A STUDY ON EUSTRESS AND ITS EFFECTS

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ABSTRACT

A life without stress is a life without challenges, simulation, and change. Today, the positive side of stress tends to be overshadowed by the concern of the negative. This analytical research paper tries to focus on the positive side of stress, known as Eustress. Eustress is a positive psychological response to a stressor. The research for the same used quantitative research method. Questionnaires were administered to people from varying demographics to study the factors affecting our stress levels and their effects on our daily activities following which factor analysis, KMO and Bartlett’s tests were used for statistical data analysis along with stepwise regression to get the final models. Results revealed that stress does play a constructive role in our lives improving our competence, speed, productivity, and adroitness.

Keywords: Stress, Eustress, Efficiency, Competence, Productivity, Adroitness.

INTRODUCTION

Stress, the most characteristic feature of modern society, is actually a combination of psychological, physiological, and behavioural reactions that people have in response to events that threaten or challenge them. These responses are triggered by the Autonomic Nervous System (ANS), which influence internal organs and regulating heart rate, respiratory rate, blood vessel, galvanic skin response, and so on. It has received growing interest from industries and academia. Numerous studies suggest that the concept is being studied extensively but in a negative sense. It is generally being referred to as the synonym of ‘distress’, a state of ill-being in which happiness and comfort have been surrendered. As a consequence, the concept of positive stress (Eustress) is insufficiently explored.

According to Nelson and Simmons et.al [5], the analysis and development of Eustress are incomplete. There are 83,779 references devoted to distress and only 51 devoted to Eustress as per the PubMed database. Due to this same reasons, there is variation among the thoughts of the scientists. The concept of Eustress was introduced by Hans Selye [7-8], distinguishing it from the negative stress. He described it as “healthy, positive, constructive results of stressful events and stress response”. Lazarus [2] proposed a second approach to understanding eustress in his stress model where he described it as ‘positive cognitive response to a stressor, which associated with positive feelings and a healthy physical state’. While in some models, eustress is included only as a lack of negative effects. Milsum[4] considers eustress as an ideal (negative emotions) can occur in response to the condition of the well-functioning homeostatic system. Edwards and Cooper [1] identified eustress as a positive discrepancy between perception and wishes.

These approaches show that Eustress is not really defined by the type of the stressor but actually by how a person perceives it. It is linked with well-being and positive attitudes and is said to improve our performance. Scientifically, Positive stress is said to increase an organism’s adaptive capacity. Repeated exposure makes our body develop both a physical and a psychological sense of control. Our body does this by producing extra interleukins, a chemical that helps regulate the immune system and provides a temporary defensive mechanism. Stress also increases brain power by increasing the production of brain chemicals which strengthens the connections between neurons in our brain which boosts memory and learning scores.
The purpose of our paper is to address the factors affecting our stress levels and study their positive contribution to the improvement and enhancement of our performance.

**Research Statement**
The research aimed to contradict the notion of distress being a synonym to stress. We aim to study the positive effects of stress.

**Research Design**
The quantitative research method is used for the research purpose. We employed the method of primary data collection by formulating a questionnaire with 40 questions.

**Variables and Measures**
We got a response from 1333 participants who were required to complete the questionnaire. It consisted of sections like demographic information, social stress, family stress, financial stress, and emotional stress and positive effects of stress. Categorical questions were used in the demographic section. The ordinal scale was used to measure demographics and Bipolar Likert scale for other research questions.

**Empirical Results**
The results of this research have been evaluated by using various inferential statistical techniques. Moreover, a graphical representation of some imperative results has been displayed for a clearer understanding.

**Methods and techniques**
- Kaiser-Meyer-Olkin (KMO) Test for sampling adequacy
- Bartlett's test of sphericity tests
- Factor analysis.
- Stepwise regression

**Analysis**
A questionnaire consisting of questions based on 10 possible positive effects and different personal, emotional, social and financial factors was designed and data for 1333 participants to study the following positive effects has been collected:

1. Efficiency
2. Ability to meet a deadline
3. Detachment from social media
4. Creativity
5. Productivity
6. Mental strength on repeated exposure to stress
7. Spontaneity
8. Speed of completion of a task
9. Problem-solving approach
10. Sense of responsibility

(We have used SPSS software for analysing the data.)

We run a factor analysis test for these 10 effects.

Setting up the null hypothesis,

**H₀:** Correlation matrix of the positive effects is an identity matrix, i.e. the positive effects under study are unrelated.

**H₁:** Correlation matrix of the positive effects is not an identity matrix, i.e. at least two of the positive effects under study are related.

For Bartlett’s test of sphericity, the p-value is 0.000 indicating that the null hypothesis is rejected at 5% level of significance, i.e. factor analysis may be useful for our data. Also, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.845 indicating that factor analysis is beneficial for data.
For 2 components the eigenvalue is greater than 1, hence the factors (positive effects) are divided into 2 components. However, it is observed that in the process of factor analysis, only 51.156% of data could be retained.

The 2 components whose eigenvalue is greater than 1 can be seen in the scree plot above. The 2 components obtained have been named as:
1. Adroitness ($Y_1$)
2. Competence ($Y_2$)

The rotated component matrix shows the representation of each of the positive effects in the two components. The first component has been explained the best (82.6%) by problem-solving ability and the second one has been explained the most (66.1%) by detachment from social media.

Similarly, data for 1333 participants on the following 19 factors causing stress was collected:
1. Family problems
2. Fulfilment of all wishes by parents/partner
3. The imposition of expectations by family/friends
4. Dissatisfaction in relationship
5. Sense of insecurity and loneliness
6. The need for approval from society for every decision
7. Dressing as per fashion and not comfort
8. Outing with friends
9. Fear of social gatherings
10. Physical appearance
11. Dislike towards financial dependence on family/friends
12. Inability to afford things owned by friends
13. Making a living in an expensive city
14. Uncertainty of survival due to changes in the economy
15. Overthinking about situations
16. Fear of risk
17. Falling in trouble repeatedly
18. The pressure to maintain performance standards
19. Clarity about future choices

A factor analysis on the above factors is run. Setting up the null hypothesis,

H₀: Correlation matrix of the factors causing stress is an identity matrix, i.e. the factors causing stress under study are unrelated

H₁: Correlation matrix of the factors causing stress is not an identity matrix, i.e. at least two of the factors causing stress under study are related

**Rotated Component Matrix**

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work more efficiently when put under pressure</td>
<td>.429</td>
<td>.524</td>
</tr>
<tr>
<td>I only complete a task when I am given a deadline</td>
<td>.168</td>
<td>.569</td>
</tr>
<tr>
<td>I detach myself from social media to handle work pressure</td>
<td>-.055</td>
<td>.561</td>
</tr>
<tr>
<td>My creativity increases due to thinking too much</td>
<td>.104</td>
<td>.580</td>
</tr>
<tr>
<td>Stress boosts my productivity</td>
<td>.569</td>
<td>.466</td>
</tr>
<tr>
<td>Repeated exposure to stress has made me stronger</td>
<td>.724</td>
<td>.389</td>
</tr>
<tr>
<td>My spontaneity has increased in long term on being exposed to a lot of stress</td>
<td>.569</td>
<td>.421</td>
</tr>
<tr>
<td>My mood increases when burdened with work</td>
<td>.700</td>
<td>.275</td>
</tr>
<tr>
<td>My approach to solving a particular problem has become better after dealing with stressful situations</td>
<td>.826</td>
<td>.001</td>
</tr>
<tr>
<td>Exposure to stress has made me mindful of my responsibilities</td>
<td>.792</td>
<td>.026</td>
</tr>
</tbody>
</table>

**Extraction Method:** Principal Component Analysis
**Rotation Method:** Varimax with Kaiser Normalization

a. Rotation converged in 3 iterations.
For Bartlett’s test of sphericity, the p-value is 0.000 indicating that the null hypothesis is rejected at 5% level of significance, i.e. factor analysis may be useful for our data. Also, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.757 indicating that factor analysis is beneficial for data.

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3.547</td>
<td>18.669</td>
<td>18.669</td>
</tr>
<tr>
<td>2.</td>
<td>1.858</td>
<td>9.834</td>
<td>28.503</td>
</tr>
<tr>
<td>3.</td>
<td>1.557</td>
<td>8.195</td>
<td>36.658</td>
</tr>
<tr>
<td>4.</td>
<td>1.340</td>
<td>7.094</td>
<td>43.792</td>
</tr>
<tr>
<td>5.</td>
<td>1.161</td>
<td>6.111</td>
<td>49.803</td>
</tr>
<tr>
<td>6.</td>
<td>1.004</td>
<td>6.265</td>
<td>55.169</td>
</tr>
<tr>
<td>7.</td>
<td>0.918</td>
<td>4.931</td>
<td>60.029</td>
</tr>
<tr>
<td>8.</td>
<td>0.850</td>
<td>4.629</td>
<td>64.548</td>
</tr>
<tr>
<td>9.</td>
<td>0.611</td>
<td>4.265</td>
<td>68.814</td>
</tr>
<tr>
<td>10.</td>
<td>0.776</td>
<td>4.082</td>
<td>72.958</td>
</tr>
<tr>
<td>11.</td>
<td>0.741</td>
<td>3.800</td>
<td>76.757</td>
</tr>
<tr>
<td>12.</td>
<td>0.707</td>
<td>3.721</td>
<td>80.518</td>
</tr>
<tr>
<td>13.</td>
<td>0.698</td>
<td>3.614</td>
<td>84.032</td>
</tr>
<tr>
<td>14.</td>
<td>0.588</td>
<td>3.145</td>
<td>87.177</td>
</tr>
<tr>
<td>15.</td>
<td>0.577</td>
<td>3.039</td>
<td>90.216</td>
</tr>
<tr>
<td>16.</td>
<td>0.537</td>
<td>2.625</td>
<td>93.043</td>
</tr>
<tr>
<td>17.</td>
<td>0.470</td>
<td>2.473</td>
<td>95.515</td>
</tr>
<tr>
<td>18.</td>
<td>0.468</td>
<td>2.340</td>
<td>97.876</td>
</tr>
<tr>
<td>19.</td>
<td>0.404</td>
<td>2.124</td>
<td>100.009</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis

From the table above, it is observed that in the process of factor analysis, the components could explain 55.189% of the variance in the data. Eigen-value for 6 components is greater than 1 so 6 components have been obtained from the process.

Data is divided into 6 components:
1. Overthinking and validation seeking (X₁)
2. Financial endurance (X₂)
3. Insecurity and self-consciousness (X₃)
4. Financial and future expectations (X₄)
5. Expectations and problems in a relationship (X₅)
6. Social anxiety (X₆)
The rotated component matrix shows the representation of each of the factors affecting stress in the 6 components formed. For example, Component 1 (i.e. Overthinking and validation seeking) is represented best (78.9%) by the tendency of overthinking about every situation.
Demographics taken under study were:

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>1. Male</td>
</tr>
<tr>
<td></td>
<td>2. Female</td>
</tr>
<tr>
<td><strong>Age Groups</strong></td>
<td>1. 15 – 19</td>
</tr>
<tr>
<td></td>
<td>2. 20 – 25</td>
</tr>
<tr>
<td></td>
<td>3. 25 – 35</td>
</tr>
<tr>
<td></td>
<td>4. 35 – 45</td>
</tr>
<tr>
<td></td>
<td>5. Above 45</td>
</tr>
<tr>
<td><strong>Family Type</strong></td>
<td>1. Joint</td>
</tr>
<tr>
<td></td>
<td>2. Nuclear</td>
</tr>
<tr>
<td></td>
<td>3. Single Parent</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td>1. Single</td>
</tr>
<tr>
<td></td>
<td>2. Dating</td>
</tr>
<tr>
<td></td>
<td>3. Married</td>
</tr>
<tr>
<td><strong>Academic Status</strong></td>
<td>1. High School</td>
</tr>
<tr>
<td></td>
<td>2. Graduation</td>
</tr>
<tr>
<td></td>
<td>3. Post-Graduation</td>
</tr>
<tr>
<td></td>
<td>4. Passed out</td>
</tr>
<tr>
<td><strong>Working Status</strong></td>
<td>1. Working</td>
</tr>
<tr>
<td></td>
<td>2. Not working</td>
</tr>
</tbody>
</table>

Stepwise regression for adroitness against all the demographics and the 6 components formed above is run.

The only significant factor in the model turns out to be Financial and future expectations. All the demographics turn out to be insignificant except age group 25-35 years for which the reference variable was assumed to be the age group above 45 years.

From the stepwise regression performed, two models have been formed, the first one including only Financial and future expectations and the second one having both age and financial and future expectations.
Setting up the null hypothesis for testing the validity of the second regression:

H₀: All the regression coefficients are zero, i.e. regression is invalid  
H₁: At least one of the regression coefficients is non-zero, i.e. regression is valid

The p-value for the F-test for testing the validity of regression is 0.000 which are less than 0.05, hence the null hypothesis is rejected at 5% level of significance, i.e. regression is valid.

Setting up the null hypothesis for t-test to test the significance of each regression coefficient in the second model:

H₀: The regression coefficient is zero, i.e. the regress or is insignificant in the model  
H₁: The regression coefficient is non-zero, i.e. the regress or is significant in the model

From the table above, we observe that the null hypothesis may be accepted for all the regressors except for regress or representing financial and future expectations and the age group 25-35 years. Hence, the model turns out to be

\[ Y_i = -0.373 A_3 + 0.201 X_6 \]

where \( Y_i \) represents adroitness, \( A_3 \) represents age group 25-35 years and takes value 1 if the age group is 25-35 years else 0, \( X_6 \) represents financial and future expectations.

In the normal PP Plot drawn for the sample values above, it is observed that the sample points lie near the straight line implying that it can be assumed that the sample has been drawn from a normal population.

Then, on running a stepwise regression for competence against all the demographics and all the 6 components formed from factors causing stress, the significant factors in the model are overthinking and validation seeking, financial endurance and insecurity and self-consciousness. All the demographics are insignificant except age group 15-19 years for which the reference variable was assumed to be the age group above 45 years as shown below
From the stepwise regression performed, four models have been formed.
Setting up the null hypothesis for testing the validity of regression model 4:

**H₀:** All the regression coefficients are zero, i.e. regression is invalid

**H₁:** At least one of the regression coefficients is non-zero, i.e. regression is valid

The p-value for the F-test for testing the validity of regression is 0.000 which is less than 0.05, hence the hypothesis is rejected at 5% level of significance, i.e. regression is valid

Setting up the null hypothesis for t-test to test the significance of each regression coefficient in the model

**H₀:** The regression coefficient is zero, i.e. the regressor is insignificant in the model

**H₁:** The regression coefficient is non-zero, i.e. the regressor is significant in the model

From the table above, we observe that the null hypothesis may be accepted for all the regressors except for regressors representing overthinking and validation seeking, Financial endurance and Insecurity and self-consciousness.

Hence, the model turns out to be

$$Y_2 = 0.287A_1 + 0.154X_1 + 0.145X_4 + 0.256X_5$$
where $Y_2$ represents competence, $A_1$ represents age group 15-19 years and takes value 1 if age group is 15-19 years else 0, $X_1$ represents overthinking and validation seeking, $X_2$ represents financial endurance and $X_4$ represents insecurity and self-consciousness.

In the normal PP Plot drawn for the sample values above, it is observed that the sample points lie near the straight line implying that it can be assumed that the sample has been drawn from a normal population.

**Limitations**
- The sample is limited to Delhi NCR, whereas a more diverse data is required for such a study.
- The sample of the study wasn’t as vast to represent a large population.
- A self-report survey is considered as ground truth in our work but it might consist of personal bias and be inconsistent.
- There has been some loss of information after applying factor analysis. We could retain 51.16% and 55.19% information of both positive effects and factors affecting stress respectively.

**DISCUSSION AND CONCLUSION**

Although most researchers attend to problems of distress, a few have studied the protective role stress plays in our lives. Therefore in our study, we aimed to explore the phenomenon by using various analytical techniques. We see from our model that stress actually has a positive, constructive role in our lives that helps us survive in difficult conditions.

Intuitively the 19 questions were divided into 4 aspects: family stress, social stress, financial stress, and emotional stress. Factor analysis was run on these 4 aspects separately as a result of which 7 factors were obtained. However, on realizing that the assumption of the above 4 aspects being uncorrelated was wrong as every factor turned out to be insignificant in the model, factor analysis was run on all the 19 questions and 6 components were obtained as a result. The fact that this assumption was wrong could be verified only once responses were collected. The names and divisions are shown in table 2.

The same process was carried out for the positive effects of stress. The factor analysis amalgamated the 10 effects and 2 components (adroitness and competence) were obtained as their result.

We took various demographics like relationship status, family type, gender, academic status, and working status in account for our model. But something to ponder upon here is that none of them turned out to be significant. This only shows us how unavoidable stress has become today. It has become a major feature in our daily lives as well as vocabularies.

Our models depict that stress does play a positive role in our lives. From the first model, we see that the adroitness of a person seems to get affected only by the future and financial expectations (which is further formed of different factors). This is significant for people from the age group of 25-35 years. This means adroitness, meaning skilful in body and mind is dependent on how clear we are about our future choices, our finances, and performances.
Also, from the second model, we see that the competence of a person is affected positively by overthinking and validation seeking, financial endurance and insecurity and self-consciousness. The result is significant for people from the age group of 15-19 years. We see that moderate levels of overthinking and caring about how other people are doing, worrying about our finances and survival can actually push us to perform more efficiently and productively.

In the lights of our results, we see that stress actually is a two-sided coin despite people believing otherwise. We need and seek stress in our lives. The data collected from 1333 people show us that stress positively affects our efficiency and productivity.

REFERENCES

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