STRESS AND HEALTH

AP Psych
Myers, Ch. 14
Stress

• The **process** by which we perceive and respond to certain events, called stressors, that we **appraise** as threatening or challenging.

• Not a stimulus OR a response but a **process** based upon appraisal of events.
Stress and Illness

- Prolonged stressors, combined with unhealthy behaviors can increase the risk of today’s leading diseases.
Behavioral Medicine

• Integrates behavioral and medical knowledge to increase health and decrease disease

• Health psychology – field of psych that contributes to behavioral medicine.

• How can we increase the ability to cope with stress to decrease illness?

• How can we change unhealthy behaviors to increase health?
STRESS RESPONSES AND STRESSORS

“It is not stress that kills us, it is our reaction to it.”
- Hans Selye
Dual-Track Stress Response System

- Triggers fight/flight
- **Fast track** (*nervous system*)
  - Sympathetic nervous system arouses body
  - Adrenal glands secrete epinephrine and norepinephrine (hormones, but active immediately in the sympathetic nervous system)
- **Slow track** (*endocrine system*)
  - Cerebral cortex, hypothalamus, and pituitary gland tell the adrenal glands to release glucocorticoids like cortisol
General Adaption Syndrome

• Hans Selye believed all organisms respond similarly to stressors AND that prolonged stress can lead to physical deterioration.

• The body adapts to stress in 3 phases:
GAS - Example

• Getting asked by the teacher to stay after class…
  • **ALARM**: sympathetic nervous system kicks in… heart races, possibly start sweating, release of stress hormones, fast-track response
  • **RESISTANCE**: increased and sustained physiological responses throughout class by the slow-tack response
  • **EXHAUSTION**: feeling sick, headache, irritability
# Stressful Life Events

<table>
<thead>
<tr>
<th>TYPE</th>
<th>EXAMPLES</th>
<th>APPRAISAL</th>
<th>HEALTH EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Catastrophes</strong></td>
<td>Weather events</td>
<td>Always threatening</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Wars</td>
<td></td>
<td></td>
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<tr>
<td><strong>Significant Life Changes</strong></td>
<td>Marriage</td>
<td>Depends on significance of event</td>
<td>Depends on significance of event</td>
</tr>
<tr>
<td></td>
<td>Divorce</td>
<td>NOT positive or negative impact</td>
<td>Young people respond more intensely</td>
</tr>
<tr>
<td></td>
<td>Child birth</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Family death</td>
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<tr>
<td></td>
<td>Loss of job</td>
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<td></td>
<td>Beginning college</td>
<td></td>
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<tr>
<td><strong>Daily Hassles</strong></td>
<td>Traffic</td>
<td>Depends on individual</td>
<td>Depends on individual</td>
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<tr>
<td></td>
<td>Annoyng roommates</td>
<td>Psychological factors (racism, etc)</td>
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<tr>
<td></td>
<td>Long lines at stores</td>
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</tbody>
</table>
## Conflict and the Individual

<table>
<thead>
<tr>
<th>Conflict</th>
<th>Definition</th>
<th>Example</th>
<th>Stress level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approach - Approach</strong></td>
<td>Decision between 2 or more <em>desirable</em> outcomes</td>
<td>“Should I go to Spain or Italy for vacation?”</td>
<td>Least stressful (win-win)</td>
</tr>
<tr>
<td><strong>Avoidance - Avoidance</strong></td>
<td>Decision between 2 or more <em>undesirable</em> outcomes</td>
<td>“Should I do my Calculus hw or study for my Physics test?”</td>
<td>Somewhat stressful (lesser of 2 evils)</td>
</tr>
<tr>
<td><strong>Approach - Avoidance</strong></td>
<td>Decision that has <em>both desirable and undesirable</em> aspects</td>
<td>“I’ve been offered a job promotion in Alaska. I would make more money but would have to move away from my family to a place that is very cold.”</td>
<td>Most stressful (mixed blessing)</td>
</tr>
</tbody>
</table>
"If your teeth are clenched and your fists are clenched, your lifespan is probably clenched."
- Adabella Radici

STRESS AND ILLNESS
Psychophysiological Illnesses

- Literally, “mind-body” illness
- Any stress-related physical illnesses, such as hypertension and some headaches
Stress and Heart Disease

- **Coronary heart disease** - *the clogging of the vessels that nourish the heart*
  - Plaque – cholesterol, fat, calcium, and dead cells
  - Can lead to atherosclerosis (hardening of the arteries due to plaque) and hypertension (high blood pressure)
- Angina – chest pain/discomfort
- Lack of blood flow to heart → heart muscle begins to die → heart attack

- Stress hormones kill cells that make up the walls of arteries
- Unhealthy behaviors can cause fat and cholesterol to build up.
Stress and the Immune System

- **Immune system** – *protects and defends the body against illnesses using white blood cells.*

- Stress hormones suppress its effectiveness.
  - B-lymphocytes (fight bacterial infections)
  - T-lymphocytes (fight cancer and viruses)

- Stress can speed the...
  - growth of cancer cells
  - the rate at which HIV (virus) develops into AIDS (syndrome).
Personalities and Stress

- Our personality type can dictate how we appraise stressors, thus our reaction to stress.

<table>
<thead>
<tr>
<th>Type A</th>
<th>Type B</th>
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</thead>
<tbody>
<tr>
<td>Competitive</td>
<td>Easy-going</td>
</tr>
<tr>
<td>Impatient</td>
<td>Relaxed</td>
</tr>
<tr>
<td>Verbally aggressive</td>
<td>Calmer when presented with stressors</td>
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<tr>
<td>Anger-prone</td>
<td></td>
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<tr>
<td>More physiologically aroused by stressors</td>
<td></td>
</tr>
</tbody>
</table>

Type A subjects are more prone to suffer from stress and be at higher risk of coronary disease than type B individuals. However, a very extreme type B may lack the necessary energy to face tasks that need a quick move.
Explanatory Style and Health

- Optimistic people tend to suffer less heart disease than pessimistic people.
  - Why do you think this is?
Perceived Control

Real/imagined loss of control of stressor/situation

Outpouring of stress hormones

Suppressed immune system

Higher susceptibility to diseases and illness

More control = Less stress
“To keep the body in good health is a duty… otherwise we shall not be able to keep our mind strong and clear.”

- Buddha

PROMOTING HEALTH & MANAGING STRESS
Coping with Stress

- Stressors are unavoidable, therefore we need to learn how to **cope** (deal or alleviate) with stress to avoid illness.

<table>
<thead>
<tr>
<th>Coping</th>
<th>Definition</th>
<th>Perceived Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem - focused</strong></td>
<td>Directly alleviating stress</td>
<td>In control</td>
</tr>
<tr>
<td><strong>Emotion – focused</strong></td>
<td>Avoiding stressor and tending to emotional needs</td>
<td>Not in control</td>
</tr>
</tbody>
</table>
Examples of Coping Styles

• Stressing out about exams.
  • Problem-focused
    • Tackle studying head-on and prepare for the exam.
  • Emotion-focused
    • Talking with friends/family about how stressed/anxious you are.

• Problems with boyfriend/girlfriend.
  • Problem-focused
    • Start a dialogue about the frustrating issues.
  • Emotion-focused
    • Eating a tub of ice cream and talking to your cat.

• Both coping styles can be used for the same situation, but sometimes one is better than the other DEPENDING on the stressor/situation.
Other ways to reduce stress...

• Form social support systems
  • Friendships
  • Intimate relationships
  • Faith communities

• Aerobic exercise

• **Biofeedback** – *a system that relays info about the physiological state, such as blood pressure or muscle tension*
  ‣ Learn to control bodily response to stress
Other ways to reduce stress…

- **Alternative medicines** - *Unproven healthcare treatments not widely taught in medical schools or in hospitals, and usually not reimbursed by insurance companies.*
  - acupuncture
  - massage therapy
  - homeotherapy
  - spiritual healing
  - herbal remedies
  - chiropractic
  - aromatherapy

- May be beneficial to some people, depending on belief of effectiveness.
Sustained emotional reactions to stressful events can be debilitating.

However…

• We can cope with stressors by problem-focused or emotion-focused coping

• We can manage stress by making ourselves emotionally and physically stronger.

• Crash Course – Stress and Health
“Giving up smoking is the easiest thing in the world. I know because I’ve done it thousands of times.”
- Mark Twain

MODIFYING ILLNESS-RELATED BEHAVIORS
Behavior-Caused Illnesses

- Common health-related complaints...
  - Fatigue
  - Headaches
  - Chest pains
  - Abdominal pains
  - Dizziness
  - Constipation
  - Insomnia

- Less than 20% of these have a clear source.

- The rest involve psychological and behavioral factors that could be changed through health-promoting programs.
Just the Facts: Smoking

- 250 million packs/day worldwide
- 1.3 billion consumers worldwide
- Teen to the grave” smoker – 50% chance of dying from smoking

- “97% of Americans believe smoking is harmful to health yet 18% of Americans smoke (2013)
- Top preventable cause of death - 438,000 deaths per year in US
- Smoking correlates with higher rates of depression, chronic disabilities, and divorce.
Smoking = Top Preventable Cause of Death

WITHIN 20 MINUTES OF QUITTING SMOKING...

YOUR BODY BEGINS A SERIES OF CHANGES THAT CONTINUE FOR YEARS.

- **20 MINUTES**
  - Your heart rate drops.

- **2 WEEKS - 3 MONTHS**
  - Your heart attack risk begins to drop.
  - Your lung function begins to improve.

- **1 YEAR**
  - Your added risk of coronary heart disease is half that of a smoker’s.

- **10 YEARS**
  - Your lung cancer death rate is about half that of a smoker’s.
  - Your risk of cancers of the mouth, throat, esophagus, bladder, kidney, and pancreas decreases.

- **12 HOURS**
  - Carbon monoxide level in your blood drops to normal.

- **1-9 MONTHS**
  - Your coughing and shortness of breath decrease.

- **5 YEARS**
  - Your stroke risk is reduced to that of a nonsmoker’s 5-15 years after quitting.

- **15 YEARS**
  - Your risk of coronary heart disease is back to that of a nonsmoker’s.

FOR MORE INFORMATION VISIT CDC.GOV
When Do People Start Smoking?

- Considered a pediatric disease – most smokers start in adolescence.
  - Especially common among those who get low grades, who drop out of school, who feel less competent and in control of their future, and whose friends, parents, and siblings smoke.

- Those who have not started smoking by the time they are in college/university, will probably not start.
Why Do People Start Smoking?

• Adolescents mimic those around them and those that they admire
  • Family (parents, siblings, etc)
  • Peers (“cool kids,” peer pressure, etc)
  • Celebrities

• Cigarette companies market cigarettes with themes that appeal to teens.
  • Independence, adventure-seeking, social approval, sophistication.

• Smoking in films and TV became more prominent in the 1990s, especially in movies marketed to teens.
Why Don’t People Stop Smoking?

• Tobacco products are as addictive as heroin and cocaine… however, have a higher addiction rate.

• Smokers become dependent, develop tolerance, and experience nicotine withdrawal and cravings, insomnia, anxiety, and irritability.

• Genes can influence predisposition to smoking → gene that influences response to dopamine.
Why Don’t People Stop Smoking?

Nicotine…

• Triggers the release of epinephrine and norepinephrine $\rightarrow$ diminished appetite and increased alertness.

• Releases dopamine $\rightarrow$ activates the reward/pleasure center in brain.

• Releases endorphins $\rightarrow$ natural opiates and stress relievers
Helping Smokers Quit

• Public health warnings
• Counseling
• Drug treatments
• Aversive conditioning
• Operant conditioning
• Cognitive therapy
• Support groups

• 1/5 participants relapse
• 50% of smokers have tried to quit at some point
• Public places ban smoking
• Higher socioeconomic classes smoke less.
Can We Prevent Smoking?

- Key aspects to smoking prevention programs:
  - Information about the effects of smoking
  - Information about peer, parent, and media influences
  - Training in refusal skills, through modeling and role-playing

- Tobacco sales could decrease if prices increase → tobacco tax

- Anti-smoking ads
For Those Who Want to Quit…

• Set a quit date.
• Inform family and friends (accountability).
• Remove all cigarettes.
• Review things you learned from previous attempts to quit and anticipate challenges.
• Use a nicotine patch or gum.
• Be totally abstinent – not even a single puff.
• Abstain from or greatly limit alcohol (which facilitates relapse).
• If other smokers live or work with you, quit together.
• Avoid places where others are likely to smoke.
• Exercise (studies have shown that quitters who exercise have higher success rates).
Just the FACTS: Obesity

- 65% of Americans are overweight.
- Fat = stored energy (evolutionary)

- Where food is scarce, plump is ideal.
- Where food is plentiful, thin is ideal.

- Severe obesity (especially among children) → diabetes, high blood pressure, heart disease, gallstones, arthritis, some types of cancer.

- 2004 – US Medicare declared obesity an illness.

- Since 1960, the average American has grown 1 inch and gained 24 lbs.
Body Mass Index (BMI)

Ratio of height and weight.

US gov’t recommends a BMI under 25.

Can you name 5 of the top 10 states in the US with the highest obesity rates?
The Social Effects of Obesity

• **Obesity is stigmatized in the US.**
  - Affects the way obese people are treated and how they view themselves.
  - Negative stereotype: slow, lazy, and sloppy.
  - Viewed as a choice by some people, evidence of a lack of self-discipline, or a personality problem (a maladjusted way of reducing anxiety, dealing with guilt, or gratifying an “oral fixation.”)
The Social Effects of Obesity

- Studies have shown that when images of people are adjusted to appear heavier, others rate these images as less sincere, less friendly, meaner, and more obnoxious.

- Obese women followed in a study for 7 years found that those who remained obese made less money and were more likely to be unmarried.

- Studies reveal a “weight bias” in job interviews, especially towards women, that could be more significant that gender or race bias.

- So why don’t people just lose weight?
The Physiology of Weight

• 1 lb = 3500 calories… therefore a 3500 calorie deficit results in 1 lb lost.

• WRONG!!! Answer lies in fat cells, set-points, metabolism, and genetics.
Fat Cells

• The number and size of fat cells are the immediate determinants of body fat.

• 30-40 billion in adults, half lie near the skin’s surface.

• Can swell to 2-3x normal size in obese person, then divide, to create more cells.

• Once created, cells can shrink, but NEVER disappear.
Set Points and Metabolism

- **Set point** – “weight thermostat”
- **Metabolism** – the body’s rate of expending energy (calories)

- Fat tissue has a lower metabolic rate, requiring less food energy to maintain (why dieting won’t get rid of it)

- Obese people have higher set points; when weight drops, metabolism decreases → adapt to save energy (fat tissue)
  - Study showed that when obese participants were given a 450 calorie/day diet, they lost only 6% of weight and metabolism dropped by 15%.
The Genetic Factor

- Adoptive children’s weight reflects birth parents.
- Identical twins have closely similar weights, compared to fraternal twins or siblings.

- Given an obese parent...
  - Boy is 3x more likely to become obese
  - Girl is 6x more likely to become obese

- Leptin (hormone) production (more = lose weight) is connected to weight loss → leptin injections
Environmental Factors

- Americans are more obese than Europeans.
- Women in lower socioeconomic classes are 6x more likely to become obese.
- TV watching correlated with increased obesity and diabetes.
- Walking-dependent communities weight less.
- Visits to fast food restaurants have tripled since 1997.
- All-you-can-eat buffets in college dining halls → “Freshman 15”
- Enlarged seats on subways, in theaters, stadiums, and planes.

Where Does The Freshman 15 Come From?
NCSU Fountain Dining Hall – check out restaurants and cafes
UNC Dining
Obesity: Nature and Nurture

- **Diathesis-stress model**
  - Behaviors are a result of both biological (nature) factors and life experiences (nurture).

- Obesity
  - Nature – set points, metabolism
  - Nurture – stress, cultural eating patterns
Genes and Environment

- GENES can account for why individuals may vary in weight compared to their peers.

- ENVIRONMENT factors can account for why the current population is more obese than the population of 50 years ago.

<table>
<thead>
<tr>
<th>AVERAGE U.S. BODY WEIGHT (POUNDS), 1960 TO 2002</th>
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<tbody>
<tr>
<td>19-year-olds</td>
</tr>
<tr>
<td>Men</td>
</tr>
<tr>
<td>1960–1962 –</td>
</tr>
<tr>
<td>1971–1974 160</td>
</tr>
<tr>
<td>1988–1994 161</td>
</tr>
<tr>
<td>1999–2002 172</td>
</tr>
<tr>
<td>Women</td>
</tr>
<tr>
<td>1960–1962 –</td>
</tr>
<tr>
<td>1971–1974 131</td>
</tr>
<tr>
<td>1988–1994 139</td>
</tr>
<tr>
<td>1999–2002 149</td>
</tr>
</tbody>
</table>

| 20- to 74-year-olds                          |
| Men                                          |
| 1960–1962 166                                |
| 1971–1974 173                                |
| 1988–1994 182                                |
| 1999–2002 189                                |
| Women                                        |
| 1960–1962 140                                |
| 1971–1974 144                                |
| 1988–1994 153                                |
| 1999–2002 163                                |

Source: Centers for Disease Control and Prevention report by C. L. Ogden & others (2004).
Losing Weight

• Fat cells only shrink… never disappear → many formerly obese people regain the weight, or struggle continuously.

• Americans spend $40 billion/year on diet foods and drinks.

• Successful weight loss include modifying lifestyles.

• Suggestions…
  • Extra tax on high-fat/calorie foods
  • Use revenue to support healthy nutrition programs or subsidize healthier food
  • Fast food free zone around schools
  • Ban advertising junk food to kids
  • Encourage activity by designing walking communities
For Those Who Want to Lose Weight

• Seek medical advise if severely overweight.
• Begin when motivated.
• Minimize temptations.
• Boost metabolism.
• Be realistic and moderate.
• Eat healthy foods.
• Don’t starve and binge.
• Avoid alcohol.
• Cope with stressors.
Final Thoughts on Health

- We all tend to deny health risks, thus the first goal of health-promoting programs must make us all realize our vulnerability to stress and behavior-related health problems.

<table>
<thead>
<tr>
<th>Biological</th>
<th>Psychological</th>
<th>Sociocultural</th>
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</thead>
<tbody>
<tr>
<td>- Genetic predispositions towards physiological reactivity, disease, addiction, depression, and other health problems</td>
<td>- Appraising stressors as challenges or threats</td>
<td>- Environmental stressors</td>
</tr>
<tr>
<td></td>
<td>- Coping ability</td>
<td>- Cultural influences on eating, smoking, and other behaviors</td>
</tr>
<tr>
<td></td>
<td>- Personality</td>
<td>- Social support</td>
</tr>
<tr>
<td></td>
<td>- Optimistic or pessimistic explanatory style</td>
<td>- Available medical support</td>
</tr>
<tr>
<td></td>
<td>- Healthful or harmful behaviors</td>
<td>- Personal control and other previous experiences</td>
</tr>
<tr>
<td></td>
<td>- Spirituality</td>
<td>- Spirituality</td>
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