Shaping With Successive Approximations

Differential reinforcement, as previously discussed, is a technique for increasing the strength of selected responses that are members of a response class. To develop a response that differs significantly from members of an existing response class, we can use the procedure of shaping with successive approximations. The shaping procedure involves the use of differential reinforcement to strengthen members of one response class. After these responses are performed consistently, the criterion for reinforcement is shifted to another response class that more closely approximates the target response to be developed. This procedure is repeated until responses are performed and reinforced in a response class that includes the target response.

Shaping with successive approximations is a procedure used to develop a new behavior or one that rarely occurs. A shaping procedure was used as one part of a treatment program to reinstate speech in Justin, a 10-year-old boy who stopped speaking after witnessing his mother’s death in a car accident. At first, Justin was reinforced with candy and praise for any speech sound he made. After he consistently made speech sounds, the criterion for reinforcement was shifted to speaking words. After Justin consistently spoke words, the criterion for reinforcement was shifted from words to phrases. In this way, Justin’s speech was shaped using successive approximations until he spoke in complete sentences.

In shaping with successive approximations, a series of initial and intermediate behaviors are established in successive approximations to the desired target behavior. The initial response that is reinforced bears some resemblance to the target behavior (e.g., speech sounds and speaking in sentences) so that the intermediate responses can be progressively shaped toward the target behavior. To shape a behavior, the practitioner takes the following steps:

1. Specify the target response (desired behavior).
2. Specify the positive reinforcer(s) to be used.
3. Specify initial and intermediate responses.
4. Reinforce the initial response each time it occurs and withhold reinforcement from other responses until the initial response is performed consistently.
5. Shift the criterion for reinforcement from the initial response to an intermediate response.
6. Reinforce the intermediate response until it is performed consistently, then shift the criterion for reinforcement gradually to other intermediate responses that are increasingly similar to the target response.
7. Reinforce the target response when it is performed.

Justin’s therapist used shaping with successive approximations to reinstate Justin’s speech as follows:

1. The target behavior was for Justin to speak in sentences in response to questions the therapist asked.
2. The positive reinforcers given to Justin were candy and verbal praise from the therapist.
3. The initial response criterion included any speech sound. Intermediate responses included words and phrases that Justin spoke in response to questions the therapist asked.
4. Initially, any speech sound Justin made was reinforced.
5. When Justin made speech sounds consistently, the criterion for reinforcement was shifted to words. Justin was required to speak words before receiving the candy and praise.
6. When Justin was speaking words consistently, the criterion for reinforcement was shifted to another intermediate response class, phrases, which was the next approximation to the target behavior. Speaking in phrases was reinforced until Justin spoke in phrases. The criterion for reinforcement was then shifted to speaking in sentences.
7. Justin was reinforced for speaking in sentences in response to questions the therapist asked. At that point, Justin’s speaking was reinforced by many people in his environment and further treatment could proceed.
A therapist employed shaping with successive approximations to teach Barbara, a teenager with muscular dystrophy, to walk with crutches instead of using a wheelchair. Although Barbara could be more independent and active on crutches, she initially refused to use them, preferring to rely on her mother or sisters to push her wheelchair. The therapist used the following steps to shape Barbara’s use of crutches:

1. The target response was walking 50 steps on crutches.
2. The positive reinforcer was praise (e.g., “good,” “very good,” and “that’s it!”).
3. The initial response was movement toward the crutches, which were placed within Barbara’s reach. Intermediate responses included touching the crutches with her hand, holding the crutches in her hand, using the crutches to raise herself from the wheelchair, standing up with the crutches properly positioned, and taking from 1 to 49 steps on the crutches.
4. Initially, when Barbara made any movement toward the crutches, she was reinforced with praise.
5. When Barbara reached toward the crutches each time they were placed within her reach, the criterion for reinforcement was shifted to the next intermediate response, touching the crutches.
6. Touching the crutches was reinforced until the touching responses were performed consistently. This procedure of reinforcing one response until it was performed consistently, and then shifting the criterion for reinforcement to the next intermediate response, continued until the target behavior, walking on the crutches, was performed and reinforced.
7. Barbara was reinforced for walking 50 steps on the crutches.

Shaping with successive approximations involves a gradual process in which a response must be developed at one level before reinforcement is shifted to the next level of approximation. After a desired response is performed, it is reinforced immediately to ensure that reinforcement is given only for appropriate responses. If the criterion for reinforcement is shifted too quickly to the next level, or if insufficient reinforcement is given, the response could extinguish. If a response receives too much reinforcement, however, it can become fixated at that level so that it is difficult to develop the next intermediate response. The shaping procedure relies on reinforcing responses that the individual is currently performing and gradually shifting the criterion for reinforcement to intermediate responses until the target response is performed.

Instructions and prompting are often used with shaping to facilitate the acquisition of new behaviors. Although shaping alone is useful with individuals who do not follow instructions, the shaping procedure becomes more effective when instructions or prompts are given at each step (see Chapter 6). Physical guidance can be used, where appropriate, to facilitate shaping. Demonstrations of the target behavior by a model can also be used to promote rapid development of desired behaviors (see Chapter 8).

Shaping with successive approximations can also include the use of punishers (see Chapter 9), as occurs in the children’s game of “hot and cold.” In this game, an object is hidden from a child who has left the room. When the child returns, he or she must find the object with the help of only two types of feedback from the rest of the group: When the child moves closer to the hidden object, the group says “hot” (positive reinforcer), and when the child moves away from the hidden object, the group says “cold” (punisher). The group uses “hot” to increase or strengthen responses toward the hidden object and “cold” to decrease or weaken responses away from the object. The child performs responses that result in the others saying “hot” and stops performing responses that are followed by their saying “cold.” Thus “hot” serves as a positive reinforcer for performing responses that lead to the hidden object, whereas inappropriate responses are weakened by “cold.”

**Summary**

1. Differential reinforcement involves the use of both positive reinforcement and extinction. One response is positively reinforced and increases in strength or likelihood of occurrence, whereas other responses are extinguished and decrease in strength or likelihood of occurrence.
2. Response differentiation is the result of differential reinforcement that involves selective positive reinforcement of certain responses and extinction of others. The reinforced responses become differentiated—that is, they are performed frequently to the exclusion of the extinguished responses.
3. The words *response* and *behavior* actually refer to a class of responses rather than a single response. When one member of a response class is reinforced, all responses in that class are also strengthened. Therefore, one member of a response class represents a subclass of responses rather than a single, discrete response.

4. The DRO procedure can be used to decrease undesired behaviors by reinforcing any behaviors other than the undesired one.

5. Differential reinforcement of incompatible behavior (DRI) is used when a behavior that interferes with the target behavior is specified to receive reinforcement, thereby reducing the likelihood that the undesired behavior will be performed.

6. Shaping with successive approximations is a procedure for establishing a new behavior or one that rarely occurs.

7. Shaping with successive approximations involves using differential reinforcement to strengthen members of one response class and then shifting the criterion for reinforcement to other response classes until the desired target behavior is performed. Intermediate behaviors are reinforced and developed as successive approximations to the desired behavior.

8. Instructions, prompting, modeling, and the use of punishers can also be used with differential reinforcement to develop new behaviors.

**Suggested Activities**

1. With one class member who has volunteered to be a subject out of the room, identify a behavior to shape in that person without using any verbal instructions. When the subject returns to the room, another student who has volunteered to be the shaper uses a toy clicker, a whistle, or hand clapping as a reinforcer to shape the subject’s behavior. The rest of the class should remain silent and refrain from providing any cues to the subject. The only instruction the subject should receive is that whenever he or she hears the clicker, the whistle, or the clapping, he or she should imagine receiving a wonderful reinforcer.

   How long did it take to shape the correct response? Was the correct response performed and reinforced? Repeat this exercise a few more times with different shapers and subjects. Discuss your observations regarding the factors that facilitated or hampered successful shaping and the experience of being a subject or shaper.

2. Pair up with another class member and silently select a class of verbal responses (e.g., about food, clothing, cars, travel) that you will differentially reinforce in your partner using attention and conversation. Use differential reinforcement to narrow your partner’s conversation so that he or she talks only about the class of responses you have identified. When both partners have had a turn at this exercise, discuss your observations regarding what seemed to work best in achieving the desired behaviors.

**References and Resources**


