Physical Activity and Mood
What is Mood?

징 A complex construct that is defined a number of different ways by different authors.

징 Negative Affect

→ Anxiety, Depression, Fatigue, Anger, Confusion

징 Positive Affect

→ Vigor, Pleasantness, Euphoria
Mood is considered to be more transient and less stable.

Does exercise make me feel good is examined on the basis of:

- mood usually measured by POMs
- intensity of exercise or PA
  (low, moderate, high)
- between differing activities
  (weight training, aerobic)
Profile of Mood States (POMS)

Negative moods:
- anger, tension, fatigue, depression, & confusion

Positive mood:
- vigor

McNair et al. (1971)
POMs

• Norms for College Students
  – Raw scores indicate normal scores
    • T = 14
    • D = 14
    • A = 10
    • V = 11
    • F = 11
    • C = 11
POMS and Exercise

McDonald & Hodgdon (1991)
Does PA lower one’s feeling of being anxious (anxiety)?

• What is your opinion? Why
Physical Activity and Anxiety

Anxiety

- A negative emotional state characterized by feelings of nervousness, worry, and apprehension
- State versus trait

A number of meta analyses suggest a small to moderate effect of physical activity on anxiety reduction ($ES=.15-.56$)

Anxiety neurosis is the largest mental health problem in the United States (8% of population)
State & Trait Anxiety

• STAI FORM Y-1 = State
  – Mean for Males = 36.8; Females = 39.5

• STAI FORM Y-2 = Trait
  – Mean for males = 36.6; Females = 39.4
Anxiety & PA Dosage

What dosage of PA produces an effect?

- Minimal anxiety reductions before 9 weeks
- Large changes after 16 weeks
- Length of a session also important
- >20 min. related to increased anxiety
  - Aerobic activity 0 to 20 minutes = ES .78
  - 20-40 minutes = ES .31
  - 40 minutes = ES .28
- Answer:
  - Any duration has an appreciable affect on anxiety.
Trait Anxiety and Physical Activity

Petruzzello et al. (1991) undertook a meta-analysis on studies examining the impact of physical activity on trait anxiety (stable over time).

An small overall effect size of .34

Aerobic activities slightly better than anaerobic activities but difference not statistically significant.
Physical Activity Versus Other Anxiety Treatments

Other behavioral techniques are

- Rest
- Progressive relaxation
- Meditation
- Biofeedback
- Hypnosis

Physical activity is as effective for anxiety reduction as other behavioral techniques used to manage the disturbance
Does PA lower one’s feeling of being depressed?

- What is your opinion? Why
Physical Activity and Depression

Non-clinical Depression

- Listlessness, feelings of gloom

Clinical Depression

- Loss of interest, lowered mood, at least 2 weeks
- At least 5 of the following:
  - Loss of appetite, weight gain or loss, sleep disturbance, decreased energy, psychomotor retardation, sense of worthlessness, guilt, concentration problems, thoughts of suicide
Physical Activity and Non-clinical Depression

- Depression is reduced with physical activity
- Effect of exercise varies from small to medium

<table>
<thead>
<tr>
<th>Category of Subjects</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school students</td>
<td>.60</td>
</tr>
<tr>
<td>College students/faculty</td>
<td>.16</td>
</tr>
</tbody>
</table>
Exercise and Clinical Depression?

- Depression is reduced with physical activity
- Effect of exercise varies from medium to large

<table>
<thead>
<tr>
<th>Source of Depression</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical rehab</td>
<td>.97</td>
</tr>
<tr>
<td>Psychological rehab</td>
<td>.55</td>
</tr>
</tbody>
</table>
Depression and Physical Activity

🎵 What type of PA is best?
   ➔ Beneficial effects occur with all types of activities (weights, aerobics, walking, etc.)

🎵 Dose-response Issue
   ➔ Longer the duration (wks.) the greater the benefit
   ➔ 9 weeks seems to be a threshold but effects are experienced immediately
PA Versus Other Depression Treatments

- PA is no more affective than group or individual psychotherapy and behavioral interventions
- Combination of physical activity & psychotherapy provides best reduction
Does PA effect one’s mood?
Does PA lower one’s feelings of being anxious or depressed?

• What have you learned? Is this a myth or fact!
Why Does Exercise Lower one’s feeling of being anxious or depressed?

- Cognitive explanations
- Physiological explanations
Cognitive Explanations

1. Expectancy hypothesis

Individuals expect to feel better so they report feeling better (Giant placebo effect?)

Doesn’t seem likely given physiology evidence

PA benefits are beyond just expectancy

2. Distraction hypothesis

Exercise is time out from daily stresses

Effects of PA produces a greater positive psychological change than did a time out
Physiological Explanations

1. Thermagenic hypothesis

Increases in core temperature associated with reduced muscle tension (e.g., saunas)
May account for anxiety reductions
Doesn’t account for changes in cognitive functioning and/or depression
Physiological Explanations

2. Monoamine hypothesis

Exercise is a stimulus that increases level of neurotransmitters (I.e., dopamine, norepinephrine, serotonin)

Neurotransmitters facilitate neural impulses across synapses.

Could account for effects of exercise on anxiety, depression, cognitive functioning
Physiology Explanations

• Endorphin Hypothesis
  – Being engaged in endurance activities causes the beta-endorphins to increase one pain threshold? (True or False)
Endorphin Hypothesis

• Endorphin act to reduce pain and contribute to feelings of euphoria

• Exercise increases endorphin levels
  – Associated with runners high
  – Beta-endorphins increases well after PA has been discontinued
  – Only proven in animals not humans
    • Maybe this is a reason why your can run a horse to death
Physiological Explanations

3. Opponent process hypothesis

Human system works to stay in balance (homeostasis)

A stimulus (pleasurable or aversive) activates the parasympathetic nervous system to establish homeostasis

Exercise (aversive stimuli) activates enhanced mood, reduced anxiety, etc.
Physiological Explanations

4. Cerebral changes hypothesis (Cognitive functioning)

a. Exercise produces structural changes including increased density of vasculature

b. Increased blood flow during exercise provides increased nutrients (O\textsuperscript{2} & glucose)
END