

# THE INFLUENCE OF STRESS INDUCING BRAIN TEASERS ON EMOTIONS AND SNACK PREFERENCES AMONG COLLEGE STUDENTS

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## ABSTRACT

**Objective:** The main purpose of the study was to investigate the relationship between stress, emotions, and snack preferences among college students. It also aimed to examine differences on unhealthy and healthy snacks as a form of stress reliever.

**Methods:** Forty-four participants aged between 20 and 49 were randomly allocated into either easy or difficult condition. Mood and stress/emotion-related eating questionnaires were administered followed by an offer of healthy and unhealthy snacks.

**Results:** Participants in the difficult condition had significantly taken more unhealthy snacks than those in the easy condition. Also, there was a significant difference on the negative mood states before and after the tests were solved.

**Conclusion:** People under stress may resort to unhealthy eating as a form of coping strategy. It also showed that stress has a major impact on emotions, particularly on negative affect.

## INTRODUCTION

Health professionals have claimed that healthy lifestyle is necessary for survival.

However, there are factors that may affect a person's decision to engage in such behaviour. Factors include the stipulations of daily activities and the emotions elicited from these demands. Indeed, stress has a crucial role in altering healthy motives. Researchers have conducted extensive studies on stress and its effects on emotions and eating behaviours.

Kandiah, Yake, and Willett (2008) argued that stress can affect a person's eating patterns and divert from healthy eating habits. Job, Oertig, Brandstätter, and Allemann (2010) used situation exercises to reveal a positive relationship between unhealthy eating and discrepancies in motives. While Oliver, Wardle, and Gibson (2000) asked a group of participants to prepare a speech. Results showed that participants who were to provide a speech had an increase consumption of fatty foods compared to those in the control group.

White, Horwath, and Conner (2013) viewed that negative emotions can serve as a trigger to uncontrollable and unhealthy eating. Tice, Bratslavsky, and Baumeister (2001) found in their experiment that emotional distress can lead people to consume snack foods.

## RATIONALE OF THE STUDY

It attempts to extend early research by measuring students' stress and emotional changes in an environment where they usually work on, the classroom. Therefore, it is only reasonable to measure such changes in this setting where it can simulate exam conditions, which is considered stressful mostly by students. Furthermore, it aims to examine differences on unhealthy and healthy snacks as a form of comfort food or a stress reliever and if healthy foods can be considered as a comfort food if offered with an unhealthy snack.

The study aims to provide an advance awareness of the effects of stress among third level students on their eating habits. In addition, the study intends to influence college policies by providing seminars and interventions to tackle the consequences of students' stress. Through these intercessions, regulation of snacks particularly the unhealthy ones may take place.

## HYPOTHESES

(H1) It was hypothesised that gender and the condition of the brain teaser will have a significant interaction effect on the number of unhealthy snacks taken. (H2) It was hypothesised that there will be significant changes in positive mood in the difficult condition. (H3) It was hypothesised that there will be significant increase in negative mood in the difficult condition. (H4) It was hypothesised that emotion and stress-related eating were significant predictors of the number of snacks taken.

## METHODS

**Participants:** 44 students of Dublin Business School (20 males, 24 females) between the ages of 20 and 49 years took part in this study.

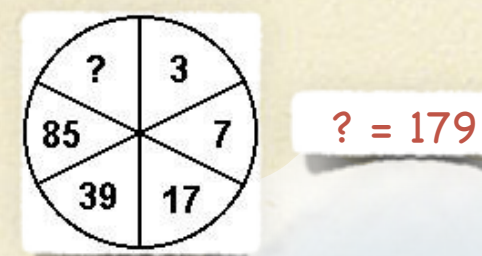
**Design:** This study utilised a quantitative approach employing mixed methods of true experimental and correlational designs. Self-Selecting sampling technique was also used. The experimental part involved the random allocation of participants to either easy or difficult brain teaser conditions. Mood changes were measured before and after answering the brain teasers as well as counting the number of healthy (fruits)

or unhealthy (chocolate bars) snacks taken. The correlational part involved the predictor variable emotion and stress-related eating and criterion variable number of snacks taken.

**Materials:** Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) is a two 10-item psychometric scales that measure both positive and negative affect; Factor 1 of Eating and Appraisal Due to Emotions and Stress or EADES (Ozier, Kendrick, Knol, Leeper, Perko, & Burnham, 2007) is a 24-item questionnaire that measures how individuals use food as a coping strategy with emotion and stress; 2 sets of 10 brain teasers (easy and difficult); healthy snacks (bananas & oranges) and unhealthy snacks (Celebrations mini chocolate bars).

## DIFFICULT BRAIN TEASERS

THE FINE GAME OF NIL = THE MEANING OF LIFE



## EASY BRAIN TEASERS

I SPARED = A SPIDER

5 10 ? 20 25      ? = 15

**Procedure:** Each questionnaire pack contained an information sheet, consent form, and safety questions. Participants then filled in the PANAS (Watson et al., 1988) pre-test followed by the Factor 1 of EADES (Ozier, et al, 2007). They were then read the instructions to the 10 brain teasers, which included 5 anagrams and 5 number sequences. After attempting to answer all 10, participants handed their papers to the experimenter. Safety questions were checked and if 'yes' was answered, the concerned participant is excluded. Otherwise, the PANAS post-test was administered, after which healthy and unhealthy snacks were offered and the number of snacks taken was tallied in their papers.

## RESULTS

### DESCRIPTIVE STATS

There were 23 participants in the easy condition and 21 in the difficult condition. the uneven split was due to the 4 participants excluded base on their answers to the safety questions. As depicted in Figure 1, participants in the difficult condition had high preferences of unhealthy snacks.

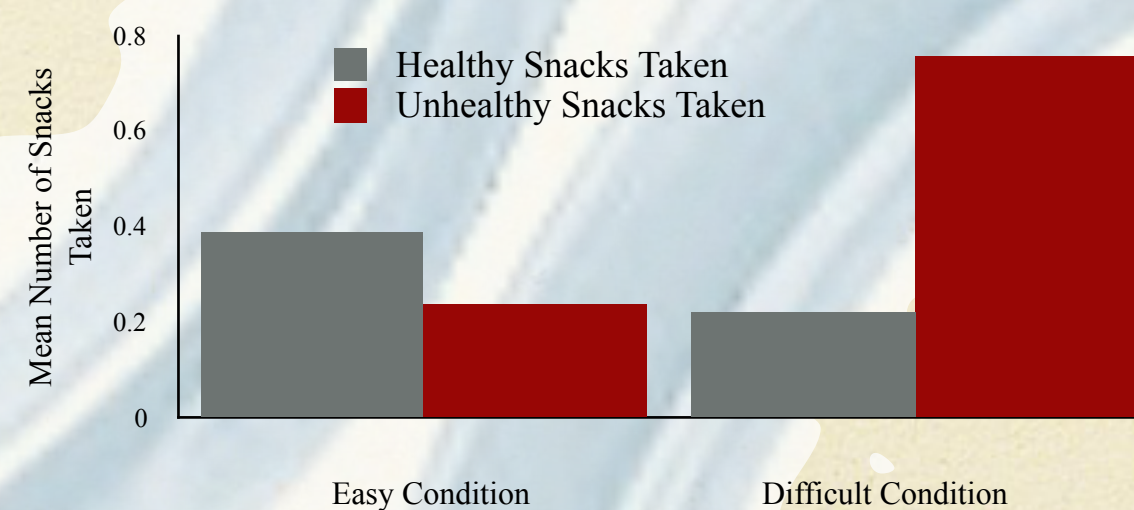


Figure 1: Mean Number of Healthy and Unhealthy Snacks Taken by Participants in Easy and Difficult Conditions

### INFERENTIAL STATS

(H1): 2-Way Between-Groups ANOVA examined the role of gender and the condition of the brain teasers on the number of healthy snacks taken and found a significant interaction effect ( $F(1,40) = 8.47, p = .006$ ). In reference to unhealthy snacks, a 2-way Between-Groups ANOVA found no significant interaction effect ( $F(1,40) = 0.12, p = .736$ ). However, a main effect was reported for the condition of the brain teaser ( $F(1,40) = 5.64, p = .022$ ) with a small effect size of 12.4%. No main effects were reported for gender ( $F(1,40) = 1.11, p = .299$ ).

(H2): Factorial 2-way Mixed ANOVA found no significant interaction effect between positive mood and the brain teasers, ( $F(1, 42)=0.93, p=.340$ , effect size of 2.2%). In relation to main effects, there was no significant difference between pre and post-tests of positive affect, ( $F(1,42)=1.39, p=.245$ , effect size=3.2%). No significant difference found between easy and difficult conditions, ( $F(1,42)=0.32, p=.573$ , effect size of 0.8%).

(H3): A Factorial 2-way Mixed ANOVA found no significant interaction effect between negative mood scores and the brain teasers, ( $F(1, 40)=1.58, p=.216$ , effect size of 3.8%). In relation to main effects, there was a significant difference found between the two time points ( $F(1,40)=18.57, p=.001$ ) with an effect size of 31.7%. More specifically, pairwise comparisons highlighted that negative mood increased after the brain teaser test (mean difference = 2.44,  $p=.001$ , CI (95%) 1.30-3.58). However, there was no significant difference between the easy and difficult conditions ( $F(1,40)=0.29, p=.591$ , effect size of 0.7%).

(H4): Using Simple Regression, it was found that emotion and stress-related eating or the scores obtained from Factor 1 of EADES (predictor variable) did not significantly predict the number of snacks taken (criterion variable) at the end of the study, ( $F(1,42)=0.16, p=.692, R^2=.02$ ).

## DISCUSSION

The present study suggests that the influence of the brain teasers on healthy snacks would be dependent on the gender of the participant. It showed that participants in the difficult condition had significantly taken more chocolate bars than those in the easy condition. It also found that males and females did not differ in terms of the amount of unhealthy snacks taken. The inconspicuous differences may be due to the fact that brain teasers on both easy and difficult conditions had the same effect to both genders.

Results suggest that positive affect before answering the anagrams and number sequences remained constant up to the end of the study. Levels of positive affect between the two conditions was found similar.

The study also detected a significant difference on negative mood before and after the tests were solved. Results implied that the attempt to answer all ten brain teasers had an effect on their negative mood states.

Finally, it was found that emotion and stress-related eating were not predictors of the number of snacks taken. This can be interpreted through the average total scores of the participants. Data suggested that the total score was above the average suggesting high-levels of self-efficacy among the participants.

## MAIN STRENGTHS

- (1) Stress and emotional changes were measured relative to students' everyday circumstances and environment, the classroom.
- (2) The current study counterbalanced between positive and negative affect unlike previous studies, which focused on negative mood.
- (3) The study was quantitative in nature. Thus, results can be applied in general population.
- (4) Deception was not applied.

## WEAKNESSES / LIMITATIONS

- (1) Small sample size.
- (2) Sample was not a good representation of the population as majority of participants were psychology students.
- (3) Confounding variables such as time of the day and season.
- (4) Anagrams on easy condition was found difficult by most participants.

## FUTURE IMPLICATIONS & CONCLUSIONS

The procedure and findings of the current research can be applied to the wider population by simply adjusting the methodology relative to the target population. The present research asserts that people who are under stress may resort to unhealthy eating as a form of coping strategy. It also showed that stress has a major impact on emotions, particularly on negative affect. Thus, the results were relevant with previous literatures that highlighted the detrimental effects of stress towards health. It is also relevant to societal issues such as obesity and other dietary diseases. One can infer that the root cause of such problems relate back to stress and poor coping mechanisms.

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