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The Effect of Experimentally Induced Stress on Facial Recognition Ability of Security Personnel's

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***Abstract*—**The facial recognition is an important task in criminal investigation procedure. The security guards-constantly watching the persons-can help to identify the suspected accused. The forensic psychologists are tackled such cases in the criminal justice system. The security personnel may loss their ability to correctly identify the persons due to constant stress while performing the duty. The present study aimed at to identify the effect of experimentally induced stress on facial recognition ability of security personnel's. For this study 50, security guards from Sangli, Miraj & Jaysingpur city of the Maharashtra States of India were recruited in the experimental study. The randomized two group design was employed to carry out the research. In the initial condition twenty identity card size photographs were shown to both groups. Afterward, artificial stress was induced in the experimental group through the difficultpuzzle-solvingtask in a limited period. In the second condition, both groups were presented earlier photographs with another additional thirty new photographs. The subjects were asked to recognize the photographs which are shown earliest. The analyzed data revealed that control group has ahighest mean score of facial recognition than experimental group. The results were discussed in the present research.

***Keywords*—**Experimentally Induced Stress, Facial Recognition, Cognition and Security Personnel.

I. INTRODUCTION

In the present circumstance, the crime rate is tremendously increased. The various criminal incidents have been exited at public places such as shopping mall, ATM centers, schools, colleges, universities movie theaters, government and private offices etc. The first responsibility of such cases has been imposed on security personnel by the management. When such cases are recorded at the local police stations the security guards are called to identify the suspects. The security guards are constantly watching the persons; who enters and exists in front of the gate. While performing his duty through the whole day his cognitive ability to recognize the faces of persons visited in the offices may loss. The security personnel can play an important role in criminal investigation. According to this point of view present research has been carried out.

The human face plays an important role in our social interaction.The face recognition is also the key part of security systems. The security personnel used to recognize those face by using some clues like any marks on face, spectacles, dress style and any unusual thing etc. They also use their intuitions, which is comes from their experience, about suspicious suspects or persons. Integration all these factors about face recognition helps security personnel to retain the faces in mind. The function of face recognition under conditions of high level stress is much interested in cognitive psychology and forensic psychology. When witnessing a crime, the response of the eyewitness is almost always one of generating a stress response to the stressor imposed by the crime. (Kenneth, A and colleague, 2004)There is strong evidence that stress can impair contextual and episodic memory tasks (Henson, Shallice, & Dolan, 1999; Lupien et al., 1998; Nadel & Jacobs, 1998). The first systematic review of the literature relating the effects of heightened stress to eyewitness memory was conducted by Deffenbaeher (1983). The moderate stress canalso impair memory function. McEwen & Sapolsky (1995) have found that experimentally induced stress negatively affects cognitive ability.Jessica D. Payne, Lynn Nodel, John J.B., Allen, Kevin G. F. Thomas & w. Joke Jacobs (2002), studied the impact of experimentally induced stress on the ability of human participants to accurately recognize words presented on a list. They found that stress selectively disrupted participants. This finding indicates that stress possibly through its impact on the hippocampus & prefrontal cortex, can potentiate false memories.Maria Soledad Beato, Sara Cadavid, Ramon F. Pulido & Maria salome Pinho (2012), studied on 'Effect of stress on False Recognition', they found, it does not enhance the vulnerability of individuals with acute stress to DRM false recognition, regardless of the level of processing.Lyle E. Bourne, Jr. & Rita A, Yaroush (2003) studied the stress and the cognition. They found mediating relationships between physiological states & cognitive functioning. How so far thus systematic review suggest that stress could influence the facial recognition.

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II. OBJECTIVE OF THE STUDY

To study the effect of experimentally induced stress on facial recognition cognitive ability of security personnel.

III. HYPOTHESIS OF THE STUDY

The experimentally induced stress would significantly affect the facial recognition ability of security personnel.

IV. METHOD

***A. Sample of the Study*:-** The fifty security personnel were selected for this experimental study. These security guard's working in college, bank, ATM, office, hospital and shopping malls. Their age ranged from 30 to 40 year.They were selected from Sangli, Miraj and Jaysingpur city of Maharashtra states of India.

***B. Tools used for the Study*:-**

i) Photographs :- Identity card size fifty photographs of college students were used to show to the security personnel in two conditions. The twenty photographs for firstcondition and fifty photographs with additional of thirty new photographs were used. The random presentation method was used.

ii) Puzzle :- Paper pencil and oral puzzles were employed in the study. Difficulty level had been assessed through pilot study which was conducted on security guards. It was observed in the pilot study that the stress level was arisen while puzzle solving

task. Some physical and emotional symptoms of stress arisen due to these puzzles. Hence, these puzzles are used as stress factors.

iii) Nonsense Syllabus :- Words based on Peterson and Peterson's trigrams (meaningless three-consonant syllables) are used in the study. These words are presented to the participants accordingly the design used for the recognition of identity card photos.

V. DESIGN OF THE STUDY:-

Pre and post randomized two group design was employed for the study as under

Groups	1st Condition	Interval	2nd Condition
Controlled	Presentation of 20 photos	20 minutes of cancellation task	Recognition
Experimental	Presentation of 20 photos	Presentation of puzzles for 20 minutes	Recognition

VI. PROCEDURE OF EXPERIMENT

The security guards were randomly divided into conditions viz. control and experimental. In the first condition both groups were presented twenty photographs. Afterward the control group was asked to perform a simple task of word cancellation in an alphabet chart for a twenty minutes. While the experimental group were given a puzzle solving task for a twenty minutes. In the final condition of experiment both groups were again presented twenty photographs with additional thirty photographs and asked to identify the previously shown photographs.

VII. RESULTS AND DISCUSSION

Table 1 showing Mean, SD and t value of controlled and experimental groups for Percentage of Facial Recognition

Group	N	Mean	SD	df	T
Control	25	79.36	8.66	48	7.469**
Experimental	25	58.20	11.20		

** = 0.01 alpha level of significance

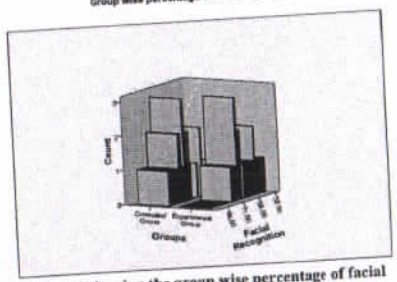

Figure 1 showing the group wise percentage of facial recognition

Table 1 shows the difference between controlled and experimental group of security personnel. The mean score of experimental group is 58.20 and SD is 11.20 and the mean score of control group is 79.36 and SD is 8.66. The obtained't' value of mean differences is 7.469. The 't' value is significant on 0.01 significant level. The hypothesis, "The experimentally induced stress would significantly affect the facial recognition cognitive ability of security personnel" is accepted.

Table 2 showing Mean, SD and t value of controlled and experimental groups for Percentage of Consonant Trigrams

Group	N	Mean	SD	df	T
Control	25	85.80	9.53	48	1.22
Experimental	25	83.64	8.76		

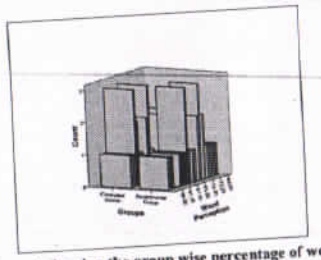

Figure 2 showing the group wise percentage of word perception

Table 2 indicates that the security personnel of control group has a mean score of percentage of consonant trigrams is 85.80 while the mean score of experimental group is 83.64. Their SD are respectively 9.53 and 8.76. The obtained t value is 1.22 which is not significant. The main aim of the study was that to see dose the heightened stress level affects the ability of recognition of the human faces among security guards. Since, the aim significantly proved; the study further extended to countercheck that do the same level of stress also affects the word perception? The results depicted in the table and graph 2does not supported the extended aim. The retroactive inhibition effect due to the similar stimulus presented in both conditions are indicated by several researchers. This effect is not seen about the trigram consonant in the present investigation as similar stimulus are not presented in pre and post conditions but as indicated in table and graph 1 the inhibitory effect is observed about the facial recognition cognitive ability. Hence, it could be concluded that heightened level of stress affects the cognitive ability of facial recognition.

VIII. CONCLUSION OF THE STUDY

1. The facial recognition cognitive ability of security personnel is less in experimental group.
2. Facial recognition ability of security personnel is strongly influenced by stress factors.

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CERTIFICATE OF ATTENDANCE AND PRESENTATION

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