

ॐ  
अनुसंधान

# Anusandhan

NDIM's Journal of Business and Management Research

Vol. VII, Issue 2, August 2025  
ISSN No.: 2581-8120



Guru Gobind Singh  
Indraprastha University



Crossref

Crossref.ID/DOI-10.56411



New Delhi Institute of Management

Anusandhan: NDIM's

*Journal of*

**Business**

**and**

**Management**

**Research**

Vol.VII, Issue 2, August 2025

ISSN No. 2581-8120



**Dr. Bindu Kumar**

Managing Editor

**Prof.(Dr.) Anudeep Arora**

**Prof.(Dr.) Shubham Agarwal**

Associate Editors

**Prof. (Dr.) Madhu Arora**

Editor-in-Chief

---

## Editorial Advisory Board

**Mr. Rajiv Yadav**

IAS

Ex-Chairman, Brahmaputra Board at Government of India

**Prof. Anu Singh Lather**

Vice Chancellor of Ambedkar University and former Pro Vice Chancellor of Delhi Technological University

**Sr. Tarlochan Singh**

Former MP, Rajya Sabha

Former Press secretary to president of India

**Dr. C. Arvind**

Former Education Secretary, Govt. of NCT of Delhi

**Mr. J.S. Maini**

(Retd) IAS

**Dr. Nitin Malik**

Registrar, Gujarat National Law University, Gujarat, India

Email: registrar@gnlu.ac.in

**Mr. Ayush Kumar**

Managing Director, New Delhi Institute of Management Vice President, Society for Employment and Career Counselling

**Prof. (Dr.) Neena Sinha**

Professor, USMS GGS IP University,

Co-Chairperson NAAC & NIRE, GGSIPU

**Prof. (Dr.) Sanjiv Mittal**

Professor, USMS, GGS IP University

**Prof. (Dr.) R.K. Mittal**

Vice-Chancellor of Chaudhary BansiLal University, Bhiwani, Haryana

**Prof. (Dr. ) Ajeet N. Mathur**

Visiting Professor, IIM Ahmedabad, IIM Calcutta (2022); Professor IIM Ahmedabad(2006-2020)

**Dilip Kumar Bandyopadhyay**

Chief Advisor (FPO); Chairman Law School, Amity Group,

Vice Chancellor IMS Unison University (Former),

Vice Chancellor, GGSIPU (Former),

Professor, Dean and Acting Director, IIM, Lucknow (Former)

**Prof. MadhuVij**

Senior Professor at FMS, University of Delhi,

Board Member at ArunJaitley National Institute

of Financial Management, Ministry of Finance

and Lal Bahadur Shastri Institute of Management, New Delhi

Visiting Professor at ABVSME, JNU, New Delhi

**Dr. Harsh Purohit**

Dean, FMS-WISDOM and Off. Dean  
Jamnalal Bajaj School of Legal Studies  
Banasthali Vidyapith (Deemed University -  
Women)

**Dr. Sandeep Kumar Gupta**

Professor & Director; School of Liberal Studies &  
Deputy Director; School of Management, CMR  
University, Bengaluru, Professor & Dean (Staff  
Welfare); Centre for Statistics, Modelling and  
Simulation, AMET Business School, Faculty of  
Management Studies, AMET University, Chennai,

**Prof. Sayonara de Fatima Teston**

Professor, University of Western Santa Catarina  
(UNOSEC), Brazil,  
Owner ASTA Advisory, Consulting

**Dr. Serdar Vural UYGUN**

Associate Prof. (Dr.), Nevsehir Haci Bektas Veli  
University, Faculty of Economics and  
Administrative Sciences

**Prof. Adel M. Sarea**

Professor at Ahlia University, Member, University  
Council, Bahrain,  
Ahlia University, Director, MBA Program

**Prof. Patrick Zawadzki**

Professor, University of Western Santa Catarina  
Data Scientist, AstaAssessoria

**Prof. (Dr.) Durgesh Tripathi**

National Coordinator "Society and Media"  
MOOCs SWAYAM, Ministry of Education

**Dr. Alina Costin**

Aurel Vlaicu University of Arad, Romania

---

## Editorial Review Board

- Dr. Sachin Kumar Mangla, University of Plymouth, UK, sachinmangla@gmail.com
- Dr. Anil Kumar, London Metropolitan University, UK anilror@gmail.com
- Dr. Akshay Gajanan Khanzode, IIM Visakhapatnam, India, akshay@iimv.ac.in
- Dr. Sanju Kumar Singh, Airlangga University, Surabaya, Indonesia, singhsanju@feb.unair.ac.id
- Prof. (Dr.) Poonam Khurana, Edgewood University, United States, pkhurana@edgewood.ed
- Dr. Shad Ahmad Khan, University of buraimi, Sultanate of Oman, khan.shadahmad@gmail.com
- Md Wakil Hossain, Goenka College of Commerce & Business Administration, Kolkata, India, mdwakhossain@gmail.com
- Dr. Amarjeet Singh, Shri Ram College of Commerce, University of Delhi, India, amarjeet.singh@srcc.du.ac.in
- Dr. Anamika, Amity University, Mumbai, Maharashtra, India, asrivastava@mum.amity.edu
- Dr. P.S. Raychaudhuri, Jamia Hamdard, New Delhi, psray@jamiahamdard.ac.in
- Dr. Prashant Kumar, Phonics University, Uttarakhand, India, gprashant630@gmail.com

## **Outcomes**

### **1. Article 1 “The Influence of Gender Stereotypes on the Perception of Brand Personality: An Empirical Study”**

The study found that gender stereotypes significantly influence brand personality perceptions. Men showed a stronger preference for masculine brands, while women favored feminine brands. These results highlight the role of gender biases in shaping consumer brand choices, offering valuable insights for targeted brand positioning and marketing strategies.

### **2. Article 2 “CAMEL Rating Framework: A Tool for Assessing Bank Financial Performance”**

The study concludes that the CAMEL rating framework is a vital tool for assessing and improving the financial resilience of Indian banks. It effectively identifies risks, aids regulatory compliance, and strengthens stakeholder confidence. However, challenges like high NPAs in public sector banks and the need to adapt to digital transformation remain crucial for its continued relevance.

### **3. Article 3 “Analyzing Efficient Market Hypothesis in CryptoCurrency Market”**

The study reveals that Bitcoin, Ethereum, and Binance Coin generally demonstrate market efficiency, though it fluctuates during periods of extreme volatility influenced by regulatory and macroeconomic events. Bitcoin shows the highest efficiency, highlighting the role of liquidity and adoption in market predictability. These findings stress the importance of adaptive trading strategies and contribute to understanding the dynamics of the Efficient Market Hypothesis in cryptocurrency markets.

### **4. Article 4 “Impact of Pride on the Emotion Climate at Workplace”**

The study establishes that pride significantly and positively influences the emotional climate in workplaces within the Delhi-NCR region, explaining 38.7% of its variance. By fostering pride through recognition and achievement-oriented practices, organizations can enhance positivity, employee engagement, and overall well-being. These findings provide actionable insights for leaders and HR professionals seeking to cultivate emotionally resilient and motivated teams.

## **5. Article 5 “The impact of e-cigarettes on memory ability and psychological wellbeing”**

The study found that young adults who regularly use e-cigarettes showed significantly lower memory ability and higher psychological distress compared to non-users. Strong negative correlations were observed between e-cigarette use and both memory functioning and psychological well-being. These results indicate a potential link between e-cigarette consumption, reduced cognitive performance, and increased mental health concerns.

## **6. Article 6 “Population education – way to progress”**

The article highlights that population education is essential for national development, as it creates awareness about controlling population growth and promotes healthy lifestyles. By adopting a multidisciplinary approach and involving schools and teachers, it can prepare youth with a broad outlook. When viewed as an asset, population can be effectively utilized for the country’s progress.

---

## Chairperson Message

---

I am pleased to share Vol.VII, Issue 2, **August 2025 of *Anusandhan: NDIM's Journal of Business and Management Research***. This issue features a compelling range of scholarly contributions addressing contemporary issues in business and management.

The lead article, '*The Influence of Gender Stereotypes on the Perception of Brand Personality: An Empirical Study*', is co-authored by Premlata from Lady Shri Ram College for Women, University of Delhi, and Subhojit Banerjee from Gautam Buddha University, Greater Noida.

The second paper, '*CAMEL Rating Framework: A Tool for Assessing Bank Financial Performance*', is written by Srishti Arora and K. Ravi Sankar from the School of Management Studies, IGNOU, Delhi.

In the third article, '*Analyzing Efficient Market Hypothesis in the Cryptocurrency Market*', authors Lakshya Jain, Ayush Begani, and Pratyasha Parida from the Indian Institute of Foreign Trade, Kakinada, explore the dynamics of digital asset markets.

The fourth paper, '*Impact of Pride on the Emotional Climate at the Workplace*', is presented by Geetu from Rukmini Devi Institute of Advanced Studies, Guru Gobind Singh Indraprastha University, Delhi, along with Professor Anju Verma from the Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar.

The fifth paper, '*The Impact of E-Cigarettes on Memory and Psychological Well-Being Among Young Adults*' is contributed by Ms. Khushi Jain and Dr. Mamata Mahapatra from Amity Institute of Psychology and Allied Sciences, Amity University, Noida.

The sixth paper, is on '*Population Education-Way to progress*' by Prof.(Dr.) Ekta Bhatia from Gokul Das Hindu Girls College, Moradabad, U.P., India

This issue also includes a book review by Ms. Renuka from Amity University, Noida, focusing on a recent publication in the field of digital marketing.

I hope research contribution published in this journal is valuable for researchers and readers, I commend the editorial team for ensuring the timely publication of the journal.

**Dr. Bindu Kumar**  
Chairperson, NDIM





---

## Editor's Note

---

It is with immense satisfaction that NDIM presents the latest volume of *Anusandhan: NDIM's Journal of Business and Management Research*, Vol.VII, Issue 2, August 2025, a publication committed to nurturing progressive thought in the fields of business and management. This edition brings forth a diverse collection of well-researched articles and book reviews that tackle some of the most pressing challenges and trends in today's dynamic global business environment.

In a world undergoing rapid technological change, economic shifts, and heightened attention to sustainability, the articles featured here reflect a wide spectrum of scholarly inquiry — from digital transformation and workplace emotions to financial performance assessment and behavioral impacts on youth.

At NDIM, we continuously strive to bridge academic research with practical relevance. *Anusandhan* serves as a vital platform for fostering academic debate and encouraging applied research that influences policy-making, strategic direction, and operational execution.

This time, we received 50 percent more manuscripts than in previous editions. We extend our sincere appreciation to our contributors, peer reviewers, and editorial staff, whose dedication ensures that the journal maintains high academic standards. Due to concerns related to plagiarism and unsatisfactory review outcomes, some submissions were not accepted. We hope this will motivate future authors to uphold rigorous research and ethical standards when submitting their work.

We encourage readers to delve into the articles presented and share your perspectives, suggestions, and future submissions as we move forward in advancing impactful management research. We invite prospective authors, reviewers, and critics to collaborate with us in driving meaningful societal impact through research. Special thanks to Ms. Shweta, from Trinity Institute of Professional Studies, Renuka Kapoor and Ms. Shruti from Amity University and Prof. (Dr.) Shubham Agarwal from NDIM for thoroughly proofreading of the journal and taking every point to consideration to fix grammatical errors. We also welcome experienced academicians and industry experts to join our efforts as advisory board members. For any queries, suggestions or submission of manuscript, kindly contact [editor@ndimdelhi.in](mailto:editor@ndimdelhi.in)

Warm regards,

**Prof. (Dr.) Madhu Arora**

*Editor-in-Chief*

*Anusandhan: NDIM's Journal of Business and Management Research*



---

## Contents

---

### **Anusandhan: NDIM's Journal of Business and Management Research**

- |  |           |
|--|-----------|
| <b>1. The Influence of Gender Stereotypes on the Perception of Brand Personality: An Empirical Study</b> | <b>1</b>  |
| <i>Premlata and Dr. Subhojit Banerjee</i>  |           |
| <b>2. CAMEL Rating Framework: A Tool for Assessing Bank Financial Performance</b>                        | <b>12</b> |
| <i>Srishti Arora and Dr. K. Ravi Sankar</i>  |           |
| <b>3. Analyzing Efficient Market Hypothesis in CryptoCurrency Market</b>                                 | <b>19</b> |
| <i>Lakshya Jain, Ayush Begani and Pratyasha Parida</i>   |           |
| <b>4. Impact of Pride on the Emotion Climate at Workplace</b>  | <b>29</b> |
| <i>Geetu and Anju Verma</i>  |           |
| <b>5. The impact of e-cigarettes on memory ability and psychological wellbeing</b>                       | <b>36</b> |
| <i>Khushi Jain and Dr. Mamata Mahapatra</i>  |           |
| <b>6. Population Education – Way to Progress</b>   | <b>48</b> |
| <i>Prof.(Dr.) Ekta Bhatia</i>  |           |
| <b>7. Book Review</b>  | <b>54</b> |
| <i>Renuka Kapoor</i>   |           |



---

# The Influence of Gender Stereotypes on the Perception of Brand Personality: An Empirical Study

---

Premlata

Lady Shri Ram College for Women,  
University of Delhi

Dr. Subhojit Banerjee

Gautam Buddha University,  
Greater Noida

**Premlata, ORCID ID : 0000-0001-5709-7833**

**Dr. Subhojit Banerjee, ORCID ID: 0000-0002-3609-629X**

**Abstract:** This study examines the influence of gender stereotypes on individuals' perceptions of brand personality. By examining how gendered expectations influence the perception of brands, the research aims to uncover whether and how stereotypes shape consumers' brand evaluations. Through a combination of surveys and experimental methods, this study will investigate the relationship between gender stereotypes and the five dimensions of brand personality: sincerity, excitement, competence, sophistication, and ruggedness. The findings suggested that men are more stereotyped than women, and men more often choose masculine brands, while women choose feminine brands over masculine brands. The findings will provide insights into how gender biases affect brand positioning and marketing strategies.

**Keywords:** Gender, Stereotypes, Perception, Brand, Personality

---

## 1. Introduction

Brand personality has become an exciting topic among researchers, as it profoundly influences customer perceptions and preferences. In the contemporary marketplace, forming a distinctive brand personality is a significant challenge for brands that struggle to establish a coherent and lasting relationship. According to Aaker (1997), Brand Personality is a set of human characteristics associated with a brand. These characteristics include age, gender, and other personality traits attributed to brand personality. Belk (1988), Escalas & Bettman (2003), and Sirgy (1982) suggest that consumers use brands to communicate, reinforce, and create themselves. Brand personality (Aaker, 1997 & Plummer, 1985) continues to be significant to marketers due to its ability to establish competitive superiority and differentiate brands (Keller et al., 2002), additionally boost consumer preference and utilisation (Aaker, 1999; Biel, 1993), build brand trust and loyalty (Fournier, 1998; Sung & Kim, 2010), and contributes to brand equity (Biel, 1993; Ogilvy, 1988), evoking desirable emotions (Biel, 1993; Sung & Kim, 2010).

Grohmann's (2009) influential work on brand gender has spurred a robust line of research on this topic. Brand gender refers to the personality traits linked to masculinity and femininity that are relevant to brands. It includes two separate and universal dimensions: masculine brand personality traits (MBP) and feminine brand personality traits (FBP). In Grohmann's (2008) study on brand personality and gender, the author introduced Masculine and Feminine Brand Personality instruments. These tools measure the gender aspects of brand personality using a two-dimensional, 12-item scales composed of descriptive adjectives applicable to both symbolic and utilitarian brands. The MBP scale comprises six traits (adventurous, aggressive, brave, daring, dominant, and sturdy) that are independent of the FBP scale, which includes traits like, fragile, graceful, sensitive, sweet, and tender.

Most research has shown that brand perception can be easily formed and established by the dimensions of brand personalities. Brands attempt to select different dimensions of brand personality to create a distinct identity that aligns with individual stereotypical characteristics. The specific life-set objectives include customs, beliefs, discipline, and social standards. Human often are rigid about their daily tasks, whether they involve household chores or non-household chores. These objectives make life easier while performing specific tasks, as they have already pre-set life goals. However, they eventually develop a rigid discipline to follow particular tasks. They become stereotypical practices when individuals follow them without thinking and experiencing them, making them easy life-set goals. According to Banaji and Hardin (1996), gender cues influence the formation of gender stereotypes.

Research has demonstrated that consumers' perceptions of brands can be significantly shaped by their gender identification. These stereotypes can reveal loyalty pattern influencing consumers' perspectives and purchasing intentions for gendered products or services. A current and relevant area of research will examine how gender stereotypes influence consumer perceptions of brand characteristics. This empirical study investigates the influence of gender stereotypes on consumers' perceptions of brand personality, providing valuable insights that can inform and enhance brand management and communication strategies in the real world.

In this context, the present study examines whether brand personality varies by gender. By doing so, the present research makes a substantial contribution to the literature on gender stereotypes. This is also one of the few studies that have empirically examined gender stereotypes and brand personality levels. The rest of the paper is structured as follows. It begins by providing a theoretical foundation, followed by a review of the literature and the formulation of research questions. We then describe the research method used to test the research questions, discuss the results, and suggest theoretical and managerial implications of the study. The paper concludes with an examination of its limitations and directions for future research.

The primary objective of this article is to investigate how gender stereotypes affect individuals' perceptions of brand personality. This will examine how different individuals simultaneously assess various products and choose according to their stereotypical practices. The second objective of the paper is to determine whether there are specific dimensions of brand personality that are more susceptible to gender-based evaluations and ultimately relate to brand personality dimensions scale (sincerity, competence, sophistication, ruggedness and excitement) and how brand is presented and communicated with the help of these traits which are specific gender-based evaluation in consumers' mind. This will consider the preferences and choices of consumers based on a gender-based evaluation.

According to Batra et al. (1993), it is straightforward for consumers to judge and identify a product by its colour, design, font, name, etc. According to Palan (2001 and Grohmann (2009), brand personality has two dimensions: feminine and masculine. (Grohmann, 2009) elaborated that traits that signify power, energy, strength, dominance, sturdy, and coolness are associated as masculine brands. The third objective of this paper is to analyse whether male and female consumers differ in their susceptibility to gender stereotypes when assessing brand personality. The fourth objective of this study is to investigate how

gender-congruent and gender-incongruent brand personalities influence consumer perceptions and brand loyalty. Specifically, research will explore how individuals behave when they want to give preference to different brands. Will they choose a brand according to their own choice, or will they choose according to their stereotypical traits?

This study aims to investigate the extent to which brands that conform to traditional gender stereotypes are perceived differently from those that challenge these stereotypes will be examined through an empirical analysis. Additionally, this study examines the potential implications of these findings for brand management, marketing strategies, and the broader societal discourse on gender representation in the marketplace.

## **2. Review of related studies**

The theoretical foundation of this study is the literature on brand personality, gender stereotypes, and their intersection. To study the impact of gender stereotypes on brand personality perception, a comprehensive review of the literature was conducted.

### **2.1 Gender and Gender Stereotypes**

According to Miller et al. (2009) and Albert & Porter (1988), Humans learn the foundation of socialisation and Schema Development of gender stereotypes from early childhood. Individuals are exposed to pervasive societal messages about masculinity and femininity coming from various sources like family, peers, and media. According to Hentschel et al. (2019), Young boys and girls internalise these messages through repeated exposure to the environment, family, peers, media, and other sources. Individuals internalise these stereotypes and form mental shortcuts called "schemas." Gender schemas serve as filters, influencing how we perceive and process information related to gender. Schemas shape our perceptions, so when humans encounter brands, our pre-existing gender schemas help us choose among brands based on their perceived masculinity and femininity. So, brands are automatically categorised based on "masculine" or "feminine" cues, such as product attributes, marketing imagery, colour schemes, and language use.

The influence of stereotypical associations links certain brand personality traits with masculinity (e.g., ruggedness, competence, dominance) and others with femininity (e.g., warmth, nurturing, elegance). Once we categorize a brand as "masculine" or "feminine," we tend to interpret further information to confirm our initial bias. (Shing and Singla, 2014) Furthermore, the authors of Winds (2016) examine how marketers use gender stereotypes in advertising. Marketers often intentionally leverage gender stereotypes, using imagery and language that reinforce traditional associations to target specific consumer segments. (Grau et al., 2018; and Lan et al., 2013) Analyzing how gender portrayals simplify marketing and how marketers frequently use household appliances to target women—based on stereotypical gender associations of women—suggest that marketers find it easier to display competence cues with masculine brands and warmth cues with feminine brands. Based on this evidence from the literature, we can formulate our first hypothesis.

Deaux and Lewis (1984) identified a widely accepted set of gender stereotype traits, including trait descriptors, role behaviours, occupations, and physical appearance, each with masculine and feminine forms. These categories encompass both masculine and feminine traits, such as trait descriptors like superiority and sympathy, role behaviours like leadership and nurturing, physical characteristics like hair length and body weight, and occupations including doctor, truck driver, schoolteacher, and housewife.

Gender stereotypes are deeply ingrained through socialisation processes and reinforced by cultural



norms (Bem, 1981; Fiske & Taylor, 1991). These stereotypes often associate masculinity with traits like strength, assertiveness, and competence, while femininity is linked to warmth, nurturing, and emotionality. Research on implicit bias demonstrates that individuals can hold unconscious gender stereotypes that influence their judgments and behaviours, even if they consciously reject those stereotypes.

## 2.2 *Brand Personality*

Brand personality refers to the set of human traits linked to a brand (Aaker, 1997). Consumers don't just buy products; they seek relationships and expressions of their personalities. Just as we are attracted to people who share our beliefs, interests, and values, we also prefer organizations with similar traits. For instance, someone who is daring and adventurous might choose hiking shoes from a brand known for durability and an ethos of exploration. Conversely, a person who appreciates sophistication and elegance might prefer a sleek, minimalist watch.

Grohmann's (2008) study on brand personality and gender introduced the Masculine and Feminine Brand Personality tools. These measures assess the gender aspects of brand personality along a two-dimensional, 12-item adjective scale suitable for both symbolic and utilitarian brands. The MBP scale includes six traits—adventurous, aggressive, brave, daring, dominant, and sturdy—that are distinct from the FBP scale, which features traits like, fragility, grace, sensitivity, sweetness, and tenderness.

According to Rup et al. (2018), Gender stereotypes act as a lens through which we view and interpret brands. This lens shapes our brand personality perceptions, influences our preferences, and ultimately drives purchasing decisions. Different aspects of our dispositions are stimulated by various circumstances that we encounter in our daily lives. Numerous consumers develop distinct brand personalities; for instance, they evaluate various products and brands according to their unique personality traits, even if their decisions seem inconsequential. This intricate equilibrium between the external world and one's interior self is also evident in consumerism, where companies, like individuals, adopt unique personalities to captivate and establish connections with consumers.

Osselaer and Janiszewski (2001) note that research on adaptive brand association learning indicates that advertisers frequently present consumers with various salience cues, enabling them to create multiple connections with brands. This mirroring effect stems from our innate need for self-consistency, as consumers tend to favor brands that reflect their self-image (Bosman, 1996). Such choices serve to reinforce beliefs and values, with selecting a brand that embodies desired personality traits often acting as an aspirational move to help shape an idealized self-image (Hess & Melnyk, 2016). For example, someone wishing to be seen as confident and successful might choose a luxury car brand linked to these qualities, even if they haven't fully adopted them yet. The power of brand identity lies in its ability to evoke emotions and subconscious desires. A strong brand personality goes beyond product features and benefits; it stirs emotions, tells a story, and fosters a sense of community.

The primary purpose of this study is to investigate how the influence of gender stereotypes affects the perception of brand personality among young individuals. Specifically, the study intends to do the following.

1. How do gender stereotypes influence brand personality?
2. Do male and female consumers differ in their susceptibility to gender stereotypes when assessing brand personality?
3. How do gender-congruent and gender-incongruent brand personalities affect consumer perceptions and brand loyalty?

The following research question guided the study:

Research Question 1: Individuals are to perceive brands as possessing gender-stereotypical traits (e.g., competence in masculine brands and sincerity in feminine brands).

Research Question 2: Gender stereotypes influence the perception of brand personality.

Research Question 3: Brands that align with traditional gender stereotypes will be perceived more positively compared to those that do not align with these stereotypes.

The following null hypothesis will be tested at a 0.05 level of significance:

Null Hypothesis 1 (H0): Gender stereotypes affect the brand's perception.

Null Hypothesis 2 (H02): Gender stereotypes influence the perception of brand personality.

Null Hypothesis 3 (H03): Brands that align with traditional stereotypes will be perceived as more positive than those that do not align with these stereotypes.

According to Aaker (1997), a Brand acts as a personality. Consumers do not just see products; they perceive brands as having personalities. These personalities encompass human-like brand personality traits, including sincerity, excitement, competence, sophistication, and ruggedness (Aaker, 1997). We are naturally drawn to brands that we perceive as congruent with our self-image or aspirations. Since gender is a fundamental aspect of identity, we tend to favour brands whose perceived personality aligns with our internalised gender schemas (Lieven, 2017). From this supportive literature, our first hypothesis, presented in null form, is:

### **3. Research Methods**

This study was conducted in the metropolitan state of Delhi, where the young individuals between the ages of 17 and 40 was chosen. This age group is primarily fond of brands and more specific about their choices. These age groups preferred goods or services according to their brand choice. One hundred forty-eight brand users completed the questionnaire; the sample consisted of 83 females (54.97%), 65 males (45.03%). A stratified sampling technique was used, drawing participants from various Delhi University colleges and government offices. Their minimum educational qualification is a senior secondary school; all belong to socioeconomic classes. Before filling out the questionnaire, all participants in the group of 5-15 were given exposure to the advertisement and the screenplay. They were shown advertisements of popular, selected brands, which included both stereotypical and non-stereotypical advertisements. So that they could see the brand's advertisements and how these brands form the brand personality at two different times. Before filling out a questionnaire, participants were exposed to five brands (Cadbury, Cinthol, Everest, Thar, and Surf Excel). The brand advertisements were shown in two different periods: an old ad, which was aired in the 1990s, and a new advertisement, which was aired very recently. This was done to illustrate the various trends and changes in the portrayal of distinct gender roles in advertising (Knoll et al., 2011).

One hundred forty-eight brand users completed the questionnaire, with a sample consisting of 83 females (54.9%) and 65 males (45.1%). The advertisement chosen for the study has some criteria. Firstly, the advertisement must feature a female as the central figure in feminine advertisements, whereas in masculine advertisements, the central figures are mainly men, or if women are also present, their roles are typically limited to showcasing their beauty, sincerity, and nurturing of children or family. Secondly, the advertisements are well-known among the target audience so that they can be easily recognised. Thirdly, Advertisement show stereotypical and non-stereotypical gender roles.

#### 4. Measurements

The current study used an existing scale of gender stereotypes and brand personality. The first part of the questionnaire collected demographic information. The second part included gender stereotype standardised scales (Deaux & Lewis, 1984). The final part is the Brand Personality Standardised Scale (Aaker, 1997). Since data collection took place in India, all questions were translated into the local language, Hindi.

##### 4.1 Gender stereotype

The gender stereotype measures were based on earlier research. Deaux and Lewis (1984) identified a well-established set of gender stereotype traits, including trait descriptors, role behaviors, occupations, and physical appearance, all of which have masculine and feminine versions. These categories include both masculine and feminine statements, such as trait descriptors like superiority and sympathy, role behaviors like leadership and nurturing, physical features like hair length and body weight, and occupations such as doctor, truck driver, schoolteacher, and housewife.

To assess participants' beliefs regarding traditional gender stereotypes, particularly those related to femininity and masculinity, we developed a series of statements reflecting standard societal expectations (e.g., women should always appear slim in advertisements, women should always be fairer than men, etc.). Respondents rated their level of agreement with each of the 10 statements on gender stereotyping on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"). Higher scores indicated a greater endorsement of traditional gender stereotypes, while lower scores indicated a non-traditional perspective. Cronbach's value of the gender stereotype of all 11 items is 0.945.

##### 4.2 Brand personality

Aaker's scale, used to gather data, was administered after respondents viewed an advertisement. The brand personality comprises five scales, each further divided into 10 specific dimensions. For each dimension, respondents identified the brands that best matched each statement from a list of five predetermined brands. This method effectively captured brand preferences across various personality dimensions. The overall scale's Cronbach's alpha is 0.847, indicating good reliability. This approach enabled a comparative analysis of how consumers perceive each brand across different personality aspects.

##### 4.3 Hypothesis Testing

Research question 1: Do gender stereotypes affect brand personality?

The results presented in Table 1 show that the mean and standard deviation for male respondents are 42.92 and 11.63, respectively, whereas those for female respondents are 36.67 and 9.91, respectively. The difference in the mean response of male and female respondents is 6.254.

**Table 1.** Independent *t*-test Analysis of the Influence of Gender Stereotypes between genders (Male and female)

Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t(df)</i>	<i>p</i>	95% Confidence level of difference	
Male	65	42.92	11.63	5.25	<.001	2.74	9.77
Female	83	36.67	9.91				

Ho<sub>1</sub> Gender Stereotype has no significant difference in gender (male and female)

An independent sample t-test was conducted to compare significant differences between males and females. Levene's test for equality of variances was insignificant ( $F=3.091$ ,  $p < 0.05$ ), and the p-value is less than 0.05, indicating that the assumption of equal variance holds. The t-test revealed statistical significance between the two groups. The magnitude of the difference in the mean is 6.254 at a 95% confidence level, ranging from 2.735 to 9.773, which is significant. Hence, Ho<sub>1</sub> was rejected. It is therefore concluded that there is a considerable difference between male and female gender stereotypes.

## Research question 2 Ho<sub>2</sub>

Ho<sub>2</sub>: Gender stereotypes influence their perception of brand personality

To explore how individual gender stereotypes influence brand personality evaluation, a regression analysis was conducted. This analysis aimed to determine whether the dimensions of brand personality — sincerity, competence, excitement, sophistication, and ruggedness — are affected by gender stereotype, which acts as the independent variable. Additionally, another regression analysis was carried out to examine how specific gender stereotype traits impact the dimensions of brand personality. The results clarify which brands are linked to each dimension of brand personality.

Dimension	Brand	R <sup>2</sup>	Beta coefficient	t- Value	p-value (sig.)	Interpretation
Sincerity	Cadbury	0.151	0.389	5.098	<.001	Strong effect of stereotype on sincerity
Competence	Surf Excel	0.102	0.320	4.081	<0.001	Strong effect of stereotype on competence
Excitement	Thar	0.088	0.297	3.764	<0.001	Strong significant effect
Sophistication	Surf Excel	0.102	0.320	4.081	<0.001	Strong effect of stereotype on competence
Ruggedness	Thar	0.131	0.362	4.694	<0.001	Strong significant effect

Regression analysis was conducted to determine whether gender stereotypes influence the evaluation of brand personality traits. The results showed that gender stereotypes significantly affected the sincerity dimension for Cadbury, with a notable effect only for this brand,  $R^2 = 0.151$ ,  $p < 0.05$ . Similarly, for Surf Excel, the competence dimension of brand personality was significantly influenced by gender stereotyping, with an  $R^2$  of 0.102 and  $p < 0.05$ . Furthermore, the dimensions of excitement, sophistication, and ruggedness of brand personality were significantly impacted by gender stereotyping for Thar, Surf Excel, and Thar brands, respectively.

Ho<sub>3</sub>: Brands that align with traditional gender stereotypes will be perceived more positively compared to those that do not align with these stereotypes.

First, categorize the data based on the gender stereotype score: scores of 3 or higher indicate a high stereotype, while scores below 3 indicate a low stereotype. Next, examine the data for positive or negative brand preferences. Those with a high stereotype who prefer masculine brands (such as Cinthol or Thar) will be classified as high stereotype. Conversely, individuals with a low stereotype who choose feminine brands (like Everest, Surf Excel, and Cadbury) will be classified as low stereotype.

**Table 3:** Brand Perception (Positive/ Negative) and High /Low Stereotype Crosstabulation Count

		High Stereotype	Low Stereotype	Total
Brand Perception	Negatively Perceived	107	0	107
	Positively Perceived	14	27	41
Total		121	27	148

Table 3 presents the results of the cross-tabulation, indicating a significant relationship between brand perception and gender stereotypes. The chi-square test indicates a statistically significant association ( $X^2 = 87.84$ ,  $df = 1$ ,  $p < 0.001$ ), suggesting that how a brand is perceived is closely tied to the level of gender stereotyping. The data reveals that individuals with high gender stereotypes tend to view brands negatively, often favouring more masculine brands. Conversely, those with low stereotypes are more likely to perceive brands positively, typically preferring brands seen as more feminine.

## 5. Result

A total of 148 valid responses were collected for the study. Participants were exposed to five brands: Cadbury, Surf Excel, Thar, Everest, and Cinthol. The Thar brand received an unexpectedly high number of responses, total 49, with 62% of respondents being male and 38% being female. The other brands received responses as follows: Cadbury (39), Cinthol (30), Everest (17), and Surf Excel (13). The findings indicated that different dimensions of brand personality align with different brands, reflecting individual perceptions of each brand.

Gender stereotypes differ notably between males and females, as shown by independent t-tests. The findings suggest that males and females socialise differently and encounter distinct societal expectations based on their level of stereotypical gender role adoption and expression. Additionally, analysing brand preferences by gender—considering their gender stereotype traits—highlighted divergent preferences for brand personalities.

Gender stereotypes influence brand personality to some extent, although other factors may also affect perceptions. Individuals with high gender stereotype scores tend to prefer traits like competence, excitement, and ruggedness. In contrast, those with feminine traits are more likely to select brand personality traits such as sincerity and sophistication.

Portraying traditional gender stereotypes can lead to more positive perceptions than deviating from these norms, as confirmed by a chi-square test, which shows that gender stereotypes significantly influence consumer perception. According to Lieven et al. (2015), gender closely aligns with cultural norms and societal expectations, and brands tend to stereotype traits based on consumer preferences, mainly focusing on these deeply rooted norms. Research emphasises how brands reinforce and validate consumer tastes through gender stereotypes, highlighting the importance for marketers and advertisers to stay updated on current branding and advertising trends (Hastie, 2016). When advertising campaigns and marketing strategies adhere to well-established practices, they tend to foster familiarity and a sense of belonging with the brand, thereby enhancing consumer affinity and purchase intention (Ellemers, 2017).

## 6. Discussion and conclusion

Research examined the effects of gender, gender stereotypes, brand personality, and the interaction between gender and brand personality. The brand forms perceptions through advertisement exposure, which plays

a crucial role in shaping the brand's gender perception. When a brand aims to alter its perception and personality, it updates its brand elements, along with its advertisements and social media presence. The paper shows that there are significant differences in gender and gender stereotypes, with males and females displaying distinct patterns of gender endorsement.

Generally, brands take time to develop certain perceptions, personalities, and gender-specific brand personalities (masculine and feminine) through advertisements. People may hold traditional perceptions of a brand at one time or non-traditional perceptions at another, mainly based on how gender roles are portrayed in the advertisements. The results show that females are more likely to choose the brand than men because of how its advertisements portray gender.

Gender influences stereotypes and shapes perceptions of brand personalities. The study suggests that brands can influence how they are perceived, leading to either a masculine or feminine identity. Research highlights significant differences between how males and females perceive brands, with males typically holding stronger gender stereotypes and preferring more masculine brands. A brand rebranding becomes necessary when there is a need to update, refresh, or completely overhaul the company's existing image and market position. Consequently, marketing efforts often target gender-specific audiences, emphasising masculine traits for men and feminine traits for women. People generally prefer brands that conform to traditional gender roles, and advertising and media often reinforce these stereotypes.

## **7. Managerial Implications and Future Research**

The findings will help our sales and marketing managers plan for their target audiences across different time periods, ensuring their emotions and feelings align with the brand. Marketing and sales managers should regularly evaluate the most effective communication strategies for their target customers, which can assist in fostering attachment to the brand and shaping its personality among consumers. Marketers should reposition or rebrand a brand when necessary to create a new brand image through various marketing efforts. It has been observed from advertisement exposure that brands choose to identify themselves differently at different times; essentially, they develop unique brand personalities at various intervals to reflect their culture, norms, and beliefs. To maximize brand relevance, marketers may either incorporate diverse characteristics into the core brand to appeal to both genders or develop distinct brand personalities carefully designed to resonate with a specific gender identity (Lan et al., 2013).

The results show that individuals of different genders have distinct brand preferences that align with their gender stereotype traits. Using roles in advertisements that convey assertiveness, strength, and independence is directly linked to a masculine brand personality. In contrast, roles such as sincerity, affection, love, and sympathy are directly linked to a feminine brand personality. Previous studies have also shown that individuals tend to select brands based on their personalities (Grovers & Shoormans, 2005). Brands communicate their image through advertisements, logos, names, designs, and other brand elements. These portrayals create specific perceptions that brands need to reach their target customers.

Earlier advertisements were more gender-specific, whereas modern advertisements show a reduced use of stereotypical practices. Marketing managers and sales executives should be concerned with how a brand determines what to communicate at different times. The marketing manager assesses the marketing environment, carefully deciding how to convey the brand's image to the target audience. Individual or stereotypical practices help marketers decide how to represent diverse products at various intervals.

The findings may not apply to all types of brands, as different brands have varying preferences for showcasing their identity and reaching their target customers. Data was collected from various sources, which supported the findings. Only Aaker's brand personality model was selected for research due to

its wider acceptability. The study might not be relevant for price-sensitive consumers or those who do not prioritize brand personality; they choose products based on their personal preferences, regardless of the brand's personality. Despite these limitations, this study offers insights into the relationship between gender, gender stereotypes, and brand personality among Indian consumers.

## References:

- Aaker Jennifer L. (1999). "The Malleable Self: The Role of Self-Expression in Persuasion," *Journal of Marketing Research*, 36 (February), 45–58.
- Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research*, 34(3), 347–356.
- Ailawadi, K. L., & Keller, K. L. (2004). Understanding retail branding: Conceptual insights and research priorities. *Journal of Retailing*, pp. 80, 331–342
- Albert, A. A., & Porter, J. R. (1988, March). Children's gender-role stereotypes: A sociological investigation of psychological models. In *Sociological Forum* (Vol. 3, No. 2, pp. 184–210). Dordrecht: Kluwer Academic Publishers.
- Banaji, M. R., & Hardin, C. D. (1996). Automatic stereotyping. *Psychological science*, 7(3), 136-141.
- Batra, R., Donald R. Lehmann, & Dipinder Singh (1993). "The Brand Personality Component of Brand Goodwill: Some Antecedents and Consequences," in *Brand Equity and Advertising*, David A. Aaker and Alexander Biel, eds. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bem, S. L.. Gender schema theory: A cognitive account of sex typing. *Psychological Review*, 88, 354–364.
- Biel, A. L. (1993). "Converting Image into Equity," in *Brand Equity and Advertising: Advertising's Role in Building Strong Brands*, David A. Aaker and Alexander L. Biel, eds., Hillsdale, NJ: Lawrence Erlbaum, 67–82
- Bosman, J. (1996). The Relation between Self Image and Brand Image: An Alternative Perspective. *Communications*, 21(1), 27–48. <https://doi.org/10.1515/comm.1996.21.1.27>
- Deaux, K., & Lewis, L. (1984, May 1). Structure of gender stereotypes: Interrelationships among components and gender label. *American Psychological Association*, 46(5), 991–1004. <https://doi.org/10.1037/0022-3514.46.5.991>
- Features of gender behavior of generation Y. <https://sfk-mn.ru/en/05SCSK321.html>
- Fiske, S. T., & Taylor, S. E. (2nd ed.). *Social cognition*. McGraw-Hill.
- Fournier, S. (1998). "Consumers and Their Brands: Developing Relationship Theory in Consumer Research," *Journal of Consumer Research*, 24 (4), 343–373.
- Grau, S. L., & Zotos, Y. C. (2018). Gender stereotypes in advertising: a review of current research. *Current Research on Gender Issues in Advertising*, 3-12.
- Grohmann, B. (2009). Gender dimensions of brand personality. *Journal of Marketing Research*, 46(1), 105–119.
- Grover, R.C.M. and Shoormans, J.P. (2005). "Product personality and its influence on consumer preference", *Journal of Consumer Marketing*, Vol. 22 No. 4, pp. 189-97.
- Hastie, B. (2016). Gender Stereotypes. In *The Wiley Blackwell Encyclopedia of Gender and Sexuality Studies* (p. 1). Wiley.
- Hess, A. C., & Melnyk, V. (2016). Pink or blue? The impact of gender cues on brand perceptions. *European Journal of Marketing*, 50(9/10), 1550-1574.
- Junaid, A. B. (2015). A Comparative Analysis of Male and Female Consumer Behaviour Factors for their Cosmeceutical Product Types. In *Journal of Accounting & Marketing* (Vol. 4, Issue 2). OMICS Publishing Group. <https://doi.org/10.4172/2168-9601.1000132>

- Keller Kevin L, Brian Sternthal, and Alice Tybout (2002). "Three Questions You Need to Ask About Your Brand," *Harvard Business Review*, 80 (9), 80–86.\
- Knoll, S., Eisend, M., & Steinhagen, J. (2011). Gender roles in advertising. In *International Journal of Advertising* (Vol. 30, Issue 5, p. 867). Taylor & Francis. <https://doi.org/10.2501/ija-30-5-867-888>
- Lieven, T. (2018). Brand Gender and Brand Alliances. In: *Brand Gender*. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-60219-6\\_10](https://doi.org/10.1007/978-3-319-60219-6_10)
- Lieven, T., Grohmann, B., Herrmann, A., R. Landwehr, J., & van Tilburg, M. (2015). The effect of brand design on brand gender perceptions and brand preference. In *the European Journal of Marketing* (Vol. 49, p. 146). Emerald Publishing Limited. <https://doi.org/10.1108/ejm-08-2012-0456>
- Malär, L., Krohmer, H., Hoyer, W. D., & Nyffenegger, B. (2011). Emotional brand attachment and personality: The relative importance of the actual and ideal selves. *Journal of Marketing*, 75(4), 35–52.
- Miller, C. F., Lurye, L. E., Zosuls, K. M., & Ruble, D. N. (2009). Accessibility of Gender Stereotype Domains: Developmental and Gender Differences in Children. *Sex roles*, 60, 870–881.
- Natalia, M., Otnes, C., & Supphellen, M. (2011, April 18). Consumers' perceptions of the dimensions of brand personality. <https://doi.org/10.1002/cb.355>
- Ogilvy, D. (1988). *Confessions of an Advertising Man*, New York: Atheneum.
- Palan, K. M. (2001). Gender identity in consumer behaviour research: A literature review and research agenda. *Academy of Marketing Science Review*, pp. 10, 1 –31.
- Plummer, J. T. (1984/1985). How personality makes a difference. *Journal of Advertising Research*, 24, 27 – 31.
- Pogacar, R., Angle, J., Lowrey, T. M., Shrum, L. J., & Kardes, F. R. (2021). Is Nestlé a lady? The feminine brand name advantage. *Journal of Marketing*, 85(6), 101–117.
- Rup, B K., Gochhayat, J., & Samanta, S. (2018, December 24). Role of biological sex and gender roles on perceived brand personality. <https://doi.org/10.3233/kes-180387>
- Sirgy, M. Joseph (1982). "Self-Concept in Consumer Behaviour: A Critical Review," *Journal of Consumer Research*, 9 (3), 287–300.
- Sung, Yongjun, and Jooyoung Kim (2010). "Effects of Brand Personality on Brand Trust and Brand Affect," *Psychology & Marketing*, 27 (7), 639–661.
- Van Osselaer, S. M., & Janiszewski, C. (2001). Two ways of learning brand associations. *Journal of Consumer Research*, 28(2), 202–223.
- Wu, Lan, Richard R. Klink, and Jiansheng Guo. "Creating gender brand personality with brand names: The effects of phonetic symbolism." *Journal of Marketing Theory and Practice* 21.3 (2013): 319–330.
- Yuen, T. W., Nieroda, M., He, H., & Park, Y. (2021). Can dissimilarity in product category be an opportunity for cross-gender brand extension? *Journal of Business Research*, 135, 348–357.
- Zotos, Y. C., & Grau, S. L. (2016). Gender stereotypes in advertising: exploring new directions. *International Journal of Advertising*, 35(5), 759–760.



---

## CAMEL Rating Framework: A Tool for Assessing Bank Financial Performance

---

Srishti Arora

Research Scholar,  
School of Management Studies,  
IGNOU, DELHI

Dr. K. Ravi Sankar

Professor,  
School of Management Studies,  
IGNOU, DELHI

**Srishti Arora, ORCID ID :** <https://orcid.org/0009-0009-9739-722X>

**Dr. K. Ravi Sankar, ORCID ID :** <https://orcid.org/0009-0006-1117-901X>

### Abstract:

**Purpose:** The objective of the study is to understand the financial health and performance of Indian banks using the CAMEL rating framework. It examines how the model has evolved over time, its adoption in India, and how it's being used to identify and manage risk effectively.

**Design/Methodology/Approach:** The research discusses the CAMEL model, a banking evaluation framework based on five key parameters: Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidity.

**Findings:** The CAMEL model has played an important role in strengthening both the operational and financial resilience of the Indian banks. Public sector banks face challenges such as high non-performing assets (NPAs) and operational inefficiencies, while private sector banks generally demonstrate stronger asset quality and earnings. The study highlights significant variations in performance across different bank categories, underscoring the model's role in regulatory and strategic oversight.

**Practical Implications:** The findings suggest that the CAMEL framework facilitates early detection of potential risk, aids regulatory compliance, and enhances stakeholder confidence in the banking system. However, there is a need to integrate emerging dimensions like digital transformation to maintain its relevance.

**Keywords:** *CAMEL framework, Financial Performance, Indian Banking Sector, Non-Performing Assets (NPAs), Regulatory Compliance*

---

## 1. Introduction

The banking sector is an important pillar of our economy and is essential to the financial system by providing a wide range of services. The Indian banking sector has experienced remarkable growth over the last five decades, specifically since the nationalization of banks in 1969. Assessing the financial performance of this sector is crucial for understanding the overall health of the Indian economy.

The CAMEL rating model was originally developed under the United States' financial supervisory procedures in the 1970s, but it has since been adopted by several nations, including India. The Federal Financial Institutions Examination Council (FFIEC) developed the CAMEL model as a supervisory tool and introduced it to the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC). Its main goal was to provide a consistent supervisory approach that could detect early warning signs of financial stress. It provides supervisory procedures to ensure systematic stability and meet the growing complexity in the sector.

Over time, the framework was expanded to include an additional component when 'S' was added to the CAMEL model for Sensitivity to Market Risk, transforming it into the CAMELS model. This change became important in the 1990s as market risks became more prominent in financial stability, driven by globalization and the growing complexity of financial instruments.

The framework was first introduced in India in the 1990s as a part of Banking Sector Reforms. The additions were made after the New Economic Policy (introduced in 1991), based on the recommendations of the Narasimham Committee (1995) (Biswas, S., & Bhattacharya, M. (2020), Kantharaju G. et. al. (2024)), which emphasized the need for standardized assessment tools.

Further, the framework was implemented by the Reserve Bank of India (RBI) to supervise both public and private sector banks in India. It helped identify financially weak or loss-making banks and initiate timely corrective measures. In the beginning, it was applied to the commercial banks only. When the model gained popularity, it was applied to the Non-Banking Financial Companies (NBFCs) as well, after a few modifications.

Further, there is Prompt Corrective Action (PCA), an additional measure to strengthen regulatory oversight used by the central bank to ensure early intervention and maintain stability in the banking system.

**Table 1:** Summary of the adoption of the CAMEL Framework in the US and India

Feature	United States	India
Origin	Developed by FFIEC in the 1970s.	Adopted in the post-liberalization period (1990s).
Primary Focus	The initial focus was on financial soundness; it later evolved to include market risk.	Focus on NPAs, operational efficiency, and compliance.
Regulatory Authority	Federal Reserve, OCC, FDIC	Reserve Bank of India (RBI)
Enhancements	Evolved into CAMELS with "S" for sensitivity	Integrated with Prompt Corrective Action (PCA) as used by RBI

(Source: Existing Literature)

**Table 2:** Summary of Review of Literature based on the use of CAMEL Model in the Indian Banking Sector

Author, Year	Bank (Sample)	Technique	Results and Findings
K Suresh, Subhendu Kumar Pradhan, 2023	Bank of Baroda, Indian Bank, State Bank of India, Central Bank of India, Indian Overseas Bank, UCO Bank under PSUB; IDF First Bank Ltd., Bandhan Bank Ltd., Yes Bank Ltd., Nainital Bank Ltd., Dhanalakshmi Bank Ltd., Jammu and Kashmir Bank Ltd.	CAMEL Model Analysis and Independent Sample T-Test	PSBs maintain higher reserves to meet financial obligations, generate more profit per employee, and manage their liquidity better relative to their deposits. However, most of the banks show a negative return on equity. For the two types of banks, PSUB and PSB, the T value is 2.734. This means there is a significant difference between PSBs and PSUBs for non-performing assets to net advances. For all other ratios, there is no significant difference between the two.
R. Raghavendra Rao, Prof. Ch. Srinivasa Rao, 2022	Public Sector: State Bank of India, Punjab National Bank, Bank of Baroda Private Sector: HDFC Bank, ICICI Bank, Kotak Mahindra Bank	CAMEL Model Analysis	ICICI maintained a strong CAR and high asset quality but a low D/E ratio, while PNB and BOB showed the lowest CAR. PNB also had a higher NPA. The Kotak Mahindra bank is generating strong interest and non-interest income, and again, PNB shows the lowest earnings efficiency. Bank of Baroda maintained a balanced liquidity position, followed by ICICI and SBI.
Sarit Biswas, Mousumi Bhattacharya, 2020	ICICI Bank Ltd., Axis Bank Ltd., HDFC Bank Ltd., YES Bank Ltd., Kotak Mahindra Bank Ltd., IndusInd Bank Ltd., IDBI Bank Ltd., DCB Bank Ltd., Bandhan Bank Ltd., and IDFC FIRST Bank Ltd.	CAMEL Model Analysis and ANOVA	According to the ANOVA analysis, there is a significant variation in the performance of the sample banks for most of the ratios, except for the capital adequacy ratio, which shows no significant variation. For financial ratio analysis, ICICI has the highest CAR, while the lowest was maintained by IDBI. The lowest net NPA to total assets was observed in HDFC Bank. ROE was maximum for IDFC First Bank, followed by HDFC. For interest income and liquidity, Bandhan Bank is at the top, followed by DCB and Kotak in income and HDFC and AXIS for liquidity.

Author, Year	Bank (Sample)	Technique	Results and Findings
Dr. Anand Singh 2024	Union Bank of India (pre- and post- merger)	CAMEL Model Analysis	The merger helped improve financial stability with an increase in CAR, and the average net NPA (%) reduced, indicating better asset quality and better management of bad loans. The ROA and EPS moved from negative to positive, with EPS highlighting better shareholder value.
Dr. Mansi Mathur, 2021	State Bank of India (SBI) (pre- and post- merger)	CAMEL Model Analysis	The post-merger performance improved in CAR, while the D/E ratio declined. The total advances to total assets also improved. However, ROE has reduced for SBI. The NPA ratio and slippage ratio declined, indicating a better performance. and reduced bad loans. The overall performance was better in the post-merger period in comparison to the pre-merger period.

**2. Research Objective:** To understand the financial health and performance of Indian banks using the CAMEL rating framework

**Table 3:** Summary of Implications of Financial Ratios

Parameter	Ratio	Implications in the Banking Sector
<b>Capital Adequacy</b> is used by banks to assess their capacity to absorb the potential losses and still be able to fulfill all their financial obligations. It compares the bank's capital to its risk-weighted assets. Under Basel III regulations, the Reserve Bank of India requires a minimum CAR of 9%, which is higher than the international standard of 8%. A solid capital foundation enables the bank to weather economic challenges and strengthens public confidence.	Capital Adequacy Ratio (CAR)	The bank's ability to absorb potential losses and maintain financial stability. A higher CAR ensures resilience.
	Tier 1 Capital Ratio	Measures the bank's core capital strength, reflecting its financial health and risk-bearing capacity.
	Debt-to-Equity Ratio	Assess the bank's leverage level; high ratios may indicate over-reliance on debt, increasing financial risk.
	Leverage Ratio	Shows the bank's capital buffer relative to its total exposure, ensuring protection against excessive risk-taking.

Parameter	Ratio	Implications in the Banking Sector
<b>Asset Quality</b> measures the soundness of the bank's assets, such as loans and advances. Non-Performing Assets (NPAs) are a key indicator in this category. High levels of NPAs reflect poor credit appraisal and risk management practices. The Indian banking sector, particularly public sector banks, has faced challenges due to rising NPAs in recent years.	Gross NPA Ratio	Highlights the percentage of loans classified as non-performing; a higher ratio signals poor asset quality and credit risk.
	Net NPA Ratio	Reflects the actual bad loans after provisions, showing the net impact on the bank's profitability.
	Provision Coverage Ratio (PCR)	Indicates the extent of provisioning against NPAs, showing preparedness to manage credit risk.
	Investment to Asset Ratio	Measures the proportion of assets invested in securities, indicating liquidity and risk diversification.
<b>Management Efficiency</b> is to assess the leadership, governance, and operational efficiency of the bank. Effective management ensures the optimal utilization of resources and alignment with strategic goals. In India, banks are increasingly adopting digital transformation strategies to improve management efficiency.	Cost to Income Ratio	Evaluates operational efficiency; a lower ratio suggests better cost management and profitability.
	Business per Employee	Indicates productivity of employees; higher values reflect better resource utilization.
	Profit per Employee	Shows employee contribution to profitability, important for evaluating workforce efficiency.
<b>Earnings Quality</b> focuses on the bank's ability to generate sustainable and stable profits. Consistent earnings enable a bank to expand operations, reward shareholders, and build reserves. Indian banks are striving to improve earnings by diversifying revenue streams and enhancing fee-based income.	Net Interest Margin (NIM)	Represents the profitability from core banking operations, i.e., the interest spread.
	Return on Assets (ROA)	Reflects how effectively the bank utilizes its assets to generate profit.
	Return on Equity (ROE)	Measures the return generated for shareholders, indicating profitability and equity efficiency.

Parameter	Ratio	Implications in the Banking Sector
<b>Liquidity</b> measures the bank's capacity to meet short-term obligations without undue reliance on external funding. Adequate liquidity is essential to ensure smooth day-to-day operations and maintain customer trust. In India, the RBI's liquidity adjustment facility (LAF) plays a crucial role in managing liquidity in the banking system.	Liquidity Coverage Ratio (LCR)	Assesses the bank's ability to meet short-term liquidity needs under stress scenarios.
	Loans to Deposits Ratio (LDR)	Indicates the proportion of funds deployed as loans; high values suggest potential liquidity risks.
	Quick Ratio	States the bank's ability to meet its immediate obligations using liquid assets.
	Cash to Deposits Ratio	Assesses the ability to maintain sufficient liquidity to fulfill depositor withdrawal requests.
	Operating Efficiency Ratio	Highlights cost-effectiveness in operations; a lower ratio indicates improved efficiency.
	Earnings per Share (EPS)	Represents the profitability available to shareholders, crucial for investment decisions.

### 3. Conclusion

The CAMEL model remains a cornerstone for evaluating the financial performance, soundness and stability of banks in India. It provides a structured and comprehensive approach, enabling stakeholders to make informed decisions and detect early signs of risk of vulnerability.

The study, based on literature, highlights that the public sector banks continue to face significant challenges, especially with respect to NPAs. In comparison, private sector banks show a strong asset quality, profitability, and capital adequacy, thereby highlighting better resource management.

However, given the ever-evolving financial ecosystem and dynamic nature of the Indian banking sector, there is a need for continuous refinement of the framework to incorporate emerging trends such as digital banking, fintech innovations, and environmental, social, and governance (ESG) factors.

An introduction of real-time performance dashboards into CAMEL model and predictive analytics can help provide the regulatory oversight which is more proactive and responsive to risks.

### References:

- Bank for International Settlements. (n.d.). Basel III: International regulatory framework for banks.*
- Biswas, S., & Bhattacharya, M. (2020). Financial Performance Analysis of "New Generation Private Sector Banks": A CAMEL Model Approach In Indian Context. Journal of Commerce & Accounting Research, 9(4), 37-44.*
- Mathur, M. (2021). Pre & Post Merger Analysis of SBI bank through CAMEL Model. Srusti Management Review, 14(2), 32-41.*
- Narasimha Committee (1991) on The Banking System in India, International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.6, Issue 1, page no.566-573, January-2019*

- Kantharaju G. (2024), *Comparative Performance Evaluation Of Selected Public And Private Sector Banks: CAMELS Model Approach In Indian Context - A Longitudinal Study.*, *Educational Administration: Theory And Practice*, 30(5), 7232-7244
- RaghavendraRao, R., & SrinivasaRao, C. (2022). *Performance analysis of selected Indian Banks using CAMEL Model*. *Primary International Journal of Commerce and Management Research*, 10, 20.
- Reserve Bank of India. (n.d.). *Notification: Notification on Reserve Bank of India Act, 1934 - Section 42(1) - Cash Reserve Ratio (CRR)*.
- Reserve Bank of India. (n.d.). *Basel III: Framework on Liquidity Standards - Liquidity Coverage Ratio, Liquidity Risk Monitoring Tools and LCR Disclosure Standards*.
- Singh, A. (2024). *Impact of Merger on the financial performance of Union Bank of India: an evaluation based on CAMEL Model*. *Library Progress International*, 44(3), 12460-12474.
- Suresh, K., & Pradhan, S. K. (2023). *Evaluation of Financial Performance of Banking Sector in India—A CAMEL Approach*. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, 8(5), 50.

---

# Analyzing Efficient Market Hypothesis in Cryptocurrency Market

---

**Lakshya Jain<sup>1</sup> · Ayush Begani<sup>2</sup> · Pratyasha Parida<sup>3</sup>**

Indian Institute of Foreign Trade, Kakinada, India

**Lakshya Jain, ORCID ID : <https://orcid.org/0009-0006-5874-1014>**

**Aayush Begani, ORCID ID : <https://orcid.org/0009-0002-5946-5091>**

**Pratyasha Parida, ORCID ID : <https://orcid.org/0009-0001-4194-7722>**

**Abstract:** Understanding cryptocurrency market efficiency is crucial for investors seeking to identify and exploit arbitrage opportunities. This study rigorously evaluates the market efficiency of three prominent cryptocurrencies—Bitcoin, Ethereum, and Binance Coin—over a three-year period from April 1, 2021, to March 31, 2024. We examine whether these markets adhere to the principles of the Efficient Market Hypothesis (EMH). Our findings indicate that while all three cryptocurrencies exhibit a significant degree of efficiency, efficiency fluctuates amid extreme volatility, especially during major market events like regulatory crackdowns and macroeconomic shifts. Bitcoin exhibits higher efficiency than Binance Coin and Ethereum, indicating that liquidity and adoption significantly influence market predictability. These insights have important implications for traders and institutional investors, emphasizing the need for adaptive trading strategies rather than relying on static arbitrage models. Furthermore, this study advances the understanding of EMH in digital asset markets by demonstrating how efficiency evolves in response to external forces. By offering a data-driven perspective on cryptocurrency market behavior, this research provides a foundation for future studies on financial market efficiency and digital asset valuation.

**Keywords:** Efficient Market Hypothesis; Random Walk; Variance Ratio Test; Unit Root Test

---

## 1. Introduction

The debate around market efficiency has long been a central topic in finance, with significant implications for asset pricing and investment strategies. The Efficient Market Hypothesis (EMH), introduced by Eugene Fama in the 1970s, posits that asset prices fully reflect all available information, making it impossible to consistently outperform the market through trading strategies. EMH is categorized into three forms: weak, semi-strong, and strong. Weak-form efficiency suggests that historical price and volume data cannot predict future prices. Semi-strong form asserts that all publicly available information is reflected in prices, while strong-form efficiency claims that even insider information is instantly incorporated into asset values.

While EMH has been widely studied in traditional financial markets, the rise of cryptocurrencies presents a new frontier for analysis. Cryptocurrencies like Bitcoin, Ethereum, and Binance Coin operate in a decentralized and less regulated environment, raising questions about whether these markets conform



to EMH principles. The unique nature of digital assets, marked by extreme volatility, evolving technology, and fragmented market structure, necessitates a closer examination of their efficiency.

Bitcoin, launched in 2009 by Satoshi Nakamoto, introduced the concept of decentralized digital money and blockchain technology. Ethereum, introduced in 2015 by Vitalik Buterin, expanded this concept by enabling smart contracts and decentralized applications, laying the groundwork for decentralized finance (DeFi). Binance Coin, associated with one of the largest cryptocurrency exchanges, reflects the integration of financial services such as lending, staking, and derivatives into the crypto ecosystem.

Understanding the efficiency of these markets is crucial given their growing role in global finance. Unlike traditional markets, cryptocurrency markets operate 24/7, are highly volatile, and often respond to social media trends, technological developments, and regulatory news rather than standardized financial disclosures. The decentralized and fragmented structure of these markets may lead to inefficiencies such as price discrepancies and information asymmetry, challenging EMH assumptions.

Nevertheless, mechanisms like algorithmic trading, institutional participation, and the introduction of ETFs and derivatives have enhanced market liquidity and stability, suggesting evolving efficiency. However, the impact of these changes remains an open empirical question.

This study aims to empirically test the **weak-form EMH** in the context of cryptocurrencies, focusing on Bitcoin, Ethereum, and Binance Coin. Using statistical tools such as the **variance ratio test** and **unit root test**, we evaluate whether their price movements exhibit random walk behavior—a key indicator of weak-form efficiency. The variance ratio test assesses mean reversion or randomness, while the unit root test determines the stationarity of price series.

By examining the efficiency of cryptocurrency markets, this research contributes to a deeper understanding of price formation in digital assets. The findings will offer insights for investors, policymakers, and developers of trading algorithms, enhancing decision-making in a rapidly evolving financial landscape. Ultimately, this study lays the groundwork for future research into semi-strong and strong-form efficiency in cryptocurrency markets, expanding both the theoretical and practical discourse on how these innovative markets process information.

## 2. Review of past studies

Numerous academic studies have delved into the realm of cryptocurrency market efficiency, particularly considering the exponential growth and diversification within the sector. While initial research primarily focused on Bitcoin, the surge in digital currencies during the bullish market of 2017 prompted a shift towards investigating a spectrum of high-capitalization cryptocurrencies.

Source	Year	Variables	Methodsused	Findings
Jacek Karasiński	2025	16 major cryptocurrencies using 1-minute interval data	Martingale Difference Hypothesis test, rolling window approach	Efficiency is time-varying, supports AMH; more inefficiency during volatility periods

Source	Year	Variables	Methodsused	Findings
Mokni, K., El Montasser, G., Ajmi, A. N., & Bouri, E.	2024	Bitcoin & Ethereum (daily data) + macroeconomic indicators (financial stress, liquidity)	Adjusted Market Inefficiency Magnitude (AMIM), quantile regression	Efficiency changes over time; negatively impacted by global financial stress; money flow improve efficiency
Saiful Reeza Latif, Muhammad Azri Mohd, Mohd Nazrul Mohd Amin, Arwin Idham Mohamad	2017	Bitcoin & Litecoin	Auto Regressive Conditional Heteroskedasticity (GARCH)	Inconsistent with weak form of efficiency
Eojin Yi, Biao Yang, Minhuk Jeong, Sungbin Sohn, Kwangwon Ahn	2023	Bitcoin	QHO	Close to being weakly efficient

Karasiński (2025) conducted a detailed study on high-frequency return predictability in cryptocurrency markets through the lens of the Adaptive Market Hypothesis (AMH). Using 1-minute interval data from 16 major cryptocurrencies, the research applied the Martingale Difference Hypothesis with a rolling window approach. The findings revealed that market efficiency is dynamic, fluctuating with volatility and trading activity. Periods of heightened turbulence showed greater predictability, indicating deviations from weak-form efficiency and lending support to the AMH framework, which posits that market behavior evolves with experience and environmental changes.

Mokni et al. (2024) examined time-varying efficiency in Bitcoin and Ethereum using the Adjusted Market Inefficiency Magnitude (AMIM) and quantile regression analysis. Their study incorporated macro- and micro-level variables such as global financial stress, investor sentiment, and liquidity. They found that efficiency fluctuates significantly, decreasing during financial shocks and improving with higher liquidity and inflows. These results support the idea that cryptocurrency markets are still evolving and that external conditions and internal market dynamics critically affect efficiency.

Saiful Bappa Latif et al. (2017) used GARCH models to analyze Bitcoin and Litecoin. The study concluded that these markets do not fully conform to weak-form efficiency, with historical price patterns offering some level of predictability. These inefficiencies were linked to speculative trading, investor sentiment, and market manipulation, highlighting the role of behavioral and structural factors in digital asset pricing.

Eunjie Yi et al. (2023), in contrast, applied the QHO method and found that Bitcoin is close to being weakly efficient, although brief inefficiencies can occur. Their results suggest that while prices generally follow a random walk, certain market conditions—such as structural shifts or liquidity changes—can temporarily affect efficiency. This highlights the importance for context-specific analysis in evaluating digital asset markets.

Despite growing evidence, cryptocurrencies remain fundamentally distinct from traditional financial assets. Their decentralized nature, 24/7 trading, regulatory ambiguity, and reliance on social sentiment introduce complexities that challenge conventional efficiency models. Consequently, price formation in digital assets often depends on factors beyond fundamentals, including technological developments, online communities, and macroeconomic conditions.

Building on this literature, the present study tests the weak-form EMH in Ethereum, Bitcoin, and Binance markets, offering practical insights for investors and policymakers into how well these markets process information.

### 3. Methodology

#### *Data*

The present study considers the adjusted closing daily indices of Bitcoin (BTC), Ethereum (ETH), and Binance Coin (BNB) as the basis for analysis. These adjusted closing prices account for factors such as dividends, stock splits, and other adjustments that may affect the actual value of an asset over time, ensuring a more accurate representation of price movements. The selected data spans a three-year period from April 1, 2021, to March 31, 2024, covering significant events, market cycles, and external shocks that may have influenced cryptocurrency price dynamics.

The price data were sourced from Yahoo Finance, a widely recognized and reliable financial data platform that provides historical price information on various assets, including cryptocurrencies. Yahoo Finance aggregates price data from multiple exchanges, ensuring comprehensive coverage and accuracy. The chosen timeframe captures multiple market phases, including periods of high volatility, market crashes, bull runs, and regulatory developments, thereby offering valuable insights into the efficiency and behavior of these digital assets.

#### *Methodology*

The primary aim of this study is to examine whether the cryptocurrency market demonstrates weak-form efficiency. To test this, the study investigates whether historical price movements can predict future prices. According to the weak-form Efficient Market Hypothesis (EMH), asset prices follow a random walk, implying that past price data should not enable investors to earn consistent abnormal returns.

The random walk model, excluding drift, can be mathematically described as:

$$Y_t = Y_{t-1} + e_t$$

Where:

- $Y_t$  represents the asset value at time  $t$ ,
- $Y_{t-1}$  is the value at time  $t - 1$ ,
- $e_t$  is a random error term at time  $t$ .

The **Variance Ratio (VR) Test**, introduced by Lo and MacKinlay (1988), is a widely used econometric tool to test market efficiency based on the random walk theory. This theory posits that asset prices evolve in an unpredictable manner, similar to a random walk.

To apply the VR test, the first step is to compute asset returns from the price series. Typically, **logarithmic returns** are calculated using the formula:

$$r_t = \ln(P_t / P_{t-1})$$

The return series is then segmented into non-overlapping sub-periods, each consisting of a specified number of time intervals. This segmentation allows for an analysis of return variability across different time horizons. Variance is computed both for each sub-period and for the entire dataset.

To account for autocorrelation—where current price behavior may be linked to past price behavior—an optimal lag is selected. In this analysis, a lag of 9 periods is chosen based on empirical or theoretical justification. Each sub-period, therefore, contains 9 time points. Variance is then calculated within each sub-period, as well as for the full return series.

The **Variance Ratio (VR)** is defined as:

$$\text{VR} = \text{Variance of Full Period} / \text{Average Variance of Sub-Periods}$$

A statistical test (e.g., t-test or z-test) is applied to determine if the VR significantly deviates from 1. The null hypothesis assumes a random walk ( $\text{VR} = 1$ ), while the alternative suggests deviations indicating return predictability. A VR close to 1 supports the random walk hypothesis and market efficiency; significant deviations imply that returns may exhibit patterns or autocorrelation, providing potential opportunities for profit.

The following stochastic process can also describe returns:

$$R_t = \mu + \ln(P_t) - \ln(P_{t-1}) + \varepsilon_t$$

Where:

- $R_t$  is the return at time  $t$ ,
- $\mu$  is the drift term,
- $\ln(P_t)$  and  $\ln(P_{t-1})$  are the natural logs of prices at times  $t$  and  $t - 1$ , respectively,
- $\varepsilon_t$  is an error term that is independently and identically distributed (i.i.d.), representing random noise.

Under the random walk hypothesis, the variance of the sum of returns over two consecutive periods ( $r_t + r_{t-1}$ ) should be twice the variance of a single return. Hence, the **two-period variance ratio** is:

$$\text{VR}(2) = \text{Var}[r_t(2)] / (2 * \text{Var}[r_t]) = \text{Var}[r_t + r_{t-1}] / (2 * \text{Var}[r_t])$$

Expanding this:

$$\text{VR}(2) = [2 * \text{Var}(r_t) + 2 * \text{Cov}(r_t, r_{t-1})] / (2 * \text{Var}(r_t)) = 1 + \rho(1)$$

Where  $\rho(1)$  is the first-order autocorrelation of returns. A  $\text{VR}(2)$  equal to 1 supports the random walk hypothesis. A VR below 1 indicates negative autocorrelation, while a value above 1 suggests positive autocorrelation.

The original Lo and MacKinlay (1988) test evaluates individual VRs for specific lag values ( $q$ ). However, because the random walk hypothesis requires that **all**  $\text{VR}(q)$  values equal 1, a joint test across multiple lag values is more robust. To address this, **Chow and Denning (1993)** proposed the **Multiple Variance Ratio (MVR) Test**, which simultaneously tests whether the VRs for several lag values are jointly equal to 1.

Under this framework:

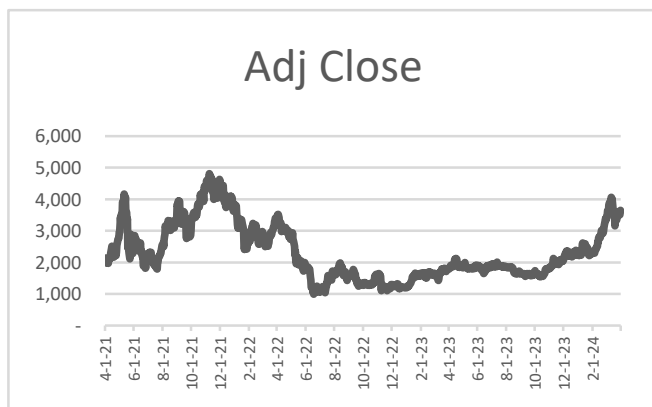
- **Lo-MacKinlay Test Null Hypothesis:**  $\text{VR}(q) = 1$
- **Chow-Denning Test Null Hypothesis:**  $M_t(q_i) = \text{VR}(q_i) - 1 = 0$ , for  $i = 1, 2, \dots, m$

Where the MVR test evaluates the joint null hypothesis across multiple lag values  $q_i$ .

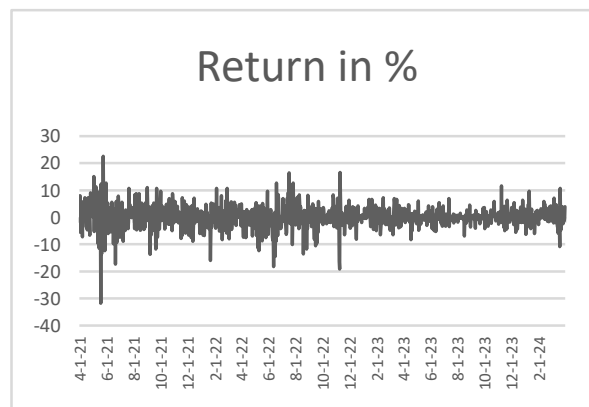
## 4. Empirical Studies

### 4.1 Data

#### A. Ethereum



**Figure 1** Line Chart of Ethereum

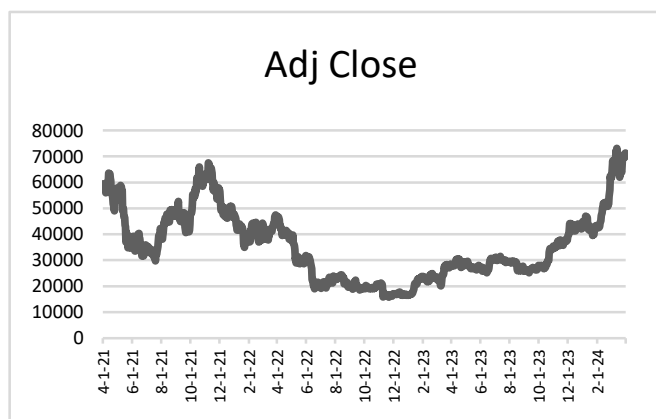


**Figure 2** Line Chart of return on Ethereum

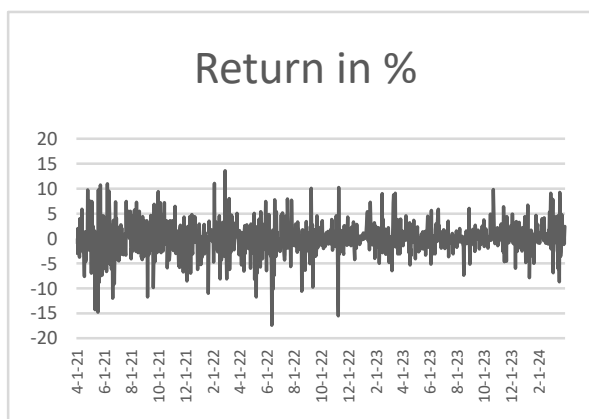
Figure 1 represents the line chart of Ethereum. It seems that this follows stochastic trend. A stochastic trend implies that the time series has a random walk component, meaning its future values depend on both its past values and a stochastic (random) term. A stochastic trend series must be differenced. Finally, these indices have been differenced and converted into line charts.

Figure 2 depicts the line chart of the return on Ethereum. It seems this is mean reverting process. Overall, the price of Ethereum might be trending upwards with random ups and downs, while its return seems to fluctuate around zero, indicating mean reversion.

#### B. Bitcoin



**Figure 3** Line Chart of Bitcoin



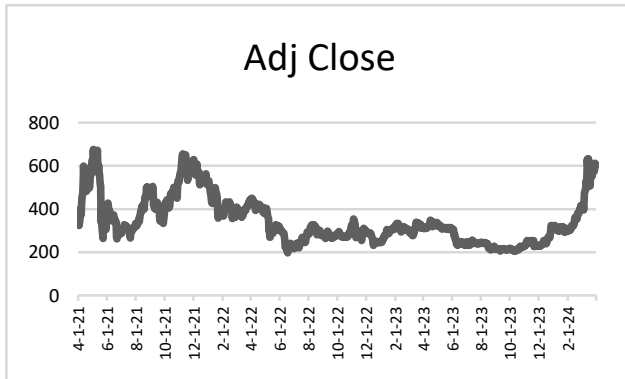
**Figure 4** Line Chart of return on Bitcoin

Figure 3, the price of Bitcoin, follows a stochastic trend. A stochastic trend is a trend that is influenced by random situations. It appears that the price of Bitcoin is increasing over time, but there is also a lot of

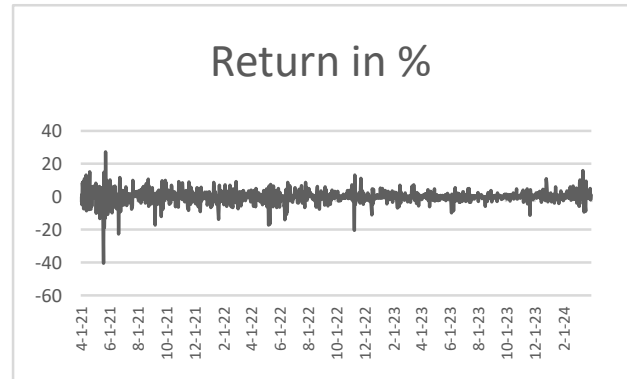
volatility in the price. This suggests that the price of Bitcoin is not only influenced by long-term trends, but also by short-term random fluctuations.

The return on Bitcoin in Figure 4 fluctuates around zero, which suggests that it is a mean reverting process. This means that even though the price of Bitcoin may be following a stochastic trend, the returns on Bitcoin tend to be zero in the long term.

### C. Binance



**Figure 5** Line Chart of Binance



**Figure 6** Line Chart of return on Binance

Through Figure 5, There appears to be a general upward trend in the price of Binance over time. This appears to show a stochastic trend. There's a general upward direction over time, but with significant volatility.

Figure 6 suggests a mean reverting process. The return fluctuates around zero, meaning large positive or negative returns tend to be followed by corrections that bring it back closer to the average. indicating mean reversion.

## 5. Descriptive Statistics

- Ethereum's daily returns over the past three years demonstrate an average daily return of 0.0559 and a standard deviation of 4.1486, indicating notable volatility. The distribution exhibits a slightly negative skewness (-0.5275) and a kurtosis of 8.9873, implying heavier tails compared to a normal distribution. Statistical tests, including the Jarque-Bera test statistic of 1686.3722 with a probability of 0.0, provides compelling evidence against the assumption of normality in Ethereum's return distribution.
- Bitcoin's daily returns over the past three years demonstrate an average daily negative return of 0.0172 and a standard deviation of 3.214975, indicating notable volatility. The distribution exhibits a slightly negative skewness (-0.3584) and a kurtosis of 3.5549, implying heavier tails than to a normal distribution. Statistical tests, including the Jarque-Bera test statistic of 600.0392 with a probability of 5.0482e-131, reject the hypothesis of normality in Bitcoin's return distribution.
- Over the observed three-year period, Binance Coin's daily return are based on an average daily return of 0.0542 and a standard deviation of 4.146769, indicating significant volatility. The distribution shows a negative skewness (-1.0077) and a kurtosis of 12.6730, suggesting heavier tails compared

to a normal distribution. Statistical analysis, including the Jarque-Bera test statistic of 7512.9397 with a probability of 0.0, provides compelling evidence against the assumption of normality in Binance Coin's return distribution.

## 6. Results and Analysis

### *Ethereum*

- **Result:** The variance ratio test applied to Ethereum with an optimal lag of 6 produced a p-value of 0.0555. This value is slightly above the conventional 0.05 threshold, suggesting Ethereum's market does not significantly deviate from the random walk hypothesis. Hence, price changes appear mostly unpredictable, offering evidence in support of weak-form market efficiency.
- **Interpretation:** Since the null hypothesis of market efficiency cannot be rejected, Ethereum's market behavior aligns with the principles of weak-form efficiency. This implies that historical price data holds limited predictive value. However, the p-value being close to the cutoff suggests that while Ethereum largely behaves efficiently, minor inefficiencies could exist—particularly during periods of market stress or volatility.
- **Analysis:** Ethereum's nearly random price behavior indicates that it generally incorporates past information efficiently. Nonetheless, the closeness of the p-value to 0.05 suggests a potential for temporary inefficiencies. Such dynamics align with the Adaptive Market Hypothesis (AMH), where markets evolve and efficiency fluctuates based on investor behavior and external conditions. Further testing using alternative tools like autocorrelation or Hurst exponent could provide deeper insight. Moreover, distinguishing between different market regimes (e.g., bullish vs. bearish) may reveal more about Ethereum's time-varying efficiency.

### *Bitcoin*

- **Result:** For Bitcoin, the variance ratio test at an optimal lag of 9 resulted in a p-value of 0.3125. This relatively high value indicates no significant departure from the random walk hypothesis, meaning Bitcoin's price movements were largely unpredictable during the observed period.
- **Interpretation:** The null hypothesis of weak-form efficiency is not rejected, suggesting that Bitcoin's market reflects historical price information efficiently. This high p-value implies that past price movements offer minimal insight for predicting future trends, which aligns well with the Efficient Market Hypothesis (EMH).
- **Analysis:** Bitcoin, the most established and liquid cryptocurrency, exhibits strong adherence to weak-form efficiency. This reflects a market where price discovery processes are robust, likely due to greater institutional involvement, higher liquidity, and broader adoption. However, efficiency is not absolute; macroeconomic factors, and technological changes can lead to temporary inefficiencies. The implication for investors is that long-term strategies based on fundamentals may be better than short-term speculation based on historical prices.

## **Binance**

- **Result:** The variance ratio test for Binance Coin (BNB) using an optimal lag of 1 yielded a p-value of 0.1749. This value, though lower than Bitcoin's, remains above the 0.05 significance level, indicating moderate support for weak-form efficiency, with some potential minor inefficiencies.
- **Interpretation:** The test results do not reject the null hypothesis of efficiency, suggesting that BNB's price movements are largely random. However, the mid-range p-value indicates the possibility of short-term inefficiencies, possibly due to unique structural factors specific to Binance's ecosystem.
- **Analysis:** As a utility token closely linked to the Binance exchange, BNB's market behavior is influenced by exchange-driven activities such as token burns, trading incentives, and staking rewards. These factors can intermittently distort price behavior, creating short-lived inefficiencies. The variance ratio test suggests that, overall, BNB follows a random walk, but its market structure introduces nuances not observed in more decentralized assets like Bitcoin. High-frequency trading, liquidity events, and platform-specific announcements can temporarily skew price dynamics. Unlike Bitcoin or Ethereum, which function across broader ecosystems, BNB's performance is tightly integrated with Binance's platform. Thus, evaluating its efficiency requires accounting for both macro trends and platform-specific developments.

## **7. Conclusion**

This study analyzed the weak-form efficiency of Bitcoin, Ethereum, and Binance Coin using the variance ratio test over a three-year period. The results indicate that all three cryptocurrencies largely follow a random walk, supporting weak-form efficiency under the Efficient Market Hypothesis (EMH). Bitcoin and Binance Coin exhibit strong adherence to market efficiency, while Ethereum shows minor deviations, suggesting occasional inefficiencies. These findings imply that historical price data offers limited predictive power for future returns, posing challenges for traders seeking to consistently outperform the market. However, Ethereum's slight inefficiency may provide short-term opportunities during periods of heightened volatility. For institutional investors and portfolio managers, the results highlight the need for risk-aware strategies that reflect the evolving nature of cryptocurrency markets, which remain more volatile and less regulated than traditional financial systems.

The study also extends EMH analysis to the digital asset space, emphasizing the role of liquidity, adoption, and technological development in shaping market behavior. As crypto markets mature, efficiency is likely to improve, driven by regulatory developments and increased institutional participation. While the analysis provides valuable insights, it is limited by its time frame and methodology. Future research should explore different time horizons, incorporate alternative techniques like machine learning or sentiment analysis, and assess semi-strong and strong-form efficiency.

In conclusion, this research contributes to understanding how cryptocurrency markets function and evolve. It offers both theoretical value and practical guidance for investors navigating the complexities of digital asset trading.



## References:

- Abou Tanos, B., & Badr, G. (2024). Price delay and market efficiency of cryptocurrencies: The impact of liquidity and volatility during the COVID-19 pandemic. *Journal of Risk and Financial Management*, 17(5), 193. <https://doi.org/10.3390/jrfm17050193>
- Bartos, J. (2015). Does Bitcoin follow the hypothesis of efficient market? *International Journal of Economic Sciences*, 4(2), 10–23. <https://doi.org/10.20472/ES.2015.4.2.002>
- Bouteska, A., Sharif, T., Isskandarani, L., & Abedin, M. Z. (2025). Market efficiency and its determinants: Macro-level dynamics and micro-level characteristics of cryptocurrencies. *International Review of Economics & Finance*, 87, 103938. <https://doi.org/10.1016/j.iref.2025.103938>
- Brauneis, A., & Mestel, R. (2018). Price discovery of cryptocurrencies: Bitcoin and beyond. *Economics Letters*, 165, 58–61. <https://doi.org/10.1016/j.econlet.2018.02.001>
- Brouty, X., & Garcin, M. (2022). A statistical test of market efficiency based on information theory. *arXiv*. <https://doi.org/10.48550/arXiv.2208.11976>
- Karasiński, J. (2025). The predictability of high-frequency returns in the cryptocurrency markets and the adaptive market hypothesis. *Central European Economic Journal*, 8(1), 1–19. <https://doi.org/10.2478/ceej-2025-0003>
- Latif, S., Mohd, M. A., Amin, M. N. M., & Mohamad, A. I. (2017). Testing the weak form of efficient market in cryptocurrency. *Journal of Engineering and Applied Sciences*, 12, 2285–2288. <https://doi.org/10.3923/JEASCI.2017.2285.2288>
- Łęt, B., Sobański, K., Świder, W., & Włosik, K. (2023). Investor sentiment and efficiency of the cryptocurrency market: The case of the Crypto Fear & Greed Index. In *Eurasian Studies in Business and Economics* (Vol. 25). [https://doi.org/10.1007/978-3-031-36286-6\\_16](https://doi.org/10.1007/978-3-031-36286-6_16)
- López-Martín, C., Benito Muela, S., & Arguedas, R. (2021). Efficiency in cryptocurrency markets: New evidence. *Eurasian Economic Review*, 11, 403–431. <https://doi.org/10.1007/s40822-021-00182-5>
- Mokni, K., El Montasser, G., Ajmi, A. N., & Nguyen, D. K. (2023). On the efficiency and its drivers in the cryptocurrency market: The case of Bitcoin and Ethereum. *Financial Innovation*, 9, 39. <https://doi.org/10.1186/s40854-023-00566-3>
- Myeong, J., & Kim, D. (in press). Market reactions to crypto-specific announcements: Analyzing behaviors in coins and tokens. *Central European Economic Journal*. <https://doi.org/10.2478/ceej-2025-0003>
- Souza, O. T., & Carvalho, J. V. F. (2024). Market efficiency assessment for multiple exchanges of cryptocurrencies. *Revista de Gestão*, 31(2), 137–151. <https://doi.org/10.1108/REGE-05-2022-0070>
- Wei, W. C. (2018). Liquidity and market efficiency in cryptocurrencies. *Economics Letters*, 168, 21–24. <https://doi.org/10.1016/j.econlet.2018.04.003>
- Yi, E., Yang, B., Jeong, M., Sohn, S., & Ahn, K. (2023). Market efficiency of cryptocurrency: Evidence from the Bitcoin market. *Scientific Reports*, 13. <https://doi.org/10.1038/s41598-023-31618-4>
- Zhang, W., Wang, P., Li, X., & Shen, D. (2018). The inefficiency of cryptocurrency and its cross-correlation with Dow Jones Industrial Average. *Physica A: Statistical Mechanics and Its Applications*, 510, 658–670. <https://doi.org/10.1016/j.physa.2018.07.032>
- Özcan, R., Khan, A. U. I., & Iftikhar, S. (2024). Whether the crypto market is efficient? Evidence from testing the validity of the Efficient Market Hypothesis. *Bulletin of Monetary Economics and Banking*, 27(1), Article 5. <https://doi.org/10.59091/2460-9196.2227>

---

# Impact of Pride on the Emotion Climate at Workplace

---

**Geetu**

Assistant Professor,  
Rukmini Devi Institute of Advanced Studies,  
Guru Gobind Singh Indraprastha University,  
Delhi, India

**Anju Verma**

Professor,  
Haryana School of Business,  
Guru Jambheshwar University of Science & Technology,  
Hisar, Haryana, India

**Geetu, ORCID ID: 0009-0007-2506-6726**

**Anju Verma, ORCID ID: 0000-0002-5976-0931**

**Abstract:** This study explores the influence of pride—a discrete positive emotion—on the emotional climate within workplace settings, with a focus on organizations in the Delhi-NCR region. Drawing upon the theoretical foundations of the broaden-and-build theory and affective events theory, the research examines how individual experiences of pride contribute to shaping collective emotional environments. Utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM) on data collected from a sample of 420 employees across diverse organizational sectors, the study reveals a significant and positive relationship between pride and emotional climate ( $\beta = 0.622$ ,  $p < 0.001$ ). The model demonstrates moderate explanatory power, with pride accounting for 38.7% of the variance in emotional climate. Reliability and validity measures affirm the robustness of the constructs used. The findings highlight the practical importance of fostering pride through recognition and achievement-oriented practices, as it plays a critical role in enhancing workplace positivity, employee engagement, and overall organizational well-being. This research offers valuable insights for leaders and HR professionals aiming to build emotionally resilient and motivated workforces.

**Keywords:** Emotion, Emotional Climate, Organization, Pride.

---

## 1. Introduction

In contemporary organizational behavior research, emotions are no longer regarded as irrational disruptions to productivity but as integral components of workplace dynamics and employee well-being (Ashkanasy & Dorris, 2017). Among the spectrum of discrete emotions influencing organizational functioning, pride stands out as a self-conscious emotion that can significantly shape interpersonal interactions, motivation,

and organizational culture (Tangney, Stuewig, & Mashek, 2007). Pride, when experienced authentically and constructively, reinforces a sense of accomplishment and personal worth, thereby promoting engagement and fostering prosocial behavior (Williams & DeSteno, 2008). However, when expressed excessively or inauthentically, pride may also breed arrogance or alienation, thereby affecting the emotional climate of teams and departments.

The concept of emotional climate refers to the shared affective tone and emotional experience prevalent within an organizational unit (Barsade & Knight, 2015). It encompasses the collective mood and emotional norms that govern employee interactions and perceptions. The emotional climate is a crucial determinant of organizational outcomes, including communication patterns, creativity, collaboration, and overall job satisfaction (Isen & Reeve, 2005). While extensive research has explored the role of negative emotions (e.g., anger, anxiety) in shaping emotional climates, the impact of positive self-referential emotions like pride remains under-explored.

This study aims to investigate how the expression and perception of pride among employees influence the emotional climate of the workplace. By examining pride's dual potential—as a motivator of excellence and a source of interpersonal friction—this research contributes to a nuanced understanding of how emotions shape the socio-emotional fabric of organizations.

## 2. Literature Review

Pride is classified as a self-conscious, moral emotion, which arises from internal appraisals of success, competence, or adherence to social or organizational values (Tracy & Robins, 2007). It can manifest in two forms—authentic pride, associated with hard work and achievement, and hubristic pride, linked to arrogance and inflated self-worth (Tracy, Cheng, Robins, & Trzesniewski, 2009). Authentic pride has been found to motivate perseverance, enhance team cohesion, and foster leadership emergence (Williams & DeSteno, 2009). Conversely, hubristic pride often results in interpersonal conflict and reduced trust within teams.

Emotional climate refers to the enduring collective mood within a workgroup or organization, shaped by shared experiences and interactions (Ashkanasy & Härtel, 2014). A positive emotional climate is marked by warmth, trust, optimism, and collaboration, whereas a negative climate reflects tension, cynicism, and emotional withdrawal (Barsade & Gibson, 2007). The emotional tone of a workplace has profound implications for employee morale, innovation, and retention (George, 2000).

Positive emotions such as pride can elevate organizational morale and influence the emotional tone of workplace interactions (Geetu., & Verma, A. (2024). Employees who feel proud of their work or organization are more likely to engage in constructive behavior, support colleagues, and contribute to a positive work atmosphere (Fredrickson, 2001). Authentic pride enhances self-efficacy and fosters a culture of recognition and shared achievement, reinforcing a cohesive emotional climate (Menges & Kilduff, 2015). On the other hand, hubristic pride may elicit envy, exclusion, or competition, thereby undermining collective emotional harmony (Verbeke, Belschak, & Bagozzi, 2004).

Leaders play a critical role in shaping emotional climates through emotional expression and regulation (Ashkanasy & Daus, 2005). Leaders who demonstrate pride in their teams' achievements model positive emotional conduct and promote a climate of respect and motivation (Humphrey, 2002). However, when leaders express hubristic pride, it can foster resentment and emotional disengagement among employees (Gooty, Connelly, Griffith, & Gupta, 2010). Thus, leadership expression of pride acts as a signal that either nurtures or disrupts the emotional ecosystem of the workplace.

The interpretation and impact of pride on emotional climate can vary across cultural and organizational contexts. In collectivist cultures, overt expressions of pride may be perceived as boastful, potentially disrupting group harmony (Eid & Diener, 2001). Conversely, in individualistic cultures, pride is often celebrated and seen as a sign of competence and success. Understanding these cultural nuances is essential for evaluating pride's role in emotional climate formation across diverse workplace settings.

### 3. Research Objective

- To examine the role of the emotion pride on the emotional climate at the workplace

### 4. Research Methodology

This study adopts a quantitative, cross-sectional research design to explore the impact of pride—a positive, self-conscious emotion—on the emotional climate prevailing in workplace environments across the Delhi-NCR region. The conceptual framework is informed by the broaden-and-build theory of positive emotions (Fredrickson, 2001), which postulates that positive emotions, such as pride, can expand individuals' momentary thought-action repertoires and build enduring personal and social resources. Additionally, affective events theory (Weiss & Cropanzano, 1996) provides a foundation for understanding how workplace events triggering pride influence affective responses, which collectively shape the emotional climate of organizations. In this study, pride functions as the independent variable, measured through validated instruments that assess authentic pride—linked to achievement, effort, and prosocial behavior (Tracy & Robins, 2007)—while emotional climate, the dependent variable, is operationalized through dimensions such as warmth, structure, recognition, identity, and conflict (Tagiuri & Litwin, 1968; Litwin & Stringer, 1968).

Data were collected through a structured and pre-tested questionnaire consisting of items adapted from validated scales in organizational behavior literature. The final sample comprised 420 full-time employees drawn from diverse sectors within Delhi-NCR. Stratified random sampling was employed to ensure demographic and organizational heterogeneity, enabling robust generalizability of the findings.

### 5. Data Analysis

To evaluate the structural and measurement integrity of the model examining the impact of pride on emotional climate, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using SmartPLS. This approach was chosen due to its suitability for predictive analysis and its effectiveness in estimating complex relationships among latent constructs with relatively small to moderate sample sizes (Hair et al., 2017). The analysis focused on assessing both the reliability and validity of the measurement model.

Table 1. presents the factor loadings of the individual items measuring the independent construct—Pride. All five indicators demonstrated acceptable standardized loadings, ranging from 0.684 to 0.825, thereby surpassing the recommended threshold of 0.60 (Chin, 1998). The highest loading was observed for PRIDE\_3 (0.825), reflecting the motivational power of pride derived from accomplishments within the organization. PRIDE\_2 and PRIDE\_1 also showed strong loadings (0.759 and 0.741, respectively),

indicating cognitive and affective alignment with organizational identity. PRIDE\_4 and PRIDE\_5, while slightly lower (0.694 and 0.684), remained within acceptable limits and contributed positively to the composite construct.

Reliability was assessed through Cronbach's Alpha and Composite Reliability (CR). The Cronbach's Alpha coefficient for the pride construct was 0.795, indicating good internal consistency and exceeding the minimum acceptable value of 0.70 (Nunnally & Bernstein, 1994). Composite Reliability (CR) was calculated at 0.837, further confirming the scale's reliability and convergent adequacy (Hair et al., 2010).

Convergent validity was evaluated through the Average Variance Extracted (AVE), which stood at 0.834—well above the threshold of 0.50 (Fornell & Larcker, 1981). This suggests that a substantial proportion of variance is captured by the construct as compared to measurement error, thereby reinforcing the construct validity of the pride scale used in the study.

**Table 1.** PLS-SEM Results – Measurement Model for Pride

S.No.	Item	Factor Loadings
PRIDE_1	'I am proud of the contribution I have made in the organization'	0.741
PRIDE_2	'I think that I can be proud of what I know about the organization'	0.759
PRIDE_3	'Because I take pride in my accomplishments in the organization, I am motivated to continue'	0.825
PRIDE_4	'In the organization, I feel so proud I feel on top of the world'	0.694
PRIDE_5	'In the organization, I am very satisfied with myself'	0.684
		<b>Cronbach's Alpha- 0.795</b>
		<b>CR- 0.837</b>
		<b>AVE- 0.834</b>

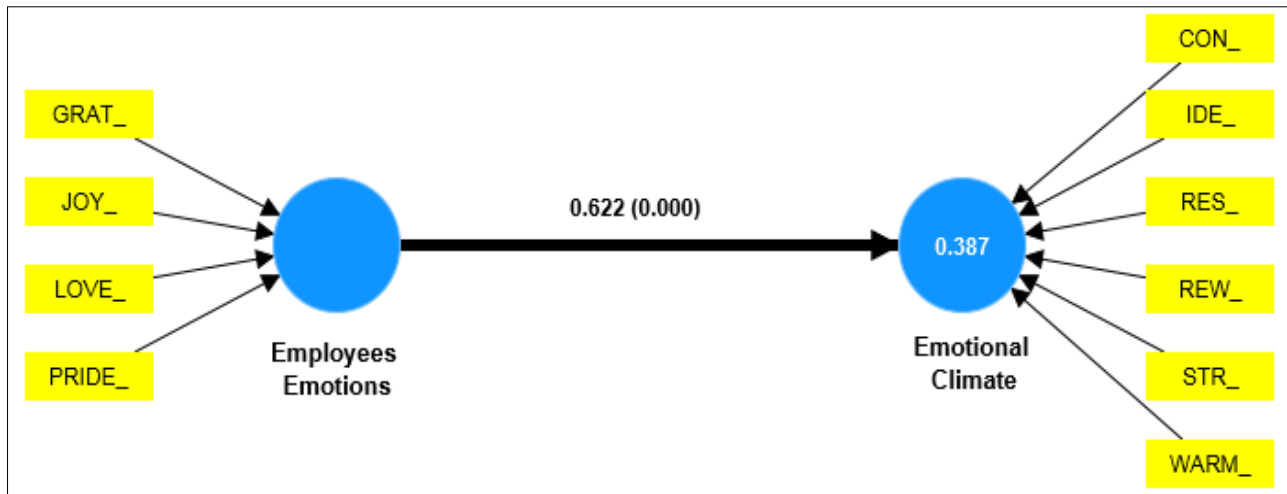
The structural model was assessed to examine the hypothesized relationship between employee emotions and the emotional climate within the workplace. As illustrated in the PLS-SEM path diagram, the construct "Employees' Emotions" was modeled as a second-order latent variable comprising four key emotional subcomponents: Pride, Companionate Love, Joy, and Gratitude. The endogenous variable, "Emotional Climate," was measured through six dimensions—Structure, Responsibility, Reward, Warmth, Conflict, and Identity—consistent with the organizational climate framework by Tagiuri and Litwin (1968).

The path coefficient from Employees' Emotions to Emotional Climate was found to be statistically significant ( $\beta = 0.622$ ,  $p < 0.001$ ), indicating a strong and positive influence of employee-experienced emotions on the emotional climate at the workplace. This result implies that when employees consistently experience positive discrete emotions such as pride, joy, love, and gratitude, it leads to a more favorable emotional atmosphere characterized by higher trust, identity alignment, perceived support, and interpersonal warmth.

The  $R^2$  value for the dependent construct Emotional Climate is 0.387, suggesting that approximately 38.7% of the variance in the emotional climate is explained by the emotional experiences of employees. This reflects a moderate level of explanatory power according to conventional benchmarks (Hair et al., 2017), thereby reinforcing the importance of emotion-driven factors in shaping the collective emotional tone of organizations.

In conclusion, the structural model offers empirical validation that fostering pride and other positive emotions among employees can significantly enhance the emotional climate of an organization, thereby contributing to employee well-being, engagement, and organizational effectiveness.

**Fig.1.** Impact of Pride on the Emotion Climate at Workplace



## 6. Major Findings and Conclusion

The study revealed that pride significantly and positively influences the emotional climate at the workplace, with the path analysis indicating a strong relationship ( $\beta = 0.622$ ,  $p < 0.001$ ). Employees who experience pride in their contributions tend to foster a more constructive emotional environment, marked by warmth, recognition, identity, and mutual respect. The model showed moderate predictive power, with pride explaining 38.7% of the variance in emotional climate, highlighting its pivotal role while acknowledging the influence of other factors. Measurement indicators confirmed the reliability and validity of the pride construct, supporting its robustness as a psychological variable in organizational settings. Overall, the findings suggest that fostering pride through meaningful recognition, acknowledgment of accomplishments, and supportive leadership can significantly enhance the emotional climate, promote employee well-being, and contribute to a more cohesive and motivated workforce. This underscores the practical importance of integrating emotion-driven strategies in human resource and organizational development practices.

These findings are consistent with the broaden-and-build theory (Fredrickson, 2001), which posits that positive emotions expand individuals' thought-action repertoires and build enduring organizational resources. Furthermore, it supports the affective events theory (Weiss & Cropanzano, 1996), suggesting that emotional experiences within workplace contexts have substantial downstream effects on organizational climate and functioning.

## References:

- Ashkanasy, N. M., & Dorris, A. D. (2017). Emotions in the workplace. *Annual Review of Organizational Psychology and Organizational Behavior*, 4, 67–90. <https://doi.org/10.1146/annurev-orgpsych-032516-113231>

- Ashkanasy, N. M., & Härtel, C. E. J. (2014). Positive and negative affective climate and culture: The good, the bad, and the ugly. *Journal of Organizational Behavior*, 35(1), 116–136. <https://doi.org/10.1002/job.1902>
- Barsade, S. G., & Gibson, D. E. (2007). Why does affect matter in organizations? *Academy of Management Perspectives*, 21(1), 36–59. <https://doi.org/10.5465/amp.2007.24286163>
- Barsade, S. G., & Knight, A. P. (2015). Group affect. *Annual Review of Organizational Psychology and Organizational Behavior*, 2, 21–46. <https://doi.org/10.1146/annurev-orgpsych-032414-111316>
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295–336). Lawrence Erlbaum Associates.
- Eid, M., & Diener, E. (2001). Norms for experiencing emotions in different cultures: Inter- and intranational differences. *Journal of Personality and Social Psychology*, 81(5), 869–885. <https://doi.org/10.1037/0022-3514.81.5.869>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Geetu, & Verma, A. (2024). Positive emotions mediate the communal and exchange relationships at the workplace: An empirical investigation. *International Journal of Experimental Research and Review*, 41(Spl.), 106–119.
- George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human Relations*, 53(8), 1027–1055. <https://doi.org/10.1177/0018726700538001>
- Gooty, J., Connelly, S., Griffith, J., & Gupta, A. (2010). Leadership, affect and emotions: A state of the science review. *The Leadership Quarterly*, 21(6), 979–1004. <https://doi.org/10.1016/j.leaqua.2010.10.005>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage Publications.
- Humphrey, R. H. (2002). The many faces of emotional leadership. *The Leadership Quarterly*, 13(5), 493–504. [https://doi.org/10.1016/S1048-9843\(02\)00140-6](https://doi.org/10.1016/S1048-9843(02)00140-6)
- Isen, A. M., & Reeve, J. (2005). The influence of positive affect on intrinsic and extrinsic motivation: Facilitating enjoyment of play, responsible work behavior, and self-control. *Motivation and Emotion*, 29(4), 297–325. <https://doi.org/10.1007/s11031-006-9019-8>
- Litwin, G. H., & Stringer, R. A. (1968). *Motivation and organizational climate*. Harvard University Press.
- Menges, J. I., & Kilduff, M. (2015). Group emotions: Cutting the Gordian knots concerning terms, levels of analysis, and processes. *Academy of Management Annals*, 9(1), 845–928. <https://doi.org/10.5465/19416520.2015.1033148>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.
- Tagiuri, R., & Litwin, G. H. (1968). *Organizational climate: Explorations of a concept*. Harvard Business School.
- Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral emotions and moral behavior. *Annual Review of Psychology*, 58, 345–372. <https://doi.org/10.1146/annurev.psych.56.091103.070145>
- Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: A tale of two facets. *Journal of Personality and Social Psychology*, 92(3), 506–525. <https://doi.org/10.1037/0022-3514.92.3.506>

- Tracy, J. L., Cheng, J. T., Robins, R. W., & Trzesniewski, K. H. (2009). Authentic and hubristic pride: The affective core of self-esteem and narcissism. *Self and Identity*, 8(2–3), 196–213. <https://doi.org/10.1080/15298860802505053>
- Verbeke, W., Belschak, F. D., & Bagozzi, R. P. (2004). The adaptive consequences of pride in personal selling. *Journal of the Academy of Marketing Science*, 32(4), 386–402. <https://doi.org/10.1177/0092070304266117>
- Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes, and consequences of affective experiences at work. *Research in Organizational Behavior*, 18, 1–74.
- Williams, L. A., & DeSteno, D. (2008). Pride and perseverance: The motivational role of pride. *Journal of Personality and Social Psychology*, 94(6), 1007–1017. <https://doi.org/10.1037/0022-3514.94.6.1007>
- Williams, L. A., & DeSteno, D. (2009). Pride: Adaptive social emotion or seventh sin? *Psychological Science*, 20(3), 284–288. <https://doi.org/10.1111/j.1467-9280.2009.02297.x>



---

## The impact of e-cigarettes on memory ability and psychological wellbeing

---

Khushi Jain<sup>1</sup>, Dr. Mamata Mahapatra<sup>2</sup>

<sup>1</sup>Research Scholar, Corresponding Author, <sup>2</sup>Professor  
Amity Institute of Psychology and Allied Sciences,  
Amity University,  
Uttar Pradesh, Noida,

**Khushi Jain, ORCID ID : <https://orcid.org/0009-0004-8742-9535>**

**Dr. Mamata Mahapatra, ORCID ID : <http://orcid.org/0000-0001-6350-6007>**

**Abstract:** Substance use is a growing concern among young adults, with increasing attention drawn towards the cognitive and psychological implications of e-cigarette consumption. This study explored whether young adults who use e-cigarettes differ significantly in memory ability and psychological well-being compared to those who do not. A total of 130 university students aged 18 to 26 participated, with 65 identified as regular e-cigarette users and 65 as non-users. Standardised tools—the Multifactorial Memory Questionnaire (MMQ) and Ryff's Psychological Well-Being Scale—were administered. The results showed that e-cigarette users had significantly lower memory ability scores and greater psychological distress than non-users. Statistical analysis revealed strong negative correlations between e-cigarette usage and both memory ability and psychological well-being. These findings suggest that regular use of e-cigarettes may be associated with reduced cognitive functioning and increased psychological issues among young adults. However, further longitudinal and experimental studies are needed to confirm causality and uncover underlying mechanisms.

**Keywords:** E-cigarettes, Memory ability, Psychological well-being, Young adults

---

### Introduction

Substance use problems create significant personal, societal, and economic challenges globally (Bouchery et al., 2011). Key risk factors include personality traits, mental illness, vulnerability, easy access, and family dynamics (Cox et al., 2015; Ducci & Goldman, 2012; Vink, 2016). Despite a decline in some substances like cigarettes, overall usage remains steady or rising (Johnston et al., 1975–2014).

University students are particularly vulnerable, with alcohol being the most studied and commonly abused substance (Johnston et al., 2015). Students are typically aged 1–4 years post-secondary school and enrolled full-time in college. Early intervention and awareness of risk factors can aid prevention (Moher et al., 2015).

In India, the reported use of substances is: alcohol (14.6%), tobacco (12.4%), cannabis and opioids (2.8% each), sedatives (1.08%), and inhalants (0.7%) (Ambedkar et al., 2019). The average initiation age ranges from 12 to 15 years (Jiloha, 2017). Stress from academics, poor health, injuries, and risky behaviors are key contributing factors (Kar et al., 2021; Skidmore et al., 2016).

## ***Smoking***

Smoking is a global health issue affecting all populations (Terracciano & Costa, 2004; Peres et al., 2019). In developing countries, tobacco causes 80% of related deaths (WHO, 2024). In India, 42.4% of men and 14.2% of women aged 15+ use tobacco (GATS-2, 2020), with total users rising to 253 million by 2022, ranking India second globally (WHO, 2024; World Bank, 2023).

Despite policies, quitting tobacco remains difficult (Foulds et al., 2006; Joshi et al., 2010). The WHO's MPOWER initiative addresses this with six strategies: Monitor tobacco use, Protect people from smoke, Offer help to quit, Warn of dangers, Enforce bans, and Raise taxes (WHO, 2011).

## ***Nicotine***

With rising tobacco use, reducing its prevalence is a global priority. The key strategies are preventing initiation and supporting cessation to improve health and increase life expectancy (Doll et al., 2004; Taylor et al., 2002; Timmermans et al., 2018; Le et al., 2024).

Global tobacco use among people aged 15+ declined from 32.7% in 2000 to 22.3% in 2020, with a further 2% drop expected by 2025 (WHO, 2023).

Nicotine, the primary addictive component of tobacco, makes up 90% of alkaloids in the plant, with about 8.4 mg per cigarette (Padhiary et al., 2020). It helps the plant resist nitrogen deficiency (Sabine & Klaus, 2014).

Nicotine dependence varies by individual. Compulsive use, psychoactive effects, and reinforcement behavior indicate dependence (U.S. Dept. of Health and Human Services, 2014).

## ***E-cigarettes smoking behavior***

E-cigarettes, or electronic nicotine delivery systems, contain glycerol, flavors, and nicotine (Marques et al., 2021). Originally designed to help smokers quit, they can still cause harm. Aerosols from e-cigarettes may lead to respiratory issues and contain cancer-linked substances (National Academies, 2018; Campaign for Tobacco-Free Kids, 2021).

Awareness of e-cigarettes in the U.S. doubled from 2009 to 2010, reaching 2.7%, though limited research exists on usage across different groups. In Poland, 23.5% of high school students had tried them, and 8.2% used them recently (Goniewicz & Zielinska-Danch, 2012).

Use among youth is rising globally, including in India. About 4% of Indian adolescents are familiar with e-cigarettes (Thampi et al., 2018; TISS & MoHFW, 2016–2017). Social media promotes their appeal, with over 460 brands noted (Pepper et al., 2016), and many companies continue selling them despite health concerns (ICMR, 2019).

Frequent use is linked to addiction, mood disorders, poor impulse control, and negative effects on brain development (U.S. Dept. of Health and Human Services, 2020).

### ***Impact on memory after smoking***

Quitting smoking can result in various withdrawal symptoms and signs. Individuals may experience difficulty concentrating and also notice a decline in attention and their working memory capabilities (Falcone et al., 2013a; Gilbert et al., 2004; Heishman, 1998; Heishman et al., 1994; Hendricks et al., 2006; Mendrek et al., 2006). Brain imaging studies indicate that the frontal regions of the brain may be impacted, contributing to the challenges faced from not smoking. Smokers have shown these issues while performing activities that demand sustained focus and working memory (Falcone et al., 2013b; Kozink et al., 2010; Xu et al., 2006).

Recent research indicates evident neurotoxic impacts on brain health and links regular smoking to the onset of dementia (Swan et al., 2007; Reitz et al., 2005; Sabia et al., 2012; Rusanen et al., 2011). Over 60,000 individuals are particularly vulnerable to experiencing strokes and heart attacks (Nakamura et al., 2012). Additionally, studies have revealed that women face a higher risk of developing dementia and experiencing cognitive decline compared to men (Tarraf et al., 2020). Effects on psychological distress after smoking

Half of those who smoke tobacco struggle with mental health issues and addiction (Lien, 2016). Individuals who smoke cigarettes tend to exhibit higher levels of depression (Anjit et al., 2019; Grant et al., 2004; Berg et al., 2019). Additionally, smoking e-cigarettes has been associated to increased impulsivity (Grant et al., 2019).

Compared to non-smokers, individuals who e-cigarettes as well as cigarettes face a greater risk of depression and suicide (Pham et al., 2020). Numerous studies indicate a relationship between smoking and schizophrenia that is influenced by genetic factors (Ripke et al., 2014; Tobacco & Consortium, 2010).

### ***Rationale***

E-cigarettes have become increasingly popular, especially among teens and young adults. While they were initially marketed to help people quit smoking, they have contributed to addiction and raised concerns about their effects on brain function and mental health.

Research on their cognitive effects is mixed—some studies suggest nicotine may enhance memory, while others show it can harm memory and mental well-being. As vaping becomes more common, mental health issues appear to be rising.

This study aimed to explore the link between e-cigarette use, memory function, and psychological health in college students. It assessed how vaping affects recall, recognition, stress, and anxiety. I hypothesized that e-cigarette users would show poorer memory performance and higher psychological distress compared to non-users.

The findings may support public health policies, inform healthcare providers, and add to academic research on the risks of e-cigarettes.

### ***Aim***

To assess the memory ability and psychological well-being of young students who consume e-cigarettes and those who do not consume e-cigarettes.

## **2. Objectives**

1. To study the effects of e-cigarette use on individual's memory ability.
2. To investigate the effects of e-cigarette use on individual's psychological well-being.
3. To compare the memory ability and psychological well-being differences among e-cigarette users and non-users.

## **3. Review of Literature**

Novak and Wang (2024) applied the PRISMA-ScR framework to assess cognitive outcomes related to e-cigarette use. They reviewed 11 studies, including both experimental and cross-sectional designs. Results showed mixed findings: while some studies indicated neutral or mildly positive cognitive effects in smokers, others revealed impairments in memory and decisionmaking among both users and non-users. In a related study, Novak and colleagues (2024) examined the link between e-cigarette consumption and mental functioning—specifically attention, self-efficacy, and emotional well-being—among 432 adolescents aged 11 to 18. E-cigarette users reported greater distractibility, lower academic self-efficacy, and increased levels of anxiety, depression, and stress. However, the study acknowledged that its survey-based design limited the ability to draw causal conclusions. Nadar and colleagues (2021) investigated long-term cognitive outcomes of smoking by comparing 73 smokers with 84 non-smokers using various neuropsychological tests. Smokers demonstrated lower performance in areas like attention, memory, and executive functioning, though processing speed was not affected. Additionally, those who started smoking earlier and smoked more heavily experienced greater cognitive deficits. Prasedya and colleagues (2020) conducted an animal study in which mice were subjected to traditional and electronic cigarette vapor for 14 days. Mice displayed memory deficits and delayed responses to rewards. Inflammatory markers, including elevated TNF- $\alpha$  levels, were detected in brain tissue, indicating that both vapor types may trigger neuroinflammatory processes. Tilden (2020) used fMRI to evaluate cognitive changes after vaping in ten individuals following nicotine abstinence. Participants showed improved performance on a rapid visual processing task post-vaping, along with increased activation in brain areas like the dorsolateral prefrontal cortex and angular gyrus. These findings point to a possible link between vaping and enhanced brain function. Tobore (2019) reviewed more than 100 studies on the rising frequency of e-cigarette use among young population and associated health effects. The review cited risks such as oxidative stress, attention and memory problems, and psychological symptoms. Adolescents were highlighted as particularly vulnerable due to ongoing brain development. Goniewicz and colleagues (2018) evaluated exposure to toxicants in 5,105 participants across user groups. Sole e-cigarette users had lower levels of harmful substances like TSNA and PAHs compared to smokers. However, dual users exhibited higher levels than either group, highlighting complex exposure dynamics. Caponnetto and colleagues (2017) conducted a randomized crossover study comparing cognitive and behavioral effects of traditional cigarettes and two generations of e-cigarettes. Cognitive performance did not significantly differ across groups. Craving levels rose over time in all groups, supporting the role of e-cigarettes as a cessation tool with limited cognitive disruption. Akanbi and colleagues (2015) surveyed 150 Nigerian college students to assess the impact of drug use on academic performance. Significant differences were found between users and non-users, with gender differences also present. The study recommended awareness campaigns and improved campus counseling services.

## 4. Research Methodology

### *Hypothesis*

**H<sub>1</sub>:** There is a significant relationship between e-cigarette use and an individual's memory ability.

**H<sub>0</sub>:** There is no significant relationship between e-cigarette use and an individual's memory ability.

**H<sub>2</sub>:** E-cigarette use is significantly associated with psychological wellbeing.

**H<sub>0</sub>:** E-cigarette use is not significantly associated with psychological wellbeing.

**H<sub>3</sub>:** There is a significant difference in memory ability and psychological well-being between individuals who consume e-cigarettes and those who do not.

**H<sub>0</sub>:** There is no significant difference in memory ability and psychological well-being between individuals who consume e-cigarettes and those who do not.

### *Sample*

The study sample comprised 100–150 young adults (aged 18–26 years), primarily university students, selected using a purposive sampling technique. Participants were recruited from colleges, universities, social media platforms, and public or private spaces frequented by young adults. Inclusion criteria required participants to be enrolled university students, fluent in the language of assessment, regular e-cigarette users for at least six months, and willing to provide informed consent. Individuals with neurological disorders, undergoing treatment for severe mental health conditions, or using other psychoactive substances were excluded. The independent variable was e-cigarette use, while the dependent variables included memory ability and psychological well-being.

### *Tools used*

**Socio-demographic details.** Demographic questions assessing participant's name, age, gender, educational qualification, if the participant is currently using e-cigarettes, if they do then for how long they have been using e-cigarette and lastly if they often experience difficulties with memory or concentration

**Multifactorial Memory Questionnaire (MMQ):** The Multifactorial Memory Questionnaire (MMQ) measures an individual's awareness and beliefs about their memory (metamemory) through three subscales: Satisfaction, Ability, and Strategy. This study used the MMQ-Ability subscale, which assesses perceived memory performance in daily life.

Participants rated how often they experienced 20 common memory errors over the past two weeks on a 5-point Likert scale. Scores range from 0 to 80, with higher scores indicating better perceived memory. The MMQ-Ability subscale has shown high reliability (Cronbach's  $\alpha = 0.93$ ) in prior research with 130 English-speaking adults (Troyer & Rich, 2002).

**Ryff's psychological well-being scale:** Carol Ryff's 1989 scale measures psychological well-being across six dimensions: self-acceptance, personal growth, life purpose, positive relationships, environmental mastery, and autonomy. It shows strong internal consistency ( $\alpha = 0.86$ – $0.93$ ) and good test-retest reliability ( $0.81$ – $0.88$  over six months). The scale is validated through strong correlations with other well-being measures.

## Procedure

This study assessed memory and psychological well-being in 130 Indian young adults (ages 18–26), including 65 e-cigarette users and 65 non-users, with equal numbers of males and females. Participants were selected through purposive sampling. They were informed about the study, gave consent, and completed the survey after instructions and rapport building.

## Statistical analysis

Data were analyzed using SPSS (version 29.0). Descriptive statistics (mean, standard deviation) summarized the data. Independent samples t-tests compared memory and psychological well-being between e-cigarette users and non-users, as well as between males and females. Correlation analysis examined the relationship between e-cigarette use, memory, and psychological health.

## 5. Results

**Table 4.1:** Depicting the socio-demographic of the sample (N=130)

Demographic profile	Sub-category	Consume e-cigarettes (n=65)		Do not consume (n=65)	
		N	Percentage (%)	N	Percentage (%)
Age	18	2	3.07	3	4.61
	19	6	9.23	6	9.23
	20	15	23.07	12	18.46
	21	11	16.92	11	16.92
	22	9	13.84	10	15.38
	23	9	13.84	5	7.69
	24	7	10.76	6	9.23
	25	3	4.61	10	15.38
	26	3	4.61	2	3.07
Gender	Male	35	53.84	30	46.15
	Female	30	46.15	35	53.84
Qualification	Postgraduate	16	24.61	25	38.46
	Graduate	49	75.38	40	61.53

Participants were aged 18–26. Among e-cigarette users, 23 were aged 18–20, 29 were 21–23, and 13 were 24–26. Among non-users, 21 were aged 18–20, 26 were 21–23, and 18 were 24–26. The user group included 35 males and 30 females, while the non-user group had 30 males and 35 females. All participants were either undergraduates or graduates.

**Table 4.2.** Mean comparison of participants who are E-cigarettes smokers and non-smokers

Variables	Mean	SD	Mean	SD	t(128)	p	Cohen's d
Memory ability	42.42	3.414	61.55	6.374	-21.340	0.048	3.74
Psychological disorder	82.91	9.607	105.60	6.997	-15.393	0.049	2.70

Table 4.2 shows significant differences between e-cigarette users and non-users. Users had lower memory scores ( $M = 42.42$ ,  $SD = 3.41$ ) than non-users ( $M = 61.55$ ,  $SD = 6.37$ ),  $t(128) = -21.34$ ,  $p = .048$ , with a very large effect size (Cohen's  $d = 3.74$ ). Psychological distress was higher in users ( $M = 82.91$ ,  $SD = 9.61$ ) than in non-users ( $M = 105.60$ ,  $SD = 7.00$ ),  $t(128) = -15.39$ ,  $p = .049$ , also with a large effect size (Cohen's  $d = 2.70$ ).

**Table 4.3.** Correlation analysis of participants who smoke e-cigarettes and who do not

Variable	USE AND NO USE	MMQ	PWT
USE AND NO USE	1	-0.88	-0.80
MMQ	-0.88	1	0.71
PWT	-0.80	0.71	1

Table 4.3 presents the correlation analysis between e-cigarette use, memory ability (MMQ), and psychological well-being (PWT). E-cigarette use showed strong negative correlations with memory ability ( $r = -0.88$ ) and psychological well-being ( $r = -0.80$ ), indicating that greater use is linked to lower scores on both measures. A positive correlation was found between memory ability and psychological well-being ( $r = 0.71$ ), suggesting they are closely related. All variables were perfectly correlated with themselves ( $r = 1$ ).

## 6. Discussion

Substance use, especially tobacco and alcohol, remains a major concern among college students. In India, tobacco use is widespread, with nicotine being the primary addictive agent. Although e-cigarettes were introduced to help smokers quit, evidence shows they may harm lung function, cognitive development, and mental health.

This study examined memory and psychological well-being in 130 young adults (aged 18–26), evenly split between e-cigarette users and non-users. Results showed that e-cigarette users had significantly lower memory scores ( $M = 42.42$ ) and higher psychological distress ( $M = 82.91$ ) than non-users ( $M = 61.55$  and  $M = 105.60$ , respectively), with very large effect sizes (Cohen's  $d > 2.70$ ).

Correlation analysis revealed strong negative associations between e-cigarette use and both memory ( $r = -0.88$ ) and psychological well-being ( $r = -0.80$ ). A positive correlation ( $r = 0.71$ ) was found between memory ability and mental health. These findings supported all three study hypotheses.

The results align with past studies linking nicotine use to memory decline and psychological distress (e.g., Nadar et al., 2021; Novak et al., 2024), though some research suggests nicotine may temporarily enhance certain cognitive functions. Overall, the study adds to growing evidence that e-cigarette use

negatively affects young adults' cognitive and psychological health, highlighting the need for preventive measures and further research.

## **7. Conclusion**

This study compared memory performance and psychological health in 130 young adults, half of whom used e-cigarettes. Results showed that e-cigarette users had poorer memory and higher psychological distress. While the findings highlight risks, they should be interpreted with caution due to methodological limitations. More research is needed to explore long-term effects across age groups.

### **Implications:**

- Raise public awareness about cognitive and mental health risks of e-cigarettes.
- Strengthen policies to prevent e-cigarette use among adolescents.
- Develop evidence-based interventions to reduce e-cigarette dependence.

### **Future Scope:**

- Use longitudinal studies to track long-term cognitive effects.
- Investigate neurological mechanisms behind cognitive and psychological changes.
- Compare effects of e-cigarettes with other substances like tobacco or cannabis.

### **Limitations:**

- Short study duration limits understanding of long-term effects.
- Small sample size restricts demographic generalizations.
- Variations in e-cigarette use affect consistency.
- Memory is complex and hard to measure comprehensively.
- Self-reported data may include bias or inaccuracies.

### **References :**

Akanbi, M. I., Augustina, G., Theophilus, A. B., Muritala, M., & Ajiboye, A. S. (2015). Impact of Substance Abuse on Academic Performance among Adolescent Students of Colleges of Education in Kwara State, Nigeria. *Journal of education and practice*, 6(28), 108-112.



- Ambekar A, Chadda R, Khandelwal S, Rao R, Mishra A, Alok A. Magnitude of Substance Use in India. New Delhi: Ministry of Social Justice and Empowerment, Government of India; 2019.
- Anjit A, Korhonen T, Buchwald J, Heikkilä K, Tuulio-Henriksson A, Rose RJ, et al. Testing the reciprocal association between smoking and depressive symptoms from adolescence to adulthood: a longitudinal twin study. *Drug Alcohol Depend.* 2019;200:6470 <https://doi.org/10.1016/j.drugalcdep.2019.03.012>.
- Berg NJ, Kivuruusu OH, Lintonen TP. Longitudinal prospective associations between psychological symptoms and heavy episodic drinking from adolescence to midlife. *Scand J Public Health.* 2019;47(4):420–7 <https://doi.org/10.1177/1403494818769174>.
- Borland, R., Partos, T. R., Yong, H. H., Cummings, K. M., and Hyland, A., “How much unsuccessful quitting activity is going on among adult smokers? Data from the International Tobacco Control Four Country cohort survey,” *Addiction*, vol. 107, no. 3, pp. 673–682 2012. <https://doi.org/10.1111/j.1360-0443.2011.03685.x> CrossRefGoogle ScholarPubMed\
- Bouchery, E. E., Harwood, H. J., Sacks, J. J., Simon, C. J., & Brewer, R. D. (2011). Economic costs of excessive alcohol consumption in the US, 2006. *American journal of preventive medicine*, 41(5), 516-524.
- Campaign for Tobacco-free kids (2021). Electronic cigarettes and youth.[Online]. Available at: <https://www.tobaccofreekids.org/assets/factsheets/0382.pdf> (Accessed 24.05.2022).
- Caponnetto, P., Maglia, M., Cannella, M. C., Inguscio, L., Buonocore, M., Scoglio, C., ... & Vinci, V. (2017). Impact of different e-cigarette generation and models on cognitive performances, craving and gesture: A randomized crossover trial (CogEcig). *Frontiers in Psychology*, 8, 127.
- Charalampous, M., Grant, C. A., Tramontano, C., & Michailidis, E. (2019). Systematically reviewing remote e-workers' well-being at work: A multidimensional approach. *European journal of work and organizational psychology*, 28(1), 51-73.
- Cox, W. M., Klinger, E., & Fadardi, J. S. (2015). The motivational basis of cognitive determinants of addictive behaviors. *Addictive Behaviors*, 44, 16-22.
- Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ.* 2004;328:1519.
- Ducci, F., & Goldman, D. (2012). The genetic basis of addictive disorders. *Psychiatric Clinics*, 35(2), 495-519.
- Ethiopia Demographic and Health Survey 2011. Central Statistical Agency, Addis Ababa, Ethiopia and ICF International, Calverton, Maryland, USA; March 2012
- Falcone M, Smith RM, Chenoweth MJ, Bhattacharjee AK, Kelsoe JR, Tyndale RF, Lerman C, Cent PRN. Neuroimaging in Psychiatric Pharmacogenetics Research: The Promise and Pitfalls. *Neuropsychopharmacol.* 2013a;38:2327–2337.
- Falcone M, Wileyto EP, Ruparel K, Gerraty RT, Laprate L, Detre JA, Gur R, Loughhead J, Lerman C. Age-related differences in working memory deficits during nicotine withdrawal. *Addiction biology.* 2013b
- Foulds, J., Gandhi, K. K., Steinberg, M. B. et al., “Factors associated with quitting smoking at a tobacco dependence treatment clinic,” *American Journal of Health Behavior*, vol. 30, no. 4, pp. 400–412, 2006. <https://doi.org/10.5993/AJHB.30.4.6> CrossRefGoogle Scholar
- GATS. Global Adult Tobacco Survey-2 Factsheet India 2016–17. [Internet]. [cited 2024 Jun 12]. Available from: <https://ntcp.mohfw.gov.in/assets/document/surveys-reportspublications/Global-Adult-Tobacco-Survey-Second-Round-India-20162017.pdf>
- GATS2. GATS-2 Global Adult Tobacco Survey Fact Sheet India 2016-17. Mumbai: Ministry of Health and Family Welfare, Government of India; 2017.
- Gilbert DG, McClernon FJ, Rabinovich NE, Sugai C, Plath LC, Asgaard G, Zuo YT, Huggenvik J, Botros N. Effects of quitting smoking on EEG activation and attention last for more than 31 days and are

- more severe with stress, dependence, DRD2 A1 allele, and depressive traits. *Nicotine Tob Res.* 2004;6:249–267.
- Goniewicz M. L., Zielinska-Danch W. 2012. Electronic cigarette use among teenagers and young adults in Poland. *Pediatrics*, 130, 4. doi:10.1542/peds.2011-344
- Goniewicz, M. L., Smith, D. M., Edwards, K. C., Blount, B. C., Caldwell, K. L., Feng, J., ... & Hyland, A. J. (2018). Comparison of nicotine and toxicant exposure in users of electronic cigarettes and combustible cigarettes. *JAMA network open*, 1(8), e185937-e185937.
- Grant BF, Stinson FS, Dawson DA, Chou P, Dufour MC, Compton W, et al. Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders. *Arch Gen Psychiatry.* 2004;61(8):807–16 <https://doi.org/10.1001/archpsyc.61.8.807>.
- Heishman, S.C., Taylor, R.C., Henningfield, J.E., 1994. Nicotine and smoking: a review of effects on human performance. *Exp. Clin. Pharmacol.* 2, 345–395.
- Heishman SJ. What aspects of human performance are truly enhanced by nicotine? *Addiction.* 1998;93:317–320. [PubMed] [Google Scholar]
- Hendricks PS, Ditte JW, Drobes DJ, Brandon TH. The early time course of smoking withdrawal effects. *Psychopharmacology.* 2006;187:385–396.
- Indian Council of Medical Research (2019). White Paper on Electronic Nicotine Delivery System. *Indian J Med Res*, 149, 574-83.
- Jentsch, J. D., Ashenhurst, J. R., Cervantes, M. C., Groman, S. M., James, A. S., & Pennington, Z. T. (2014). Dissecting impulsivity and its relationships to drug addictions. *Annals of the New York Academy of Sciences*, 1327(1), 1-26.
- Jiloha RC. Prevention, early intervention, and harm reduction of substance use in adolescents. *Indian J Psychiatry* 2017;59:111-8.
- Johnston, L. M. Tobacco smoking and nicotine. *Lancet*, 1942, 2, 742.
- Joshi, U., Modi, B., and Yadav, S., “A study on prevalence of chewing form of tobacco and existing quitting patterns in urban population of Jamnagar, Gujarat,” *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, vol. 35, no. 1, pp. 105–108, 2010.10.4103/09700218.62560CrossRefGoogle Scholar
- Kar SK, Rai S, Sharma N, Singh A. Student suicide linked to NEET examination in India: A media report analysis study. *Indian J Psychol Med* 2021;43:183-5.
- Kozink RV, Lutz AM, Rose JE, Froeliger B, McClernon FJ. Smoking withdrawal shifts the spatiotemporal dynamics of neurocognition. *Addiction biology.* 2010;15:480–490.
- Le TTT, Mendez D, Warner KE. The benefits of quitting smoking at different ages. *Am J Prev Med.* 2024;67(5):684–8.
- Lien L. Smoking, mental health and addiction: a review of the literature. *J Addict Prev Med.* 2016;1(1):1–4.
- Marques P, Piqueras L, Sanz MJ (2021). An updated overview of c-cigarette impact on human health. *Respir Res*, 22, 151.
- Mendrek A, Monterosso J, Simon SL, Jarvik M, Brody A, Olmstead R, Domier CP, Cohen MS, Ernst M, London ED. Working memory in cigarette smokers: Comparison to non-smokers and effects of abstinence. *Addict Behav.* 2006;31:833–844.
- Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4(1):1.
- Nakamura, K. *et al.* Influence of smoking combined with another risk factor on the risk of mortality from coronary heart disease and stroke: Pooled analysis of 10 Japanese cohort studies. *Cerebrovasc. Dis.* 33, 480–491 (2012).

- National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems
- (2018). Public Health Consequences of E-Cigarettes. In 'Harm Reduction', Eds Eaton DL, Stratton K, Kwan LY National Academies Press, United States, pg 596.
- Novak, M. L., & Wang, G. Y. (2024). The effect of e-cigarettes on cognitive function: a scoping review. *Psychopharmacology*, 241(7), 1287-1297.
- Novak, M. L., Gyawali, P., & Wang, G. Y. (2024). Association Between E-Cigarettes, Cognition and Mood in Adolescents. *Substance Use & Misuse*, 59(12), 18201827.
- Padhiary, S.; Samal, D.; Khandayataray, P.; Murthy, M.K. A systematic review report on tobacco products and its health issues in India. *Reviews on environmental health* 2020, <https://doi.org/10.1515/reveh-2020-0037>.
- Pepper JK, Ribisl KM, Brewer NT (2016). Adolescents' interest in trying flavoured e-cigarette to control, 25, 62-6.
- Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. *Lancet*. 2019;394(10194):249– 60.
- Pham, T., Williams, J. V., Bhattarai, A., Dores, A. K., Isherwood, L. J., & Patten, S. B. (2020). Electronic cigarette use and mental health: a Canadian population based study. *Journal of affective disorders*, 260, 646-652.
- Prasedya, E. S., Ambana, Y., Martyasari, N. W. R., Aprizal, Y. M., Nurrijawati, & Sunarpi. (2020). Short-term E-cigarette toxicity effects on brain cognitive memory functions and inflammatory responses in mice. *Toxicological research*, 36(3), 267-273.
- Reitz, C., Luchsinger, J., Tang, M. X. & Mayeux, R. Effect of smoking and time on cognitive function in the elderly without dementia. *Neurology* 65, 870–875 (2005).
- Ripke S, Neale BM, Corvin A, Walters JT, Farh K-H, Holmans PA, et al. Biological insights from 108 schizophrenia-associated genetic loci. *Nature*. 2014;511(7510):421. Return to ref 6 in article
- Rusanen, M., Kivipelto, M., Quesenberry, C. P., Zhou, J. & Whitmer, R. A. Heavy smoking in midlife and long-term risk of Alzheimer disease and vascular dementia. *Arch. Intern. Med.* 171, 333–339 (2011).
- Sabia, S. *et al.* Impact of smoking on cognitive decline in early old age: The Whitehall II cohort study. *Arch. Gen. Psychiatry* 69, 627–635 (2012).
- Sabine, S.; Klaus, R. The Chemistry of Tobacco - Part 3. Wiley-VCH Verlag GmbH & Co., 2014; <https://doi.org/10.1002/chemv.201400117>.
- Shmulewitz, D., Greene, E. R., & Hasin, D. (2015). Commonalities and differences across substance use disorders: psychological and epidemiological aspects. *Alcoholism: Clinical and Experimental Research*, 39(10), 1878-1900
- Skidmore CR, Kaufman EA, Crowell SE. Substance use among college students. *Child Adolesc Psychiatr Clin N Am* 2016;25:735-53.
- Swan, G. E. & Lessov-Schlaggar, C. N. The effects of tobacco smoke and nicotine on cognition and the brain. *Neuropsychol. Rev.* 17, 259–273 (2007).
- Tarraf, W. *et al.* Cardiovascular risk and cognitive function in middle-aged and older hispanics/latinos: Results from the hispanic community health study/study of latinos (HCHS/SOL). *J. Alzheimer's Dis.* 73, 103–116 (2020).
- Tata Institute of Social Sciences (TISS)-Mumbai, Ministry of Health and Family Welfare (Government of India). Global Adult Tobacco Survey GATS 2 India 2016-17. [Online].
- Taylor DH, Hasselblad V, Henley SJ, Thun MJ, Sloan FA. Benefits of Smoking Cessation for Longevity. *Am J Public Health*. 2002;92:990–6.

- Terracciano A, Costa PT. Smoking and the five-factor model of personality. *Addiction*. 2004;99(4):472–81.
- Thampi V, Nair R, Rawat R, Makhaik A, Dey S (2018). A review study on vaping and status of vaping in India. *J Cancer Clin Trials*, 3, 147.
- The World Bank's Population Estimates and Projections*[accessed November 2023] *Explanation: The estimated number of tobacco users is calculated by applying the WHO's estimated percentage of tobacco smokers for 2023 to the World Bank's projected population figures of the same year for people aged 15 and older. These figures should be used with caution, as they do not account for the 95% credible interval around the estimate.*
- Tilden, S. E. (2020). Working Memory and Electronic Cigarettes: Do Flameless Cigarettes Light Up the Brain? (Doctoral dissertation, The Pennsylvania State University).
- Timmermans EJ, Huisman M, Kok AAL, Kunst AE. Smoking Cessation and 16-year Trajectories of Functional Limitations Among Dutch Older Adults: Results from the Longitudinal Aging Study Amsterdam. *J Gerontol A Biol Sci Med Sci*. 2018;73:1722–8.
- Tobacco T, Consortium G. Genome-wide meta-analyses identify multiple loci associated with smoking behavior. *Nat Genet*. 2010;42(5):441.
- Tobore, T. O. (2019). On the potential harmful effects of E-Cigarettes (EC) on the developing brain: The relationship between vaping-induced oxidative stress and adolescent/young adults social maladjustment. *Journal of adolescence*, 76, 202-209.
- Torregrossa, M. M., Corlett, P. R., & Taylor, J. R. (2011). Aberrant learning and memory in addiction. *Neurobiology of learning and memory*, 96(4), 609-623.
- U.S. Department of Health and Human Services (2020). Re: Smoking Cessation: A Report of the Surgeon General. In Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. Office on Smoking and Health. [Online]. Available at: <https://www.hhs.gov/sites/default/files/2020-cessation-sgr-full-report.pdf> (Accessed 24.05.2022).
- U.S. Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- Vink, J. M. (2016). Genetics of addiction: future focus on gene× environment interaction?. *Journal of studies on alcohol and drugs*, 77(5), 684-687.
- WHO global report on trends in prevalence of tobacco use 2000–2025, fourth edition. n.d. <https://www.who.int/publications-detail-redirect/9789240039322>. (Accessed 2 Mar 2023).
- WHO. Tobacco or health: a global status report. Geneva: World Health Organization, 1997.
- World Health Organization (2020). E-cigarettes are harmful to health. [Online]. Available at: <https://www.who.int/news/item/05-02-2020-c-cigarettes-areharmful-to-health> (Accessed 24.05.2022).
- World health organization, “Tobacco” fact sheet [Internet]. [cited 2024 Jun 12]. Available from:<https://www.who.int/news-room/fact-sheets/detail/tobacco>
- World Health Organization, *WHO report on the global tobacco epidemic, 2011: warning about the dangers of tobacco: executive summary* (No. WHO/NMH/TFI/11.3), World Health Organization, Geneva, 2011.Google Scholar
- World Health Organization: Non-age-standardized estimates of current tobacco use,tobacco smoking and cigarette smoking (Tobacco control: Monitor)*[accessed February 2024]
- Xu J, Mendrek A, Cohen MS, Monterosso J, Simon S, Brody AL, Jarvik M, Rodriguez P, Ernst M, London ED. Effects of acute smoking on brain activity vary with abstinence in smokers performing the N-Back task: a preliminary study. *Psychiatry Res*. 2006;148:103–109.

---

## Population Education – Way to Progress

---

Prof.(Dr.) Ekta Bhatia

Professor & In-Charge

B.Ed. Department

Gokul Das Hindu Girls College,

Moradabad, U.P., India

**Prof. (Dr.) Ekta Bhatia, ORCID ID : <https://orcid.org/0009-0009-1512-566X>**

**Abstract:** The real wealth of a country is its people. Population is very important factor in the upliftment of country. The distribution of population is affected by many physical factors. Population education is a continuous process and promotes healthy approach for family planning and prepares youth for better life style. The main objective of the population education is to create awareness to control the increasing population. It is multi disciplinary approach and it's content is derived from various subjects. Different methods of teaching are used for it. Efforts for promotion of population education have been done in India. Teachers and schools can play important role to prepare students with broad outlook by providing population education. It should be taken as challenge. If population is seen as capital, then it can be utilize for the development of country.

**Keywords:** Population, Population in India, Population Education

---

### 1. Introduction

The real wealth of a country is its people. These people use all the resources of the country and make the policies of the nation. We can say that population is very important factor in the upliftment of a country. The rapid growth of population can become obstacle in the path of development if it is not utilized with proper planning. Uncontrolled urbanization, increase in crime, pollution, overcrowding , political turmoil -all these take place due to the rapid growth of population. With increased population, it becomes very difficult to solve the problem of unemployment. Food scarcity is also the result of increased population, further, it is connected with under nourishment of the people. These countries also become the victim of the vicious circle of poverty. Social infrastructure is also affected by the rapid population growth. Polluted air and water, noise population in big cities are the results of increased population. Johnson said that the hungry world cannot be fed until and unless the growth of its resources and the growth of its population came into balance. Each man and women and each nation must make decisions of conscience and policy in the phase of this great problem.

**Need of Population Education:** On the basis of density of population, the world has been divided into three zones-1 Regions of high density population 2. Regions of moderate density of population 3 Regions of low density of population. The distribution of population is effected by many physical factors

such as climate, location, relief, energy resources, soils, altitude and by many non-physical factors as demographic, historical, cultural factors, industrialization, urbanization, modernization etc. The changing behaviour, attitude, educational understanding of people of country can bring drastic changes and can put effect upon all these factors. Population Education is a continuous process after one generation to another generation. It promotes healthy approach for family planning and prepares youth for better lifestyle. It can prove helpful in controlling population explosion and environmental degradation. Hence, need of population education becomes of immense importance in educating the people for betterment of nation. Population is increasing very fast in the world and to control it, population education is essential. We need population education to make the people aware for proper arrangement of education, health, transportation etc for our citizens. For environment conservation, proper nutrition and health development for upliftment of social life. For the economic development of the country, to upgrade the living standard of the people and to maintain balance in supply of food, clothes, houses, energy sources, oil etc. to our citizens to increase production.

**Concept of Population Education** In his theory, Thomas Malthus (1798) explained that the number of people would increase faster than the food supply. Any further increase would result in a population crash caused by famine, disease and war. Malthus published his thoughts related to population growth in the book 'An Essay on the Principles of Population'. In 20th century, American economist, politicians and educationist felt the need to provide knowledge about the causes and bad effects of population growth to children from the very beginning. In 1962, Professor Thomas and Philip M. Hauser focus to make the population education as a part of school curriculum. In 1964, Professor Sloan Wayland, from Teachers College, Columbia University, introduced the concept of population education, gave the name population education and prepared the related subject matter for it. Alva Myrdal advocated to study population in education. In 1970, UNESCO organized a workshop on population education and decided the objectives of population education. Strategy, regarding the population education, was also prepared. According to the definition of UNESCO, Population Education is a community nation and world. Its objective is to develop students' response was and logical attitude and behaviour while dealing with the situation. Frank Jemin defined, it is an educational program which throws light on both quantitative and qualitative aspects of education. In simple words, the education, which is concerned with the population matters such as mortality, fertility, migration etc., is called population education. By educational process of population education, learners are made able to understand the causes, nature and consequences of population growth.

**Objectives of Population Education** The main objective of the population education is to control the increasing population of the world. The other objectives of population education are -

- To give knowledge about the increasing population to children, youth and adults.
- To give the knowledge about the consequences of population growth.
- To give them knowledge about the causes of population growth.
- To give them knowledge about the measures to check the population growth.
- To develop the attitude for controlling the population.
- To develop the attitude for increase in production.
- Develop the attitude in them for limited consumption of natural resources and produced goods.

#### **Nature of Population Education**

To attain the higher level qualitative life, it is the prime requirement to regulate the population. Through educational efforts and means only population education can develop the ability of decision making in

regulating population. Inter relationship between change in population and qualitative development can be understood by educational programmes of population education. Responsible behaviour and attitude towards the problems arising due to the rapidly increased population and efforts to be done for their solution, can be developed with the effective implementation of population education. It is a value-laden subject, more sensitive and requires skillful handling. It is a multi-disciplinary approach and its content is derived from various subjects such as Biology, Sociology, Demography, Statistics, Psychology, Economics etc.

Review of Related Literature Kalediene and Petrauskiene(2000) found inequalities in life expectancy in Lithuania to be highly correlated with education. Winkeby & others, (1992) suggested that prevention through better education was very important. Pagare(2019) studied the educational awareness among the scheduled tribes, the small family norms and population growth in the Thane District. 500 respondents were elected for study. He found that scheduled tribe people live in joint family, do not take proper care of children. Most of them are illiterate, superstitious and facing poverty. There is very little awareness about population education among the scheduled tribes people.

Mete and Mandal (2023) studied the recommendations of educational policies related to population education and its integration into the school curriculum of the WBBSE and CBSE. They concluded in their study that in the syllabus of CBSE & WBBSE board many topics are included by which students become able to understand the concept of population and its application in their real life.

'Education at a Glance 2024' (an OECD publication) focused on equity in education and on the labour market. The indicators highlighted that in educational resources, study choices, proficiency, access to education -disparity are faced by different democracy groups. The final analysis presented the effect of education on prospects and outcomes of labour market. Females are given lower wages in comparison to males.

Bhat(2025) remarked in his study that forty percent population of India would be urban by 2025. and pressure will be on urban amenities. The rate of urbanization may be faster in South India due to level of literacy and education in comparison to North India. Due to it the migration of labours may increase from north India to farmlands of the south. To realize the demographic gift proper policies were pursued by India, it would be sitting pretty in the year 2025. Otherwise unemployment and social evils associated with it will be difficult to control.

The United Nations Population Fund (UNFPA) has released its report State of World Population (2025) titled "The Real Fertility Crisis." It remarked India as the world's most populous country and also highlighted the major shifts in ageing, fertility and reproductive autonomy. It also studied population size, life expectancy, fertility rate trends and gaps, healthcare, gender norms, youth and working age demographics, barriers to reproductive autonomy etc. It also recommended to remove the structural barriers and to give priority to reproductive rights over population control. It is noticed in the area of population studies that demographic behaviour is associated with the education. Demographic transition from high levels to low levels of fertility is effected by the spread of education throughout a population. Delayed marriages and first births are also the result of education. Fertility levels preferences and regulation are also affected by the education. Small families are preferred by highly educated women. Mortality has and education are associated strongly with one another and in the social economic development of country education plays an important role and policy making.

## **2. Methods of Teachings and Contents of Population Education**

Various countries of the world use different sources to provide the population education to its citizens. In our country India, population education is given through formal education, non-formal education, adult

education, by using means of mass communication and voluntary organizations. It is not an easy work to teach population education. Different methods of teaching can be used. These are - Audio - visual method, Computer assisted method, Value classification method, Internal method of role playing, Self instructional method, Enquiry oriented or discovery method, Value classification method. The contents of population education have been suggested by Mehta and Jayasuria. It includes - 1 The population growth, its causes and various situations 2 Population, health and nutrition 3 National and international population programmes. 4 Biological factors- family life and population. 5 Social development and consequences of population growth. 6 . Economic development and consequences of population growth.

Efforts for Promotion of Population Education in India The Government of India took the project of population education to cover the children of the country. For this project, the aid was provided from NCERT and UNESCO. Many steps have been taken to aware the students in schools about increasing population. Family planning programme was started in 1952 in India, during the first five year plan. In 1961, the government paid more attention towards the family planning awareness. In 1969, national conference was organized by Family Planning Association of India to discuss on population education. Many suggestions came into light-

- Population education cell should be established in NCERT.
- Population education should be given place in curriculum of teacher education and school education at all the levels.
- Study material and books, methods of teaching and evaluation should be developed.
- Population education should be given to understand the importance of small family.

### **3. Problems and Suggestions Related to Population Education**

There are some problems related to the population education in India. Though, subject matter for population education is prepared by NCERT. It is considered negative to provide sex education with population education in our country. It is also a big question, when to start population education. Some people thought that it should be started from the primary level of education, but other people are of the view that it should not be part of school education. The another problem is how to provide population education. It is said that population education should be taught like other school subjects, but other view is that people should be made aware at all levels. In schools, it becomes difficult to impart population education to students because of the prejudice of parents and guardians, shortage of proper trained and qualified teachers in population education, lack of proper planning about it and lack of co-ordination among the agencies who are working for the family planning education and welfare. There is strong need to develop training modules to train the teachers. Orientation of officers and other staff of family planning and welfare department is also required to implement it effectively. Development of curriculum, and text books, for primary, secondary and higher levels of education, are also needed. Research work should be promoted. Matter, consulting population education, should be available in regional languages also. From time to time, evaluation of all programmes related to population education should be done strictly, to make it more effective. School subjects like languages, mathematics, science, health education and social studies should be correlated with population education programmes. The role of teachers is very important in this procedure. They can bring change in the mindset of students and their classroom activities. The active participation of teachers and students can create understanding and application of providing population education in school environment. Schools are the best places to prepare future generation with broad attitudes and innovative thoughts, ready to contribute itself in the development of family, society and nation.



#### 4. Key Role of Education & Population Education

Education is the main source of social change. Population control is a big task and it should be taken as a challenge. Through education, we can aware the students from the very beginning, but a wide programme of awareness is also needed to make it more successful. Means of communications, posters, pamphlets, magazines, books, radio, television, mobile, internet can work as good source for making the people aware about it. Government is also doing its efforts at all the levels. Understanding towards the issues related to population can be developed in citizens of India through educational approach of population education. All of us have to understand the importance of population education and practical approach should be adopted to control the overpopulation. Serious efforts can give good results. Population education is a multi- disciplinary concept. Relationship between the social- economic process and population factors can be understand with the help of population education. Knowledge and skills of people can be affected by it. Population education is helpful to create awareness for family planning , to improve attitude for women health in family, and economic development of country. People become more responsible in taking decisions about their family size and its upliftment by using their knowledge in life. This will create positive effect on individual, social and further national progress.

#### 5. Conclusion

World Population Day is celebrated on 11th July every year. This day is celebrated to highlight the problem of overpopulation and to raise awareness about its effects. This day is an opportunity not only for awareness but also for determining our priorities regarding population balance and it inspires us to make a balance world with resources, opportunities and respect. In 2023, India is on the first place with the maximum population. Due to rapid increase in population are countries also facing many problems such as Malnutrition, lack of safe birth services in rural areas, reduced agriculture land, polluted water and air, traffic jam, crowd in hospitals railway station ,bus station and at other places. In this circumstances, education and awareness are the keys to control rapidly increasing population . With proper planning and policies, increasing population can be helpful in economic development. Indian markets are the centre of attraction for the multinational companies. Skilled labours on low wages are available in our country

In developed countries labour cost is more than developing countries, that increases the production cost. Due to it, these companies prefer to hire skilled ,educated persons which are available on comparatively less salaries in developing countries. Tamil Nadu Gujarat Maharashtra and Uttar Pradesh States are on the priority for industrial investment and because of it employment is created not only on local level but also it has increased export of the country. If population is seen as capital, then it can be utilized for the development of country and India can become leader of the world.

#### References :

- Agarwal, J.C. ( 2009 ). Population Education. Shipra Publication, Delhi.1 -30.
- Ali, L. (2020). Environmental Education and Population Education. Ashok Publications, Delhi. 1-70.
- A.S. & Thakur, A.(2013). Teacher in Emerging Indian Society. Agarwal Publications, Agra.363 -367.
- Bhat,B.A.(2021). Population Education.Taran Publication, New Delhi, 9 -68.
- Bhat,P.N.M.(2025). Demographic Scenario. Institute of Economic Growth, Delhi.1-10
- Gorain,S.C.(2023). Impact of Population Education on Population Explosion: An Indian Perspective.

- International Journal of Research Publication and Reviews, Vol.4, No.2, pp1213-1218, February 2023.
- Ghoreishi M (2003) Population ,Education and Development : The Concise Report, Department of Economic and Social Affairs Population Division United Nations, New York ,2003.p 1-39.
- Jain,R.K & Abhishek,N. (2025). Articles on Population. Hindustan, 11 July 2025, pp.10 Jansankhya Ban Jaye Vardaan, Article in Dainik Jagaran,6 July,2025
- K.K.(2013).Population Education- Elements, Dimensions and Policy Planning. Kanishka Publication,. Delhi. 5-46. Thakur,
- Naik,M.Importance of Population Education in Emerging Context.Mahi Publication.1-77.
- N.R.S.& Chaturvedi, S.(2014). Teacher in Emerging Indian Society.R.Lal Book Depot, Meerut.579 -576. Shrivastava,
- Pagare B.P.(2019). A Normative Survey of Population Education Awareness Among The Schedule Tribes In Thane District -(MS)-India, Think India Journal, Vol-22-Issue-14-December -2019.9753 -9759
- Prasad,S.(2021). Migration and Rural Development: Pre - covid scenario, Notion Press, Chennai. Sarkar, R.(2020). Environmental and Population Education. Rita Publication, Kolkata.50-78. Saxena ,

### Web Resources :

- <https://unacademy.com/content/kerala-psc/study-material/child-development-and-welfare/population-education-definition-problems-of-over-population/>
- <https://www.oecd.org> <https://www.drishtiiias.com> <https://conserve-energy-future.com>
- <https://en.m.wikipedia.org/wiki/Population><https://blog.vasavicollegeofeducation.in/notes/popedu/POPULATION-EDUCATION-NOTES.pdf>
- <https://populationcommission.nic.in> [https://www.researchgate.net/publication/351911451\\_POPULATION\\_EDUCATION](https://www.researchgate.net/publication/351911451_POPULATION_EDUCATION)
- [https://www.researchgate.net/publication/370028529\\_Place\\_of\\_Population\\_Education\\_in\\_Education\\_Policies\\_and\\_School\\_Curriculum](https://www.researchgate.net/publication/370028529_Place_of_Population_Education_in_Education_Policies_and_School_Curriculum)
- [https://scholar.google.co.in/citations?view\\_op=view\\_citation&hl=en&user=NZLxY1kAAAAJ&citation\\_for\\_view=NZLxY1kAAAAJ:5nxA0vEk-isC](https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=NZLxY1kAAAAJ&citation_for_view=NZLxY1kAAAAJ:5nxA0vEk-isC)
- <https://www.oecd.org/en.html>
- [https://osre.ncert.gov.in/images/survey/Sixth\\_Survey/ch12\\_s.pdf](https://osre.ncert.gov.in/images/survey/Sixth_Survey/ch12_s.pdf)

---

## Book Review

---

### Book Name: Digital Marketing

Reviewed by:

**Renuka Kapoor**

**Amity University, Noida, ORCID ID: <https://orcid.org/0009-0006-8138-4625>**

The book Digital Marketing, co-authored by Prof. (Dr.) Madhu Arora and Ms. Shweta, is a well-organised and academically aligned resource, specifically designed to meet the curriculum requirements of undergraduate programs such as BBA and B. Com across various universities offering digital marketing courses. It also serves as a valuable guide for aspiring digital marketing professionals seeking foundational knowledge and practical insights in the field.

The strength of the book lies in its clarity, comprehensiveness, and adherence to contemporary digital trends. The book is divided into four units and includes 22 chapters, covering a wide spectrum of topics—from basic definitions to advanced digital marketing strategies, including SEO, content marketing, campaign management, web analytics, and legal/ethical considerations. Notably, it places significant emphasis on the evolution of digital marketing and the growing significance of customer-centric strategies in an increasingly interconnected digital landscape.

The first unit lays the groundwork by introducing the concept, scope, and various types of digital marketing, such as SEO, email, influencer, and social media marketing. The second and third units delve deeper into consumer behaviour, integrated marketing communications, and platform-specific tactics. Unit four stands out by addressing contemporary tools like mobile marketing, campaign planning, and analytics.

One of the standout features of this book is its use of real-life examples and relevant illustrations, which not only simplify complex concepts but also make the content more engaging and relatable. This visual and practical approach greatly enhances the reader's understanding, making it an excellent learning tool.

The language of the book is simple yet professional, making it ideal for beginners without compromising academic rigour. With a 5/5 rating from multiple university-level experts, Digital Marketing book is highly recommended for undergraduate students and anyone beginning their journey in this dynamic field.

To sum up, Digital Marketing book by Prof. (Dr.) Madhu Arora and Ms. Shweta is more than just a textbook; it is a comprehensive guide to understanding and applying digital marketing in the real world. It is timely, relevant, and academically sound, serving as an indispensable tool for students preparing to enter a digitally driven job market.

**AUTHORS:** Prof. (Dr.) Madhu Arora & Ms. Shweta, **PUBLISHER:** Eureka Publications

## Submission and Format Requirements

A typical manuscript should be between **3,000 and 4,000 words**, **excluding** references, tables, and figures. However, **longer submissions** may be accepted if they are of **exceptional quality**.

Here is a **paraphrased version** of the provided submission and referencing guidelines:

### Submission Format

Manuscripts may be submitted in either **single or double spacing**, with a **preference for Times New Roman, 12-point font**. Once accepted, all articles will be properly formatted for publication by the journal.

The manuscript should include the following components:

- Title
- Abstract
- Main text
- Conflict of interest statement
- References and notes
- Tables, figure captions, and figures
- Keywords

**Do not include** author names, biographical notes, or acknowledgements in the submitted version. Additionally, ensure that **author details are not embedded** in the document's file properties or metadata.

### References and Notes

- This journal uses the **Harvard (author-date)** referencing style.
  - Example: *Hamel (2000) suggests...* or *A study by Nelson and Winter (1982) found...*
- All sources cited in the text must appear in a **full, alphabetized reference list** at the end.
- **Footnotes** should be avoided unless they briefly clarify a specific point. These notes should follow the reference list in **numbered order**.
- Only include sources that are:
  - Published
  - Accepted for publication (not just submitted)
  - Accessible via libraries or institutions
- Sources must be in **English**.

**Reference entries** should include:

- Full names and initials of all authors
- Year of publication
- Article/book title
- Journal or book title (in italics)
- Volume and issue numbers for journals
- Publisher and format (for books/conferences)
- Page numbers

- DOI (if available)

**Web sources** should also include:

- Access date (e.g., *accessed 20 August 2025*)
- A valid, short URL (no more than 90 characters, avoid link shorteners)
  - Example: use `https://www.dss.gov.au/` instead of a long, detailed URL

### Figures

- All diagrams, illustrations, and photographs are called **Figures**, and should be:
  - Numbered consecutively
  - Placed at the **end of the manuscript**
- Colour figures will appear in colour **online only**, and black and white in print.
- Use **black and white** whenever possible, unless colour is essential.
- Ensure **high resolution**, especially for line diagrams, since image and text details may be reduced during formatting.

### Permissions

- If using third-party material (figures, data, images), **explicit permission** must be obtained from the rights holder.
- These materials must be properly credited using "**Source:**", followed by a permission statement:
  - Example: *Source: Van Deselar 2020. Reproduced with permission of Elsevier.*

### Units of Measurement

- Follow the **SI (Système International)** unit system.
- Imperial units will be converted unless doing so distorts the meaning or precision of the statement.

### International Context

- Avoid assuming familiarity with local organisations or institutions; provide context from an **international perspective**.
- Always use full names for countries and regions (e.g., avoid "America" or "Europe" as stand-alone terms).
- Specify **national currencies**.
- Expand all acronyms into **English**.

### Translated Works

- When translating:
  - Spell out acronyms in **English** (e.g., IIRP – French personal income tax).
  - Be cautious with labels, suffixes, and mathematical terms; verify against standard **English-language references**.

### Use of AI Technology

- AI tools (e.g., ChatGPT) **cannot be listed as authors**.
- Authors are **fully responsible** for all content, including text assisted by AI.
- If AI was used for writing or editing, this must be **acknowledged** in the article's **Acknowledgements section**.

- **Spellcheckers, grammar tools, or reference managers** do not require such acknowledgement.
- **Journal Ethics**
- To meet academic and professional standards, the journal only accepts articles that are **original, unpublished, and not under review elsewhere**. Submissions must not include any **defamatory, unlawful, or rights-infringing** content. All listed authors are required to confirm that they have read and approved the final version of the article.
- The submitting author must hold the **copyright** and have the legal right to sign the **Author Copyright Agreement**. By submitting, the author agrees to all of these terms.
- The publisher maintains the authority to **re-review** or even **reject** a paper after acceptance if it fails to meet editorial or peer review standards, or is otherwise found to be inappropriate for publication.
- Should an author wish to **withdraw** their paper from consideration or transfer it to another journal, they must do so by **submitting a formal written withdrawal** before submitting it elsewhere. Failure to comply with these conditions may lead to **penalties or sanctions**.

### Call for Papers

Call for papers for upcoming issue of **Anusandhan: NDIM's JOURNAL OF BUSINESS AND MANAGEMENT RESEARCH**, A peer reviewed Journal Volume VIII, Issue 1, February 2026, ISSN 2581-8120. Aim of the Journal is to explore recent advancements in area of contemporary management research such as Finance, Accounting, Marketing, Human Resource Management, Industrial Relations, Commerce, Economics, Computer Science, Information Technology, International Business Affairs etc. **Also book reviews are published.**

**Advantages of publishing are Article published in NDIM journal will be treated as peer reviewed. Also** No article processing/publishing fees. Crossref/DOI to each paper. Link to ORCID I'D for more visibility.

For further Queries, feel free to connect [editor@ndimdelhi.in](mailto:editor@ndimdelhi.in)

Last date of sending papers is **December 30, 2025**.

Annual Subscription Price @1,000/- for the journal. All communication should be addressed to:

The Editor,

Anusandhan- NDIM's Journal Of Business and Management Research

New Delhi Institute of Management,

Near Batra Hospital,

New Delhi-110062

Ph 011-29962605

Website: [www.ndim.edu.in](http://www.ndim.edu.in)

Email: [editor@ndimdelhi.in](mailto:editor@ndimdelhi.in)







