Types of Punishment

- **Positive Punishment**
  - Generally referred to as Punishment
  - When response occurs, consequence is presentation of an aversive stimulus
  - Probability of response decreases

- **Negative Punishment**
  - More often referred to as Penalty
  - When response occurs, consequence is removal of a reinforcer
  - Probability of response decreases

**Negative Punishment / Penalty**

- Time-out: removing the person from the setting, or removal of unidentified positive reinforcers, for a brief period of time contingent upon the response

- Response-cost: removing a specific positive reinforcer contingent upon the response

**Extinction of Punishment Procedures**

- Extinction of Positive Punishment following acquisition:
  - Do Not Present the Aversive Stimulus when the response occurs

- Extinction of Negative Punishment (Penalty) following acquisition:
  - Do Not Remove the Positive Reinforcer when the response occurs

**As in Reinforcement, with Punishment Procedures:**

- One can distinguish between Intrinsic and Extrinsic punishment
  - Intrinsic = the activity itself is punishing
    - for example, riding a roller coaster makes you feel sick; you’re less likely to ride another one because it was inherently punishing
  - Extrinsic = the activity is followed by a separate event that is punishing
    - for example, being rude to a parent results in loss of your allowance for the week; you’re less likely to be rude to your parent in the near future

**As in Reinforcement, with Punishment Procedures:**

- One can distinguish between Primary and Secondary Punishers, as well as Generalized Punishers
  - Primary Punisher = one that does not require learning to be effective
    - for example, pain is avoided from birth
  - Secondary Punisher = a punishment that was originally neutral and became aversive through pairing it with a primary punisher
    - for example, loss of an allowance has been associated with inability to buy things which has been associated with hunger and/or embarrassment
Problems or Side Effects of Punishment

- Mild punishment may not be effective and/or lose its effectiveness and responding may recover
  - Skinner (1938) concluded that punishment was not effective
  - Boe and Church (1967) showed that Skinner’s aversive stimulus was too mild

Comparing Mild Punishment

- Skinner (1938) trained rats to barpress for food
  - Extinction: one group punished (paw slap) during first 10 minutes of 1st session and one normal extinction group
  - The punished group suppressed during the 10 minutes but then slowly recovered and caught up to the unpunished group
  - Skinner concluded that punishment was not effective
- Boe and Church (1967) replicated Skinner’s study, but used varying levels of shock as punishment
  - Their results resembled Skinner’s with mild intensities of shock
  - With more intense shocks, however, the results showed significant suppression of responding over many sessions of extinction
  - Boe and Church concluded that if the punishment is of sufficient severity, it is quite effective

Problems or Side Effects of Punishment

- Mild and/or ineffective punishment that is then switched to stronger punishment may serve to inoculate the subject against more intense levels of punishment E3
  - e.g., Azrin, Holz, and Hake, 1963
  - e.g., Miller, 1960

Innoculation against Punishment

- Azrin, Holz, and Hake (1963)
  - Trained pigeons to key peck for food
  - Once pecking was strongly established they then punished the birds (plus provided food) for key pecking: 2 groups: 80 volt group vs. 60 volt group
  - The 80 volt group suppressed responding right away
  - The 60 volt group did not suppress; Azrin et al. increased intensity of shock in steps until the birds hit the same level of suppression
  - In order to suppress responding they had to go to 500 volts!!

Problems or Side Effects of Punishment

- Aversive (pain producing) stimuli have been shown to produce aggression as a side effect in animals and humans F5
  - In animals, see Ulrich and Azrin, 1962
    - Shock caused a pair of rats to fight
    - Been shown in cats, raccoons, monkeys & alligators
  - In humans, see Berkowitz, Cochrane, and Embree, 1979
    - Teachers with their hand in ice-cold water chose to be more punitive with their “Pupils”

Problems or Side Effects of Punishment

- Conditioned emotional responses (CERs) may be classically conditioned to stimuli associated with punishment F3.4
  - e.g., fear and anxiety to the person and/or situation; inability to teach correct behavior; person may avoid the person administering punishment
  - see Martin (1977):
    - Boys working on series of tasks were praised, reprimanded or ignored for effort
    - Put more effort into reprimanded tasks
    - In absence of teacher, reprimanded tasks were never freely chosen
Problems or Side Effects of Punishment

- Punishment of an inappropriate behavior does not directly strengthen the occurrence of appropriate behavior and may even result in a general suppression of behavior $^{P1}$
  - For example, if a child is punished for playing aggressively, the child may simply stop playing with other children

Problems or Side Effects of Punishment

- The strong emotional responses that accompany punishment may interfere with the ability to attend to and/or learn from the situation: narrowing of attention
  - Like the Yerkes-Dodson law
  - see Cheyne, Goycoche, and Walters, 1969

Problems or Side Effects of Punishment

- The Yerkes-Dodson law:
  - With easier tasks, higher levels of motivation are optimal; performance suffers with low levels of motivation
  - With difficult tasks, lower levels of motivation are optimal (if you’re over-motivated and the task is difficult, then performance suffers)
  - See Telegdy and Cohen, 1971

Problems or Side Effects of Punishment

- The use of punishment, through the process of modeling, could teach the person that punishment is an acceptable means of controlling behavior $^{P6}$
  - Classic work by Bandura, Ross, and Ross (1963)
  - Field study by Leyens, Camino, Parke, and Berkowitz (1975)
    - 2 weeks of recreational films (violent vs. nonviolent)
    - Higher aggression during a.m. and p.m. play periods for physically violent film group

Problems or Side Effects of Punishment

- Because punishment often has an immediate effect in stopping an unwanted behavior, the use of punishment is often strongly reinforcing to the person administering it, and may therefore result in increasing use and/or increasing severity of punishment $^{P7}$

Problems or Side Effects of Punishment

- The situation or the person delivering the punishment could become an $S^0$ for punishment: person may learn to suppress the behavior only in the presence of the punisher or the particular situation
  - e.g., one does not speed in the presence of a policeman’s car
### Problems or Side Effects of Punishment

- Strong aversive stimuli, or intense punishers, may result in neurotic behavior and/or trauma to the individual
  - see Masserman and Petchel, 1953
- Work with rats has shown that many of the symptoms (phobic behavior, agitation, passivity) are similar to those found in post-traumatic stress disorder in humans
  - see Foa, Zinberg, and Rothbaum, 1992

### Problems or Side Effects of Noncontingent Punishment

- Subjects that are exposed to repeated aversive stimuli that they have no control over may develop:
  - Learned helplessness
  - Experimental Neurosis

### Noncontingent Punishment

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<th>Learned Helplessness</th>
<th>Experimental Neurosis</th>
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<td>Masserman and Petchel, 1953: monkeys and toy snakes</td>
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<td>Dweck and Reppucci, 1973: children and math problems</td>
<td>Masserman, 1943: cats and shock or blasts of air</td>
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### Effective Use of Punishment

- Choose the “amount” and “quality” of the punishment carefully:

  The punishment should be intense enough from the outset to be effective, but not so intense that it causes powerful emotions and/or trauma to the individual

### Effective Use of Punishment

- Avoid any delay in punishment:

  Solomon, Turner, and Lessac (1968) found that hungry dogs learned to avoid a preferred food within 3 or 4 punishments, regardless of delay (0 sec, 5 sec or 15 sec)

  However, in extinction the 15 sec delay group began eating the preferred (previously punished) food within 3 minutes, the 5 sec delay group resisted for 8 days, and the 0 sec delay group resisted for 2 weeks
Effective Use of Punishment

- Delays in humans:

- Aronfreed (1968) repeated Solomon’s study with children. Pairs of toys, one attractive and one not were presented. The attractive one was always punished, but with delays of 0, 2, 6, or 12 seconds.

- In extinction, half of the children in the 0 & 2 sec delay groups withheld reaching for the attractive toy, and half reached after 5 min. The children in the other groups all reached and in less than 1 min on the average.

Effective Use of Punishment

- The schedule of punishment is important: consistent, 100% punishment is most effective for early acquisition.

- Once acquisition is complete, then intermittent punishment will continue to maintain the suppression (Clark, Rowbury, Bacer, & Bacer, 1973)

Effective Use of Punishment

- Stimulus control is very important as well.

- If you want the behavior to remain suppressed in several situations, then it may be necessary to provide punishment under a couple of different circumstances and/or administered by different people.

Effective Use of Punishment

- Language (in humans) is critical as well

Aronfreed’s (1968) study included one delayed punishment group that was given an explanation with the punishment. This group was much more likely to resist temptation during extinction than the other delay groups.

Effective Use of Punishment

- Explanation accompanying punishment may be more effective in humans because

  - The explanation helps to clarify which response was punished

  - Explanations can provide justification for why punishment occurred (making it ‘fair’ or reasonable)

Effective Use of Punishment

- Punishment of inappropriate behavior will be more effective if combined with differential reinforcement of other behavior, especially incompatible behavior.
Summary

- Punishment is most effective when it is immediate, firm, consistent, delivered in a variety of settings, includes reinforcing appropriate behavior, and when it is accompanied by a clear (and fair) explanation.

- Under these circumstances, punishment can be a powerful technique for suppressing behavior.