parent then says "Oh no!" and laughs, thereby reinforcing the behavior, the child is likely to repeat this behavior again. Also, modeling of behaviors does not stop with observing caregivers. Children will model behavior that they observe in other children, characters they see on television, and video characters.

Modeling and Imitation

Vincent is 5 years old and is watching his favorite TV show, Teenage Mutant Ninja Turtles. The show has four turtle characters that fight crime in the city through martial arts techniques. Later that week, Vincent is on the playground with a group of four boys. The boys decide that one child is their sworn villain and begin spin-kicking him and throwing "ninja stars" (sticks) at him. His friends cheer him as he spin kicks the villain.

This change in Vincent's behavior is best explained by imitation as he did not engage in these types of behaviors prior to watching the show. One event that strengthened the likelihood that these behaviors would be imitated is that the Teenage Mutant Ninja Turtles were often rewarded for their fighting actions. Secondly, Vincent's friends reinforce him for his actions.

Modeling can become a powerful teaching tool to develop children's social skills. Exposing young children to peers or siblings who are able to share, take turns, and use words to express themselves provides powerful examples of prosocial behavior. Modeling becomes even more influential if the model is reinforced for their good deeds, and if the child imitating this behavior is also reinforced. By clearly pointing out and reinforcing the peer's good choices, caregivers will discover that their child shortly demonstrates the same behavior, and should praise him or her.

Modeling and Imitation

Sean is 2 years old and is playing with his older sister, Alicia (age 5). Alicia is playing with one of her more interesting toys and sees her brother reach out for it. At that moment, Alicia gives the toy to Sean. Their father, having seen the entire interaction, praises Alicia saying, "Alicia! Thank you so much for sharing your toy with your brother!" He wishes to reinforce Alicia's good behavior and point out that this behavior is what he likes to see from both Alicia and Sean.

Later, Sean is playing with blocks with his sister. When his father comes around, he picks up a block and hands it to his sister saying, "Sharing!" Sean's father praises him for sharing with his sister.

Using Stories to Facilitate Imitation/Modeling in Novel Situations

Social stories are tools that can be used to teach children how to behave in situations that might be new to them, such as going to school, or for scenarios that they usually have difficulty with, such as going to the doctor's office. These stories can be particularly useful for children diagnosed with autism spectrum disorders (ASDs); however, they can be used effectively with any child. Social stories include both text and pictures and are written from the perspective of the child. The ratio of text and pictures is selected by the age and developmental level of the child. For example, younger children will need more pictures and less text than older children. Social stories typically include a mix of descriptive, perspective, and directive sentences. It has been recommended that a story should include 3–5 descriptive and perspective sentences for every directive (Gray et al., 1994).

After creating a social story, the story is shared with the child numerous times so that the child can learn the skills embedded within the story. The text essentially provides a model for the child to follow in a difficult situation. The text from a sample story appears in Fig. 6.1:
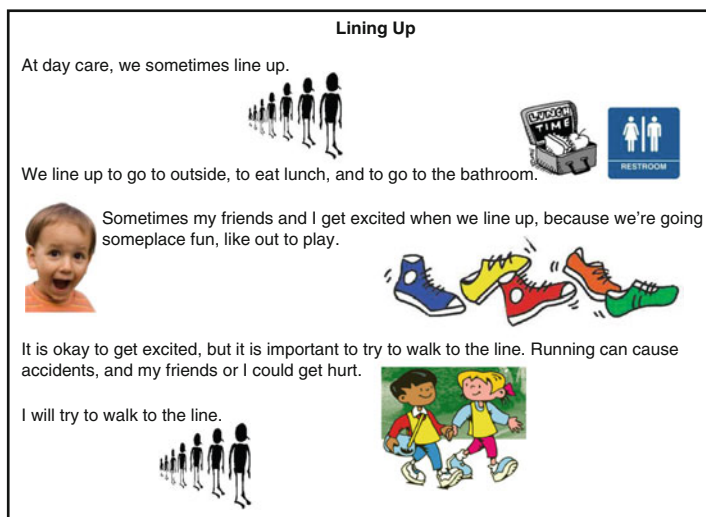
Lining Up

At day care, we sometimes line up.

We line up to go to outside, to eat lunch, and to go to the bathroom.

Sometimes my friends and I get excited when we line up, because we're going someplace fun, like out to play.

It is okay to get excited, but it is important to try to walk to the line. Running can cause accidents, and my friends or I could get hurt.

I will try to walk to the line.

Fig. 6.1 Sample social story

Shaping

Shaping refers to a process of setting a behavioral goal, then breaking down the goal into smaller, more attainable steps, and combining both positive reinforcement and ignoring to achieve the goal. This strategy is often used by teachers to develop skills that a child has not yet mastered, and ensures that the child will be have success with each step in the right direction.

An example of shaping the behavior of using words for requests would be to first show the child a desired object, such as a cookie, prompt the child to say "cookie," offer praise for approximations of the word, and reinforce the child by giving him the cookie. As the child becomes more proficient in requesting with one word, the demands are gradually be increased, so that the child is expected to eventually say "I want cookie please." The key to shaping behavior is having knowledge of which skills the child already possesses, understanding which steps are needed to reach the desired goal, and gradually increasing behavioral expectations towards the goal.

Shaping is a very helpful tool that allows parents and caregivers to help children attain behavioral goals by reinforcing the "baby steps" towards mastery. It is unrealistic to expect that a child will master a complicated behavior without first mastering the foundational skills, so the skills needed to reach the desired goal are broken down into easier to manage approximations, and progress is reinforced. Shaping is a teaching technique that utilizes all of the principles of reinforcement to reach the desired behavior.

Conclusions

Documented through years of careful research, the application of behavioral principles has been shown to improve human behavior and developmental outcomes. Early intervention professionals must acquire a solid understanding of behavioral principles, how they influence behavior, and how to use these strategies successfully in order to improve the lives of the children and families they serve. The next chapter will go into more detail on how to apply behavioral principles in everyday practice.

Assess Your Knowledge

1. After a child kicks the dog, his parents laugh. The child now kicks the dog daily. For the child, this is an example of:

   a. Positive punishment
   b. Positive reinforcement
   c. Negative punishment
   d. Negative reinforcement

2. A preschool teacher reports that they have "punished Johnny" for hitting his peers by having him sit in the corner. Johnny's hitting behavior has actually increased since this "punishment" has been implemented. Is having Johnny sit in the corner an effective punishment?

   a. Yes
   b. No
   c. Not enough information to tell

3. In the past, if Ethan threw a tantrum when his mom was running errands, she would immediately go home. Ethan's mom has decided to try to eliminate this behavior by ignoring the tantrum and continuing to run errands. She notices that the first time she tries this method, Ethan's tantrum is worse than usual. What is the term to describe this?

   a. Extinction
   b. Punishment
   c. Extinction burst
   d. Reinforcement

4. A therapist wishes to teach a child how to verbally ask for a snack instead of crying, and thinks about steps to reach this goal. Which behavioral methods would likely work well?

   a. Shaping
   b. Punishment
   c. Tertiary intervention
   d. Tantrums

5. When Jillian, a 3-year-old, comes to her parents' room at night crying, her parents let her sleep with them. For Jillian's parents, this is an example of:

   a. Positive reinforcement
   b. Negative reinforcement
   c. Shaping
   d. Extinction

6. How should you encourage a parent to extinguish a behavior such as whining?

   a. Encourage the parent to spank the child for whining
   b. Encourage the parent to consistently ignore the whining behavior and give the child attention for desired behavior
   c. Encourage the parent to ignore everything the child does
   d. Encourage the parent to tell the child to stop whining in a calm voice

7. Elizabeth is at day care where she sees another child climb up on the counter to get a snack. Later that evening, Elizabeth attempts to climb the cabinets in her family's kitchen. Elizabeth learned this behavior through:

   a. Shaping
   b. Imitation

   c. Extinction
   d. Reinforcement

8. Which schedule of reinforcement is recommended if a child is learning a new skill?

   a. Fixed interval
   b. Variable interval
   c. Intermittent
   d. Continuous

9. Social Stories apply which behavioral principle:

   a. Modeling & Imitation
   b. Extinction
   c. Punishment
   d. Negative Reinforcement

10. Time Out is not generally an effective strategy for children who are?

   a. Less than 2 years old
   b. 3–8 years old
   c. Wanting to escape an aversive situation
   d. Both a and c

Assess Your Knowledge Answers
1) b   2) b   3) c   4) a   5) b   6) b   7) b   8) d   9) a   10) d