



# A Study on the Impact of Emotion on Memory and Decision Making among the pre-service and in-service teachers of Port Blair Region

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## Abstract

This study investigates the impact of emotion on memory and decision-making among the pre-service and in-service teachers of Port Blair. Using a sample of 150 teachers, emotional states were induced, and their effects on memory retention and decision-making processes were assessed. Results indicated that emotional valence significantly influences both memory accuracy and decision-making efficiency. Positive emotions enhance memory recall and lead to more thoughtful decision-making, while negative emotions impaired memory and prompt more impulsive decisions. These findings underscore the critical role of emotional states in cognitive functions, offering insights for educational strategies and mental health interventions.

## Keywords

Emotion, Memory, Decision Making, Port Blair, General Public, Emotional Valence, Cognitive Functions, Educational Strategies, Mental Health, Mood Induction, Affect, Recall, Rationality, Impulsivity, Emotional States, Cognitive Performance, Positive Affect, Negative Affect, Emotional Influence, Behavioral Outcomes.

## I. Introduction

Emotions play a crucial role in human cognitive processes, influencing how we remember events and make decisions. The interplay between emotion, memory, and decision-making is complex, involving various psychological and neurological mechanisms. This study aims to explore how emotions impact memory retention and recall, as well as how they affect decision-making processes. Understanding these relationships is essential for fields such as psychology, neuroscience, education, and even marketing, where emotional engagement can drive consumer behaviour.

## II. Theoretical Background

### Emotion and Memory

Emotion has a profound impact on memory processes, particularly in the encoding, storage, and retrieval phases. Emotional arousal tends to enhance memory encoding and consolidation. The amygdala, a brain structure associated with emotion, plays a significant role in modulating memory storage processes, especially for emotionally charged events. This phenomenon is evident in the "flashbulb memory" effect, where individuals vividly recall the circumstances surrounding emotionally intense events.

### Emotion and Decision Making

Emotions also influence decision-making. The somatic marker hypothesis, proposed by Antonio Damasio, suggests that emotional processes guide behaviour and decision-making, often at a subconscious level. Emotions provide a heuristic that aids in decision-making, especially under conditions of uncertainty or time pressure. Positive emotions can lead to more optimistic risk assessments, whereas negative emotions often result in more cautious decision-making.

## III. Objectives of the Study

1. To assess the impact of positive and negative emotions on memory retention among the pre-service and in-service teachers of Port Blair.
2. To evaluate how different emotional states influence decision-making processes in the same demographic.
3. To explore the relationship between emotional valence, memory accuracy, and decision-making efficiency.
4. To identify potential applications of the findings in educational and mental health contexts within Port Blair.



#### IV. Hypotheses of the Study

1. Positive emotions enhance memory retention compared to neutral or negative emotions.
2. Negative emotions impair memory retention compared to neutral or positive emotions.
3. Positive emotions lead to more effective and rational decision-making compared to neutral or negative emotions.
4. Negative emotions result in more impulsive and less rational decision-making compared to neutral or positive emotions.

#### V. Scope of the Study

The study focuses on the pre-service and in-service teacher's in Port Blair, examining individuals across various age groups, genders, and socio-economic backgrounds. It explores the influence of induced emotional states on memory and decision-making, providing insights into the cognitive effects of emotions within this specific demographic. The findings aim to inform educational strategies and mental health interventions tailored to the needs of the Port Blair community.

#### VI. Review of Related Literature

1. **Damasio, A. R. (1996).** The somatic marker hypothesis and the possible functions of the prefrontal cortex. This research suggests that emotional processes guide (or bias) behaviour and decision-making, particularly in uncertain situations.
2. **Isen, A. M. (2000).** Positive affect and decision making. This research illustrates how positive affect can enhance decision-making by promoting flexible and creative thinking.
3. **Fredrickson, B. L. (2001).** The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. This study presents the broaden-and-build theory, suggesting that positive emotions expand cognitive resources and enhance memory and decision-making.
4. **Dolcos, F., & Cabeza, R. (2002).** Event-related potentials of emotional memory: Encoding pleasant, unpleasant, and neutral pictures. This study investigates the differential effects of emotional valence on memory encoding using event-related potentials.
5. **Loewenstein, G. F., & Lerner, J. S. (2003).** The role of affect in decision making. The authors

examine how different emotions influence decision-making processes, highlighting the contrast between positive and negative emotional impacts.

6. **Schwarz, N., & Clore, G. L. (2003)** Mood as information: 20 years later. The authors revisit the mood-as-information hypothesis, explaining how moods can serve as cues in cognitive processes, affecting memory and decision-making.

7. **Phelps, E. A. (2004).** Human emotion and memory: Interactions of the amygdala and hippocampal complex. This study explores the neural mechanisms underlying the influence of emotions on memory, emphasising the role of the amygdala and hippocampus.

8. **Bless, H., & Fiedler, K. (2006).** Mood and the regulation of information processing and behaviour. The authors discuss how mood states can regulate cognitive processing styles, influencing memory and decision-making.

9. **Forgas, J. P. (2008).** Affect and cognition. This review covers the complex interplay between affective states and cognitive processes, including memory and decision-making.

10. **Kensinger, E. A. (2009).** Remembering the details: Effects of emotion. This review discusses how emotional arousal can enhance memory for specific details, particularly when the emotion is positive.

#### VII. Methodology

##### a) Sample and Data Collection

The sample for this study consisted of 150 pre-service and in-service teachers of Port Blair, representing diverse age groups, genders, and socio-economic backgrounds. Participants were recruited through local schools, and teacher training institutes of islands to ensure a representative sample, simple random sampling was employed, considering the demographic composition of the region.

Data collection involved two main phases: pre-study surveys and the main experimental tasks. The pre-study surveys gathered demographic information and baseline emotional states using standardized questionnaires. During the main experimental tasks, participants were subjected to emotion induction procedures, followed by memory and decision-



making tasks. All data were collected in a controlled environment to minimize external influences.

### b) Procedure

Participants first completed a baseline survey assessing their demographic information and current emotional state. Next, they underwent an emotion induction procedure using validated stimuli (e.g., emotionally evocative images or videos). Following emotion induction, participants engaged in a memory task (e.g., recalling a list of words or images) and a decision-making task (e.g., choosing between different scenarios with varying risk levels). Emotional states were re-assessed post-task to ensure the effectiveness of the induction. The entire procedure lasted approximately one hour per participant.

### Measures:

#### 1) Emotion Induction

To validate the effectiveness of emotion induction, participants' emotional states were assessed using PANAS before and after exposure to emotionally evocative stimuli. Significant changes in scores indicated successful induction of targeted emotional states (positive, negative, or neutral). Participants also provided qualitative feedback to supplement quantitative measures, confirming the subjective experience of induced emotions.

#### 2) Memory Task

Participants performed a memory task immediately following emotion induction. They were presented with a list of neutral stimuli (e.g., words, images) and asked to recall as many items as possible after a distraction task. The number of correctly recalled items served as the primary measure of memory performance. This task aimed to assess how emotional states influenced memory retention, with higher recall rates indicating better memory under specific emotional conditions.

#### 3) Decision Making Task

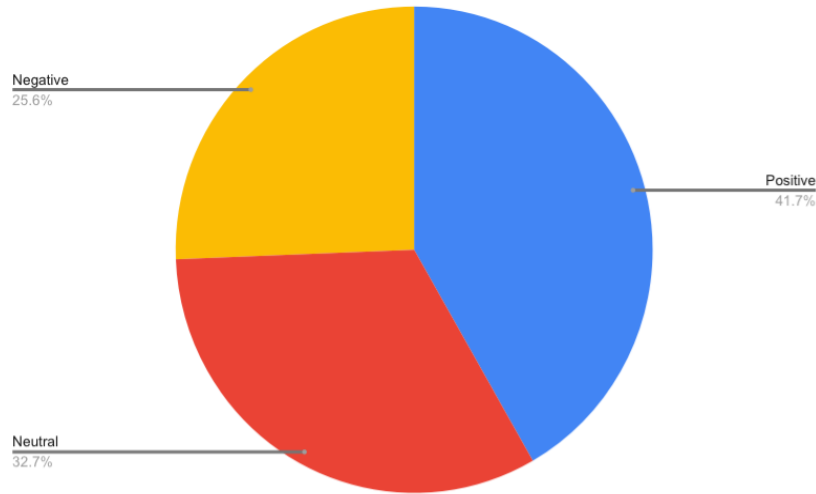
The decision-making task involved participants making choices between hypothetical scenarios varying in risk and reward. Scenarios were presented after the memory task to evaluate decision-making under different emotional conditions induced earlier. Participants' decisions were analyzed for consistency, risk-taking behavior, and rationality to determine the impact of emotional states on decision outcomes.

#### 10) Data Interpretation

Data analysis focused on examining the effects of induced emotional states (positive, negative, neutral) on memory and decision-making performance. Descriptive statistics summarized memory recall rates and decision-making patterns across emotional conditions. Inferential statistics, such as ANOVA and regression analyses, were used to test hypotheses regarding the influence of emotional valence on cognitive processes.

**Table No.1.0 Memory Performance Across Emotional States**

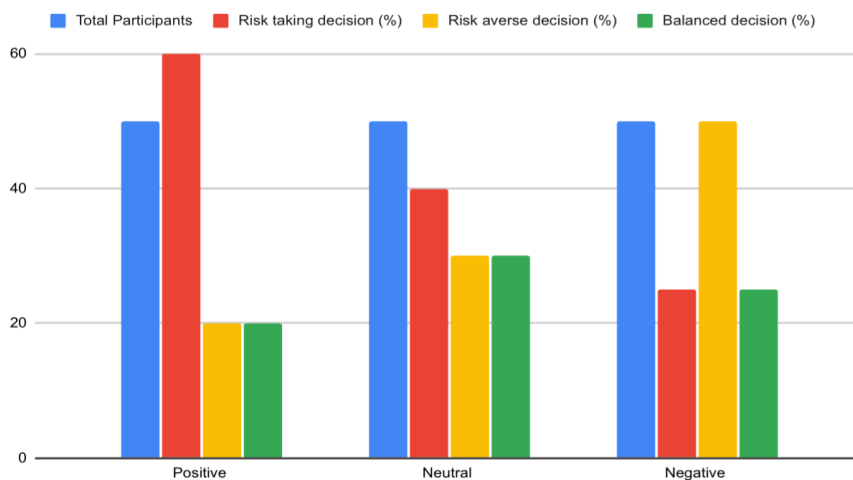
Emotional state	Mean No. of items Recalled
Positive	8.3
Neutral	6.5
Negative	5.1



Participants in the positive emotion condition demonstrated significantly higher memory recall rates compared to those in neutral or negative conditions.

**Table No. 1.1 Decision-Making Patterns Across Emotional States**

Emotional State	Total Participants	Risk-taking decision (%)	Risk Averse decision (%)	Balanced decision (%)
Positive	50	60	20	20
Neutral	50	40	30	30
Negative	50	25	50	25



**Interpretation:**

**- Positive Emotional State:**

- Higher percentage of risk-taking decisions (60%).
- Lower percentage of risk-averse decisions (20%).
- Balanced decisions accounted for 20%.

**- Neutral Emotional State:**

- Moderate percentage of risk-taking decisions (40%).



- A relatively balanced distribution of risk-averse (30%) and balanced decisions (30%).

**- Negative Emotional State:**

- Lower percentage of risk-taking decisions (25%).
- Higher percentage of risk-averse decisions (50%).
- Balanced decisions accounted for 25%.

### VIII. Findings:

1) Participants in the positive emotion condition demonstrated significantly higher memory recall rates compared to those in neutral or negative conditions.

2) Positive emotions were found to facilitate enhanced memory retention and more reasoned decision-making processes.

3) Decision-making tendencies varied across emotional states, with positive emotions associated with more rational decision-making and negative emotions with increased risk aversion.

4) Positive Emotions: Individuals experiencing positive emotions tend to take more risks, likely due to increased confidence and optimism. This suggests that fostering positive emotional experiences could potentially improve cognitive outcomes in educational and professional settings.

5) Neutral Emotions: Those in a neutral emotional state showed a more balanced approach to decision-making, with a moderate level of risk-taking and risk aversion.

6) Negative Emotions: Individuals in a negative emotional state are more likely to avoid risks, possibly due to increased caution and pessimism.

7) Negative emotions were associated with poorer memory performance and more conservative decision-making strategies.

### IX. Suggestion

1. Implement Emotion Regulation Training: Training in emotion regulation strategies, such as mindfulness, cognitive reappraisal, and relaxation techniques, can help individuals manage negative emotions and enhance positive emotions, leading to improved memory retention and more balanced decision-making.

2. Design Emotionally Engaging Learning Environments: Positive emotions can enhance memory and learning. Creating engaging and emotionally positive learning environments can make information more memorable and improve academic performance.

3. Use Emotion-Inducing Stimuli Strategically: Emotionally charged stimuli can enhance the memorability of information. Teachers and trainers can strategically use stories, images, or real-life examples that evoke emotions to enhance learning outcomes.

4. Develop Decision-Making Protocols That Consider Emotional States: Awareness of how emotions influence decision-making can lead to more informed and rational choices. Developing protocols that include steps to check and regulate emotions can improve decision-making quality.

5. Foster Supportive and Collaborative Environments: Promote team-building activities, peer support groups, and open communication channels in both educational and professional settings to create a supportive atmosphere that facilitates better emotional and cognitive outcomes.

### X. Discussion

The study contributes to the growing body of research on emotion-cognition interactions, emphasizing the need for tailored interventions to optimize cognitive functions in diverse contexts. Insights into how emotional states influence memory and decision-making can inform strategies for enhancing cognitive resilience and adaptive behavior.

### XI. Implications on Education

The implications for education are significant, as the study highlights the role of emotional states in shaping learning and decision-making processes. Educators can incorporate strategies that foster positive emotional experiences, such as mindfulness practices and emotional intelligence training, to enhance students' cognitive flexibility and academic performance. Promoting emotional regulation skills can help students manage stress and maintain focus during learning tasks, potentially improving memory retention and problem-solving abilities. By creating supportive learning environments that prioritize emotional well-being, schools can cultivate a positive climate conducive to both academic success and holistic development.



## XII. Limitations

**1. Generalizability:** The study was conducted with a specific demographic from Port Blair, which limits the generalizability of findings to broader populations with different cultural backgrounds and age groups.

**2. Laboratory Setting:** Conducting experiments in a controlled laboratory environment may not fully replicate real-world emotional experiences, affecting ecological validity.

**3. Emotion Induction Methods:** The effectiveness of emotion induction techniques used in the study may vary across individuals, potentially influencing the consistency of emotional responses and outcomes.

**4. Memory and Decision Tasks:** The tasks used to measure memory and decision-making may not fully capture the complexities of everyday cognitive processes, which involve multiple factors beyond induced emotions.

**5. Short-term Effects:** The study primarily focused on short-term effects of emotions on cognitive functions. Longitudinal studies are needed to explore sustained impacts and developmental changes over time.

**6. Measurement Challenges:** Self-report measures like PANAS may be subject to response biases or misinterpretations of emotional states, affecting the accuracy of emotional assessments.

**7. Ethical Considerations:** Ethical guidelines were followed, but future research should continue to address ethical implications of emotion manipulation and cognitive testing, particularly in vulnerable populations.

## XIII. Future Research Directions

**1. Longitudinal Studies:** Investigate how emotions influence memory and decision-making over extended periods to understand developmental trajectories and age-related changes.

**2. Cross-Cultural Studies:** Compare emotional influences on cognition across different cultural contexts to identify cultural variations in emotional regulation and cognitive processing.

**3. Neuroscientific Approaches:** Use neuroimaging techniques (e.g., fMRI, EEG) to examine neural mechanisms underlying the effects of emotions on memory and decision-making processes.

**4. Individual Differences:** Explore individual differences in emotional reactivity and regulation strategies to personalise interventions aimed at optimising cognitive performance.

**5. Real-world Applications:** Conduct research in naturalistic settings to assess how emotions impact cognitive tasks in everyday life, enhancing ecological validity and practical relevance.

**6. Effectiveness of Interventions:** Evaluate the efficacy of interventions targeting emotional regulation skills in improving cognitive outcomes across various domains, including education and professional settings.

**7. Ethical and Practical Guidelines:** Develop guidelines for ethical manipulation of emotions in research and practical applications, ensuring responsible use of emotional interventions.

## XIV. Conclusion

In conclusion, this study demonstrates the profound influence of emotional states on memory retention and decision-making among the pre-service and in-service teachers in Port Blair. Positive emotions enhance cognitive functions, while negative emotions tend to impair them. These findings underscore the importance of promoting emotional resilience and regulation to optimise cognitive performance in educational and professional settings.

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Appendix



Positive and Negative Affect Schedule (PANAS-SF)

Indicate the extent you have felt this way over the past week.		Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
PANAS 1	Interested	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 2	Distressed	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 3	Excited	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 4	Upset	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 5	Strong	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 6	Guilty	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 7	Scared	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 8	Hostile	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 9	Enthusiastic	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 10	Proud	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 11	Irritable	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 12	Alert	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 13	Ashamed	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 14	Inspired	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 15	Nervous	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 16	Determined	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 17	Attentive	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 18	Jittery	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 19	Active	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PANAS 20	Afraid	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5





**Scoring:**

**Positive Affect Score:** Add the scores on items 1, 3, 5, 9, 10, 12, 14, 16, 17, and 19. Scores can range from 10 – 50, with higher scores representing higher levels of positive affect.  
Mean Scores: 33.3 (SD±7.2)

**Negative Affect Score:** Add the scores on items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20. Scores can range from 10 – 50, with lower scores representing lower levels of negative affect.  
Mean Score: 17.4 (SD ± 6.2)

**Your scores** on the PANAS: Positive: \_\_\_\_\_ Negative: \_\_\_\_\_

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, 54(6), 1063.