# Chapter 12
# Reinforcement


***Topics Covered Within This Chapter***

| Topics |
|---|
| Categories of Reinforcers |
| Dimensions of Reinforcement |
| Schedules of Reinforcement |

Reinforcement is a fundamental principle within the field of behavior analysis. Although the term reinforcement has other meanings outside of the field of behavior analysis, within our field we define reinforcement as a consequence that makes future engagement in the response that preceded it more likely. Skinner describes reinforcement in this way; "Events that are found to be reinforcing are two sorts. Some reinforcements consist of presenting stimuli…These we call positive reinforcers. Others consist of removing something…These we call negative reinforcers. In both cases the effect of reinforcement is the same—the probability of response is increased." (Skinner, 1953, pp. 73). Within this chapter, we will primarily focus on positive reinforcement. The specific topics we will discuss within this chapter include categories of reinforcers, dimensions of reinforcement, and schedules of reinforcement.

## Categories of Reinforcers

There are several types of reinforcers including unconditioned, conditioned, automatic, social, edibles, activities, etc. We describe reinforcers according to learning history, delivery modality, and form.

**Supplementary Information** The online version contains supplementary material available at [https://doi.org/10.1007/978-3-031-09932-8_12].



T. N. Davis, J. S. Akers, *A Behavior Analyst's Guide to Supervising Fieldwork*,
https://doi.org/10.1007/978-3-031-09932-8_12

## *Learning History*

The first distinction between reinforcers that we will highlight is the impact of a learning history. *Unconditioned reinforcers* are stimulus changes that increase responding without a prior learning history (Cooper et al., 2020). That is, they naturally reinforce behavior that is beneficial for survival. Reinforcers such as food, escape from extreme temperatures, and physical contact do not require explicit pairing with other reinforcers to impact behavior. In contrast, *conditioned reinforcers* are stimulus changes that increase responding due to a history of pairing with other reinforcers (Cooper et al., 2020). For example, money does not function as a reinforcer for infants, rather over time money is paired with a variety of reinforcers and eventually functions as a reinforcer due to these pairings.

## *Delivery Modality*

The second distinction between reinforcers we will review is the delivery modality, specifically whether another person has control over when the reinforcer is delivered and withheld. *Socially mediated* contingencies are those that are controlled by another person. For example, another person can deliver attention or tangible items. In contrast, *automatic reinforcement* can be defined as contingencies that are not arranged by the social community. This describes instances in which the behavior itself results in reinforcement such as sensory stimulation. The distinction between socially mediated reinforcement and automatic reinforcement is commonly emphasized when referring to challenging behavior as the functional analysis can be used to determine whether behavior is maintained by social reinforcement or automatic reinforcement (see Chap. 9 for details). Despite the discussion focusing on challenging behavior, automatic reinforcement maintains both appropriate and inappropriate behavior. For example, Skinner describes automatic contingencies maintaining complex behavior such as perceiving and problem solving (Vaughan & Michael, 1982).

## *Form*

The third distinction between reinforcers is the form. That is, specifying the physical differences of the various reinforcers. *Edible reinforcers* are those that the individual can orally consume such as a cookie or a cracker. *Tangible reinforcers* are those with which the individual can physically interact such as a ball or a tablet. *Activity reinforcers* are those that include a behavior that can occur for an extended period of time such as playing a game or running around the track. *Social reinforcers* are those that include an interaction with another person such as a friend saying

"hi" or a parent smiling at a child. *Sensory reinforcers* are those that engage one of the five senses in a way that is pleasing such as smelling something that is pleasant or touching something soft.

## Dimensions of Reinforcement

We will now transition to the different dimensions or parameters of reinforcement. The primary dimensions of reinforcement include quality, immediacy, magnitude, and rate. These dimensions can be thought of as how good the reinforcer is (quality), how fast the reinforcer is coming (immediacy), how much of the reinforcer will be delivered (magnitude), and how often the reinforcer will be delivered (rate). These descriptions are not exhaustive, but for the purposes of this chapter they provide a good starting point. Stress to your supervisees the importance of accounting for all dimensions of reinforcement when arranging contingencies for their clients. They must consider how responding will be impacted in the event that different dimensions are manipulated. It is possible that some reinforcers will lose potency if dimensions are altered. For example, altering the reinforcement interval with a tablet from 30 seconds to 5 seconds may result in the tablet no longer serving as an effective reinforcer because the magnitude is below a certain threshold. Another example could be changing the speed of delivery from immediate to after a 10-second delay which would likely negatively impact the effectiveness of the reinforcer.

In the applied literature, the dimensions of reinforcement are often manipulated as part of a differential reinforcement procedure. Differential reinforcement used to target challenging behavior typically includes challenging behavior being placed on extinction while an alternative response (e.g., communication, compliance) results in access to the reinforcer (see Chap. 23 for additional information about DRA). There are situations in which it may not be feasible to withhold all reinforcement for challenging behavior. In these situations, researchers have evaluated the effectiveness of manipulating the dimensions of reinforcement to differentially reinforce responding. For example, Briggs et al. (2019) evaluated the impact of providing a longer break (magnitude), a break with a high-preference stimulus (quality) or a combination of the two, contingent upon compliance responses while simultaneously maintaining the length of the break contingent on challenging behavior. These researchers observed an increase in compliance and a decrease in challenging behavior when they manipulated the quality and magnitude of the reinforcer for compliance.

Different responses across individuals are sensitive to different dimensions of reinforcement. Therefore, Brown et al. (2021) developed a preassessment to determine to which dimension of reinforcement participants may be most sensitive. Then using the information gathered in the preassessment, these researchers implemented differential reinforcement of an alternative behavior in which the target behavior (i.e., simulated challenging behavior) resulted in reinforcement that was either

lower quality, delayed, or shorter magnitude. For both participants, researchers observed differentiated responding, specifically higher rates of the alternative behavior which resulted in access to the higher quality reinforcer than the target behavior which resulted in access to the lower quality reinforcer.

## Schedules of Reinforcement

### *Basic Schedules*

Finally, we will discuss schedules of reinforcement. Schedules of reinforcement are "rules that describe the relationship between responses and reinforcer deliveries…" (Cooper et al., 2020, pg. 301). There are three basic schedules of reinforcement including ratio schedules, interval schedules, and time schedules. Ratio schedules are response-based schedules in which a fixed (i.e., consistent) or variable number of responses results in reinforcement. This is the schedule with which the majority of your supervisees are likely to be familiar.

Interval schedules are based on both responding and the passage of time. That is, these schedules specify that the first response that occurs after an interval has elapsed will result in reinforcement. Many supervisees have difficulty describing interval schedules correctly, thus you will want to ensure your supervisees avoid these two common errors. First, many supervisees refer to interval schedules as reinforcement for continuous engagement in a response for a specific duration of time. For example, a supervisee might describe providing reinforcement contingent on a client sitting in their seat for 1 minute as a fixed interval (FI) 1-minute schedule. This is incorrect because for interval schedules the behavior that occurs during the interval is irrelevant and does not impact the delivery of reinforcement. Second, many supervisees describe interval schedules as time-based schedules. That is, they describe reinforcement being provided at the end of the interval regardless of responding. This is inaccurate because interval schedules require both the passage of time and responding.

Time-based schedules specify that a reinforcer is delivered after an interval of time has elapsed regardless of the behavior. This is also referred to as noncontingent reinforcement, although there is some debate as to whether that is the most appropriate description (see Poling & Normand, 1999). However, the term is based on the fact that reinforcement is provided contingent on the passage of time rather than a specific response in which the individual engages. For more information on noncontingent reinforcement, see Chap. 24.

### *Compound Schedules*

Compound schedules include more than one basic schedule of reinforcement. Two commonly used compound schedules are multiple schedules and chain schedules. Multiple schedules and chain schedules include two or more basic schedules (i.e., components) that are associated with discriminative stimuli. For multiple schedules, the components rotate based on the passage of time and for chain schedules, the components rotate based on the completion of each basic schedule. Both multiple schedules and chain schedules operate in a variety of situations, but they are often used during schedule thinning following functional communication training.

The typical arrangement for using a multiple schedule following functional communication training is for one component to signal a fixed ratio 1 schedule for engagement in the functional communication response and the other component to signal extinction for the functional communication response. Thus, schedule thinning entails increasing the duration of the extinction component such that the individual tolerates longer periods of time in which the reinforcer is unavailable. The typical arrangement for using a chain schedule following functional communication training is for one component to signal a fixed ratio schedule for engagement in a work or academic task (e.g., cleaning up toys, completing math problems) and the other component to signal a fixed ratio 1 schedule for engagement in the functional communication response. The response requirement for the first component must be met before the second component signaling the ratio schedule for the functional communication response will become available. Therefore, schedule thinning entails increasing the response requirement for the first component. For more information on chain schedules, see Chap. 19 on chaining.

## Group Supervision Meeting

Below is a plan for activities to incorporate into a 1-hour meeting with a small group of supervisees.

***Group Supervision Meeting Agenda***

| Time | Activity |
|---|---|
| 0:00–20:00 | Review Major Concepts |
| 20:00–25:00 | Contingency Identification Activity |
| 25:00–30:00 | Classifying Reinforcers |
| 30:00–40:00 | Manipulating Reinforcer Dimensions |
| 40:00–55:00 | Guess That Schedule |
| 55:00–60:00 | Knowledge Check |

**Materials Needed**

- Appendix A: *Manipulating Reinforcer Dimensions Activity*, 1 copy for each supervisee
- Appendix B: *Schedules of Reinforcement Activity*, 1 copy for each supervisee
- A timer
- Materials for free-operant behavior

## *Reading Assignments*

At least 1 week prior to the group supervision meeting, assign your supervisees to read about the subject. Below is a list of recommended assigned readings.

- Briggs et al. (2018)
- Brown et al. (2021)
- Saini et al. (2016)
- Skinner (1958)

## *Review Major Concepts*

Begin your group supervision meeting by reviewing the major concepts associated with reinforcement including the categories of reinforcers, dimensions of reinforcement, and schedules of reinforcement. A brief summary of each is provided below, and PowerPoint slides are available to share with your group.

### Categories of Reinforcers

Review the different categories of reinforcers with your supervisees. The three categories we suggest using to classify reinforcers include (a) learning history, (b) delivery modality, and (c) form.

**Learning History** First, discuss the distinction between unconditioned and conditioned reinforcers. This distinction falls under the umbrella of learning history because conditioned reinforcers are established based on a history of being paired with other reinforcers. In contrast, unconditioned reinforcers are established without any prior learning history. Provide examples of unconditioned and conditioned reinforcers and ask your supervisees to identify additional examples.

Definitions:

1. Unconditioned reinforcer: A stimulus change that functions as a reinforcer because of the species evolutionary development (Cooper et al., 2020).
2. Conditioned reinforcer: A stimulus change that functions as a reinforcer because of prior pairing with one or more other reinforcers (Cooper et al., 2020).

**Delivery Modality** The next distinction is related to the mode in which reinforcement is delivered. Reinforcers can be socially mediated or automatic which refers to contingencies that are not manipulated by other people. Provide examples of socially mediated and automatic reinforcers and ask your supervisees to identify additional examples. Make sure to include examples of reinforcement for appropriate behavior rather than focusing solely on stereotypy and self-injurious behavior.

1. Socially mediated reinforcement: A contingency in which the consequence for the behavior is presented by another person (Cooper et al., 2020).
2. Automatic reinforcement: Reinforcement that occurs independent of the social mediation of others (Cooper et al., 2020).

**Form** Finally, discuss the different forms of reinforcers. Provide examples of edible items, social interactions, activities, and tangible items and have your supervisees identify additional examples.

### Dimensions of Reinforcement

Following the discussion of categories of reinforcers, introduce the different dimensions of reinforcement with your supervisees. Discuss the importance of understanding the different dimensions and how your supervisees can leverage this information to effectively impact client behavior. Provide examples of using differential reinforcement without extinction by manipulating the different dimensions of reinforcement. The examples provided below are not exhaustive but can serve as a starting point for discussing dimensions of reinforcement.

1. Quality of reinforcement: a high preferred item versus a moderate preferred item.
2. Magnitude of reinforcement: longer access to the reinforcer versus shorter access to the reinforcer.
3. Immediacy of reinforcement: reinforcement provided immediately versus reinforcement provided after a delay.
4. Rate of reinforcement: reinforcement provided more frequently versus reinforcement provided less frequently.

### Schedules of Reinforcement

Next, review the three basic schedules of reinforcement with your supervisees. It is important to start with the basic schedules because if your supervisees are having difficulty with the basic schedules, they will also have difficulty with the compound

schedules. Provide examples of ratio, interval, and time schedules and ask your supervisees to identify additional examples.

Basic schedules:

1. Ratio: A fixed or variable number of responses results in reinforcement.
2. Interval: The first response emitted after a fixed or variable interval has elapsed results in reinforcement.
3. Time: Reinforcement is delivered following a fixed or variable duration of time.

Once you are confident that your supervisees have a strong understanding of the basic schedules of reinforcement, transition to the two commonly used compound schedules of reinforcement, multiple schedules, and chain schedules. Provide examples of multiple schedules and chain schedules, and ask your supervisees to identify additional examples.

Compound schedules:

1. Multiple schedule: A compound schedule that includes two or more basic schedules of reinforcement each associated with discriminative stimuli. The components rotate based on the passage of time. Reinforcement is provided contingent upon meeting each individual component response requirement.
2. Chain schedule: A compound schedule that includes two or more basic schedules of reinforcement each associated with discriminative stimuli. The components rotate based on the completion of the response requirement for each component. Reinforcement is provided contingent upon meeting all component response requirements.

## *Contingency Identification Activity*

Use the vignettes provided below or develop six vignettes that include three examples and three nonexamples of reinforcement. Present the vignettes one by one and have your supervisees read the vignette and determine if it is an example of reinforcement or a not an example of reinforcement. They should identify the consequence (i.e., stimulus change) and explain why it is an example or nonexample of reinforcement.

Lizzie is a dog. One day Lizzie's owners were sitting at the table eating breakfast. Lizzie sat on her hind legs and lifted her front paws. Immediately after she sat up on her hind legs, her owner placed a plate with eggs in front of Lizzie. Now, when Lizzie sees her owners eating at the table, she sits back on her hind legs and lifts her front paws.

Questions:

- What is the response Lizzie engaged in?
- Did the response increase?
- Is this an example of reinforcement?

Riley is learning to communicate using picture cards. While sitting at a table with the clinician, he touches a card with a picture of Skittles®. The clinician gives him a Skittle®. Riley touches the card a second time and the clinician gives him another Skittle®. Now, anytime Riley sees the card displaying Skittles®, he touches the card and receives Skittles®.

Questions:

- What is the response Riley engaged in?
- Did the response increase?
- Is this an example of reinforcement?

Leighton is playing at her neighborhood playground. She walks over to a brown dog who is walking nearby. She reaches out to pet the dog, and the dog licks her. She laughs and keeps reaching out to the dog, and the dog continues to lick her.

Questions:

- What is the response Leighton engaged in?
- Did the response increase?
- Is this an example of reinforcement?

Dan turned in his homework 3 days early. Miss Ramos announces to the class how Dan is exceeding her expectations and publicly praised him for submitting his homework early. As a result, Dan stopped submitting his assignments before the due date.

Questions:

- What is the response Dan engaged in?
- Did the response increase?
- Is this an example of reinforcement?

Briggs is an eight-year-old boy with a developmental disability. In the lunchroom, the students are expected to stand in a single file line while waiting for their food. On one occasion, Briggs left the line and walked around the lunchroom. His teacher verbally reprimands Briggs for leaving the line. The next day during lunch, Briggs left the line three times.

Questions:

- What is the response Biggs engaged in?
- Did the response increase?
- Is this an example of reinforcement?

Loren is a 27-year-old woman with a TBI. Loren receives rehabilitation services in an inpatient hospital for individuals with TBI. One of Loren's goals is completing daily-living skills. For this goal, a staff member told Loren to vacuum her room. Immediately after Loren finished vacuuming her room the staff member provided Loren with a token. The next time Loren was asked to vacuum her room, she refused.

Questions:

- What is the response Loren engaged in?
- Did the response increase?
- Is this an example of reinforcement?

## *Classifying Reinforcers Activity*

For this activity, refer to the example stimuli provided in the PowerPoint slides or identify other potential reinforcers. For each reinforcer, have your supervisees determine the probable learning history, mode of delivery, and form. There may not be a specific right or wrong answer for the stimulus; however, it is important for your supervisees to explain why they classify the reinforcers in a specific way.

- Stimuli that may potentially function as reinforcers: cheese cracker, receiving a phone call, swinging, flickering lights, board game, and cool air.

## *Manipulating Reinforcer Dimensions Activity*

Provide each of your supervisees a copy of the *Manipulating Reinforcer Dimensions Activity* (Appendix A). Divide your supervisees into groups and have each group work through all three examples. For each case example, have your supervisees provide specific strategies for manipulating reinforcer dimensions to differentially reinforce target behavior. Then, have your supervisees present their responses to the large group. Provide guidance and feedback as needed.

## *Guess That Schedule*

For this activity select a free operant response in which one of your supervisees can easily engage. The response should be discrete such that it is clear when one response has ended, and next response has begun. The response should be simple enough that engaging in multiple responses will not be overly taxing. Example responses might include clapping, knocking on the table, waving, etc. Remember, the response needs to be a free operant response rather than a response that is dependent on the presentation of an instruction or stimulus. The supervisee serving as the behaver during the activity should be free to engage in any rate of responding without limitation. Then, you will reveal the target basic schedule of reinforcement to one (or two) supervisees. (Two supervisees may be helpful for implementing interval and time schedules). You can identify five different basic schedules or use the following FR 3, FR 5, FI 10 seconds, FI 15 seconds, FT 15 seconds. The supervisee(s)

who are aware of the schedule will provide reinforcement to the behaver according to their assigned schedule of reinforcement. The other supervisees will observe the individual behaving and the individual(s) reinforcing the behavior of the other individual and attempt to identify the schedule of reinforcement.

## *Homework*

Provide each supervisee with a copy of the *Schedules of Reinforcement Activity* (Appendix B). Your supervisees should review this document prior to individual supervision. They should identify any portions of the procures about which they are unsure. Your supervisees should also use preference assessment data to identify their client's top three to five preferred reinforcers. They should identify strategies for manipulating dimensions of reinforcement for each stimulus. That is, for each stimulus, they must specify how to alter the dimensions of quality, magnitude, immediacy, and rate.

***Knowledge Check***

1. Identify 3 to 5 examples of unconditioned and conditioned reinforcers.
2. Describe the difference between social and automatic reinforcement.
3. Identify and describe the 4 dimensions of reinforcement.
4. Describe the procedures for an FI 5-minute schedule in which the behavior is hand raising.
5. Describe the similarities and differences between multiple and chain schedules.

**Homework for Individual Supervision without a Client**

1. Identify their client's top 3 to 5 reinforcers. Write out how specific reinforcer dimensions can be manipulated with each reinforcer. Quality, magnitude, immediacy, and rate should be included in the dimensions.
2. Review Appendix B: *Schedules of Reinforcement Activity*.

## Individual Supervision Meeting Without a Client

Below is a plan for activities to incorporate into a 45-minute meeting with an individual supervisee.

***Individual Supervision Meeting Without a Client Agenda***

| Time | Activity |
|---|---|
| 0:00–10:00 | Manipulating Dimensions of Reinforcement |
| 10:00–30:00 | Compound Schedule Practice |
| 30:00–45:00 | Client-Directed Activities |

**Materials Needed**

- Appendix B: *Schedules of Reinforcement Activity*
- Appendix C: *Compound Schedule Procedural Fidelity Checklist*
- List of client's top reinforcers and reinforcer dimensions
- Stimuli to signal components of the compound schedule
- Picture cards (positive and negative reinforcement)
- Materials for selected work tasks
- A timer

### *Manipulating Dimensions of Reinforcement*

Before the meeting, your supervisee should have developed a list of their client's top three to five reinforcers and potential strategies for manipulating the dimensions of these reinforcers. During your meeting, review the document and correct any errors your supervisee may have made. Discuss ways in which your supervisee can specifically use these procedures with their client for increasing appropriate behavior. These manipulations can be used to differentially reinforce responses that are prompted or independent, responses that are more or less difficult for the client, and responses that are approximations of a terminal behavior. Refer to Chap. 23 on DRA for additional information.

### *Compound Schedule Practice*

Before the meeting, identify stimuli to use to signal the two components of the compound schedule. Some examples include a card with a different color on each side, a poster board with a different color on each side, or colored wristbands. Also, create picture cards of the "reinforcers." The reinforcer will be a tangible item for

the multiple schedule and a break from demands for the chain schedule. For the chain schedule, select a work task (e.g., identifying letters, picking up toys) that will be presented during the first component. For the purpose of this activity, the basic schedules are already specified on the *Schedules of Reinforcement Activity* document (see Appendix B). For the multiple schedule, one component will signal an FR 1 for engagement in the card exchange (i.e., $S^D$) and the other component will signal extinction (i.e., $S^\Delta$). Components will rotate after 30 seconds. For the chain schedule, the first component schedule is an FR2 for the selected work task and the second component schedule is an FR1 for the card exchange. The first component will rotate to the second after the FR2 schedule is met. After engaging in the card exchange, the reinforcer should be provided for 30 seconds.

During the role-play activity, you will serve as the confederate client while your supervisee implements the procedures. Emit errors during the role play so your supervisee can practice responding to potential client errors. Examples of errors include attempting to exchange the card during the $S^\Delta$ of the multiple schedule or the first component of the chain schedule, attempting to exchange the card when you already have the reinforcer, and engaging in challenging behavior (e.g., hitting the table). In addition, delay exchanging the card after the alternation of components on some trials to ensure your supervisee alternates components at the correct time for the multiple schedule and continues presenting demands until you exchange the card during the chain schedule. After the practice session ends, provide feedback to your supervisee and continue practicing until they implement the procedures with 85% fidelity.

## *Client-Directed Activities*

Discuss which compound schedule would be most appropriate for the supervisee's client. We will describe procedures for multiple schedules and chain schedules; however, if you prefer to use a conjunctive schedule or alternative schedule of reinforcement, consult the Cooper et al. (2020) textbook for more information. If your supervisee is already using a compound schedule with their client, consider asking your supervisee to implement a schedule that differs from the one they already use. With your supervisee, work through the following steps: (a) determine the target behavior you want to increase (e.g., communication response, compliance), (b) identify stimuli to pair with each of the schedule components (e.g., colored cards), (c) select basic schedules for the components of the compound schedule, (d) determine the length of each component, and (e) identify a work task (chain schedules only). During this meeting, you and your supervisee should develop a procedural fidelity checklist (using Appendix C) that you can use to evaluate your supervisees performance when implementing the compound schedule with their client. Following the meeting, your supervisee should finalize the *Compound Schedule Procedural Fidelity Checklist* and develop a data sheet for collecting data on the

client's behavior. They should have both data sheets prepared for you to collect data to evaluate their fidelity of implementation and IOA for data collection.

**Homework for Individual Supervision with a Client**

1. Prepare data sheets for implementing selected compound schedule (i.e., multiple or chain).
2. Finalize *Compound Schedule Procedural Fidelity Checklist* (Appendix C).

## Individual Supervision Meeting with a Client

Below is a plan for activities to incorporate into a 45-minute supervision session in which you observe your supervisee with a client.

***Individual Supervision Meeting with a Client Agenda***

| Time | Activity |
|---|---|
| 0:00–20:00 | Compound Schedule Administration |
| 20:00–30:00 | Session Procedures |
| 30:00–45:00 | Performance Feedback |

**Materials Needed**

- Data sheets for client responding, 2 copies
- Appendix C: *Compound Schedule Procedural Fidelity Checklist*
- *Supervision Observation Form*
- Materials for multiple schedule or chain schedule

### *Compound Schedule Administration*

Prior to your meeting with your supervisee, they should have finalized the *Compound Schedule Procedural Fidelity Checklist* and their data sheet for the selected compound schedule and provided you with a copy of both. Observe your supervisee introduce the compound schedule with their client. Following the administration of the compound schedule, provide specific feedback according to the procedural fidelity checklist.

## *Session Procedures*

Following your supervisee's administration of the compound schedule, continue to observe your supervisee target other goals with their client. During this portion of the observation, collect data using the *Supervision Observation Form.*

## *Performance Feedback*

After you observe your supervisee, provide them with your data collection sheet and ask your supervisee to calculate IOA. Discuss and resolve any discrepancies between your data and the supervisee's data. Then, provide feedback to your supervisee according to the *Compound Schedule Procedural Fidelity Checklist*. For each component of the procedure completed correctly, provide behavior-specific praise, and for each component of the procedure completed incorrectly, provide feedback and model the correct implementation of the component. If your supervisee expresses interest, provide role-play opportunities. Answer any questions posed by your supervisee.

## *Mastery Criterion*

In order to progress from this lesson, your supervisee must (a) accurately collect data with at least 80% agreement and (b) implement the protocol for the for the compound schedule with at least 80% fidelity. If either of these are not met, a second individual meeting without a client should be scheduled. This meeting should include intensive role play and feedback.

***Future Growth***

- ☐ Observe your supervisee provide feedback to another trainee on their administration of the compound schedule.
- ☐ Ask your supervisee to develop a procedural fidelity checklist for administering a different compound schedule.

## Appendix A: Manipulating Reinforcer Dimensions Activity

1. Kiara is a 10-year-old female with traumatic brain injury. She engages in aggressive behavior directed toward staff who are working with her on conversation skills. The BCBA observes the aggressive behavior and determines that this behavior is likely maintained by escape from working on conversation skills. The intensity of Kiara's aggression is such that the staff cannot safely implement escape extinction. Therefore, the BCBA must develop a differential reinforcement procedure in which aggression and correct conversation skills both result in escape. The BCBA conducted a preference assessment, and the results are provided in Fig. A.1.

   Provide three strategies that the BCBA could employ to increase conversation skills while also decreasing aggression.

   *Example*

   *Consequence for aggression: 30 second break with no additional stimuli*
   *Consequence for conversation skills: 1 minute break with the tablet*

   Strategy #1

   Consequence for aggression:
   Consequence for conversation skills:

   Strategy #2

   Consequence for aggression:
   Consequence for conversation skills:

   Strategy #3

   Consequence for aggression:
   Consequence for conversation skills:

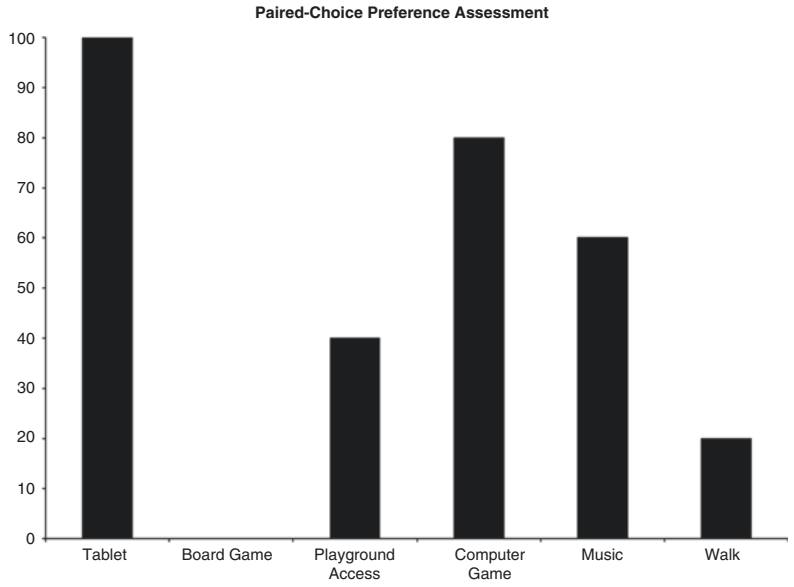


**Fig. A.1** Data for Kiara's preference assessment

2. Enrique is 4-year-old male who does not have any known disabilities. His mother has consulted a BCBA because of his difficulties with the bedtime routine. Specifically, he gets out of bed multiple times during the night, and his mom ends up sleeping in his room on most evenings. His mom would like for him to stay in bed after she tucks him in. The only acceptable exception would be getting out of bed once to use the restroom. The BCBA must develop a differential reinforcement procedure in which staying in bed all night and getting up once during the night both result in reinforcement. The BCBA conducted a preference assessment, and the results are provided in Fig. A.2.

   Provide three strategies that the BCBA could employ to increase the frequency of staying in bed all night.

   *Example*

   *Consequence for staying in bed all night: banana*
   *Consequence for getting out of bed once: crackers*

Strategy #1

Consequence for staying in bed all night:
Consequence for getting out of bed once:

Strategy #2

Consequence for staying in bed all night:
Consequence for getting out of bed once:

Strategy #3

Consequence for staying in bed all night:
Consequence for getting out of bed once:

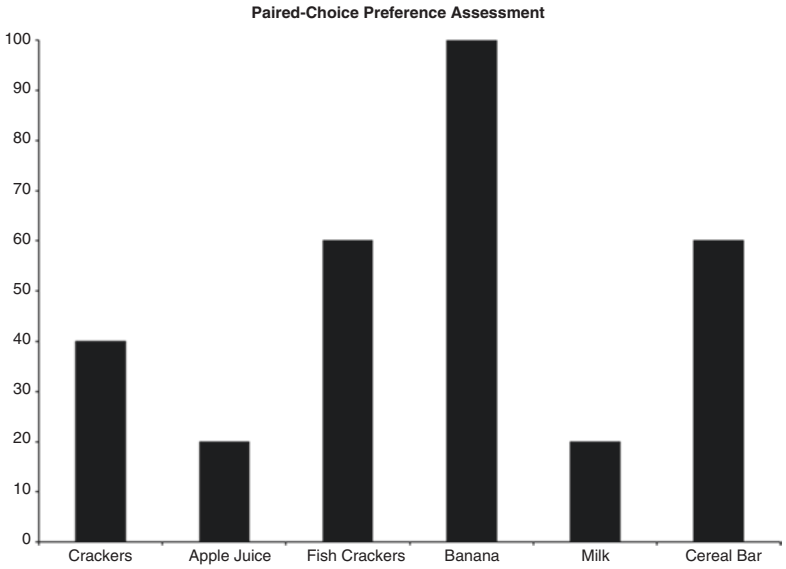


**Fig. A.2** Data for Enrique's preference assessment

3. Hiromi is a 16-year-old male diagnosed with an intellectual disability. The BCBA is providing services to teach Hiromi to complete several self-care tasks including his own laundry. Hiromi has mastered all the steps required to wash and dry his clothes; however, he often leaves his clothes in the drier for multiple days and his parents have to wait to do their own laundry. The BCBA is concerned that withholding the reinforcer if Hiromi does not remove his clothes immediately will negatively impact the maintenance of the entire chain of behavior; thus, the BCBA needs to develop a differential reinforcement procedure in which removing the clothing from the drier immediately and after a delay both result in reinforcement. The BCBA conducted a preference assessment, and the results are provided in Fig. A.3.

   *Example*

   *Removing clothes immediately: immediate access to his phone for 15 minutes*
   *Removing clothes after a delay: access to phone for 10 minutes after a 5 minute delay*

   Strategy #1

   Removing clothes immediately:
   Removing clothes after a delay:

   Strategy #2

   Removing clothes immediately:
   Removing clothes after a delay:

   Strategy #3

   Removing clothes immediately:
   Removing clothes after a delay:

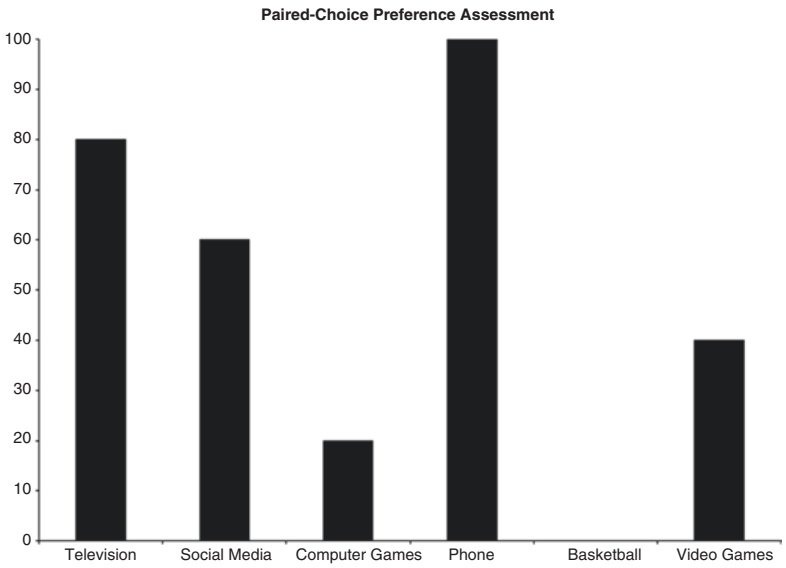


**Fig. A.3** Data for Hiromi's preference assessment

## Appendix B: Schedules of Reinforcement Activity

### Multiple Schedule

Components:

$S^D$—30s—FR1 for card exchange
$S^\Delta$—30s—EXT for card exchange

Data recorded on whether

1. The supervisee ensured the picture card was available at all times.
2. The supervisee provided access to the tangible following a correct card exchange.
3. The supervisee withheld the tangible for incorrect card exchanges.
4. The supervisee accepted and reset the picture card after attempted exchanges.
5. The supervisee allowed access to the tangible for the remainder of the 30 second interval.
6. The supervisee removed the tangible at the end of the interval.
7. The supervisee alternated from one component (e.g., $S^D$) to the other component (e.g., $S^\Delta$).

Instructions for data sheet:

- ☐ The boxes that are blank should be scored with a +/−. The boxes that are grayed out are not applicable for that component. For example, during the $S^\Delta$ component the tangible is not available, so the reinforcement interval is grayed out.
- ☐ Each row represents a component of the multiple schedule.
- ☐ The first row is the $S^D$ component.
- ☐ The second row is the $S^\Delta$ component.
- ☐ These two components rotate after every 30 seconds.

Multiple Schedule (+ if correct; − for incorrect)

| Interval (in seconds) | Component schedules | Picture card available | Card exchange reinforced | Withheld tangible | Picture card reset | Reinforcement interval | Tangible removed | Alternated components |
|---|---|---|---|---|---|---|---|---|
| 0 s–30 s | $S^D$ FR 1 | | | | | | | |
| 31 s–60 s | $S^\Delta$ EXT | | | | | | | |
| 61 s–90 s | $S^D$ FR 1 | | | | | | | |
| 91 s–120 s | $S^\Delta$ EXT | | | | | | | |
| 121 s–150 s | $S^D$ FR 1 | | | | | | | |
| 151 s–180 s | $S^\Delta$ EXT | | | | | | | |
| 181 s–210 s | $S^D$ FR 1 | | | | | | | |
| 211 s–240 s | $S^\Delta$ EXT | | | | | | | |
| 241 s–270 s | $S^D$ FR1 | | | | | | | |
| 271 s–300 s | $S^\Delta$ EXT | | | | | | | |

## Chain Schedule

Components:

1st—FR 2 (work task)
2nd—FR1 (30-second break from work tasks)

Data recorded on whether

1. The supervisee ensured the client met the work requirement by completing two tasks independently or following a model prompt
2. The supervisee ensured the picture card was available at all times
3. The supervisee provided access to a break following a correct card exchange
4. The supervisee continued presenting demands for incorrect card exchanges
5. The supervisee accepted and reset the picture card after attempted exchanges
6. The supervisee allowed access to the break for 30 seconds
7. The supervisee represented work tasks at the end of the interval
8. The supervisee alternated from one component to the other component

Instructions for data sheet:

- ☐ The boxes that are blank should be scored with a +/−. The boxes that are greyed out are not applicable for that component. For example, during the EXT (extinction) component the break is not available, so the reinforcement interval is greyed out.
- ☐ Each row represents a component of the chain schedule.
- ☐ The first row is the work (EXT) component.
- ☐ The second row is the FR1 component.
- ☐ The work component transitions to the FR1 component after the learner completes 2 work tasks.

Chain Schedule (+ if correct; − for incorrect)

| Exchange schedule | Task schedule | Met task requirement | Picture card available | Card exchange reinforced | Withheld break | Picture card reset | Reinforcement interval | Tasks represented | Alternated components |
|---|---|---|---|---|---|---|---|---|---|
| EXT | 2 Tasks | | | | | | | | |
| FR 1 | ---- | | | | | | | | |
| EXT | 2 Tasks | | | | | | | | |
| FR 1 | ---- | | | | | | | | |
| EXT | 2 Tasks | | | | | | | | |
| FR 1 | ---- | | | | | | | | |
| EXT | 2 Tasks | | | | | | | | |
| FR1 | ---- | | | | | | | | |
| EXT | 2 Tasks | | | | | | | | |
| FR1 | ---- | | | | | | | | |

## Appendix C: Compound Schedule Procedural Fidelity Checklist

Supervisee: _____ Supervisor: _____

Client: _____ Date & Time: _____

Client Learning Objective: _____

| Step | Implemented Correctly? + = Yes − = No |
|---|---|
| | |
| | |
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| | |
| | |
| | |

_____ / _____ * 100 = _____ % of steps completed correctly

Steps Completed Correctly. Total Number of Steps

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