

Gradual Change Models:

Getting a New Sequence of Behaviors to Occur with Behavioral Chaining

Behavior Chaining

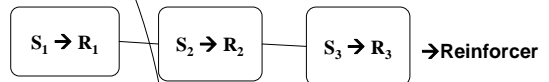
- A stimulus-response chain is a sequence of discriminative stimuli where each response produces the S^D for next response. A reinforcer follows the final response.
- Graphically that looks like:
- $S^D_1 \rightarrow R_1 \rightarrow S^D_2 \rightarrow R_2 \rightarrow S^D_3 \rightarrow R_3 \dots S^+$
- A chain is only as strong as the weakest link. If a S^D fails to evoke a response, the next S^D will not be produced and the rest of the chain will not occur.

Methods of Behavioral Chaining

- *Total Task Presentation* – the learner attempts all the steps from the beginning to the end of the chain on each trial and continues with total task trials until all steps are mastered.
- Note: other techniques, such as fading, are generally needed concurrently for total task chaining.

Methods of Behavioral Chaining

- *Total Task Presentation*

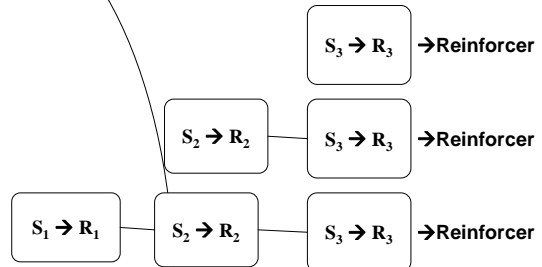


Methods of Behavioral Chaining

- *Backward Chaining* – the chain is constructed in reverse order.
- The last step is established first, then the next to last step is taught and linked to the last step, and so on.
- Useful for teaching dressing, grooming and verbal behaviors to developmentally disabled individuals.

Methods of Behavioral Chaining

- *Backward Chaining*



Backward Chaining

- Example:
 1. Take pants from the dresser
 2. Hold them upright with front facing away from you
 3. Put one leg in
 4. Put the other leg in
 5. Pull the pants up
 6. Button the button or snap
 7. Zip up the zipper

Backward Chaining

- Rationale for *backward chaining*: when you reinforce the last step (doing the zipper) in the presence of all the stimuli of the previous steps (e.g. having the button snapped) through the principle of conditioned reinforcement, the stimuli of the previous steps will become conditioned reinforcers as well as S^Ds for the subsequent steps.

Backward Chaining

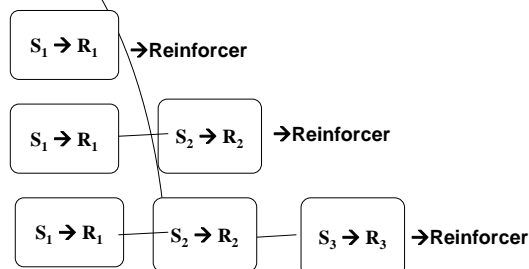
- Backward chaining therefore always has a conditioned reinforcer to strengthen each new response that is added.
- Example: Reinforcement of the last step in the presence of the appropriate stimulus, over trials establishes that stimulus as a discriminative stimulus for the last step and as a conditioned reinforcer for the next to last step.

Methods of Behavioral Chaining

- *Forward chaining*: the initial step is taught first, then the first and the second, then the first, second and third, and so on.
- Total task presentation and forward chaining are more common in everyday situations outside of the behavior modification setting.

Methods of Behavioral Chaining

- *Forward chaining*:



What method is most effective?

- Bellamy, Horner & Inman (1979) say that total task presentation has advantages, at least when teaching developmentally disabled people.
 1. It requires the trainer to spend less time in partial assembly or disassembly to prepare the task for training.
 2. It appears to focus on teaching response topography and response sequence simultaneously, and should therefore produce results more quickly.
 3. It appears to maximize the learner's independence early in training.

Factors Influencing the Effectiveness of Chaining:

1. Do a task analysis: identify the components of the final sequence.
2. Each component should be simple enough to be learned without great difficulty and selected so that there is a clear-cut stimulus or set of stimuli to signal the completion of a component.
3. This will facilitate the development of those stimuli as conditioned reinforcers for the preceding component and discriminative stimuli for subsequent components.

Factors Influencing the Effectiveness of Chaining:

2. Consider strategies for independent use of prompts by learners. If the learner can read, write out the steps and give it to him. If the learner is disabled, give picture prompts or teach them to recite self-instruction steps.
3. Model the full sequence of responses while verbally describing the performance at each step before requiring the learner to do it.
4. Begin training with the behavioral chain.

Factors Influencing the Effectiveness of Chaining:

5. Reinforce each correct completion of each step with praise and social reinforcers. Gradually phase out the praise as the learner becomes more skilled and maintain the performance with the single reinforcer at the end of the chain.
6. Decrease extra assistance at individual steps as quickly as possible by using fading.

Chaining Pitfalls and Cautions:

- Be careful when an inappropriate response precedes an appropriate response that is then reinforced. This can establish undesirable behaviors in the chain.

Behavioral Chaining Summary:

1. Do a task analysis and identify the units of the chain.
2. Teach the units in the proper predetermined sequence.
3. Use fading to decrease extra help at each step.
4. Be sure the learner performs the entire set of components learned up to that point, either forward or backward.

Behavioral Chaining Summary:

5. Use ample reinforcement early on in training and decrease this as the learner gets more skilled.
6. Effectively apply reinforcement at the end of the chain.