



Functional Relations, Extinction, Generalization and Discrimination

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Psychology 417



Steady State Strategy and Baseline Logic

- Steady or stable state responding: pattern with little variation in its measure dimension over time (Johnston and Pennypacker, 1993)
- Baseline logic: Prediction, verification and replication
- Steady state strategy: Repeatedly expose a subject to a given condition to obtain a stable pattern of responding before the next condition



Possible question

- Baseline logic provides for which of the following:
 - a. Prediction
 - b. Parsimony
 - c. Verification
 - d. Replication
 - e. A, C and D



Baseline data: Nature and function

- Behavior-environment relations
- Compare data of repeated measures of behavior
- Under different environmental conditions
- Evaluate effects of presence or absence of a variable
- Baseline: serves a control condition



Baseline data

- Subjects performance in absence of independent variable provides objective basis for effect of addition of independent variable
- Provides information for initial criteria for reinforcement
- Objective vs subjective measures
- Confirms if there is need for an intervention



Which is true about baseline data?

- A. Baseline level of responding is of little help in deciding on schedules of reinforcement
- B. Baseline data serves as a control
- C. Baseline data is often subjective
- D. Baseline data can confirm need for an intervention
- E. both A and D.



Baseline data patterns

- Stable
- Ascending
- Descending
- Variable



Baseline data

- Stable trends are best for looking for effects of the independent variable
- Ascending and descending trends should be treated cautiously because behaviors are in process of being changed/there may be independent variable confounds
- For variable trends, determine if the trend show improving or variable performance



Possible question

- Illustrate the following baseline data trends
- Stable trend
- Ascending trend
- Descending trend
- Variable



When to intervene on ascending and descending trends/what variable trends mean

- Trend (ascending or descending) indicates deteriorating performance
- Unacceptable variable responding indicates you should not implement the independent variable because you can not tell if it or an unknown confound is responsible for any change



Prediction

- Anticipated outcome of an unknown or future measure
- Consistency of first 5 data points predicts (if no changes are made) the consistency of the next 5 data points
- Baseline should be continued until stability is clear (Baer, et al, 1968)
- Practice effects: improvement in performance based on repeated opportunities to emit behavior during baseline measures (may affect 0 responding)



Possible question

- What can you predict from a stable baseline of five days?
 - a. Nothing
 - b. That if nothing is changed, the stability of the next 5 data points
 - c. That practice effects are the cause of variability
 - d. None of the above



Affirmation of the consequent

- When there is a stable baseline (steady state responding) and no independent variable is introduced the path would stay the same.
- Question? Will, with the introduction of an independent variable, the data path will change?
- If the independent variable is the controlling factor, then the data will show a change in behavior
- Must first confirm several if A then B possibilities



Possible question

- Which of the following would provide the best affirmation of the consequent?
- A. steady state responding baseline and implementation of the independent variable results in a change
- B. highly variable baseline and implementation of the independent variable results in a change
- C. steady state responding baseline and implementation of the independent variable results in a change, removal results in a return to steady state responding and reintroduction results in a change
- D. descending baseline and an introduction of the independent variable results in a continued descent in trend
- E. All of the above



Verification

- Verify that the prior level of baseline responding would have remained unchanged if the independent variable had not been introduced (Risley, 1969)
- Prediction component of steady state responding applies to steady state responding in any phase of an experiment
- Case for a functional relationship becomes stronger with the addition and removal of the independent variable if behavior change is observed



Replication

- Within an experiment, repeating independent variable manipulations and obtaining similar outcomes



Functional relations are dependent on

- Accuracy/sensitivity of data collection system
- Degree of control over variables
- Duration of phases in the experiment
- Stability of responding in a phase
- Speed, magnitude and consistency of changes between phases



Reversal design

- Repeated measures of behavior in a given setting that includes
 - Initial baseline
 - Intervention
 - Return to baseline
- A-B-A
- A-B-A-B is preferred



Alternating Treatments Design

- Rapid alteration of two or more distinct treatments (independent variables)
- Effects on the target behavior (dependent variable) are measured
- This allows determination of which treatment or combination will produce greatest improvements
- Can use a multiple treatment reversal design
- Experimental method to compare two or more treatments
- Includes three components of steady state strategy of prediction, verification, replication



Multiple baseline design

- Most widely used experimental design
- Analyze effects of independent variables across behaviors, setting or subjects
- Does not require withdrawal of treatments
- Can be used when target is likely to be irreversible or when it is undesirable, unethical or impractical to reverse conditions
- Involves time lagged application of treatment variables



Multiple baseline designs

- Predictions are made when stable baseline is achieved
- Verification is achieved if there is little or no change in other behaviors not subject to the independent variable
- Independent variables effect is inferred if other behaviors remain unchanged
- Verification is not demonstrated directly
- Replication is achieved if after stable responding on a second baseline the independent variable is applied to the next behavior and the data effect for the first behavior is replicated



Changing criterion design

- Evaluates effect of a treatment applied in graduated or stepwise fashion
- Baseline logic: prediction and replication
- Stable responding in each phase is prediction, replication each time level of behavior changes systematically
- Verification by varying length of phases, demonstrate that behavior changes are related to changes in criterion



Extinction

- Reducing the frequency of a previously reinforced behavior: extinction
- Zero probability of reinforcement
- Effectiveness requires identification of reinforcing consequences and withholding those consequences for behavior
- Application can be difficult in applied settings



Procedural vs functional

- Procedural: ignoring
- Functional: withholding maintaining reinforcers
- FBA's: enable distinction between procedural vs functional forms of extinction



Extinction misuse

- Saying a behavior is extinguishing or another procedure that is use to reduce behavior as extinction is incorrect.
- Extinction is not forgetting; is elimination of behavior because you withdraw reinforcement
- Response blocking is not an extinction procedure



Confusing non-contingent reinforcement and extinction

- NCR presents reinforcers non-contingently
- NCR is effective for decreasing problem behavior but is not extinction



Extinction of Behavior Maintained by Positive Reinforcement

- If a behavior is maintained by positive reinforcement, behavior does not produce the reinforcer.



Extinction of Behavior Maintained by Negative Reinforcement

- Place behavior on escape extinction
- Behavior does not result in removal of aversive stimulus
- Guide task completion
- Food refusal, escape extinction



Extinction of Behavior Maintained by Automatic Reinforcement

- Placed on sensory extinction, mask or remove the sensory consequence
- Examples: goggles to mask eye poking, cotton mitts for hair twirling



Extinction Effects

- Produces gradual reduction in behavior
- Gradual increase in pauses between responses
- Initial increase in frequency and magnitude of behavior
- Extinction burst: increase in response frequency
- Burst is a worsening of problem behavior before improvement
- Spontaneous recovery: Reappearance of behavior after it reaches pre-reinforcement level



Effective use of extinction

- Withhold all reinforcers maintaining the behavior
- Withhold reinforcement consistently
- Combine extinction with other procedures with other procedures (differential reinforcement, antecedent interventions)
- Use instructions
- Extinction produced aggression



Guard against Unintentional Extinction

- Have to be careful to prevent unintentional extinction
- Maintain extinction decreased behavior, while fading or removing items that produced sensory extinction
- Imitation
- Ethical issues in use of extinction



Resistance to Extinction

- Intermittent reinforcement: May have greater resistance to extinction than CRF
- Variable ratio and variable interval schedules may be more resistant to extinction than FR and FI schedules
- EO's: more resistant to extinction under high motivation vs low motivation
- Effects of number, magnitude and quality of reinforcement
- Number of previous extinction trials
- Response effort



Generalization

- Stimulus generalization occurs when an antecedent stimulus has a history of evoking a response that has been reinforced, then similar stimuli also evoke the response.
- Stimulus generalization gradient:
Graphic depiction of stimulus generalization and discrimination



Discrimination

- Stimulus discrimination: One behavior and two antecedent stimulus conditions.
- Responses are reinforced under one stimulus condition and not reinforced in the presence of another stimulus condition.
- Discriminative stimuli vs



Concept formation

- Concept formation: stimulus generalization within a class of stimuli and discrimination between class of stimuli
- Antecedent stimulus class: members evoke the same response class
- Feature stimulus class: Stimuli share common physical form
- Arbitrary stimulus class: Evoke same response, but do not share a stimulus feature
- Matching to sample: teach arbitrary stimulus class



Stokes and Baer article assignment

- Review the article
- Complete note cards with the 8 types of generalization described in the article
- Describe the type of generalization
- Provide an example of the type of generalization described from examples the authors used