

Stress and Relaxation in Relation to Personality

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Harish Kumar Sharma¹

Abstract

Relaxation plays a significant role in facing stress. The aim of the present study is to see whether personality patterns determine an individual's ability to relax. As a reaction to stress, coping is the best way to handle stress, which requires rational and conscious thinking. Does this ability to relax anyway facilitate coping reactions? A study was conducted on 100 college students. Results revealed that extraverts relax easily than introverts. In addition, if intelligence level is average or above average, relaxation does play a role in facilitating coping reactions. It suggests that in designing techniques of stress management, the personality and intelligence level must be taken into consideration to make techniques effective.

Keywords

arousal, coping, intelligence, personality, relaxation, stress, stress management

Stress is a serious concern in the life of every individual. It is related to blockage in the satisfaction of needs. It may be due to frustration or conflict or pressure, but it is experienced as strain both psychological and physiological. (Atkinson et. al., 1988). Cannon (1932) described stress as the process whereby the body is shifted into an aroused state called the fight-or-flight response to respond to a crisis. Selye (1956, 1976b) gave a model of stress known as General Adaptation Syndrome (GAS). Selye (1956, 1976b) defined stress as excessive burning of energy resources. Various physiological changes in the body are activated in three stages: alarm, resistance, and exhaustive. The objective is to resolve the stress, but if it continues to the third exhaustive stage, then decomposition of body takes place that eventually can lead to death of the person. In the course of stress, the person may develop various psychosomatic disorders like heart attack, blood pressure, migraine, ulcer, and so on (Selye, 1976a).

In the same way, strain is also experienced psychologically. It can also be explained within the three stages described by Selye in his model. In psychological strain, the arousal of cortex will increase. Continuous stress can lead to delusions and hallucinations. Coping reactions will be replaced by defense mechanisms, and the person can develop mental disorders. The psychological strain as equated to arousal of cortex is explained well by Lindsley (1951) in his theory of activation. The arousal of cortex varies in degrees. In the minimum arousal state, the person will be sleeping. As the person thinks, the arousal increases. The further rise in arousal at a particular point will be experienced as stress or emotions. It appears from the above explanation that stress is always negative. However, stress can be both positive and

negative. When the stress is pleasant and positive, it is known as *eustress*. However, when it is painful and negative then it is termed as *distress*.

Thus, it can be understood that stress is experienced when there is some emergency or problem, or when some extra efforts are required to handle a situation. It results in activation of physiological systems and arousal of the cortex. The arousal of cortex is related to personality by Eysenck (1967) in Causal Model of personality types. These are based on three biological determinants.

1. Difference in excitatory–inhibitory neural processes.
2. Difference in arousal of cortex.
3. Difference in visceral brain activity.

As per this model, inhibitory neural processes are strong in extraverts and weak in introverts. An individual's neurotic and stable personality patterns depend on activity of visceral brain. Higher visceral brain activity leads to higher anxiety reactions. In this sense, personality and stress are related to each other. Eysenck (1982) stated that introverts are more stress prone than extraverts. Friedman and Rosenman (1990) in a longitudinal study established a link between Type A personality and coronary heart diseases (CHD). Type A personalities are competitive, ambitious, impatient, aggressive, and fast talking, and so live in stress. Suzanne Kobassa (1966) found that hardy personalities were less likely to see

¹S. B. S. Government College, Kotkapura, Punjab, India

Corresponding Author:

Harish Kumar Sharma, S. B. S. Government College, 161 Arvind Nagar, Kotkapura, Punjab 151204, India
Email: harish_sbs@yahoo.com

events as stressful. Hardy personality person has control, commitment, and challenge.

Closely related to stress is relaxation. Stress brings strain whereas relaxation reduces it. Stress gives the pain but relaxation relieves it. Coping and defense reactions are also applied to attain the relaxation. However, the focus is the person's ability to relax in stressful situations. It is important to understand its nature in this context.

Relaxation is a conscious attempt to bring physiological changes and arousal of brain to normal level.

Here relaxation is stated as a conscious attempt because for relaxation, individual consciously tries to control arousal of brain. The definition suggests relaxation as a response to reduce arousal at physiological and psychological level. Dienstbier (1989) stated that "stress control" has become almost synonymous with arousal reduction. Benson (1975, 1983) argued that all the relaxation techniques produce a single "relaxation response," characterized by diminished sympathetic arousal. Schwartz, Davidson, and Goleman (1978) commented on autogenic training (Luthe & Schultz, 1969) that it has specific effects on the autonomic functions included in the autogenic exercises, but it also produces a general decrease in physiological arousal. Jacobson (1938) observed that people in stress tended to add to their discomfort by tensing their muscles. So, progressive muscle relaxation is designed to reduce muscular tension.

However, relaxation may take place spontaneously, when stressful situation gets over. But here, my focus is increasing the efficiency of a person and stopping the negative impact of stress.

During stress periods, ability to relax serves a very significant purpose. It is well-understandable fact that nobody likes to experience the strain of stress. Everyone likes to get relief from this painful experience. To get relief, individual depicts two types of reactions: coping and defense. In coping, the person attempts to solve the stress with realistic and rational orientation of mind. But in defense reactions, the person attempts to avoid the stress with unrealistic and irrational approach of mind. Excessive use of defense reactions distorts the reality and the person's behavior becomes abnormal. However, coping is the positive and strong way to overcome stress. But for coping, it is essential that functioning of brain should remain well intact. According to Yerkes–Dodson law (1908), best performance comes when the arousal of brain is at optimum level, and for complicated task, the required optimum arousal level is low. Thus, it is clear that best functioning in stressful condition requires lower arousal level. But in stress, the arousal level rises up and if emotions get involved then it amplifies the arousal level. So here comes the significance of relaxation. If a person learns how to relax the brain in stress to bring the arousal level to a normal level, then there is better chance of using the coping. Within this context, it is very right to call it as *ability to relax*. Thus, in designing different techniques of stress management to reduce arousal at cortex and body, personality patterns should be given a serious consideration.

The effectiveness of techniques can be enhanced by knowing the personality of the individual.

Objectives

1. To relate arousal of cortex to personality.
2. To relate arousal of cortex to intelligence.
3. To relate the ability to relax with personality.
4. To relate the ability to relax with intelligence.
5. To relate coping to intelligence.
6. To relate arousal of brain to coping.
7. To relate ability to relax with coping.

Hypotheses

1. Extraverts have lower arousal than introverts.
2. There is no relationship between arousal of brain and intelligence.
3. Extraverts can relax easily than introverts.
4. There is no relationship between ability to relax and intelligence.
5. Intelligence affects coping reactions.
6. Arousal of brain affects coping reactions.
7. Ability to relax facilitates coping reactions.

Method

Sample

A sample of 100 college students of S. B. S. Government College's degree classes with age between 18 and 21 was selected randomly. Older people were not selected as they could have learnt through experience or by medicine to relax.

The participants were college students of BA IInd and IIIrd year, rural, and unmarried. Among these, 62 were male and 38 female.

Tools and Technique

Biofeedback apparatus (galvanic skin response). It is an electrical apparatus used to measure the electrical potential on the surface of skin. It is done using implanting electrodes on the surface of skin. Any stress on mind releases sweat on the surface of the skin and electrical potential varies. This variance is displayed in digital scores and lighting mode on the apparatus.

Raven's standard progressive matrices (SPM) test. This test was developed in fundamental research into the genetic and environmental determinants of "intelligence" by Raven in 1936. Raven tried to measure two main components of general cognitive ability (*g*), which were identified by Spearman in 1923. The SPM was first fully standardized by J. C. Raven on 1,407 children in Ipswich, England, in 1938

Table 1. Difference in Arousal for Personality

Parameters	Extravert	Introvert	Difference in means	T-score	df	Significance
M	250.10	187.70	62.4	2.05	55	Significant at .05 level
SD	125.11	96.74				
SE	25.02	17.40				
n	26	31				

(J. C. Raven, 1941). It is applied widely in both practice and research and has high reliability and validity. It is one of the best tests for measuring IQ level.

Eysenck's Personality Inventory. It is a personality test constructed by Hans Eysenck in 1975. The test is constructed on the basis of four temperaments of model of personality given by Galen. It consists of 57 statements and every statement has options of yes/no. It judges extraversion/introversion and emotionally stable/neurotic personality. The test has high reliability and validity.

Self-made test to identify coping/defense reactions. It is a test consisting of 16 statements. Each statement depicts some stressful situation, and the response to such situations can be made just below each. Response is given in short form in two to three lines. The response is then evaluated as rational or irrational, emotionally balanced or imbalanced. C is marked if rational and emotionally balanced. D is marked if irrational and emotionally imbalanced. Total of C indicates coping score and D indicates defense reaction. The reliability and validity are yet to be determined.

For statistical analysis, "t test" was used to determine the significance of difference between means

Procedure

The sample was divided into five different groups. Tests were conducted on 2 days. On the first day, Raven's test of intelligence and Eysenck's personality inventory were given to each group one after the other. First of all, participants were given test of intelligence. They were instructed how to perform. After completion of intelligence test, personality test was given. They were instructed to read the instructions mentioned in the test and were asked to complete as quickly as possible. For both tests, participants took almost 3 hr. On the second day, participants were first given test for giving reactions to stress producing items mentioned in the test of identifying coping/defense reactions. For each item, they had to give reply in two to three lines. They were also instructed to finish quickly. This test took about 20 to 25 min for every group. After this, they were given a little rest and then they were called one by one. Electrodes were implanted on two alternative fingers of the same hand and initial starting score displayed was noted. Then, according

to instructions they tried to relax as much as possible within 5 min. By instructing to start, stopwatch was started. On completion of 5 min, they were asked to stop and the reading from display screen was noted. After taking score from each participant of the group, the same round was started in the same order to get second round scores in similar manner. Average of start score and end score for both rounds of each participant was calculated. Average of difference between start and end scores was also calculated to see the degree of relaxation. For some participants, tests were also administered with a little adjustment in groups of two to three with a little flexibility because of unavoidable circumstances.

Results and Discussion

Now it is clear that stress is a heightened state of arousal. Arousal level of brain depends on the stimulation from external environment and internal thoughts. However, Zuckerman and Eysenck described individual differences on the basis of arousal patterns. Eysenck described two personality types on the basis of this differentiation on arousal patterns. Eysenck stated that extraverts have lower arousal level than introverts in normal conditions. Results as obtained and shown in Table 1 clearly confirm Eysenck's theory. As arousal is measured using Biofeedback apparatus (galvanic skin response), higher score on this apparatus means lower arousal level and vice versa. As shown in Table 1, extraverts obtained a mean arousal score of 250.10 and introverts obtained 187.70. There is a difference of 62.4 points. This difference is found significant at .05 level. So, this means that extravert's arousal level is significantly lower than introverts. Thus, personality is a very important determinant, if stress is equated with arousal level. This indicates that introvert's higher arousal level generally keeps them near to threshold point of stress. It means that introverts are more stress prone than extraverts. Eysenck (1982) stated that introverts are more stress prone. Thus, results obtained in Table 1 approve the first hypothesis that extraverts and introverts differ in arousal level.

The second hypothesis is that there is no relationship between arousal level and intelligence. But the results obtained as shown in Tables 2 and 3 show that there is no difference for arousal between high- and average-intelligent

Table 2. Parameters of Arousal at Different Intelligence Levels

Different levels of intelligence	M for arousal	n	SD	SE
High (80th-95th Percentile)	256.06	29	166.10	31.39
Average (50th-75th Percentile)	231.72	42	119.99	18.52
Low (below 50th Percentile)	168.87	29	108.78	20.56

individuals; however, significant difference in arousal of high- and low-, and average- and low-intelligent individuals was found. These results show that high- and average-intelligent individuals are almost similar in their arousal level, but once intelligence level decreases from average level, the alertness of brain also increases. But these results must be interpreted very carefully. It is possible that intelligent participants took the test more comfortably and with more ease and that is why they were feeling less stress than participants with low intelligence. It is possible that participants with low intelligence took the task as something very difficult and as a result increases in the arousal level were observed. So hypothesis according to results is partially true, but it must be further checked in research.

The results shown in Table 4 are very important for present article. These results not only hold the third hypothesis true but also give a new understanding about relaxation to stress. While conducting the study, participants were asked to relax their brain as quickly as possible to see any difference in relaxation between extraverts and introverts. Results show that extraverts were able to decrease their arousal very quickly to relax. Extraverts were able to relax by 388.00 points and introverts were able to relax by 187.55 points. The difference of 200.45 points is a very big difference, and it is also found very significant at even .01 level. These results can be explained very well with reference to personality theory of Eysenck. As stated earlier while discussing personality, there are two neural processes in the nervous system. These are excitatory and inhibitory neural processes. Excitatory neural process stimulates the brain and thus increases the arousal level; whereas, the inhibitory process produces inhibition against excitatory neural process to decrease the arousal level. According to Eysenck, there is an imbalance between these two processes in extraverts and introverts. In extraverts, inhibitory process is strong and as a result the inhibition develops very quickly and also dissipates very slowly. It means that extraverts can relax very quickly. However, introverts have poor inhibitory neural process and thus inhibition not only develops very slowly but also dissipates very quickly. It means that introverts cannot relax as easily as extraverts. So this was stated in the hypothesis and the results confirm the hypothesis. It can be concluded that techniques of relaxation

Table 3. Difference in Arousal at Different Intelligence Levels

Different levels of intelligence	T-score	SE total	df	Significance
High and average level	0.63	38.50	69	Insignificant
High and low level	2.32	37.52	56	Significant at .05 level
Average and low level	2.27	27.67	69	Significant at .05 level

Table 4. Difference in Relaxation for Personality

Parameters	Extravert	Introvert	T-score	df	Significance
M	388	187.55	4.36	55	Significant at .05 and .01 level
SD	191.40	140.88			
SE	38.28	25.33			
n	26	31			

cannot relax extraverts and introverts equally. This is a very important point for the purpose of the present article.

Tables 5 and 6 show the results to see whether intelligence helps the person to relax. Difference in relaxation among the participants at different intelligence levels is observed. No significant difference in relaxation at different intelligence levels was observed. These results show that intelligence does not anyway help the person to relax as stated in the fourth hypothesis. Thus, the hypothesis is true that there is no relationship between intelligence and relaxation. It does not matter whether the individual is high or low in intelligence as far as ability to relax is concerned.

Intelligence as such does help in relaxation, but it plays a very important role to get a permanent relief from stress. No person wants to live continuously under the pain of stress. To get relief, individuals make two types of reactions as already described. But we know that coping reactions are best in the face of stress. These reactions are conscious, rational, and realistic in nature, and thus, intelligence plays important role in making decisions to get rid of stress. For this good planning, deep logical thinking plays important role, and it is possible with intelligence. So, the hypothesis is postulated that coping is related to intelligence. Results in Tables 7 and 8 show that the hypothesis is true. Number of coping reactions made by participants at different intelligence levels was observed. It is found that after average intelligence level, rise in intelligence do not make any significant change in making coping reactions. But as intelligence level decreases from average level, a significant decrease in using coping reactions is found. As shown in Tables 7 and 8, average-intelligent participants made maximum coping reactions but there is no significant difference between average and high intelligence levels for making coping reactions. But significant difference is obtained between high- and

Table 5. Parameters of Relaxation at Different Intelligence Levels

Different intelligence levels	<i>M</i>	<i>n</i>	<i>SD</i>	<i>SE</i>
High (80th-95th Percentile)	301.87	29	231.09	43.68
Average (50th-75th Percentile)	246.37	42	203.80	31.84
Low (below 50th Percentile)	257.06	29	178.80	33.80

low-, and average- and low-intelligence level. So the hypothesis that intelligence facilitates coping reactions is true. If level of intelligence is low, it is most likely that the person will make defense reactions that are irrational and unrealistic in nature.

If intelligence is an important determinant in getting rid of stress then what is the significance of relaxation. There is a very important and crucial function of relaxation. This will become very clear if the relationship of arousal level with coping reactions for high-intelligent participants (including average-intelligent participants) is studied. It is already stated that stress can also be defined as heightened arousal state. In the face of stress, it is natural that arousal level will increase. So it is important to know how arousal level can affect the use of coping reactions even when the participants are sufficiently intelligent. According to Lindsley's activation theory, the functioning of brain gets disorganized if severe rise in arousal level takes place. According to Lindsley, emotions amplify the rise in arousal level in stress. So it can be expected that at heightened arousal state, cognitive capacities will be badly affected. Yerkes-Dodson law also states that performance is best at the optimum arousal

Table 6. Difference in Relaxation for Intelligence

Different intelligence levels	<i>T</i> -score	<i>df</i>	<i>SE</i> total	Significance
High-low level	0.81	69	55.23	Insignificant
High-average level	1.02	56	54.05	Insignificant
Average-low level	0.23	69	46.43	Insignificant

Table 7. Parameters of Coping at Different Intelligence Levels

Different levels of intelligence	<i>M</i> for coping	<i>n</i>	<i>SD</i>	<i>SE</i>
High (80th-95th Percentile)	8.12	29	3.27	0.61
Average (50th-75th Percentile)	8.06	42	2.75	0.42
Low (below 50th Percentile)	6.25	29	3.23	0.61

Table 8. Difference in Coping at Different Intelligence Levels

Different levels of intelligence	<i>T</i> -score	<i>df</i>	<i>SE</i> total	Significance
High-average	0.08	69	0.74	Insignificant
High-low	2.17	56	0.86	Significant at .05 level
Average-low	2.44	69	0.74	Significant at .05 level

Table 9. Parameters of Coping for Arousal (Average and Above Average Participants)

Arousal levels	<i>M</i> for coping	<i>n</i>	<i>SD</i>	<i>SE</i>
0-170 uts (high arousal)	7.40	27	3.54	0.69
171-350 (medium arousal)	9.10	28	2.75	0.52
Above 350 (low arousal)	7.12	16	2.36	0.60

Table 10. Difference in Coping at Different Arousal Levels (Average and Above Average Participants)

Different arousal levels	<i>T</i> -score	<i>df</i>	<i>SE</i> total	Significance
High-medium arousal	1.97	53	0.86	Significant at .10 level
High-low arousal	0.30	41	0.91	Insignificant
Medium-low arousal	2.50	42	0.79	Significant at .05 level

level only. For the difficult task, the required optimum level is low and for simple task it is high. Thus, the hypothesis is postulated that arousal level of brain affects coping reactions. Results obtained are shown in Tables 9 and 10. Table 9 shows that high-intelligent participants give 7.40 mean coping reactions at high arousal level, 9.10 mean coping reactions at medium arousal level, and 7.12 at low arousal level. Difference in using coping reactions at high versus low arousal level is found insignificant. However, difference between high versus medium and medium versus low is found significant. It means that when intelligence level is high, individuals make maximum reactions only at medium arousal level. If arousal level deviates away from medium arousal level, a significant decline in using coping reactions was observed. Thus, hypothesis is true. Thus, it can be said that individual's maximum intellectual capacities will come true only at medium arousal level. In this context, the significance of relaxation becomes evident. If a person has higher ability to relax in the face of stress and thus able to bring the

Table 11. Parameters of Coping for Relaxation (Average and Above Average Participants)

Different relaxation levels	<i>M</i> for coping	<i>n</i>	<i>SD</i>	<i>SE</i>
High (above 400)	8.44	17	2.16	0.54
Medium (200-400)	9.46	22	3.54	0.77
Low (below 200)	7.40	32	2.48	0.44

Table 12. Difference in Coping at Different Relaxation Levels (Average and Above Average Participants)

Different relaxation levels	<i>T</i> -score	<i>df</i>	<i>SE</i> total	Significance
High-medium relaxation	1.08	37	0.94	Insignificant
High-low relaxation	1.51	47	0.69	Insignificant
Medium-low relaxation	2.34	52	0.88	Significant at .05 level

arousal level at medium or optimum then it has the best chance to use coping reactions to overcome stress. Thus from another angle, it also can be stated that if the intelligence level is low then arousal level or relaxation ability decreases the chance to use coping reactions significantly. But even then, relaxation itself can help them to have control on decomposition up to whatever extent it is possible.

Ability to relax thus helps the person to overcome stress, but relaxation to very low arousal level can also create problem. As stated by Lindsley that toward the lowest end of arousal continuum, the person is either dead or in sleep state. Naturally, if the arousal will decrease during relaxation then the alertness will decrease and it will affect the intellectual capacities of brain. So relaxation to optimum level is very important. Thus, the hypothesis is postulated that ability to relax can affect coping reactions. Results obtained are shown in Tables 11 and 12. Results show that participants who have medium level of ability to relax use maximum coping reactions, that is 9.46, but the participants who can relax up to higher level use little less reactions, that is 8.44. No significant difference is found for coping between these two levels, that is, high and medium. However, the participants who have low ability to relax utilize significantly lesser coping reactions than participants who have high and medium ability to relax. Thus, the hypothesis that ability to relax affects coping reactions is true, but results of performance at the highest level of relaxation are not collected here because from our real-life experience we know that in almost sleepy stage, performance is always poor. Even then, relaxation up to sleepy

stage in certain stages may help the person to recover from inhibition of fatigue, tiredness, and exhaustion of energy resources.

Conclusion

Stress is considered as heightened arousal state. Relaxation is lowering of arousal. Thus, both are very significant in present world. This study is conducted to understand the relationship of these variables with personality, intelligence, and coping reactions. Various results obtained give very interesting and important insight about the relationship among these variables. Personality is found very important in stress and relaxation. As per Eysenck's theory, it is found that extravert's arousal level is significantly lower than that of introverts. Thus it also confirms Eysenck's another conclusion that introverts are more stress prone than extraverts. As introvert's arousal level is generally high, it is already set to easily develop stress. Relaxation is also found very significantly related with personality. Results show that extraverts relax very easily and quickly than introverts. The reason as mentioned in Eysenck's theory is that inhibitory neural process is strong and as a result inhibition not only develops very quickly but also dissipates very slowly. So, decrease in arousal takes place quickly and relaxation develops. However, introverts have poor inhibitory neural process and as a result inhibition develops very slowly and dissipates quickly. So, introvert's arousal level decreases very slowly and finds a lot of difficulty in relaxing. Thus to understand the relationship between stress and relaxation, personality plays a significant role. To develop various techniques of relaxation, personality must be taken into focus.

The variable intelligence is also studied in relation with arousal, relaxation, and coping. It is found that intelligence has relationship with arousal level. It is found that average- and high-intelligence participants have significantly lower arousal level than participants having low-intelligence level. It is perhaps because the intelligent participants took the given task with ease than less-intelligent participants. That is why no significant relationship with relaxation was found. So intelligence does not seem to any way affect arousal and relaxation. But in coping, intelligence plays an important role. It is found that average- and high-intelligent participants used significantly more coping reactions than participants low in intelligence. As coping is rational and reason-based reaction, intelligence was expected to determine coping reactions and results confirmed the hypothesis. It is also found that even if participants have good intelligence level, ability to relax further significantly affects the making of coping reactions. Participants who relaxed to medium arousal level use significantly more coping reactions than participants who relaxed to low or high arousal level. Thus this study confirms that a medium-level relaxation facilitates intelligence in

increasing coping reactions. These results are well in accordance to Lindsley theory and Yerkes–Dodson law.

Declaration of Conflicting Interests

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Bios

Harish Kumar Sharma is born in Amritsar, Punjab, INDIA, on 17th Sept. 1967. He completed M.A, M. Phil, Ph. D from Guru Nanak Dev University, Amritsar and working in government college, Kotkapura, Punjab, INDIA. He is also taking classes of nursing and physiotherapy at Baba Farid University of Health Sciences, Faridkot, Punjab, INDIA.