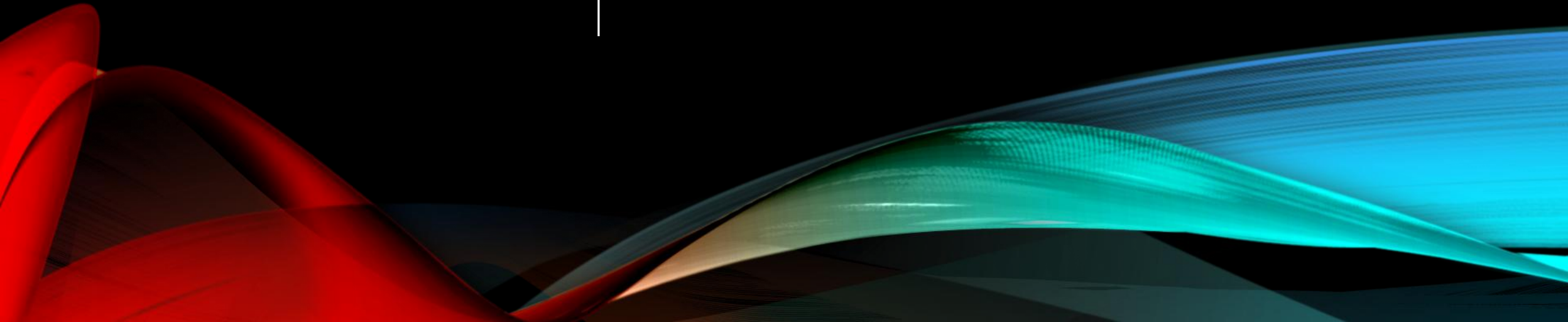


©Susan F Goran

HUMOR: NOT JUST A LAUGHING MATTER



TODAY'S LEARNING OBJECTIVES

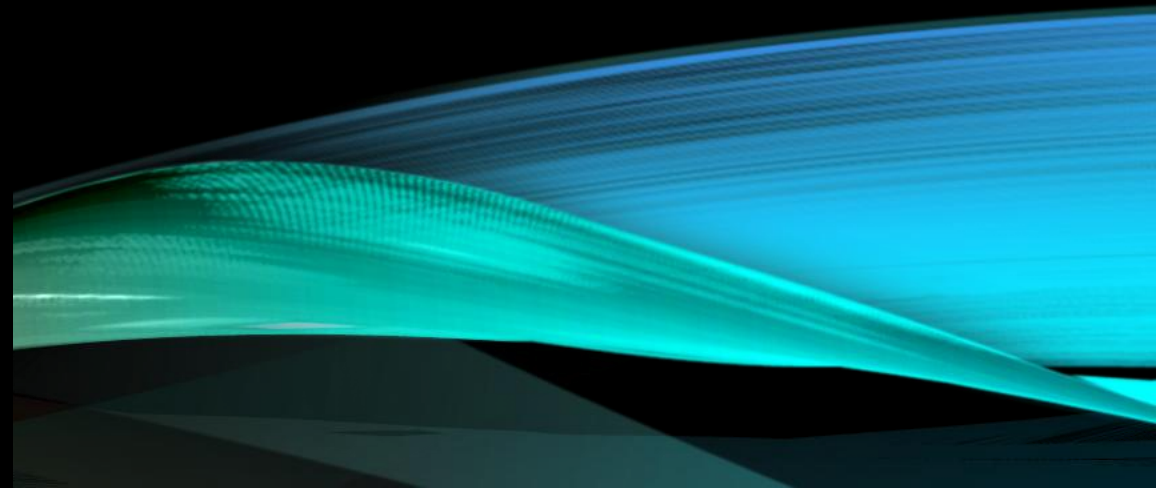
- ✓ Describe 3 positive physiological benefits of humor on the human body.
- ✓ Discuss the role of laughter and humor in reducing stress.
- ✓ Discuss how humor can reduce symptoms of anxiety or depression.



Photo by Lotte
Meijer on
Unsplash



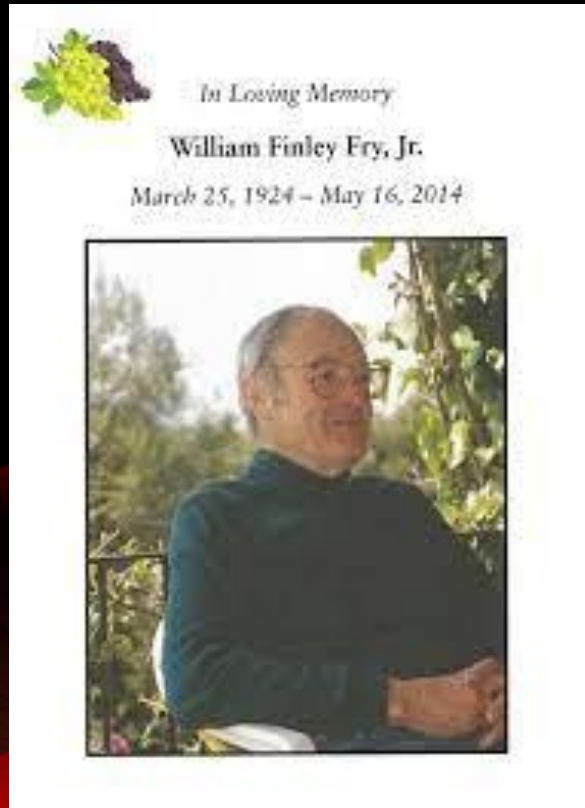
**HOW MANY
BENEFITS OF
LAUGHTER CAN
YOU IDENTIFY?**



An abstract graphic on the left side of the slide, featuring a vibrant red background with a green, curved, ribbon-like shape that spirals upwards and to the right.

PHYSIOLOGICAL BENEFITS OF LAUGHTER

LAUGHTER RESEARCH



- William F. Fry, Psychology at Stanford University, was a pioneering investigator who pursued laughter and as a field of study and created the term **gelotology**, the study of laughter
- Requested research public funds for humor research; not awarded funding (deficits from Vietnam war)
- Fry's pioneering work provided evidence and mechanistic insights for the positive physiological impact of humor, which paved the path for future investigation
- The biology of humor

EMOTION-MIND-BODY TAPESTRY

- Now well documented and generally accepted that human emotions interact with the mind and body in complex and powerful ways that impact our health
- Basic human emotions, such as anxiety, depression, fear, joy (mirth), and laughter, profoundly impact physiological processes.
- Psychoneuroimmunology (PNI), defined as the interaction between behavioral, nervous, endocrine, and immune systems, began in the 1970
- Increased scientific evidence supporting the emotion-mind-body relationship clearly documents that mood, thoughts, and feelings have a profound impact on our immune system and general health

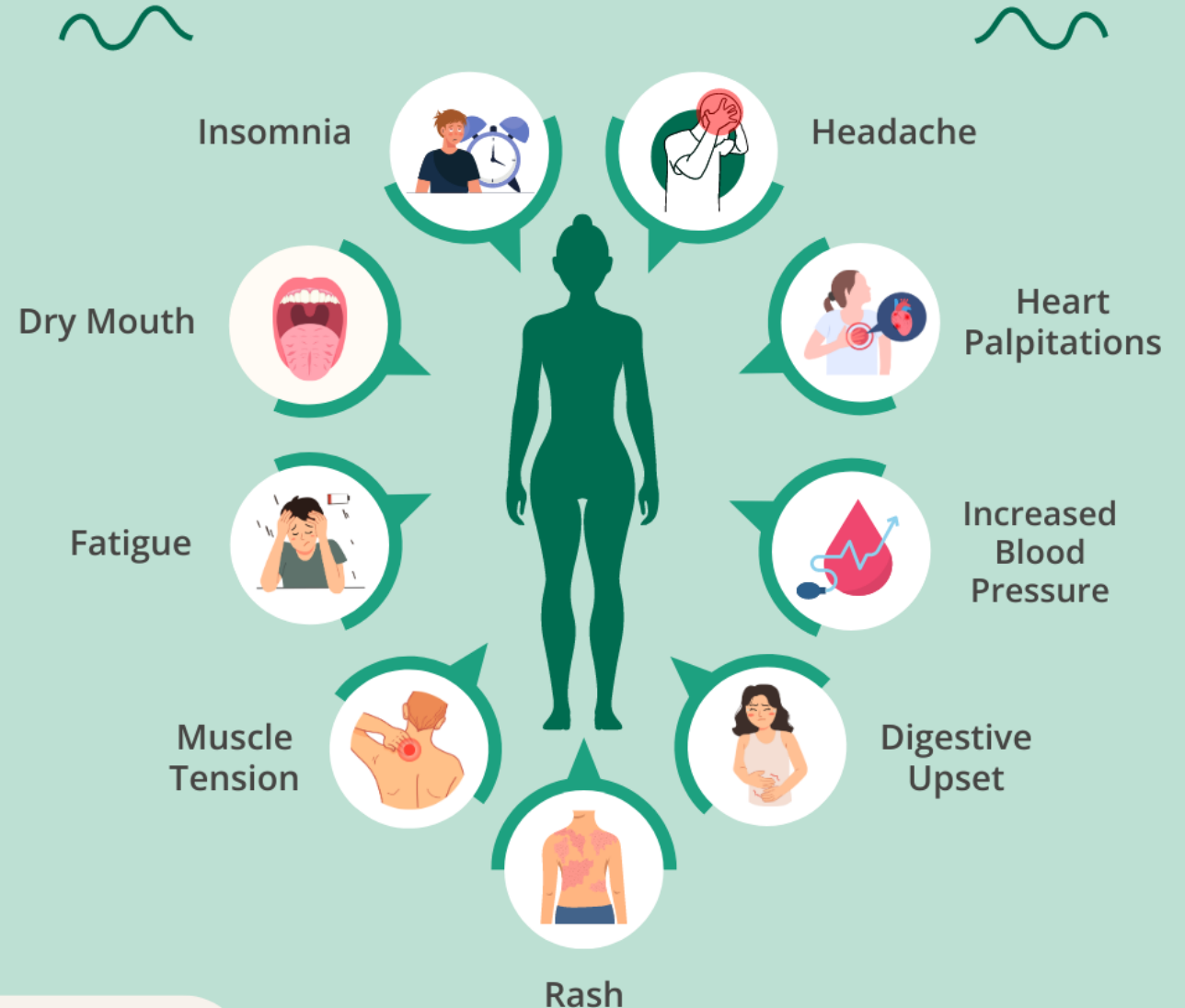


Photo by Birmingham Museums Trust on
Unsplash

IMPACT OF STRESS

- Stress leads to an increase in stress-related hormones, thus weakening the function of the immune system making people more susceptible to disease
- Increases blood pressure and workload on the heart leading to different dysrhythmias
- Constriction of the blood vessels leading to renal damage and increased clot formation, stroke & myocardial infarction
- Increases the work of the respiratory system
- Leads to changes in mental function

How Stress Affects the Body





CAN LAUGHTER ALLEVIATE STRESS?

- Emotional states are associated with different physiological indicators
- Measuring salivary IgA levels: 1985-1995
 - Several studies showing mixed results
- 1989 Measuring stress hormones levels (10 men)
 - Mirthful laughter experience appears to reduce serum levels of cortisol, dopac, epinephrine, and growth hormone
 - <https://pubmed.ncbi.nlm.nih.gov/2556917/>
- 2001, Beck: neuroimmune parameters 52 men
 - Increases were found in natural killer cell activity; immunoglobulins G, A, and M with several immunoglobulin effects lasting 12 hours into recovery from initiation of the humor intervention <https://pubmed.ncbi.nlm.nih.gov/11253418/>

IMMUNOENHANCEMENT

- Natural killer (NK) cell cytotoxicity as an indicator of immune system functioning: lymphocytes which can lyse tumor cells while leaving normal cells intact
 - 1989: 22 breast cancer patients viewed both a humorous video and a distressing video; sense of humor was also included and measured using the Coping Humor Scale (CHS)
 - No significant change in NK numbers or levels of cytotoxicity
 - Scores on the CHS were positively correlated with numbers of NK cells
 - Berk (2001) series of 5 separate studies; 52 healthy males, who viewed a humor video for 1 h, labs at 10 min before, 30 min into, 30 min after and 12 h after the intervention.
 - Increases were found in natural killer cell activity; immunoglobulins G, A, and M, with several immunoglobulin effects lasting 12 hours into recovery
 - Bennett (2003): 33 healthy adult women to examine the effect of laughter on stress and NK cell activity
 - Finding indicated that only the subjects who laughed out loud during the humor video had significantly increased immune function; persons who just smiled or did not have observable responses to the humor video did not have positive changes in immune function
 - *Significant relationship between the amount of laughter and change in immune function*



DOES THE TYPE OF LAUGHTER MAKE A DIFFERENCE IN BENEFIT?

- Neuroimaging suggests that different neural pathways are used in these 2 forms of laughter.
 - Spontaneous (“genuine”) laughter; unforced laughter; often in response to a stimulus
 - Self-induced (volitional) laughter: (simulated de novo) we create ourselves, without the trigger of something actually funny
- More studies on spontaneous laughter
- 2010 review cataloged the available scientific evidence on the physical benefits of both spontaneous and simulated laughter

Mora-Ripoll R. The therapeutic value of laughter in medicine. *Altern Ther Health Med*. 2010;16(6):56-64.
- Motion creates emotion theory (MCET): Laughter as a physical activity; benefits from laughter are similar to the effects of exercise

LAUGHTER YOGA (SELF-INDUCED/SIMULATED LAUGHTER)

- Exercise program developed by Indian physician Dr Madan Kataria (1995)
 - Anyone can laugh without relying on humor, jokes or comedies; *Fake it till you make it.*
 - It is practiced in more than 110 countries.
 - Combines laughter exercises with yoga breathing techniques
 - Brings more oxygen to our body and brain making us feel more energetic and healthy.
 - Ten to 15 minutes of LY exercises can reduce stress, make your immune system stronger and keep your mind positive during challenging times <https://www.laughteryoga.org/>
- Class involved deep breathing, making loud “ha” noises with a hand on the belly or chest, and walking around to other class members, laughing while making eye contact
- Yoga Ideally suited for seniors



<https://www.laughteryoga.org/news/laughter-yoga-giggling-and-its-healing-power-by-lauren-keating/>

CURRENT RESEARCH

- “When we laugh, when we’re funny, when we’re engaged with funny people who make us feel better, there is a decrease in cortisol and there’s an increase in the endorphins/feel good hormones (dopamine, oxytocin and endorphins) Mayo Clinic expert and oncologist Edward T. Creagan, M.D. <https://mcpress.mayoclinic.org/healthy-aging/the-health-benefits-of-humor/>
- Laughter can help to not just alleviate but actually reverse the body’s stress response.



LAUGHTER FOR IMPROVING HEART HEALTH

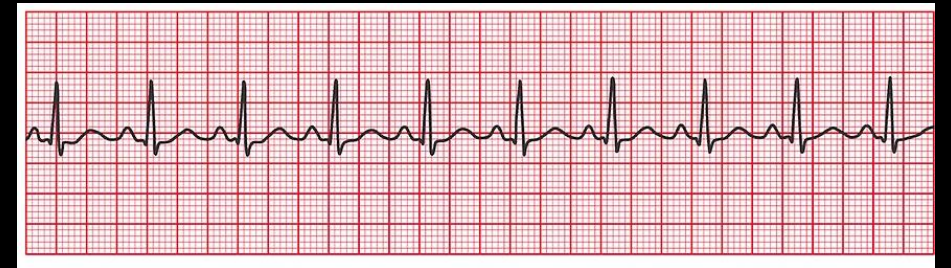
- Laughter produced by watching a humorous video increased sympathetic nervous system arousal as indexed by increased galvanic skin resistance, increased heart rate (HR) and decreased finger temperature.
- Similarly, watching a humorous video produced a significant increase in HR and blood pressure, compared to watching a control video.
- 72 adults (48 female, 24 male; average age 24.15 years)
 - simulated laughter produces stronger cardiovascular responses than spontaneous laughter; findings support the theory that laughter acts as a form of exercise, with more frequent and intense laughter producing a greater exercise effect on the body

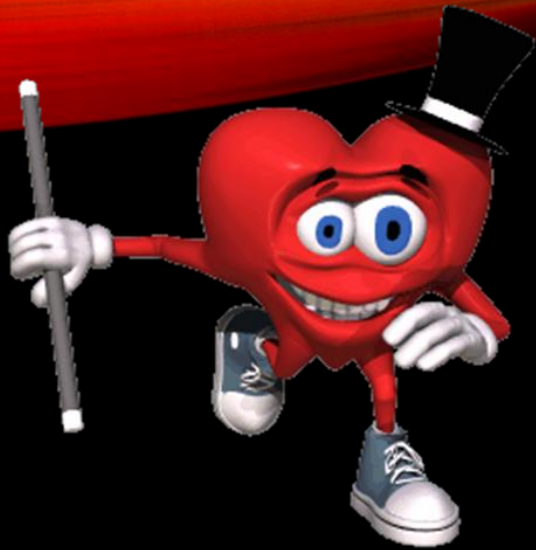


Image Credit: Explode / Shutterstock.com

HEART RATE & HEART RATE VARIABILITY

- Heart rate: beats per minute; changes depending on the body's need for oxygen
- Heart rate variability: measure of heart health
 - HRV is the normal rhythmic variations in consecutive heart beats that index the cardiovascular system's ability to meet demand
 - HRV represents both the sympathetic and parasympathetic effects on the heart.
 - Stress or exercise triggers parasympathetic reduction and subsequently sympathetic activation leading to increased HR and decreased HRV
- Laughter initially increases heart rate to meet body's demand, and increases the amount of oxygenated blood circulating improving cardiovascular function



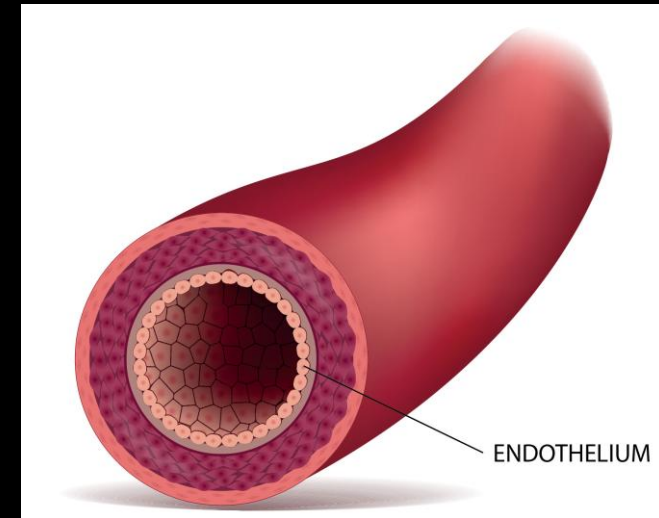


BLOOD FLOW

- Onset of mirthful laughter has a significant impact on blood pressure, almost simultaneously causing intra-arterial pressure to rise. Cessation of laughter is followed by brief decrease of pressure to varying levels slightly below the pre-laughter baseline.
- Volunteers were randomized to two different phases
1) included watching a movie or segment of popular comedies (e.g., Saturday Night Live) 2) view a movie known to promote mental stress (e.g., the opening segment of Saving Private Ryan (DreamWorks, 1998)
 - high resolution ultrasound of the brachial artery
 - 22% increase in flow with laughter = improved vascular tone, enhanced production of nitric oxide
 - 35% reduction in flow with stress

IMPACT ON THE ENDOTHELIUM

- Studies of the vascular endothelium (inner most lining of the blood vessels)
- Endothelial cells secrete vasoactive chemicals:
 - Endothelial-derived relaxing factor or nitric oxide (NO), causing relaxation and vessel dilation, reduce vascular inflammation, decreasing platelet activation (decreases blood pressure & reduces clot formation)
- Michael Miller, director of the Center for Preventive Cardiology at the University of Maryland Medical Center
 - Mental stress negatively impacts the endothelium by causing vasoconstriction, an inflammatory response and possibly the buildup of cholesterol, potentially leading to coronary artery disease
 - His studies also documented that, during laughter, the endothelium facilitates vasodilation and an increase in blood flow.



EFFECTIVE EVEN WITH CAD

- Saffi, 2023: study split 26 adults with an average age of 64 and all diagnosed with coronary artery disease into two groups
 - One group watched two different hour-long comedies on television each week and the other that watched serious documentaries about topics like politics or the Amazon rainforest.
 - After 12 weeks, the participants who watched comedy showed a 10% improvement in a test that measured how much oxygen their hearts could pump around their bodies
 - Participants also underwent blood testing that showed a reduction of inflammatory biomarkers, an indicator of how much plaque has built up in the blood vessels, for people who watched comedies compared to the other group. “This study found that laughter therapy is a good intervention that could help reduce that inflammation and decrease the risk of heart attack and stroke.”

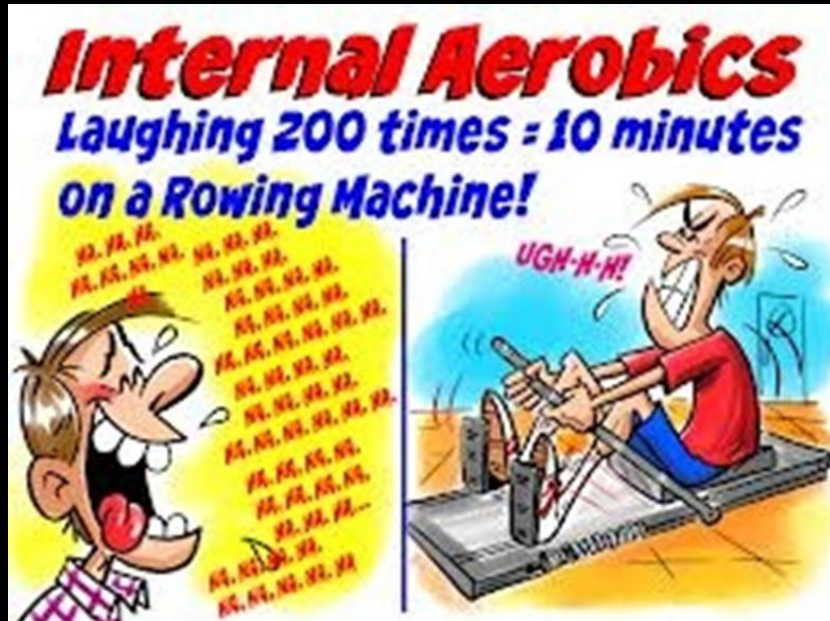
<https://www.webmd.com/heart/news/20230828/laughter-really-is-good-for-the-heart-study-finds>

RESPIRATORY BENEFITS

- Fry (1977, 1982, 1986, 1988, 1992, 1994): Using a pulse oximeter, he investigated the change in oxygen saturation after 3 min of continuous laughter. Although there was no change in oxygen saturation, laughter resulted in increased ventilation, increased muscle activity, increased minute volume, and the creation of forceful exhalation that could mobilize and remove pulmonary secretions <https://journals.physiology.org/doi/full/10.1152/advan.00030.2017>
- Decreases pulmonary dead space
- May lead to hiccupping and coughing, which clears the respiratory tract by dislodging mucous plugs
- Increased oxygenation
- Exercises the diaphragm



LAUGHTER AS AEROBIC EXERCISE



- Laughter is stimulating: exercises skeletal muscle, strengthen muscles in the chest, abdomen, and back
 - rectus abdominis, multifidus, erector spinae, and obliques
- Activates internal oblique muscles to similar levels as crunches and back lifting exercises.
- Improves muscle tone Wagner H, Rehmes U, Kohle D, Puta C. (2014). Laughing: a demanding exercise for trunk muscles. J Mot Behav. 46(1):33-7. doi: 10.1080/00222895.2013.844091.
- During laughter, various muscle groups are activated for periods of seconds at a time, while the period immediately after the laugh leads to general muscle relaxation. This post-laughter relaxation can last up to 45 min
- Changes are in effect only during periods of intense laughter, which are very difficult to sustain for any length of time. This makes it unlikely that laughter can be regarded as a realistic substitute for aerobic exercise <https://pmc.ncbi.nlm.nih.gov/articles/PMC2249748/>

LAUGHTER ON THE BRAIN

- ✓ Humor intertwined with our cognitive health
- ✓ Increased memory related to improved norepinephrine uptake
- ✓ Wei Zheng , Xiaolu Wang (2023): positive affect derived from humor can in turn provide immediate feedback to the cognitive system, which enhances text comprehension
- ✓ Increased creativity (Bidderman, 2017)

off the mark.com by Mark Parisi



SOMEWHERE MICHELLE'S PLASTIC SURGEON WAS WONDERING WHERE HE LEFT HIS CELL PHONE

YOUR SKIN IS GLOWING

- Stimulates endorphin release; natural mood boosters with an anti-inflammatory effect
- Improved circulation/blood flow; can improve skin tone and appearance.
- Stress Reduction: can significantly reduce the risk of skin problems like acne and eczema.
- Potential Collagen Production:
 - Endorphins can stimulate collagen production, a protein that helps maintain skin elasticity and reduce wrinkles
- Laugh: exercises 43 facial muscles which improves skin tone & appearance
- Improves oxygen flow which has a strong rejuvenation impact with new cell production
- Happy expressions actually soften wrinkles' overall appearance. In fact, it's frown lines that are more to blame for diminished skin elasticity



<https://nationaltoday.com/beautiful-skin-month/>

IMPACT ON DIABETES

- Diabetes can take a tremendous toll on both physical and psychological health
 - #1 cause of renal failure
 - 2-3X risk for heart disease/stroke
 - Greater risk of peripheral neuropathy, peripheral arterial disease and higher rates of lower-limb amputation
 - 1.5 – 3 X rates of depression
 - 2 X rate of anxiety
 - 1.5–2.5 times the risk of dementia
- Unknown it also affects sense of humor.



LAUGHTER TO HELP MANAGE PAIN

- Proverbs 17:22 : “A cheerful heart is good medicine, but a crushed spirit dries up the bones,”
- Endorphins are a class of opioid peptides produced in the central nervous system (CNS); function as neurotransmitters but also play a crucial role in the management of pain through their analgesic properties (body's morphine)
- High levels of CNS endorphins will be associated with an elevated pain threshold
- Norman Cousins (1979) Anatomy of an Illness as Perceived by the Patient
- Hypothesis: social laughter elevates pain thresholds both in the laboratory and under naturalistic conditions (Dunbar et. al, 2011).
 - Results confirmed that when laughter is elicited, pain thresholds are significantly increased, whereas when subjects watched something that does not naturally elicit laughter, pain thresholds do not change (and are often lower).
 - Highest pain thresholds occurred when laughing in groups
 - These results can best be explained by the action of endorphins released by laughter.
 - <https://pmc.ncbi.nlm.nih.gov/articles/PMC3267132/#RSPB20111373C40>

“DOCTORS OF DELIGHT”



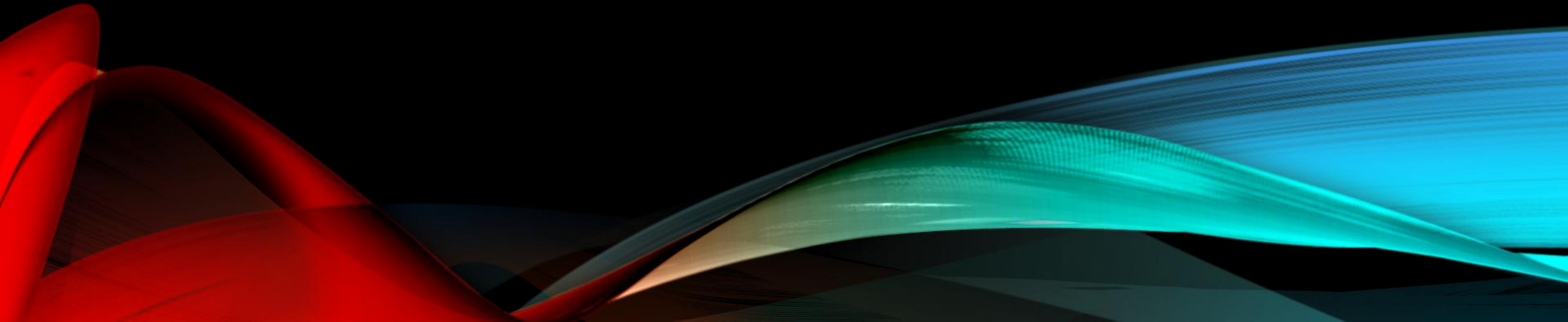
- Hunter Doherty "Patch" Adams is an American physician, comedian, social activist, clown, and author. He founded the Gesundheit! Institute as a not-for-profit in 1989.
- Professional Clown Doctors began working in hospitals in 1986 under a program called the Big Apple Circus Clown Care Unit, which was started in New York City.
- “Doctors of Delight”: Boston Children’s Hospital: “Out of laughter comes hope, and from hope, the possibility of healing.” Jay Stewart as Doc Skeeter

CHRONIC PAIN

- 55%–66% older adult population c/o chronic pain (persists past the normal time of healing; 3 months)
- Associated with negative mood states and life satisfaction
- Pérez et al. (2019) examined the effects of humor on chronic pain sensation.
 - Distractions created by the humor, such as watching a comedy clip, increase pain tolerance.
 - Humor positively affects coping with pain and emotional distress caused by chronic pain



PSYCHOLOGICAL EFFECTS OF HUMOR & LAUGHTER



HOW DO YOU USE HUMOR?

Test your Humor Style

Humor Styles Questionnaire

Rod A. Martin, Ph.D.

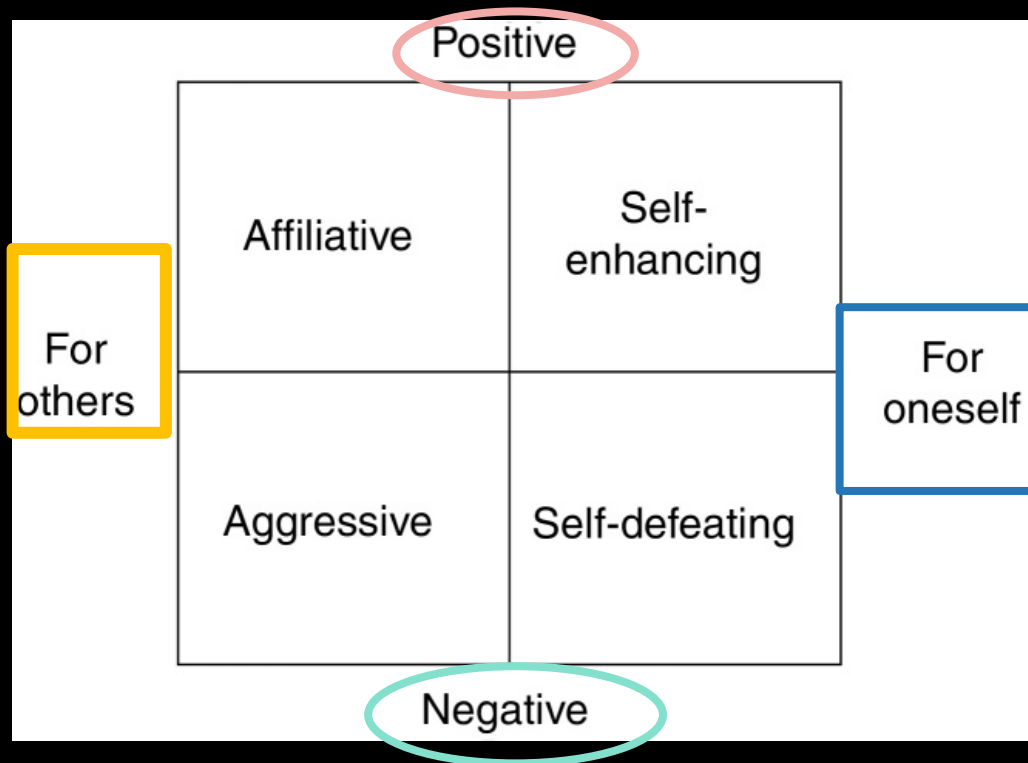
INSTRUCTIONS: People experience and express humor in many different ways. Below is a list of statements describing different ways in which humor might be experienced. Please read each statement carefully, and indicate the degree to which you agree or disagree with it. Please respond as honestly and objectively as you can. Answer by clicking one of the option buttons beside each item, using the following scale:

	Totally Disagree 1	Moderately Disagree 2	Slightly Disagree 3	Neither Agree nor Disagree 4	Slightly Agree 5	Moderately Agree 6	Totally Agree 7
1. I usually don't laugh or joke around much with other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If I am feeling depressed, I can usually cheer myself up with humor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. If someone makes a mistake, I will often tease them about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I let people laugh at me or make fun at my expense more than I should.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I don't have to work very hard at making other people laugh -- I seem to be a naturally humorous person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Even when I'm by myself, I'm often amused by the absurdities of life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. People are never offended or hurt by my sense of humor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I will often get carried away in putting myself down if it makes my family or friends laugh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I rarely make other people laugh by telling funny stories about myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. When telling jokes or saying funny things, I am usually not very concerned about how other people are taking it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I often try to make people like or accept me more by saying something funny about my own weaknesses, blunders, or faults.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I laugh and joke a lot with my friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. My humorous outlook on life keeps me from getting overly upset or depressed about things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I do not like it when people use humor as a way of criticizing or putting someone down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I don't often say funny things to put myself down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I usually don't like to tell jokes or amuse people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<http://www.humorstyles.com/>

- Used to assess how people use humor in their daily life
- **Affiliative Humor:** Tendency to share humor with others, tell jokes and funny stories, make others laugh, use humor to facilitate relationships, put others at ease.
- **Self-Enhancing Humor:** Tendency to maintain a humorous outlook on life even when not with others, use humor in coping with stress, cheer oneself up with humor.
- **Aggressive Humor:** Tendency to use humor to disparage, put down, or manipulate others; use of ridicule, offensive humor; potentially use sexist and racist jokes.
- **Self-Defeating Humor:** Tendency to amuse others at one's own expense, self-disparaging humor; laughing along with others when being ridiculed or teased; using humor to hide one's true feelings from self and others.

TYPES OF HUMOR



- Martin et al. (2003)
 - Depression was negatively correlated with positive uses of humor, but positively correlated with self-defeating humor
 - Similar results for anxiety
 - Positive correlations between self-enhancing humor and optimism.
- Dyck and Holtzman (2013)
 - Use of humor determined the appearance of depressive symptoms, depending on the perception of support from one's social circle.
 - This perception depended on the subjects' sex; women were perceived as more hostile when they used aggressive humor.

HUMOR STYLES AS PROTECTORS AGAINST ANXIETY AND DEPRESSION



- Rnic, Dozois, and Martin (2016)
 - Looked for connections between distorted thinking, the uses of humor, and depressive symptoms.
 - Significant correlations between the appearance of depressive symptoms and aggressive, self-defeating and self-enhancing uses of humor
 - First two correlations were positive, the latter was negative
 - Better psychological wellbeing was not related to being funny in specific instances, but rather the predominant use of humor in everyday life
- Scoring high on the two positive humor styles has been linked with various positive health outcomes, such as being happier and having healthier relationships. On the other hand, having high scores on the negative humor styles can have a negative effect on one's health.

DEPRESSION

- Globally, it is estimated that 5% of adults suffer from depression, a leading cause of disability worldwide and a significant contributor to the global burden of disease
- Study looked at the relationships between the four humor styles and depression.
 - sample of 1,154 Australian twins; 339 of them were identical, and 236 were non-identical; same sex twins; 145 individuals were diagnosed with depression
 - 145 individuals were diagnosed with depression
- Results:
 - women were 2.5 X more likely than men to suffer from depression
 - people diagnosed with depression used self-defeating humor more than non-depressive people
 - depressive twins used the two positive humor styles (affiliative and self-enhancing) less than non-depressive twins
 - 26% of the differences in the depression scores were attributed to additive genetic factors, while 74% were due to non-shared environments

Study highlights the fact that humor is not always good for us, and in some cases might have severe negative effects.

EFFECTS OF HUMOR ON PATIENTS WITH DEPRESSION

- Goldberg and Harrow, 2005: Humor as a form of therapy could improve QOL & the long-term outcome of depression
- Konrad et al., 2013: Use of humor therapy: humor-treatment group had different humor-rich sessions, either by looking at the humorous perspective of everyday things or through conversation, making funny faces, remembering funny things, and so on
 - showed significant changes in outcomes such as physical health, satisfaction with life, improvement in suicidal ideations, and sad mood



ANXIETY

- A type of intrusive, repetitive, and uncontrollable chain of negative thoughts and images
- The more effort you make in trying to distance yourself from the anxiety, the greater the boomerang effect the anxious thoughts will take in returning; As counterintuitive as it sounds, you need to allow and even invite your anxiety to be present in order to work through it and overcome it
- Anxiety can be a shape-shifter; presents differently for everyone, but with the common theme of focusing on those triggers that each individual finds most distressing and consequential
- It is not the trigger that is the culprit of your discomfort, but rather, it is your reaction to the trigger
- Exaggerate the fear, the better you will be able to see it as outlandish and excessive



ANXIETY: A SHOCKING EVENT

- 1990: Study of threat-induced anxiety
 - 53 undergrad students
 - Receive an electrical shock in 12 minutes
 - Option to listen to either a humorous, a non-humorous, or no tape prior to the shock.
 - Those exposed to a humorous film consistently rated themselves **less anxious** and reported smaller increases in stress as the time to receive a shock approached

Yovetich, N. A., Dale, J. A., & Hudak, M. A. (1990). Benefits of humor in reduction of threat-induced anxiety. *Psychological Reports*, 66(1), 51–58. <https://doi.org/10.2466/PRO.66.1.51-58>

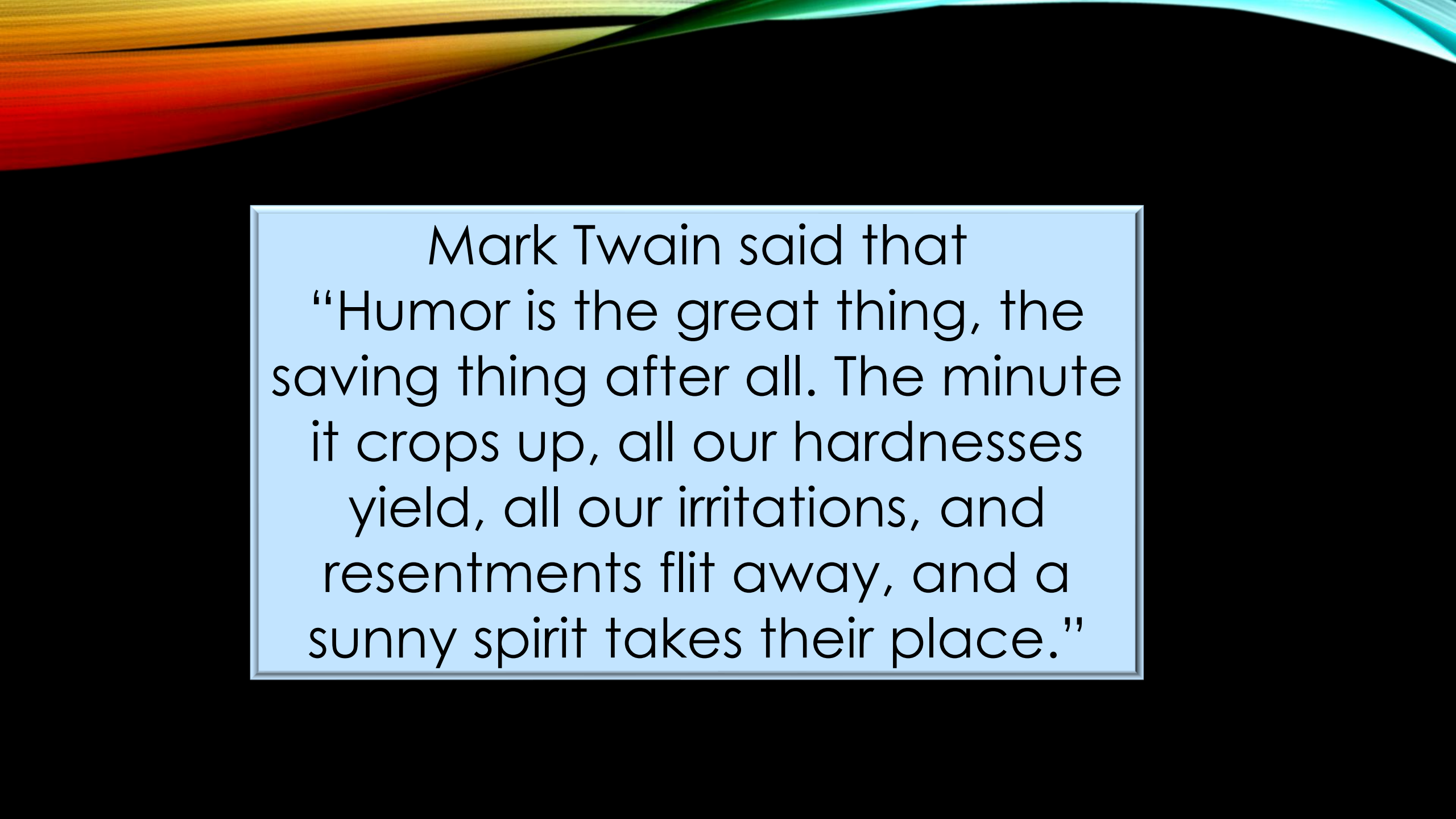


TEST ANXIETY

2012: Having a good laugh prior to the exam may inhibit anxiety and prevent performance impairment

- ❑ 33 men, 51 women volunteers (extra credit) told it was a 20-question difficult math test
- ❑ read either 10 cartoons, 10 short poems or nothing at all
- ❑ conclusion: Exposure to humorous cartoons prior to taking a difficult math test enhanced performance on the test, in part, by alleviating the amount of state anxiety participants felt while taking the math test.





Mark Twain said that
“Humor is the great thing, the
saving thing after all. The minute
it crops up, all our hardnesses
yield, all our irritations, and
resentments flit away, and a
sunny spirit takes their place.”

Therapeutic Social Functions of Humor

