# APPLIED BEHAVIOR ANALYSIS (ABA)
# THE "LOVAAS METHODS" LECTURE NOTE

이 자료는 이바 로바스 교수의 응용행동수정 강의를 리차드 손 임상심리학박사가 요약해서 정리한 것입니다.

## "Lovaas Method" Philosophy
- □ Children stay with family at home
- □ If not working (no positive changes in 2, 3 months), be flexible to change and try different approach
- □ Be firm and consistent
- □ Keep the child busy throughout the day
- □ Be patient
- □ Always seek feedback from other parents, therapists, and professionals

## Applied Behavior Analysis Basics

Definition of Learning
- □ Learning is always inferred from performance
- □ Learning involves an inferred change in the mental state of the organism

Classical Conditioning: Create proper association between "NO" and AVERSIVENESS.
- □ Pavlovian Classical Conditioning
- □ Little Albert

Operant Conditioning: Develop associations between behaviors and consequences.
- □ Thorndike and Skinner
- □ Positive behaviors will be rewarded, and negative behaviors will be reprimanded or punished

Changing Behaviors in two ways:
1. By controlling stimulus: most difficult, almost impossible to control environmental stimuli
2. By controlling consequences: doable, can be controlled

## Heart of ABA: Discrete Trial

## $S^D$ ➜ R ⬅ $S^r$

1) $S^D$ is a signal, language, or instruction that cues $S^r$ is available if R is engaged in. It specifically signals which R is reinforced and which R is not.
2) Time between each discrete trial should be within 2 to 5 seconds in order to sustain attention. Move quickly and fluidly.
3) Discrete trial builds structured programs and allows us to repeat the same procedure.
4) Because we learn new concepts and objects through associating right inputs, discrete trial helps create right associations.

$S^D$: Discriminative Stimulus; $S^R$: Primary Reinforcement; $S^r$: Secondary Reinforcement; $S^p$: Prompt

## $S^D$ Control

Example)
Kevin checks mail only once a day.
David answers the phone and there is no response from the other party. David hangs up.

What are stimuli in Kevin's mail-checking routine?
What are stimuli in David's phone answering?
What are responses in the two cases?
What are the end results of these two responses?

*Kevin and David are said to be under $S^D$ control.*

Therapists, teachers, and parents control the $S^D$ through discrete trial. Reinforce appropriate behavior and properly consequate negative behavior.

## Reinforcement

1. Give $S^r$ immediately after R (5 seconds may be too late)
2. Use small amount and variety in order to avoid satiation (This applies to both primary and social reinforcement)
3. Tightly control food around home and school in early stages of learning.
4. Individualize $S^r$.
5. Reward only when responds without prompts

6. Fade out S$^R$ gradually, count 2 and increase the count to 3, 4, 5 and so forth until you give S$^R$, and then change S$^R$ to social reinforcement.
7. Temporal control is extremely important here in acquisition stage.

**Positive Reinforcement**: Providing primary or social reinforcement upon positive/correct responses

**Negative Reinforcement**: Removal of negative or aversive event upon appropriate behavior

**Self-Stimulatory Behavior**
1. SSB is inversely related to positive behavior, and therefore we must teach other skills (opposing or competing skills) for the children.
2. Children receive their own sensory reinforcement through SSB.
3. Children also manipulate their environment through SSB – Escape/Avoidance behavior.
4. DO NOT let the child engage in SSB during session. Should you let him do, let him do only when the child has completed what has been asked for. S$^r$ should be only 1 to 5 seconds.

   While in training – Suppress with firm restrain, appropriate punishment, and/or loud "NO."

   During downtime – Substitute with other behavior or proper toy play.

**"Toy Selection" to accommodate idiosyncratic SSBs.**

1. Visual stimulus
2. Auditory stimulus
3. Tactile stimulus
4. Vestibular stimulus

**Disruptive Behavior**: What does the child gain by this behavior? DO NOT GIVE IN unless the child completes his/her task first. In order to decrease negative behavior:
1. Define the target behavior.
2. Do the functional analysis. What causes the disruptive behavior? What are antecedents? Prevent if it can be reasonably done so, but do not simply give in.
3. Build alternative/competing skills.
4. Always consequate disruptive behaviors.

**Motivation**: Lack of motivation is typical of most autistic children.
1. Heavily reinforce correct responses and be aversive to negative behavior.

2. Develop explicit reinforcement/punishment system using $S^r$ and $S^R$.
3. Assess what the child likes most and establish a firm control over it.
4. Have the child work for the prize.
5. Establish token economy if desired and let the child work toward points and earn the prize at the end of session or day. School and home should work together.
6. The child can win or lose points.

**Attention**:
1. Child's attention is mandatory to have any meaningful session.
2. SSB is the worst enemy.
3. Overselection may be the cause of it but also related to poor motivation.
4. Minimize visual, auditory, or tactile stimulus around the training area.

**Shaping**

Shaping is used to teach more complex behaviors such as brushing, combing, tying shoes, putting on clothes, etc. *The terminal or goal behavior is achieved by reinforcing small steps or approximations toward the final response rather than reinforcing the final response itself.* Responses are reinforced that either resemble the final response or include components of that response. By reinforcing successive approximations of the final response, it is gradually achieved. Responses increasingly similar to the final goal are reinforced, and they increase; responses dissimilar to the final goal are not reinforced, and they extinguish.

**Shaping for Language Development**

Responses that approach the final goal are reinforced. Responses that do not approach that goal are extinguished. For example, when parents are trying to develop use of the words *mommy* or *daddy* in an infant, they usually reinforce any approximation (for example, *ma* or *da-da*) by smiling, hugging, and praising effusively. At the same time, but usually without thinking about it, they do not attend to (extinct) sounds that are not close to the words they with (for example, *goo*, *milk*). Over time, parents reinforce sounds and syllables that come closer to the words *mommy* and *daddy*.

**Backward Chaining**

Backward chaining is used to train social and self-care skills consist of a sequence of several responses. A sequence of responses is referred to as a *chain*. The component parts of a chain usually represent individual responses already in the repertoire of the individual. Yet the chain represents a combination of the individual responses ordered in a particular sequence.

For example, getting dressed is a set of behaviors often trained among severely mentally retarded children. The sequence may include such behaviors as taking clothes out of the drawer, placing them on a bed, putting on a shirt, and so on for other articles of clothing. Putting on a turtleneck

shirt can be divided into several constituent behaviors such as pulling the shirt over one's head, putting one's arms through the sleeves, pulling the shirt down, tucking the shirt in, and so on.

## Discriminative Stimulus (S$^D$)
An event immediately preceding reinforcement becomes a signal for reinforcement.  An event that signals that behavior will be reinforced is referred to as a discriminative stimulus.  An S$^D$ sets the occasion for behavior: it increased the probability that a previously reinforced behavior will occur.  An S$^D$ not only signals reinforcement but also eventually becomes a reinforcer itself.  The frequent pairing of an S$^D$ and the reinforcer gives the S$^D$ reinforcing properties of its own.

## Prompt and Prompt Fading

### Prompt
Developing a behavior is facilitated by using cues, instructions, gestures, directions, examples, and models to initiate a response.  Prompts are events that help initiate a response.  They come before a response has been performed and are designed to facilitate its performance.  Behavior can be prompted in several different ways:
1. Guiding: physically assisting a person to perform a behavior. For example, holding a child's arm to assist him in placing a spoon in his mouth.
2. Instructing: verbal command to do something.
3. Pointing: physical instruction to do something.
4. having a person observe a model: have a child watch someone else play a game or other behavior

### Prompt Fading
The ultimate goal is to obtain the terminal response in the absence of prompts.  Although prompts may be required early in training, they can be withdrawn gradually or faded as training progresses.  Fading refers to the gradual removal of a prompt.  As the child begins to perform a target behavior the prompt can be provided less frequently.  The correct behaviors are reinforced without reminders and soon do not need to be prompted at all or only very rarely.

*Note*: Use prompts at the baseline and gradually fade out all S$^P$s. In acquisition, prompt every second trial. Once mastered, prompt after two failures in a row.
1. Initial sound prompt: "Ma . . ." "Coo . . ."
2. Intrusive modeling: "Mama," "Cookie"
3. Intrusive physical prompt: hand-over-hand.
4. Position/visual/intonation prompt.
5. Be careful with inadvertent prompt.

## Punishment

Punishment is the presentation of an aversive event or the removal of a positive event following a response, which decreases the frequency of that response.  There are two types of punishment in the ABA.  In the first type, an aversive event is presented after a response.  For example, a child is reprimanded or slapped after engaging in some maladaptive behavior.  The second type of punishment is the removal of a positive event after a response.  Examples include losing privileges after staying out late, losing money for misbehaving, or being isolated from others.

Do not punish for failure but for negative behaviors.
1. Corner behavior
2. Extinction
    a. If attention-seeking behavior, withhold an kind of attention for the behavior
    b. If avoidance/escape behavior, withhold removal of demands.
3. Time out
    a. Sit the child in a chair for a few minutes facing a wall. If it allows "self-stimming" or reinforcing escape/avoidance, do not this procedure.

**Punishment and Negative Reinforcement**
Punishment and Negative Reinforcement are different.  The key difference is that reinforcement, whether negative or positive, always refers to procedures that increase a response, whereas punishment always refers to procedures that decrease a response.  In *negative reinforcement*, an aversive event is removed after a response; in *punishment*, an aversive consequence follows a response.

**Extinction**
Extinction refers to the cessation f reinforcement of a response.  Non-reinforcement of a response results in its eventual reduction or elimination. In extinction, no consequence follows the response; an event is neither taken away nor presented.  In punishment, some aversive event follows a response or some positive event is taken away.

*Extinction usually takes the form of ignoring a behavior that was previously reinforced with attention*.  For example, a teacher may ignore children who talk without raising their hands.  A therapist may ignore certain self-defeating statements made by the client.  In each of these examples, the reinforcer (such as attention, approval, or sympathy) previously given for the response is no longer presented.

**GENERALIZATION**

The effect of reinforcement on behavior may either extend beyond the conditions in which training has taken place or extend to behaviors other than those included in the program.  The

ways in which effects of the program may extend beyond the contingency are referred to as *generalization*.

**Stimulus Generalization**

Stimulus generalization occurs if a response reinforced in one situation or setting also increases other settings even though it is not reinforced in the other settings. Stimulus generalization refers to the generalization or transfer of a response to situations other than those in which training takes place.

1. Try to work in several environment
2. Have several teachers
3. Program common stimuli at home and school: $S^D$ should be the same or similar
4. Common reward schedule at home and school: $S^r$ should be consistent across settings.

**Response Generalization**

The reinforcement of a response increases the probability of other responses that are similar. This is referred to as *response generalization*. For example, if a child is praised for smiling, the frequency not only of smiling but also of laughing and talking might increase. Thus, although only one response is trained in the situation, a variety of similar responses may also be performed.

1. Changing one behavior produces change in many behaviors. For example, sit down will promote quiet sitting, compliance, and tolerance.
2. Start with functional language such as cup, juice, shoes, spoon, cookie, open, close, sit, pick . . .
3. Build appropriate play: Change SSB to more appropriate plays.
4. Build compliance: Sit Down; Look at Me; Stand Up; Close the Door; Put It Down; Pick It up . . .

**Other Issues to Consider in Applied Behavior Analysis**

Dealing with emotional attachment between the child and therapist.

**Training Parents as Therapists**

□ Parents know their children the best: the developmental history, current needs, and learning style
□ Therapist will come and go but parents will stay.
□ Parents form the foundation for learning at home

◻ Home-based programs can extend to school programs and other community skills.

Role of Parents:
◻ Be a part of the initial assessment
◻ Assist in establishing specific training objectives
◻ provide direct instructions
◻ Be the therapists-in-charge

How much education can you provide?
Parents must decide how to balance between education and economy. There is a trade-off.