

# Lecture 7

**Book: Behavior Modification – What it is and How to do it**

**Chapter 7: Intermittent Reinforcement to Decrease Behavior**

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## Summary

Differential reinforcement of low rates (DRL): It is a schedule of reinforcement in which a reinforcer is presented only if a particular response occurs at a low rate. One type of DRL called limited-responding DRL, specifies a maximum allowable no. of responses during a certain time interval in order for a reinforcer to occur. Limited responding DRL is useful when two conditions hold: (a) some of the behavior is tolerable but (b) less of it is better. A second type of DRL called spaced responding DRL requires that a specified behavior not occur during a specified interval, and after the interval has passed, an instance of that behavior must then occur in order for a reinforcer to occur. Instances of a specified behavior must be spaced out over time. Spaced responding DRL is useful when the behavior wanted to reduce is actually desirable provided that it does not occur at too high a rate. For e.g. a student who always calls out the right answers in class deprives classmates of the chance to respond to the teacher's questions. We would not want to diminish this child's correct answering. We would hope, however, to reduce the calling out behavior. we might do this by placing the behavior on the following type of DRL schedule: any target response that occurs after 15 minutes of the previous target response is immediately reinforced; any target response that occurs within 15 minutes of the previous target response is not reinforced. In this case, a target response before the interval has passed causes the timing of the interval to start over again. This procedure is called a spaced-responding DRL.

Differential reinforcement of zero responding: It is a schedule in which a reinforcer is presented only if a specified response does not occur during a specified period of time. A target response before the interval has passed causes the timing of the interval to start again. Working with nurses in a hospital, researchers Cowdery, Iwata and Pace (1990), began with a schedule referred to as DRO 2 minutes. If scratching did not occur (zero rate) in the 2 minutes interval, Gerry was given tokens that he could later exchange for access to TV, snacks, video games and various play materials. If scratching occurred during the 2 minute interval, the interval started again. Over

several days the DRO interval was increased to 4 minutes, then to 8 minutes, then to 15 and eventually to 30 minutes. Although DRO was initially applied in brief sessions, it was subsequently extended to the entire day. Eventually Gerry was discharged from the hospital, and his parents continued to use the procedure at home. If an undesirable behavior occurs often and for long intervals, beginning with a DRO of short duration would be wise. For e.g. DRO 5 minutes might be used to eliminate tantrum behavior. this procedure could be carried out by resetting a stop watch to zero each time a tantrum occurred allowing it to tick off seconds when the tantrum stopped. Reinforcement would occur when a continuous 5 minutes had elapsed with no tantrums.

Differential reinforcement of incompatible behavior: If we decide to decrease a target response by withholding reinforcer for it and by reinforcing an incompatible response, the schedule is referred to as differential reinforcement of incompatible (DRI) behavior. For e.g. a teacher who wants to eliminate the running around the room behavior of one student with attention deficit hyperactivity disorder. One possibility would be to put the behavior on DRO schedule, however it might be replaced by an incompatible behavior that is also undesirable – for e.g. lying on the floor. To avoid this, DRI instead of DRO might be used by specifying the incompatible behavior that is to be reinforced. Some examples of incompatible behaviors for target behaviors are: biting fingernails (target behavior) and it's incompatible behavior would be keeping hands below shoulders. Similarly for a target behavior or swearing, the incompatible behavior to increase would be talking without swearing.

Differential reinforcement of alternative behavior: It is a procedure which involves the extinction of a problem behavior combined with reinforcing a behavior that is topographically dissimilar to but not necessarily incompatible with the problem behavior. For e.g. to decrease the aggressive behavior of Kyle, a 4 year old boy with severe developmental disabilities, Vollmer et. al implemented a DRA. During training sessions, they reinforced compliance with performing various requested tasks and ignored aggressive behavior. The DRA was effective in decreasing Kyle's aggressive behavior as well as increasing his compliance.

Pitfalls of schedules for decreasing behavior: One of the main pitfalls that is unique to DRL is the tendency to unknowingly reinforce a desirable behavior on a DRL, thereby causing that undesirable behavior to occur at a low rate rather than reinforcing the behavior on a schedule that would maintain that behavior at a high rate. For e.g. when a child starts performing well in school, at first the teacher is quite impressed and enthusiastically reinforces the behavior. However, as the rate of the behavior increases, the teacher gradually becomes less impressed. The teacher thinks that this is obviously a bright child and so expects a high rate of good behavior. Thus, the rate of reinforcement gradually decreases, perhaps to zero, as the rate of the behavior increases. Eventually, the child learns that more reinforcement occurs when performance is at a low rate because the teacher is more impressed with good behavior when it

occurs infrequently than when it occurs frequently. Some children show only occasional flashes of brilliance in school instead of using their full potential. To avoid this type of inadvertent DRL schedule, teachers should define precisely the behavior they want to maintain at a high rate and reinforce it on an appropriate schedule.

Guidelines for effective use of intermittent schedules to decrease behavior:

1. Decide which type of schedule should be used to reduce the target behavior. Use limited responding DRL if some of the target behavior is tolerable, but the less the better. Use spaced-responding DRL if the behavior is desirable as long as it does not occur too rapidly or too frequently. Use DRO if the behavior should be eliminated and there is no danger that the DRO procedure might result in the reinforcement of an undesirable alternative behavior. Use DRI or DRA if the behavior should be eliminated and there is a danger that DRO would strengthen undesirable alternative behavior.
2. Decide what reinforcer to use. In general, the procedure will be most effective if the reinforcer is the one maintaining the behavior that you want to reduce and if the reinforcer can be withheld for that behavior.
3. Having chosen which schedule to use and a reinforcer, proceed as follows:
  - i) If a limited – responding DRL schedule is to be used:
    - (1) Record as baseline data the no. of target responses per session for several sessions or more to obtain an initial value for the DRL schedule that will ensure frequent reinforcement.
    - (2) Gradually decrease the responses allowed on the DRL in such a way that reinforcement occurs frequently enough throughout the procedure to ensure adequate progress by the student.
    - (3) Gradually increase the size of interval to decrease response rate below that obtained with (2).
  - ii) If a spaced-responding DRL schedule is to be used:
    - (1) Record baseline data over several sessions or more, determine the average time between responses, and use this average as the starting value of the DRL schedule.
    - (2) Gradually increase the value of the DRL schedule in such a way that reinforcement occurs frequently enough throughout the procedure to ensure adequate progress by the student.
  - iii) If DRO is to be used:
    - (1) Record baseline data over several sessions or more to obtain an initial interval for the DRO.
    - (2) Use DRO starting values that are approximately equal to the mean value between instances of the target behavior during baseline.

- (3) Gradually increase the size of the interval in such a way that reinforcement occurs frequently enough to ensure adequate progress by the student.
  - iv) If DRI is to be used:
    - (1) Choose an appropriate behavior to strengthen that is incompatible with the behavior to be eliminated.
    - (2) Take baseline data of the appropriate behavior over several sessions or more to determine how frequently the appropriate behavior should be reinforced to raise it to a level at which it will replace the inappropriate behavior.
    - (3) Select a suitable schedule of reinforcement for increasing the appropriate behavior.
    - (4) While strengthening the incompatible behavior, apply the guidelines for the extinction of the problem behavior.
    - (5) Gradually increase the schedule requirement for the appropriate behavior in such a manner that it continues to replace the inappropriate behavior as the reinforcement frequency decreases.
  - v) If DRA is to be used, follow all of the guidelines listed for DRI except that the behavior to be strengthened does not have to be incompatible with the behavior to be eliminated.
4. If possible, inform the individual in a manner that he or she is able to understand of the procedure being used.