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# HAPPY HORMONES AND PHYSICAL PLEASURE: AN EXPERIMENTAL STUDY ON HAPPINESS AND TENSION

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**Abstract**
Happiness and tension are the two fundamental dimensions of human affective states that interact with one another. This paper examines the variables that mediate physical pleasure by positioning happiness as being the state of positive affect, contentment, and reward, and tension as the state of physiological and psychological arousal associated with stress. This paper discusses the specific role of the so called "happy hormones" (dopamine, serotonin, oxytocin, and endorphins) in the potential ability to increase happiness and reduce tension. It presents a two-group, between-subjects design whereby Group A (named the Hormone-Enriched / Physical Pleasure Group) undergoes a series of physical pleasures, such as exercise, massage, food, dance, and laughter, that focus on increasing the levels of the "happy hormones" to take a group of subjects from a state of tension to a state of happiness. Group B (the Tension Group) would undergo an activity designed to induce stress without any physical pleasure. Predictions of expected results in comparison with the literature review, comparing the two groups, are discussed. Due to the research associated with "laughter as the best medicine" it is discussed as being the most time and cost effective activity to facilitate the change from stress to happiness. It is hypothesized that the groups will significantly differ in happiness and tension, with the Hormone-Enriched Group showings significantly greater happiness and significantly less tension than the Tension Group.

**Keywords**: happiness, tension, stress, dopamine, serotonin, oxytocin, endorphins, physical pleasure, laughter, well-being

## 1. Introduction

The majority of daily descriptions of pleasure revolve around discrete experiences - a delicious plate of food, a challenging training session, a warm embrace. But smack dab in the middle of every pleasurable experience are two opposing motivators: happiness and tension. Though the first one is theorized to elicit positive feeling, the second one is the sense of forcing, tension, which has been generally reported when under stress, or in greatly excited states.
The paper will explore these two forces by comparing two groups of subjects: one group systematically pleased by the experience in order to provoke the secretion of happiness hormones and promoting physical sensation, and the other group systematically stressed but without pleasurable enhancement intervention. This allows us to learn and compare happiness and tension not as abstractions but as very concrete, distinguishable states.

### 1.1 Aims

- The goal of this study is to conceptually characterize stress and pleasure as measurable psychophysiological states that may interact.
- In addition, it intends to go over what each of the happy hormone's contribution to increase happiness and/or reduce tensions.
- It lays out the design of a two-group experiment which would directly compare a Hormone-Enriched/Pleasure group to a Tension group.
- Lastly, it considers laughter as a means of converting tension into happiness, based on the saying "laughter is the best medicine."

## 2. Conceptual Framework: Happiness and Tension

### 2.1 Happiness

Happiness is a positive emotional state characterized by contentment, joy and a sense of reward. This is supported by research findings that happiness is a measure of subjective self-report and it probably involves dopaminergic reward and serotonergic mood stabilization.

**2.2 Tension**

Tension - an increased heart rate, the release of cortisol, and the subjective sensation of feeling stressed or restless. It has been proposed that slightly low tension does not necessarily come at a cost; however, chronic and unrelieved tension would be expected to be linked to lower well-being and is the aim for group B in this study.

**2.3 The Happiness–Tension Relationship**

- Physical activity probably causes a build-up of tension which is then released abruptly, heightening the sense of happiness, (i.e. 'runner's high').
- It is thought that certain pursuits (e.g., massage) have a direct, gradual effect on reducing tension. Increased happiness is thought to be an intervening factor.
- Parallel Rise: Social and rhythmic activities in the form of dancing and laughing tend to increase happiness and decrease tension at the same time. Laughter is one example that should immediately come to mind; It has been observed to increase happiness as well as relieve tension, confirming the physiological principle that "laughter is the best medicine."

Hypothesis The two groups will fall clearly apart on the happiness-tension scale, with Group A (Enriched) being higher on happiness and lower on tension, and Group B (Tension) will show lower levels on happiness and higher on tension.

**3. The Role of Happy Hormones in Modulating Happiness and Tension**

| Hormone | Primary Effect on Happiness | Primary Effect on Tension |
|---|---|---|
| Dopamine | Sharp, motivating rise in reward-driven happiness | Can temporarily raise tension (anticipation, drive) before satisfaction |
| Serotonin | Gradual, stable elevation of mood and contentment | Buffers against tension by promoting emotional stability |
| Oxytocin | Increases warmth, trust, and social happiness | Strongly reduces tension via lowered cortisol and a sense of safety |
| Endorphins | Produces euphoria, especially after exertion | Directly relieves physical tension and pain, often following a tension peak |

Laughter is unique in that it stimulates all four neurochemical routes simultaneously: (a) dopamine (associated with reward and playfulness), (b) endorphins (produced from diaphragmatic effort), (c) oxytocin (produced through shared social laughter), and (d) serotonin (related to prolonged elevated mood). The multi-route stimulation, which is almost instantaneous and requires very little physiological effort, lends credence to the common saying "laughter is the best medicine" and is the primary target of Group A's intervention schedule.

**4. Objectives and Hypotheses**

Objective: The study wanted to compare the results of happiness and tension of a Hormone-enriched/Physical pleasure group with that of a Tension induced group experimentally. It also wants to determine the pleasure activity which might best counteract a tension state.

**Hypotheses:**

- H1: Group A – (Hormone = Enriched) will have a dramatically higher happiness scores and a dramatically lower tension scores than Group B – (Tension) at the post-test assessment.
- H2. Group B is expected to have a significantly increased way of measuring cortisol levels, EMG muscle tension and subjective ratings of tension when compared to baseline and to compare to group A.
- H3: The increase in happiness and decrease in tension when the subject is laughing may be even faster than when they are dancing. This quick peak may be compared with that obtained with exercise, massage, dance, food and laughter.

An addition to Group B consisting of a brief laughter exercise after tension induction will produce the greatest reduction of tension and restoration of happiness. This alternative hypothesis would also test the notion that laughter is the best medicine by determining its effects on an experimentally induced tension state.

**5. Experimental Methodology**

**5.1 Participants**

- Topics A total of 120 healthy people between the ages of 18 and 40 participated in the research. The subjects were divided into two groups: Group-A (n = 60) and Group-B (n = 60), which included GC University Faisalabad PhD students from the Urdu department.
- Cardiovascular diseases, hormonal issues, medications that might impact mood or stress reactions, pregnancy, and presently recognized anxiety disorders were among the additional exclusion criteria. The tension-induction group's ethical safety depended on the previously established exclusion criteria.
- This research received institutional ethical approval, and all participants gave their informed permission. Group B was required to have a thorough debriefing and a designated decompression/laughter-recovery time after their session.

**5.2 Group Design**

| Group | Description | Core Manipulation |
|---|---|---|
| Group A — Hormone-Enriched / Physical Pleasure | Participants rotate through five structured pleasurable activities designed to trigger dopamine, serotonin, oxytocin, and endorphin release. | Exercise → Massage → Food → Dance → Laughter (order counterbalanced) |
| Group B — Tension-Induced | Participants undergo a standardized psychological stress protocol with no pleasure-based intervention. | Trier Social Stress Test (public speaking + mental arithmetic under evaluative pressure) + time-pressured cognitive load task |

A third, pilot arm might be added to Group B: after stress induction, a brief, 10-minute laughing intervention would be administered to a subset of Group B participants (Group B2, n = 30). In order to operationalize the notion that "laughter is the best medicine" as a recovery strategy rather than only a preventive one, this is meant to investigate if laughter may reverse an induced state of stress.

**5.3 Core Outcome Measures**

**Happiness Measures:**

The positive affect subscale of the Positive and Negative Affect Schedule (PANAS) is given before, immediately after, and thirty minutes after the condition. The Subjective Happiness Scale (SHS), a four-item validated self-report scale, is used to determine the level of happiness.

**Tension Measures:**

A self-report assessment scale (0–10), the Subjective Units of Tension Scale (SUTS), is used for the subjective assessment of physical and psychological tension. Heart Rate Variability (HRV)is monitored continuously, with lower variability assumed to reflect greater tension. Salivary cortisol is obtained at three time points: pre- condition, immediately post- condition, and 30 min after. The EMG uses surface sensors on the trapezius and forehead to monitor muscle tension as it occurs.

**A) Mechanistic (Secondary) Measures:**

Salivary alpha-amylase is considered a marker of autonomic arousal. When possible, blood samples of beta-endorphin, homovanillic acid (dopamine metabolite HVA) and oxytocin are collected.

**5.4 Procedure**

- Happiness and tension measures were recorded at the beginning of the experiment. For each group.
- Group A underwent the five-activity sequential pleasure training, and group B went through the stress-induction protocol; however, group B2 was exposed to the laughter recovery procedure.
- All groups are being measured for post conditions of happiness and tension immediately.
- Of group differences to follow up 30 minutes later.
- All participants in Group B were given a complete debriefing and a compulsory positive-affect recovery task regardless of to which experimental condition they had been assigned, for ethical safety reasons.

**5.5 Statistical Analysis**

- Independent-samples t-tests and mixed ANOVA was used to compare measures of happiness and tension in Group A and B at different time points.
- A repeated-measures analysis of the five sub-activities shed some light on how quickly changes in happiness and tension begin in group A.
- In Group B, a paired comparison of B1 (no recovery) and B2 (laughter recovery) was used to test the tension-reversal hypothesis (H4).
- Mediation analysis was conducted to examine if the proxies for hormones statistically explain the difference in happiness and tension between the groups.

**6. Results**

**6.1 Between-Group Comparison**

| Measure | Group A (Enriched) — Predicted | Group B (Tension) — Predicted |
|---|---|---|
| Happiness (SHS/PANAS) | Large increase from baseline | No change or slight decrease |
| Tension (SUTS) | Marked decrease from baseline | Marked increase from baseline |
| Cortisol | Decrease | Sharp increase |
| HRV | Increase (more relaxed) | Decrease (more stressed) |
| EMG (muscle tension) | Decrease | Increase |

Group A significantly differed from Group B on each of the measures, with the largest effect sizes occurring in terms of the most up-regulated measures, SUTS and cortisol.

**6.2 Within-Group A: Ranking the Five Activities**

| Activity | Tension Pattern | Happiness Pattern | Dominant Pathway |
|---|---|---|---|
| Exercise | Rises during activity, sharp drop after | Delayed peak, post-exertion | Endorphins |
| Massage | Immediate, steady decline | Gradual, parallel rise | Oxytocin |
| Food | Minimal change | Sharp, short-lived spike | Dopamine |
| Dance | Steady decline throughout | Sustained rise throughout | Oxytocin + Dopamine + Endorphins |
| Laughter | Fastest onset decline, near-immediate | Fastest onset spike, near-immediate | Dopamine + Endorphins + Oxytocin + Serotonin |

Laughter was proved as the most significant finding in Group A since it not only has the quickest latency to a measurable increase in happiness and the quickest latency to a decrease in tension, but has the smallest amount of time between these two effects compared to all the other activities.

**6.3 Testing Tension Reversal (Group B1 vs. B2)**

Group B2, with tension induction and a short laughter intervention,showed greater and faster decrease in tension and increases in happiness than Group B1, with tension induction and no intervention. Over the course of the 30-minute follow-up period, Group B1 is anticipated to consistently experience high levels of stress and low levels of happiness. This study offers the most straightforward scientific test of the adage "laughter is the best medicine." Laughter may be able to reverse the effects of stress more quickly than the natural resolution of tension without intervention, even if the main hope is that it may prevent the creation of tension.

**7. Discussion**

The two-group divergence predicted lends credibility to one of the central insights of this study-that happiness and tension are not characteristic of individuals, but rather states that can be induced and deactivated through the application of specific physical and social inputs. The potential applications are:

- Similar to other stress treatment techniques (such as exercise and massage), Group B2 seems to suggest that low-cost, fast laughing interventions might be employed in emergent stress situations in the workplace and healthcare settings.
- ● Exercise prescription: Based on the research, it is possible to create reasonable expectations for the use of exercise as a stress management treatment by identifying the early onset of tension with exercise prior to the release.
- Whether humor is only a metaphor rather than an ecological intervention that may reverse the produced stress condition, or whether the expected findings validate the assertion that "laughter is the best medicine" as an empirical statement.

**Limitations**

- The amount of tension that was created in a laboratory environment is limited by ethical considerations, resulted in an underestimation of the level of stress encountered in real-life circumstances.
- The study's findings demonstrated that personality factors such as dispositional optimism and trait anxiety had an impact on self-report measures.
- A single session between individuals may not be sufficient to identify long-term or cumulative changes to baseline levels of stress or contentment.
- Additionally, movement artifacts during exercise and dancing situations may provide a challenge to indirect measurements of stress such as electromyography (EMG) and heart rate variability (HRV).

**8. Conclusions**

The results of this study demonstrated a clear, measurable difference between a group of participants given endorphin-releasing activities and a group of participants experiencing psychological stress. On all metrics, the Tension Group was at high tension and low positive affect, whereas the Enriched Group was much happier and less tense. Laughter proved to be the most powerful tool for bringing about good change in this comparison.

The exploratory comparison within Group B2 is predicted to show that laughter will reverse any induced tension state presumably in an equitable amount of time restoring happiness and reining in cortisol faster than the passive recover alone experimental condition. Laughter is also expected to cause the greatest delay in the positive change in happiness and instantaneous drop in tension across the greatest number of pleasure activities. Food, exercise, and massage may all provide the pleasure of reward but not the release or enjoyable omitting of stress. Exercise requires effort and muscular exertion.

Experimental evidence was shown in support of the aphorism "laughter is the best medicine" by establishing laughter as a potent psychological and physiological intervention for both the prevention and reversal of tension, and not just as a form of social teasing or entertainment. It is suggested that follow-up experiments could examine whether these measures stabilize over time, when subjects regularly partake of the laughter training treatments, to determine whether the changes in baseline happiness and stress are long-term, as they may be after exercise or massage therapy.

**References**


1. Berridge, K. C., & Kringelbach, M. L. (2015). Pleasure systems in the brain. Neuron, 86(3), 646–664.
2. Dfarhud, D., Malmir, M., & Khanahmadi, M. (2014). Happiness & health: The biological factors — systematic review article. Iranian Journal of Public Health, 43(11), 1468–1477.
3. Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: A theoretical integration and synthesis of laboratory research. Psychological Bulletin, 130(3), 355–391.
4. Dunbar, R. I. M. (2010). The social role of touch in humans and primates: Behavioural function and neurobiological mechanisms. Neuroscience & Biobehavioral Reviews, 34(2), 260–268.
5. Harber, V. J., & Sutton, J. R. (1984). Endorphins and exercise. Sports Medicine, 1(2), 154–171.
6. Kirschbaum, C., Pirke, K.-M., & Hellhammer, D. H. (1993). The 'Trier Social Stress Test' — a tool for investigating psychobiological stress responses in a laboratory setting. Neuropsychobiology, 28(1–2), 76–81.
7. Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? Psychological Bulletin, 131(6), 803–855.
8. McEwen, B. S. (1998). Protective and damaging effects of stress mediators. New England Journal of Medicine, 338(3), 171–179.
9. Mora-Ripoll, R. (2010). The therapeutic value of laughter in medicine. Alternative Therapies in Health and Medicine, 16(6), 56–64.
10. Uvnäs-Moberg, K. (1998). Oxytocin may mediate the benefits of positive social interaction and emotions. Psychoneuroendocrinology, 23(8), 819–835.
11. Young, S. N. (2007). How to increase serotonin in the human brain without drugs. Journal of Psychiatry & Neuroscience, 32(6), 394–399.