

# How does star rating influence consumers' willingness to pay a premium? The roles of brand image, consumer involvement, and review volume.

By Arun Saxena



**O.P. Jindal Global University**

*A Private University Promoting Public Service*

**NAAC Accreditation - 'A' Grade**

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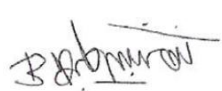
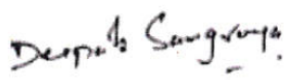
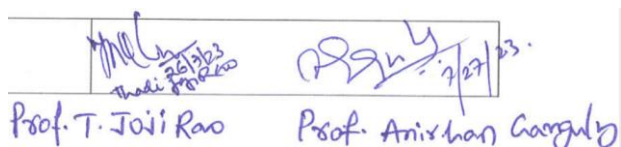


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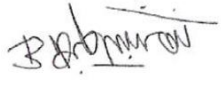
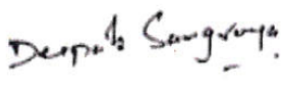
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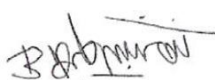
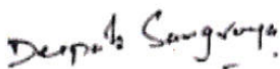
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## Abstract

Star ratings, prominently displayed on online retail websites, are influential in guiding shoppers' decisions. However, scholarly research into their role in shaping perceptions of brands and willingness to pay is still limited. This study steps into this space, providing an understanding of star ratings' impact on consumer behavior.

This study examines the effects of star ratings on online consumer behavior. This research study focused on **answering five questions**: (1) do star ratings influence shoppers' willingness to pay a premium? (2) do star ratings influence shoppers' **brand image perceptions**? (3) Do shoppers' brand image perceptions influence their willingness to pay a premium? (4) does the rating volume influence shoppers' perceptions, implying social influence? (5) does the purchase involvement moderate star rating persuasion?

Drawing upon the theoretical frameworks of social influence and persuasion, the study employs a 2x2 between-subjects experimental design across two individual studies, dissecting the impact of star ratings on willingness to pay a premium (WTPP), with the brand image as a mediating factor. Study 1 focuses on the moderating effect of purchase involvement on ratings, while Study 2 delves into the moderating role of the rating volume. An obscure brand was selected to prevent bias resulting from pre-existing brand awareness. Pretests were conducted to determine appropriate levels for factors such as star rating, rating volume, purchase involvement, and the chosen 'obscure' brand.

Data from 216 and 206 respondents from Study 1 and Study 2, respectively, were analyzed using Multivariate Analysis of Variance (MANOVA) and the Hayes process. Additional checks were conducted to ensure the robustness of the results, including evaluations for construct reliability, validity, discriminant validity, and potential common method bias.

Four key findings emerged from the study: (1) The star rating has a positive effect on both brand image perception and WTPP, (2) Brand image perception fully mediates the relationship between star rating and WTPP, (3) There is a significant interaction between star ratings and rating volume, which moderates the effect on brand image perception, and (4) The effect of star ratings on brand image perception is moderated by the level of purchase involvement.

The study extends marketing strategy, social psychology, and communication theory literature, offering practical insights for online marketers. Important managerial implications include the strategic use of star ratings in advertising and pricing strategies, emphasizing their role in enhancing brand image, influencing consumer WTPP, and optimizing market positioning. These findings suggest that businesses can leverage star ratings to reduce advertising spending, tailor advertising narratives, and inform dynamic pricing strategies, ultimately enhancing their competitive edge in the online marketplace.

The study acknowledges its limitations and suggests future research directions, paving the way for a deeper understanding of the relationship between star ratings and consumer behavior in online retail.

**Keywords:** ratings, rating volume, social influence, brand image, willingness to pay a premium, WTPP, purchase involvement.

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## Abbreviations

|                                   |                      |
|-----------------------------------|----------------------|
| Star rating.....                  | Rating               |
| Volume of ratings .....           | Rating Volume        |
| Brand image.....                  | Brand Image          |
| Willingness to pay a premium..... | WTTP                 |
| Purchase involvement.....         | Purchase Involvement |

## Chapter 1 Introduction

This research investigates how online ratings affect shoppers' brand image perceptions and willingness to pay premium prices (WTPP) amidst digital shopping and marketing changes. It begins with an analysis of the growth of electronic commerce and its implications. The study then focuses on the increased available information in the digital age, especially the importance of ratings and reviews. This chapter also describes the new challenges marketers face due to these shifts, leading to the research questions and objectives of the study. This introduction lays the groundwork for understanding the vital role of consumer ratings in online markets and outlines the detailed analysis to come.

Moving into the intricacies of consumer behavior, we recognize that price is a significant factor in consumer purchase decisions. This aspect of consumer decision-making, influenced by factors ranging from budget considerations to perceptions of value, is crucial in understanding the interplay between ratings and WTPP. Research shows that from frugal shoppers to discerning buyers, the price tag holds significant sway over their choices (Ciftci et al., 2020; Engel et al., 1969; Koen et al., 2018; Konuk, 2018). Likewise, marketers aspire to obtain a premium over market prices for their products, seeking to elevate their brand's value and maximize profitability (Namkung & Jang, 2017; Phong et al., 2021; Zhang et al., 2020). Consumers evaluate offerings based on costs (including price) and benefits, as emphasized by Zeithaml (1988). This evaluation considers price, functional advantages, emotional satisfaction, convenience, durability, reliability, and the overall product or service experience.

In response, marketers strategically position their offerings by understanding the interplay of price and benefits, aligning with consumer preferences, and effectively communicating the value-added benefits. They emphasize the product's exclusivity, status, personal values, environmental impact, emotional value, and brand differentiation to significantly drive the consumer's willingness to pay a premium.

However, the advent of electronic commerce is reshaping traditional consumer information-seeking behaviors and marketers' strategies, particularly in influencing consumer WTPP.

## **Rise of electronic commerce**

The importance of electronic commerce or online retailing is well-known. In 2021, global retail e-commerce sales reached nearly 5.2 trillion U.S. dollars. Projections indicate that this number will increase by 56 percent in the coming years, culminating in an estimated 8.1 trillion dollars by 2026. Just single-day online sales for Black Friday and cyber-Monday in 2022 were \$9.12 billion and \$11.3 billion, respectively (Adobe, 2022; Hetler, 2022).

With the unprecedented growth in electronic commerce globally, shopping has changed significantly, shifting the retail landscape and transforming consumer behavior. It has facilitated a shift from the traditional brick-and-mortar experience, inherently bounded by logistical constraints and offering a finite array of choices, to a virtually unlimited selection of goods accessible in the digital sphere (Doherty & Ellis-Chadwick, 2010). The rise of e-commerce represents more than a simple evolution in retail; it signifies a transformative shift with substantial global implications. Electronic commerce provides numerous benefits that are fueling the growth of online shopping. For instance, it offers shoppers unparalleled convenience, as they can browse and buy products anytime, anywhere, and from any device. It also enables access to a broader product range and facilitates easy price comparisons, empowering consumers to make more informed purchase decisions. Hence, online shopping offers a ripe area for scholars to study and make recommendations to marketers.

### **Information proliferation**

Before the rise of electronic commerce, the amount of information shoppers could access about products, brands, and vendors was limited. Predominantly, this information was sourced from brand communications, traditional media advertising, or personal recommendations. The introduction of online shopping platforms radically altered this scenario.

The rise of electronic commerce has also led to the proliferation of all types of information about products, brands, and vendors. Shoppers now have access to a wealth of information, including but not limited to product specifications, comparative features, pricing and availability details, shipping options and return policies, brand history, and vendor credibility. Additionally, consumers can access information sources such as product demonstrations and unboxing videos on platforms like YouTube, detailed feature comparisons on expert blogs, and direct brand interactions on social media platforms. This wealth of information provides comprehensive insights that help shoppers make informed and confident purchasing

decisions. User-generated ratings and reviews form a large part of information about the brands shoppers factor into their purchase decisions.

### **Ratings and reviews**

The rise of electronic commerce has seen a concurrent escalation in the availability and influence of online product ratings and reviews. These evaluations span numerous digital platforms, including e-commerce sites like Amazon, consumer review aggregators like TripAdvisor and Yelp, expert review forums including CNET and NDTV, and social media platforms like Twitter and Facebook. Between 2019 and 2020 alone, a staggering 87% surge in the volume of online ratings and reviews was observed (Fedewa et al., 2021).

Notably, this plethora of user-generated content has become integral to online consumer decision-making. Research evidence suggests that information from these non-company sources can often bear more influence on consumer purchase decisions than even brand-derived communication (Beyens et al., 2016; Gupta & Harris, 2010; Hennig-Thurau & Walsh, 2003; Ho-Dac et al., 2013; Liang, 2016; Mathwick et al., 2008; Shao, 2009; Yaniv & Milyavsky, 2007).

It has been revealed that a substantial 90% of shoppers reference ratings and reviews during online and offline purchases (Kaermingk, 2022; Mican & Sitar-Taut, 2020; Pitman, 2022; Smith & Anderson, 2016). During the awareness stage of shopping, online reviews rank third, following the brand website and online advertising, as the most frequent source of product or brand information KPMG (2017). Moreover, for over half the respondents, online reviews are the primary research channel during the consideration stage of purchase.

Interestingly, this consumer trust in online ratings and reviews parallels that given to personal recommendations from family and friends and outstrips trust in all forms of advertising. Purchase decisions are primarily driven by price, product features, and brand; however, online reviews hold substantial influence, ranking fourth, although this varies across regions and product categories (A.C. Nielsen, 2015; Kaermingk, 2022; Nielsen, 2013).

Importantly, this dependence on ratings and reviews for purchase decisions continues unabated, notwithstanding prevalent concerns about the authenticity of reviews, potential manipulation of star ratings (Luca & Zervas, 2016), and questions about the objectivity of these ratings in accurately representing product quality (de Langhe et al., 2016).

### **The marketers' challenge.**

In the electronic commerce era, marketers' traditional brand-building and pricing strategies face new challenges. Traditionally, marketers have adopted branding to differentiate their offerings from competitors to carve out a profitable market niche and charge a premium over competitors' prices (D. Aaker, 2003). Brands, as distinguished from products, carry with them a psychological and emotional attachment, crafting a unique perception in consumers' minds (brand image), often the influence extending beyond conscious awareness (Aaker, 1997; Back & Parks, 2003; Carroll & Ahuvia, 2006; Chaudhuri & Holbrook, 2001; Fournier, 1998; Palusuk et al., 2019; Radler, 2018). This strategy stems from an understanding that by making their offerings unique, marketers can gain a competitive edge, leading to increased customer loyalty (Jensen & Hansen, 2006), market share (Ehrenberg et al., 1997), and profitability (O'Rourke et al., 2022).

Marketers invest billions in brand communication to establish a favorable brand image, create awareness, shape perceptions, and differentiate their offerings from competitors (Turner, 2022). They strategically craft messages, develop brand stories, design visuals, and choose appropriate communication channels to convey their unique value proposition to target audiences. The goal is to build a strong brand identity that resonates with consumers, fosters trust, and enhances the overall brand image (Arya et al., 2021; Chinomona, 2016; Zehir et al., 2011). These expenditures encompass various channels and mediums, including television, print media, digital advertising, social media campaigns, influencer marketing, and more.

Alongside enhancing brand image, marketers proactively develop strategies to boost consumer WTPP. By persuading consumers to pay more for their products, marketers ensure improved profitability, which enables greater investment in innovation and marketing, thus fueling a virtuous cycle of growth. For instance, Apple's strong brand and reputation for innovation have empowered the company to charge a premium for its iPhones for a long time, compared to competitors, allowing for significantly higher profit margins (Koetsier, 2019).

A strong brand elicits positive associations in consumers' minds that add value to the brand and influence willingness to pay a premium (Anselmsson et al., 2014; Kato, 2021). Research suggests various communication strategies marketers use to persuade consumers to pay extra for a product. Notably emphasizing the product's exclusivity (Hennigs et al., 2015; Lei et al., 2021), status (Han et al., 2010; Hwang & Hyun, 2017), personal values (Gao et al., 2016), or

environmental impact (Lee et al., 2010), and emotional value (Japutra et al., 2022; T. C. Zhang et al., 2018) can significantly drive the consumer's willingness to pay a premium.

However, electronic commerce has brought forth unforeseen challenges. With the increasing significance of user-generated content, notably ratings and reviews, the control marketers once exercised over brand communication has been substantially diluted. The ratings and reviews have increasingly influenced consumer perceptions, leading to a critical shift in power toward consumers.

Limited evidence points to rating influence on shoppers' perception of quality (Flanagin et al., 2014), satisfaction (Tran et al., 2019), and willingness to pay a premium (WTPP) (Belarmino et al., 2021). They even influence purchase intention (Siddiqi et al., 2020).

Beyond individual consumer decisions, ratings and reviews also have wider business impacts. They affect brand reputation (Willems et al., 2019), consumer trust (Gavilan et al., 2018), sales (Li et al., 2020), prices (Belarmino et al., 2021), and even shareholder value (de Langhe et al., 2016). Thus, these digital user feedback systems influence consumer decision-making and overall business outcomes. However, the extent of these influences varies depending on the shopper and product characteristics and the purchasing context (Dominique-Ferreira et al., 2016; Holzwarth et al., 2006; Park et al., 2007).

Faced with these shifts, marketers need to adopt strategies that factor in the significant influence of ratings and reviews on consumers' brand perception and purchase decisions. This involves monitoring and responding to ratings and reviews, addressing negative feedback promptly, and combating the challenge of fake reviews. Furthermore, understanding how consumer-generated content influences brand perceptions, such as price, quality, reputation, and trustworthiness, is paramount. By addressing these challenges, marketers can better harness the potential of user-generated content, allowing for more nuanced and effective strategies in the digital age.

In conclusion, the rise of e-commerce presents new challenges for marketers in brand building and pricing. The growing influence of online ratings and reviews shifts significant power to consumers, impacting brand perception, trust, and purchasing decisions. Marketers must adapt by integrating these digital feedback mechanisms into their strategies. The forthcoming sections of this study will outline specific research objectives and questions to explore these challenges in the digital age.

## **Research Objectives**

Understanding the influence of ratings on shoppers' brand image perceptions and willingness to pay premium prices (WTPP) in e-commerce is crucial. Current research lacks a comprehensive analysis of how ratings affect consumers' perceptions of brand image and their WTPP. This study is designed to fill this gap by investigating the dynamics of star ratings and their influence on consumer behavior, specifically on brand image and premium pricing decisions. The study focuses on three primary objectives to augment our understanding of these interactions and generate practical applications. Details of these objectives follow.

### **Consumer perception and use of ratings**

The first objective of our study is to understand how shoppers utilize star ratings and rating volume to evaluate brands and determine the price they are willing to pay. Although some studies have highlighted the role of star ratings and the number of ratings in industries like hospitality and tourism (e.g., Hu et al., 2019), a more profound understanding of how consumers perceive ratings and how they influence brand image and willingness to pay for consumer products is required. Building on this foundational exploration of the role of star ratings and rating volume in shaping consumer behavior, we delve deeper into the psychological and social influences these factors engender, further exploring how they interact with individual and situational circumstances.

### **Psychological and social influence of ratings**

The second objective centers around understanding the impact of ratings on consumer psychology. How does social influence among unfamiliar individuals operate in an online context? Our research will investigate how ratings and rating volume exert social influence on individuals within online environments.

### **Role of individual and situational factors on the influence of ratings**

Lastly, this study explores how individual factors (like demographics) and situational factors (like purchase involvement) impact the consumers' perception of online ratings and, subsequently, their purchasing decisions. The goal is to provide actionable insights for effective rating system design.

With the proliferation of online consumer reviews and ratings, their influence on consumer behavior is undeniable. Through this investigation, we aim to fill in the existing research gaps

and contribute to a more detailed understanding of how consumers interpret and use ratings in their decision-making process, ultimately influencing their perception of brand image and willingness to pay.

## Research questions

Based on a detailed literature review, this research study has formulated five primary research questions that align with its objectives. These questions aim to explore key themes related to consumer behavior in e-commerce comprehensively.

Table 1 – Mapping Research Questions to Research Objectives

| Research Questions                                                                      | Research Objective                                                                   |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| RQ1. Do star ratings influence shoppers' willingness to pay a premium?                  | Understand consumer perception and use of ratings.                                   |
| RQ2. Do star ratings influence shoppers' brand image perceptions?                       |                                                                                      |
| RQ3. Does brand image perceptions influence shoppers' willingness to pay a premium?     |                                                                                      |
| RQ4. Does the rating volume influence shoppers' perceptions, implying social influence? | How does social influence among unfamiliar individuals operate in an online context? |
| RQ5. Does purchase involvement moderate star rating persuasion?                         | How do situational and individual factors affect star rating influence?              |

To address these questions effectively, the study is structured into two focused experiments:

Study 1 examines research questions 1, 2, 3, and 5. It delves into how purchase involvement affects consumers' interpretation of ratings and subsequent beliefs and judgments about the rated product or service.

Study 2 investigates research questions 1, 2, 3, and 4. This study focuses on the role of the rating volume, exploring how it impacts perceived social influence and, in turn, shapes consumers' beliefs about the rated product or service.

Through these targeted experiments, the research aims to thoroughly understand the interplay between ratings, brand perception, consumers' willingness to pay a premium, their level of involvement in the purchase, and the influence of rating volume.

## Significance of Study

This study looks at how online ratings affect consumer behavior, combining ideas from marketing and psychology. The research questions, detailed in Section 1.6, form the backbone of this exploration, guiding the study towards valuable theoretical advancements and practical insights.

### Theoretical Contributions:

This research makes important contributions in several areas. Firstly, it enhances marketing strategy literature by exploring how user-generated ratings influence consumer decisions. Social psychology provides new insights into the informational social influence of online ratings. Additionally, the study advances information processing theory by examining how the level of purchase involvement affects how consumers interpret star ratings, particularly in decision-making processes that rely on heuristics or quick judgments.

### Practical Applications:

The study's findings have significant implications across various areas:

*Consumer Behavior:* This research offers insights into how consumers interpret online ratings during purchase decisions. It sheds light on how this interpretation contributes to the formation of brand perception and influences their willingness to pay a premium.

*Brand Management:* The research offers new perspectives on brand management in the digital age, particularly focusing on how ratings affect brand image and consumer valuation.

*Advertising Strategy:* The findings aid in crafting more effective advertising strategies that *leverage ratings to boost conversion rates*.

*Pricing Strategy:* The study explores the influence of external factors like ratings on consumers' willingness to pay a premium, providing novel insights for pricing strategies.

The contextual background of the study, including a summary of the current state of research in these areas, positions the investigation within a broader academic landscape. This research establishes a strong foundation for its conclusions using theoretical frameworks from both marketing and psychology.

The study's theoretical and practical contributions are systematically outlined in Table 2, which maps the research questions to their respective impacts:

Table 2 - Mapping Research Questions to Theoretical and Managerial Contribution

| Research Question                                                                       | Theoretical Contribution                                                                                                                                         | Managerial Contribution                                                                                                                              |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| RQ1. Do star ratings influence shoppers' willingness to pay a premium?                  | Enhances understanding the linkage between perceived value driven by ratings and consumers' willingness to pay more. Contributes to pricing strategy literature. | Helps in devising pricing strategies considering the impact of user ratings.                                                                         |
| RQ2. Do star ratings influence shoppers' brand image perceptions?                       | Enriches branding literature by examining the effects of user-generated content (ratings) on brand image.                                                        | Guides strategies for online reputation management and customer feedback response.                                                                   |
| RQ3. Do brand image perceptions influence shoppers' willingness to pay a premium?       | Provides insights into the mediating role of brand image in the relationship between ratings and WTPP. Expands both branding and pricing literature.             | Emphasizes the importance of maintaining a positive brand image in a digital environment.                                                            |
| RQ4. Does the rating volume influence shoppers' perceptions, implying social influence? | Examines the dynamics of 'social proof' in digital contexts. Contributes to the understanding of social influence in online shopping.                            | Guides strategies to encourage customer feedback, knowing that a higher volume of reviews can significantly influence potential buyers' perceptions. |
| RQ5. Does purchase involvement moderate star rating persuasion?                         | Confirms that the level of purchase involvement influences the impact of star rating on consumer evaluations.                                                    | Assists in tailoring communication strategies according to different levels of consumer involvement.                                                 |

## Organization of Chapters

This thesis is structured as follows: Chapter 2 delivers a comprehensive literature review on star ratings, brand image, WTPP, information processing, social influence of ratings, and purchase involvement. These topics inform the subsequent development of the conceptual model and hypotheses presented in Chapter 3. Chapter 4 outlines the research design and methodology, including details of the experimental study, design, procedures, data collection, pre-tests, and pilot. Chapters 5 and 6 provide hypothesis-specific results and summaries for Studies 1 and 2. Finally, Chapter 7 concludes with discussions, implications for theory and practice, limitations, and future research directions.

## Chapter 2 Literature Review

This chapter presents a comprehensive literature review of the primary constructs underlying this research: the willingness to pay a premium (WTPP), star rating, brand image, rating volume, and purchase involvement. More exhaustive reviews of each construct can be found in Annexures 1 through 4. Following the individual reviews of the constructs, we examine their interrelationships. Subsequently, we explore the theories underpinning this research, culminating with identifying existing research gaps.

### Review Methodology

This review comprises five systematic literature reviews of star rating, brand image, WTPP, volume, and involvement. The synthesis of the literature reviews on the principal constructs is presented first, followed by research gaps and detailed reviews.

The decision to conduct five separate literature reviews was strategically aimed at exploring our research topic's multifaceted dimensions. A preliminary search using the combined keywords ("star rating" OR "average rating" OR "aggregate rating" OR "consumer rating" OR "numerical rating" OR "product rating" OR "online rating") AND ("brand association" OR "brand image" OR trust OR reputation OR personality OR price) AND ("willingness to pay a premium" OR "willingness to pay more" OR "willingness to pay premium") yielded only one article, which unfortunately did not align with our research focus.

To address this, separate searches were conducted for each construct to determine common antecedents or consequents that could logically support our hypothesis formation. This approach allowed us to delve deeper into specific areas, such as how star ratings impact perceived quality and how perceived quality is an antecedent to positive brand image and willingness to pay a premium (WTPP). It was imperative to dissect these constructs individually to build a strong foundation for our hypotheses and to ensure that our research was grounded in a thorough understanding of each element's role and influence within the broader topic.

This segmented approach to our literature review was instrumental in uncovering valuable insights and connections that may have been overlooked in a more generalized review. We believe this method has significantly contributed to the depth and quality of our research, and we are grateful for your acknowledgment of the work done in this chapter.

## Protocol

This literature review followed the PRISMA protocol used widely in marketing literature reviews (Hermes & Riedl, 2021; Moher, 2009; ter Huurne et al., 2017). The protocol consisted of four phases: identification, screening, eligibility, and inclusion of articles in the literature review.

The search for keywords began with the principal construct (e.g., star rating). The list was refined based on the discovery of its synonyms and other variations from the author keywords in identified articles, resulting in a final search string (e.g., ("star rating" OR "average rating" OR "aggregate rating" OR "consumer rating" OR "numerical rating" OR "product rating" OR "online rating").

The process is described in detail in the next section.

### *Identification:*

An extensive search was conducted for the systematic literature review using the SCOPUS bibliometric database and the EBSCO article database. The articles potentially relevant to the research topic were identified. Utilizing these databases facilitated access to a wide range of scholarly publications, ensuring comprehensive coverage of the literature.

### *Screening:*

Following the identification phase, the articles were screened based on predetermined criteria. The search was limited to specific domains of interest, including marketing, psychology, business and management, information systems, and economics. Domains such as neuroscience, medical science, and food-related topics were excluded, resulting in some exclusions.

Publications classified as conference proceedings, book chapters, editorials, surveys, notes, letters, and in-print articles were also excluded, as they did not align with the specific focus of the study. The exclusion of these publication types aimed to maintain a high standard of quality and relevance in the articles included in the review. This step also led to the exclusion of some articles.

### *Eligibility:*

To further refine the selection, eligibility criteria were established based on the Australian Business Deans Council (ABDC, 2020) journal list and journals in the Chartered Association of Business Schools' Academic Journal Guide (CABS, 2018). This criterion ensured that the selected articles came from reputable and recognized journals. Previous systematic reviews have employed similar rankings (Ismagilova et al., 2019; Khan et al., 2020; Nguyen et al., 2018). Following this criteria, a further screened list of articles was obtained.

### *Inclusion:*

In addition to the ABDC journal list, articles from non-ABDC journals were added if they had citations higher than the lowest citation count among the eligible articles. This inclusion aimed to encompass significant contributions to the literature in the research area. A rigorous identification, screening, eligibility, and inclusion process resulted in a final corpus of articles that met the predetermined criteria. These articles were carefully selected to provide a comprehensive and reliable foundation for the systematic literature review. **The articles finally included and reviewed in the thesis ranged from 2002 to 2022.** The findings from the systematic literature review are presented in the following sections.

### **Willingness to pay a premium**

The first research question is: What is the influence of ratings on consumers' willingness to pay a premium? This section reviews the literature on willingness to pay a premium (WTPP).

**Willingness to Pay a Premium (WTPP) is crucial in understanding consumer behavior, particularly in markets with premium products or brands. It denotes the additional amount a consumer is ready to pay over the standard price for a product or service, often influenced by factors like quality, brand reputation, or alignment with personal values such as sustainability.**

**WTPP is closely related to the broader concept of Willingness to Pay (WTP), which represents the maximum amount a consumer is willing to pay for a product or service. WTP reflects the consumer's perceived value based on utility or satisfaction from a product or service (Cameron & James, 1987). It sets the upper spending limit for an individual consumer, influenced by their perceptions of the product's functional and emotional benefits (Monroe & Krishnan, 1985).**

WTPP extends beyond WTP, capturing the extra amount a consumer is willing to pay for superior features or benefits. This premium is relative to the standard market price and considers the added value a consumer perceives in one brand over others (Netemeyer et al., 2004; Rao & Monroe, 1996). Factors like lower price elasticity, emotional connections, and non-economic considerations like environmental sustainability perceptions can significantly influence WTPP.

For businesses and marketers, understanding both WTP and WTPP is vital for setting effective pricing strategies. Misjudging WTP can lead to surplus loss or diminished demand due to inappropriate pricing. Meanwhile, accurately gauging WTPP can offer insights into potential sales and profit maximization, especially in markets with prevalent premium products.

### **Antecedents of WTPP**

This section reviews the antecedents of willingness to pay (WTP) and willingness to pay a premium (WTPP). The antecedents have been grouped under five broad categories: personal, psychological, product-related, contextual, and communication factors. The factors related to ratings and reviews and brand image are discussed in detail in subsequent sections. Table 3 summarizes the findings, and a brief description follows.

#### **Personal factors**

Personal demographics such as age, gender, income, education, marital status, and household size significantly influence willingness to pay a premium. For instance, Shahsavar et al. (2020) demonstrate that age and gender can affect consumer behavior towards eco-friendly products. Similarly, Cobbinah et al. (2018) found that income levels and household size are crucial in determining the willingness to pay more for safer vegetables. These demographic factors likely reflect the varying disposable income levels, lifestyle preferences, and value systems across different consumer segments.

#### **Psychological factors**

The willingness of consumers to pay a premium for products is significantly influenced by psychological factors such as product involvement, personal identification, trust, personal innovativeness, and the desire for social status. These factors collectively shape how consumers perceive and interact with products, ultimately influencing their purchasing decisions.

Campbell et al. (2014) investigate the role of product involvement, demonstrating its profound effect on consumer perceptions and behaviors and their willingness to pay a premium (WTPP). The level of consumer engagement with a product, whether as a direct influence or a moderating factor, significantly affects their perception and valuation of the product.

Balaji et al. (2019) explore the importance of personal identification and trust in how consumers respond to product attributes and their WTPP. This relationship indicates that higher personal identification with and trust in a product lead to an increased willingness to pay more, as consumers place greater value on these products.

Kasilingam and Krishna (2022) highlight the impact of personal innovativeness, particularly in adopting new technologies, on consumer attitudes towards premium pricing. This suggests that consumers with a penchant for innovation are more receptive to premium pricing, especially for technologically advanced products.

The Veblen effect, detailed by Bagwell and Bernheim (1996), further exemplifies this concept. This effect occurs when consumers are willing to pay more for products that offer a sense of exclusivity or social status despite being functionally similar to less expensive alternatives.

Moreover, environmental consciousness and social responsibility also significantly influence consumers' willingness to pay a premium. Studies by Kang et al. (2012) and Royne et al. (2011) demonstrate a direct link between environmental concern and the willingness to pay more for green products and practices. These findings reveal that consumers who value environmental and social responsibility are more inclined to pay a premium for products that resonate with these beliefs.

In conclusion, psychological factors collectively shape consumer behavior, leading to a propensity to pay higher prices for products that align with their values and perceptions.

### **Product factors**

Product and brand-related factors, including brand name, perceived quality, perceived advantages/disadvantages, symbolic manifestation of luxury, gastronomic involvement, environmental responsibility, health benefits, sensory appeal, simplicity of pricing plans, and origin information, affect a consumer's perceived value and, subsequently, their WTPP.

Kiatkawsin and Han (2019) shows that luxury and prestige associated with gastronomic experiences can drive consumers to pay premium prices. Ha-Brookshire and Norum (2011) demonstrates the impact of brand name and related attributes on consumer decision-making, further indicating the influence of brand perceptions on pricing strategies. While Balaji et al. (2019) report a significant effect of product attributes (green hotels) on tourist WTPP, Duong et al. (2022) find a strong influence of perceived value on tourist WTPP. Especially in the service industry, the perceived quality of amenities strongly influences WTPP (Boden et al., 2020; Melewar et al., 2017).

### **Contextual factors**

Contextual factors like awareness of alternate choices and relative risk, cultural norms, market conditions, and social influences also play a crucial role (Liu et al., 2022; Zhang et al., 2023). Thi Nguyen et al. (2019) indicate that awareness of food safety issues can significantly influence consumers' willingness to pay more for safer products. Similarly, Liu et al. (2020) find that consumer understanding of ecosystem services affects their willingness to contribute financially to nature conservation efforts.

### **Communication factors**

Communication and messaging influence consumer behavior, particularly their willingness to pay a premium price (WTPP) for products. A well-crafted message can significantly impact how consumers perceive and value products, affecting their purchasing decisions and WTPP. As noted by Campbell et al. (2014), the preference for locally grown products showcases the power of information availability. When consumers are well-informed about the origins of a product, they tend to develop a strong preference for locally sourced items over domestically grown alternatives. This preference is further heightened by the willingness to pay a higher premium of 9-15% more for local products. This phenomenon clearly indicates how effective communication about a product's origin can elevate its perceived value and desirability.

Chen et al. (2023) delve into the impact of brand communication and brand equity on WTPP, particularly in the context of international schools. Their findings suggest that effective brand communication strategies that enhance brand equity can lead consumers to value a brand's offerings more. This elevated perception directly translates into a greater willingness to pay premium prices.

Eustice et al. (2019) demonstrate how specific types of messaging, such as highlighting awards won in wine competitions, can significantly elevate levels of WTP. Such accolades

serve as a testament to the quality and prestige of the product, prompting consumers to value it more highly.

Garaus et al. (2021) explore the effect of emotional targeting in marketing communications. Their findings from an online experiment reveal that emotionally resonant messaging can increase consumers' willingness to pay. This emotional connection forged through targeted communication can powerfully sway consumer sentiment and the valuation of a product.

Yu et al. (2022) emphasize the effectiveness of comparative advertising in influencing consumer WTPP. When comparative ads are well-matched with consumer expectations and preferences, they can significantly enhance the perceived value of a product, leading to increased WTPP.

Lastly, Zheng et al. (2022) focus on the interaction between self-construal and green agricultural product advertising appeals. Their research indicates that when advertising appeals align with consumers' self-construal, it positively influences their willingness to pay a premium for green agricultural products. This finding highlights the importance of tailoring communication to resonate with consumers' self-perceptions and values.

In conclusion, the findings underscore the role of communication and messaging in shaping consumer perceptions and willingness to pay a premium. Effective communication strategies that leverage emotional resonance, comparative advertising, information about product origins, and brand equity can significantly enhance the perceived value of a product and influence consumer purchasing behavior.

Table 3 - Summary of Research on WTP / WTPP Antecedents

| Factor Category                | Factor                | Selected Studies                                                                                                                                                                                                         | Details                                                                                                                                                                                                                                                                           |
|--------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Psychological Factors</b>   | Emotional Preferences | Bigné et al., 2005; Kopelman et al., 2006; Ladhari, 2009; Rezaei & Ghodsi, 2014; Rucker & Galinsky, 2008; Yan et al., 2023                                                                                               | Emotional preferences shape consumers' connection with products or brands, influencing their perception of value and enhancing their willingness to pay a premium.                                                                                                                |
|                                | Involvement           | Amendah & Park, 2008; Izogo et al., 2020; O'Cass & Choy, 2008; Yan et al., 2023                                                                                                                                          | Greater involvement indicates a higher personal relevance attached to the purchase decision. As a result, consumers who are more involved in the buying process are often more willing to pay a premium.                                                                          |
|                                | Mindset               | Su & Li, 2022                                                                                                                                                                                                            | Consumers' mindset, including loss-aversion and growth orientations, plays a crucial role in WTPP.                                                                                                                                                                                |
|                                | Perceived Risk        | Choi et al., 2023                                                                                                                                                                                                        | Consumers' emotional response to potential purchasing risks plays a key role in their WTPP, particularly when buying premium products or services.                                                                                                                                |
|                                | Perceived Value       | Han, B. et al., 2011; Li et al., 2012; Zhang, Y. et al., 2020                                                                                                                                                            | Perceived value involves consumers' assessment of a product's benefits relative to its cost. High perceived value can boost consumers' willingness to pay a premium.                                                                                                              |
|                                | Satisfaction          | Bigné et al., 2005; Bigné et al., 2008; Demirgüneş, 2015; Heung & Gu, 2012; Jaiswal & Niraj, 2011; Ladhari et al., 2008; Pham & Ahammad, 2017                                                                            | Satisfaction is a critical factor influencing consumers' willingness to pay a premium.                                                                                                                                                                                            |
|                                | Self-Construal        | Hwang & Choi, 2018; Lei et al., 2020; Lei et al., 2021a; Lei et al., 2021b; Mochon et al., 2012; Zheng et al., 2022                                                                                                      | Self-construal, which relates to how consumers perceive themselves as independent or interdependent individuals, influences WTPP. Independent individuals often form a stronger connection to products that enable self-expression and customization, thus escalating their WTPP. |
|                                | Trust                 | Aksoy & Özsönmez, 2019; Habibov et al., 2018; Jian et al., 2020; Martínez, 2015; Xu et al., 2022; Zhang, B. et al., 2018                                                                                                 | Trust plays a significant role in consumers' willingness to pay a premium.                                                                                                                                                                                                        |
| <b>Product-Related Factors</b> | Product Attributes    | Balaji et al., 2019; Dangelico & Vocalelli, 2017; Demirgüneş, 2015; Delgado et al., 2013; Duong et al., 2022; Etuah et al., 2022; Hasanzade et al., 2022; Odlyzko, 2001; Owusu & Owusu Anifori, 2013; Strahilevitz, 1999 | Product and service attributes such as quality, certification, environmental soundness, health benefits, sensory appeal, simplicity in pricing plans, and information about product origin influence consumer WTPP by shaping their perceived value.                              |

| Factor Category                              | Factor                               | Selected Studies                                                                                                           | Details                                                                                                                                                                                        |
|----------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              | Quality                              | Boden et al., 2020; Chia-Jung & Pei-Chun, 2014; Franke & Schreier, 2008; Lanz & Provins, 2017; Melewar et al., 2017        | In the service industry, the quality of amenities and consumers' perceptions critically impact WTPP.                                                                                           |
| <b>Personal Factors</b>                      | Age                                  | Romano et al., 2016                                                                                                        | Age impacts consumer preferences and values.                                                                                                                                                   |
|                                              | Cultural Traits                      | Osmani et al., 2021                                                                                                        | Cultural traits indirectly influence WTPP by shaping mindset, self-construal, and satisfaction.                                                                                                |
|                                              | Education                            | Govindasamy & Puduri, 2009; Ho et al., 2022                                                                                | Education affects environmental and health consciousness.                                                                                                                                      |
|                                              | Gender                               | Kopelman et al., 2006                                                                                                      | Gender influences affective risk perceptions related to premium products or services.                                                                                                          |
|                                              | Income                               | Amiran & Hagen, 2018; Dror et al., 2007; Izogo et al., 2020                                                                | Income plays a role in WTPP by mediating affordability and perceived value.                                                                                                                    |
|                                              | Lifestyle and beliefs                | Kasilingam & Krishna, 2022; Sadik-Rozsnyai & Bertrandias, 2019                                                             | Personal factors such as lifestyle, beliefs, values, and income can affect consumers' evaluation of a product or service, influencing their willingness to pay a premium.                      |
|                                              | Miscellaneous factors                | Ibrahim et al., 2020; Izogo et al., 2020; Kopelman et al., 2006; Lee, 2011; Morales & Higuchi, 2018; Romano et al., 2016   | By affecting its antecedents, demographic and sociodemographic factors indirectly influence consumers' willingness to pay a premium (WTPP).                                                    |
| <b>Market factors</b>                        | Market context                       | Mizutani & Sakai, 2023                                                                                                     | The market context, including competition, market saturation, and the general economic environment, can impact consumers' willingness to pay a premium.                                        |
|                                              | Perception of scarcity               | (Krallman et al., 2020                                                                                                     | Scarcity can increase a product's perceived value and exclusivity, increasing consumer willingness to pay a premium.                                                                           |
|                                              | Prices of substitutes                | Akaichi et al., 2012                                                                                                       | The prices of substitute products can affect the consumer's willingness to pay a premium. If substitutes are priced lower, consumers might be less willing to pay a premium for a product.     |
| <b>Information and Communication factors</b> | Efficacy of advertising and branding | (Campbell et al., 2014; Chen et al., 2023; Eustice et al., 2019; Garaus et al., 2021; Yu et al., 2022; Zheng et al., 2022) | The efficacy of advertising, branding, promotional messages, and information transparency can significantly impact consumers' perceptions of a product and their willingness to pay a premium. |

| Factor Category                           | Factor                                 | Selected Studies                                                                               | Details                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>User-generated ratings and reviews</b> | Ratings, review volume, review valence | Belarmino et al., 2021; Book et al., 2016; Kocas & Akkan, 2016; Ögüt & Onur Taş, 2012          | These studies collectively indicate that user-generated star ratings and online reviews significantly affect customers' willingness to pay, and they influence sales conversions. However, these effects are subject to variables like review volume, review valence, and even time decay.                                                                                                                |
|                                           | Star rating, perceived quality         | Hu et al., 2019; Israeli, 2002; Li & Hitt, 2010; Wu & Gaytán, 2013; Zimmermann et al., 2018    | This set of studies explores the connection between pricing, perceived quality, and willingness to pay. Higher perceived quality (indicated by star ratings or lower variance in quality) typically increases willingness to pay. However, there are nuanced interactions, such as the time-decaying effect of online ratings on room rates and the varying impact of price on absolute and relative WTP. |
|                                           | EWOM                                   | Lis & Horst, 2013; Nieto-García et al., 2017; Nikhashemi et al., 2019; Srivastava et al., 2021 | These studies focus on the influence of electronic Word of Mouth (eWOM) on consumer behavior. Findings suggest a non-linear relationship between WOM and WTP, with eWOM valence being a strong antecedent of WTP. eWOM also significantly affects customer-brand engagement (CBE), influencing satisfaction and loyalty.                                                                                  |
|                                           | Multiple factors, including reviews    | Otto et al., 2018; Pavlou & Dimoka, 2006                                                       | These studies indicate that multiple factors, such as income, product attributes, and past seller behavior, can influence consumers' willingness to pay. Notably, reputable sellers can command price premiums due to buyers' trust in their credibility.                                                                                                                                                 |

## **Star rating**

A Star rating is an aggregate numerical customer evaluation of products, services, brands, or businesses. It is usually represented by a number and a visual comprising stars on a scale of 0 – 5. It is computed from individual customer ratings as a simple average or using an algorithm that considers multiple criteria (e.g., Amazon uses recency of rating and verification of rating provider). The star rating is also referred to as average, aggregate, consumer, product, or online rating, and it is a prominent feature on e-commerce and consumer review sites. It is based on factors such as product quality, value, and customer service, and it serves as a tool for evaluating and comparing products, services, brands, or businesses (Willemssen et al., 2011). There are three parts to star rating – ratings or valence (an average numerical customer rating), volume (the total number of customer ratings), and variance (the variation in customer ratings along the rating scale). This research focuses on the rating and the volume.

While previous literature mainly explores the effects of textual reviews, there is less research on the effects of summary ratings and volume and the interaction of these factors. The reviewed literature mostly finds positive effects of valence and volume on marketing outcomes, but there are mixed results that require further investigation. The rest of the chapter reviews the existing literature on rating, volume, and their interactions and moderating factors while examining each variable individually.

## **How is a star rating useful?**

Online shopping often brings about uncertainties for consumers due to information asymmetry, where sellers have more detailed knowledge about products than buyers. This uncertainty can pertain to product quality, shipping costs, return policies, and the reputation of the seller (Dimoka et al., 2012).

To lessen this uncertainty and make better decisions, shoppers actively seek information about the brands, products, sellers, and the overall shopping experience (Nicosia, 1966; Yaniv & Milyavsky, 2007). A common strategy for consumers to overcome this information gap is consulting ratings and reviews (Manes & Tchetchik, 2018).

Star ratings provide a succinct, objective summary of a product's pros and cons, making product comparison easier (Filieri et al., 2021; Guan & Lam, 2019). Star ratings also serve as easy-to-understand cues, reducing the mental effort required to process complex information,

especially for consumers who lack the motivation or ability to process in-depth details (De Pelsmacker et al., 2018; S. Park & Nicolau, 2015; Sparks & Browning, 2011).

Consumers are motivated to use these ratings for a variety of reasons, including seeking social validation, economic benefits, entertainment, avoiding fear of missing out, fulfilling cognitive needs, and reducing perceived online transaction risks (Hennig-Thurau & Walsh, 2003; Shao, 2009; Beyens et al., 2016; Gupta & Harris, 2010; Ba & Pavlou, 2002).

### **Star rating and social proof**

Social proof is a psychological phenomenon where individuals mimic the actions, attitudes, or opinions of others, especially in ambiguous or uncertain situations. It stems from the fundamental human instinct to conform to social norms and behaviors perceived as correct or popular within a group (Cialdini, 2011). This concept is rooted in our evolutionary tendency to rely on the crowd's wisdom for survival and decision-making.

#### *Concepts Supporting Social Proof*

Social proof is closely associated with several psychological concepts. These include:

- **Informational Social Influence:** This refers to the process where individuals accept information from others as evidence about reality, especially when they lack knowledge or expertise in a specific area (Deutsch and Gerard, 1955). It arises from the desire to make correct choices based on accurate perceptions of the social world.
- **Normative Social Influence:** This occurs when individuals conform to the expectations of others to fulfill the desire to be liked or accepted (Baek et al., 2015). It is about public compliance rather than private acceptance, often driven by the fear of social exclusion or the desire for social harmony.
- **Internalization:** As defined by Kelman (1961), internalization happens when individuals adopt others' opinions or behaviors based on the perception that these actions solve a problem or are instrumental in achieving their goals.
- **Informational Cascades:** This concept suggests that individuals disregard their information or opinions in favor of adopting the majority's opinion, especially when uncertain (Bikhchandani et al., 1992).

### **Outcomes of Social Proof on Consumer Behavior**

Social proof profoundly influences consumer behavior, shaping perceptions, reducing uncertainties, and impacting decision-making processes. Its effects manifest in various ways:

- **Risk Reduction:** Consumers often face uncertainty when interacting with unfamiliar brands or products. Social proof, manifested through aggregated opinions like reviews and ratings, helps mitigate this perceived risk (Ho-Dac et al., 2013; Lee and Bell, 2013). Seeing others' positive experiences with a product increases an individual's confidence in that product.
- **Cognitive Dissonance Alleviation:** When individuals are uncertain about their decisions, especially in complex purchasing scenarios, social proof helps reduce cognitive dissonance, providing reassurance that their choices align with the broader community's preferences (Liang, 2016).
- **Enhanced Social Benefits:** Conforming to social proof can increase social rewards. This includes establishing a socially desirable image and gaining approval within social circles, especially when opinions align with those of influencers or opinion leaders (Hsu and Tran, 2013).
- **Quality Inference:** Consumers infer product quality based on other consumers' ratings, especially when credible information is scarce. This collective judgment often holds more weight than individual evaluations (Brynjolfsson & Smith, 2000).

### **Star Ratings as Social Proof**

Star ratings are opinion-based social information derived from peer-consumers' experiences with a product (Cheung, Xiao, and Liu, 2014). They epitomize social proof in the digital marketplace. These ratings are a cumulative reflection of consumers' opinions and experiences with a product or service. They exert informational and normative influence on potential buyers (Cheung et al., 2009; Filieri, 2015). The aggregate nature of star ratings, representing the majority's view, lends a perception of quality to the product or service. As Zhu and Zhang (2010) suggest, when the number of ratings is large, the perceived quality approaches an 'objective' quality.

The principle of social proof becomes particularly relevant with star ratings (Cialdini, 2011). A high star rating, displayed prominently on e-commerce product pages, signals to consumers that many others have had positive experiences with the product, brand, or merchant (Sigurdsson et al., 2019). Consumers trust these signals and emulate the actions and opinions of others, especially in situations of uncertainty or when lacking the motivation or ability to evaluate the primary arguments of a product (Park & Nicolau, 2015; Raafat, Chater, and

Frith, 2009). Online product ratings and reviews significantly influence consumer perceptions of quality (Xie et al., 2016).

Moreover, star ratings often lead to informational cascades, where individuals follow the majority's choice, sometimes even against their initial beliefs or information (Anderson & Holt, 1997; Dholakia et al., 2002). This phenomenon is strengthened by the credibility attributed to the collective voice represented in the ratings (Brynjolfsson & Smith, 2000; Both Kelman and McGuire, 1969).

### **Star rating perceptions and outcomes**

Star ratings in the online marketplace play a vital role in shaping consumer behavior and influencing outcomes ranging from perceived product quality to actual sales. A summary is presented in Table 4, and an exhaustive review is presented in Annexure 1.

Star ratings predominantly shape consumer perceptions of product quality, capitalizing on the human inclination to perceive higher numbers as better quality (Filiari et al., 2021). Notably, the average product ratings exert more influence on these perceptions than the mere quantity of ratings (Flanagin et al., 2014; K sge et al., 2016).

Further, star ratings amplify the perceived value of products by boosting their credibility and reliability (Peiyu Chen et al., 2021). However, their influence on perceived value is less impactful than reviews (Noone & McGuire, 2014). Moreover, higher ratings assuage the perceived risk in online purchasing, serving as reliable indicators of product quality and customer satisfaction (Gavilan et al., 2019; Nakhata & Kuo, 2014; F. Wang et al., 2021).

In the online marketplace, where trust is a key pillar, high star ratings enhance consumer confidence by demonstrating seller reliability (Gong et al., 2021; Pavlou & Dimoka, 2006; Sparks & Browning, 2011). This trust, however, is subject to an intricate interplay of factors like rating volume, variance, reviewer credibility, and consumer characteristics.

Star ratings also align pre-purchase expectations with actual product performance, directly impacting customer satisfaction (Alalwan, 2020; Martin-Fuentes, 2016). Similarly, star ratings significantly influence brand image, a critical consumer decision determinant. High ratings augment trust, credibility, and perceived quality, while low ratings can tarnish the brand image (Casado-D  az et al., 2017; Zablocki et al., 2019).

Star ratings also impact purchase intentions, with an optimal impact between 4.2 and 4.5 stars (Maslowska et al., 2017). This relationship is modulated by rating variance, reviewer credibility, brand equity, and conflicting reviews (Keh et al., 2015; Siddiqi et al., 2020).

Furthermore, high star ratings foster a willingness to pay more by promoting a positive brand image and superior quality perception (Belarmino et al., 2021; Belarmino & Koh, 2021; Castro et al., 2016; Otto et al., 2018; Sangwichien & Jaroenwisan, 2017; Schamel, 2012).

Though direct research on ratings and customer loyalty is limited, high ratings are associated with attributes that nurture loyalty, including perceived quality, satisfaction, and trust (Tran et al., 2019; Tsao, 2018; J. J. Zhang & Mao, 2012).

In the realm of sales, higher ratings generally correlate with increased sales and revenue, albeit the relationship varies based on factors like rating volume, brand reputation, product nature, and competitive dynamics (Hyrynsalmi et al., 2015; Y.-J. Lee et al., 2019; B.-J. Jiang & Wang, 2008; C. Song et al., 2013).

High star ratings also amplify a product's perceived value, leading consumers to pay more (Pavlou & Dimoka, 2006; Hu et al., 2017; Abrate et al., 2012; Abrate & Viglia, 2016; Öğüt & Onur Taş, 2012).

Lastly, star ratings guide search and browsing behaviors, with higher-rated items enjoying increased visibility and conversion rates, indicating the persuasive effect of star ratings (Guan & Lam, 2019).

These studies reflect the role of star ratings, impacting every step of consumer decision-making, from browsing behavior to post-purchase satisfaction and loyalty.

Table 4 - Summary of Research on Star Rating Outcomes

| S.No. | Outcome           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | References                                                                                                                             |
|-------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Perceived quality | <p>Online ratings substantially influence consumer perception of product quality and subsequent purchase decisions. This is partly due to the neurological predisposition of humans to interpret higher numbers as indicators of better quality and desirability.</p> <p>According to Flanagin et al. (2014), consumers rely heavily on web-based information compared to other channels, especially in electronic commerce environments. While average product ratings significantly influence perceptions of product quality and purchase intention, their number carries a smaller weight, suggesting a suboptimal use of rating information (Flanagin et al., 2014). Küsgen et al. (2016) corroborate these findings, emphasizing the significant impact of review valence and average ratings on quality perception.</p> | (Filieri et al., 2021; Flanagin et al., 2014; Küsgen et al., 2016; Pascucci et al., 2022; Resnick & Montania, 2003; Zhao et al., 2016) |
| 2     | Perceived value   | <p>High star ratings enhance perceived value by creating the perception that the products are more dependable, credible, and superior to lower-rated counterparts. The rating had a small effect on perceived value compared to a larger effect on reviews.</p> <p>There were not many studies that studied rating and perceived value relationships. An experimental study (Noone &amp; McGuire, 2014) reported that rating had a small effect on perceived value compared to a larger effect of reviews.</p>                                                                                                                                                                                                                                                                                                                | (P. Chen et al., 2021; Noone & McGuire, 2014)                                                                                          |
| 3     | Perceived risk    | <p>This sense of assurance from other consumers' positive experiences (higher ratings) reduces the perceived risk, making the online purchasing decision easier and safer.</p> <p>Star ratings mitigate perceived risks in online shopping by acting as reliable indicators of product quality and customer satisfaction (Gavilan et al., 2019; Nakhata &amp; Kuo, 2014). This, in turn, facilitates safer online purchasing decisions. Wang et al. (2016) further emphasized that product ratings influence risk perception and alter consumer behavior. Importantly, the influence of ratings extends to various aspects of online consumer behavior, such as app downloads, signifying their overarching role in digital decision-making processes (Wang, 2017).</p>                                                       | (Gavilan et al., 2019; Nakhata & Kuo, 2014; F. Wang et al., 2021; Q. Wang et al., 2016)                                                |
| 4     | Trust             | <p>Ratings alleviate concerns in an environment of information asymmetry and indicate a seller's reliability. They reflect others' assessments of the product's quality, influencing consumers' trust in the product or the seller.</p> <p>High ratings cultivate trust in online commerce by signaling seller reliability and customer satisfaction, thereby alleviating concerns in environments marked by</p>                                                                                                                                                                                                                                                                                                                                                                                                              | (Belanger et al., 2002; Chang et al., 2015; Gong et al., 2021; Pavlou & Dimoka, 2006; Sparks & Browning, 2011)                         |

| S.No. | Outcome            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | References                                                                                                                |
|-------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|       |                    | information asymmetry (Gong et al., 2021; Pavlou & Dimoka, 2006; Sparks & Browning, 2011). This trust is nuanced and affected by rating volume, variance, reviewer credibility, and individual consumer characteristics. Studies confirm that high ratings increase trust and shape consumer decisions, with numerical ratings and positive information boosting trust and booking intentions (Sparks & Browning, 2011). While consumers prioritize security features (Belanger et al., 2002), feedback text and numerical ratings enrich a seller's reputation (Pavlou & Dimoka, 2006). High scores and social proximity amplify trust values (Chang et al., 2015), and physician ratings significantly influence patient selection (Gong et al., 2021), highlighting the pivotal role of star ratings in various online contexts.                                                                                                                                                                                                                                                                                               |                                                                                                                           |
| 5     | Satisfaction       | Potential buyers often interpret star ratings as a measure of previous customers' satisfaction with a product. Moreover, online reviews and ratings can positively influence customer satisfaction by aligning pre-purchase expectations with the product's performance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | (Alalwan, 2020; Martin-Fuentes, 2016)                                                                                     |
| 6     | Brand image        | Star ratings notably shape brand perceptions; high ratings enhance trust, credibility, and perceived quality, while low ratings can damage brand image and customer loyalty. The quantity and distribution of these ratings further bolster consumer confidence or generate uncertainty, emphasizing the significant role star ratings play in shaping the brand image.<br><br>The literature on the impact of star ratings on shoppers' perceptions of the brand image or other brand characteristics is sparse. One study in the literature search reported the impact of industry-conferred star ratings on the perceived brand image of hotels in China (J. Jiang et al., 2014). Another China-based study (J. J. Zhang & Mao, 2012) reported that online reviews impacted the brand image of the hotels. Finally, one study found that brand image moderated the relationship between ratings and hotel booking intentions Casado-Díaz et al. (2017). More specifically, ratings had a more substantial effect on purchase intentions for hotels with poorer brand image and less impact on those with a better brand image. | (Casado-Díaz et al., 2017; Zablocki et al., 2019)                                                                         |
| 7     | Purchase intention | An individual's perception of product quality, influenced by various ratings and reviews, is crucial in shaping purchase intentions.<br><br>Purchase likelihood increases with ratings up to 4.2-4.5 stars, then decreases (Maslowska et al., 2017). Review elements, such as ratings, variance, reviewer credibility, brand equity, and conflicting reviews, impact purchase intentions (Keh et al., 2015; Siddiqi et al., 2020). Attitude ambivalence, product usage/appearance, and numerical ratings' correlations with dominant reviews influence purchase intentions (Le et al., 2022; Z.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (Cheng et al., 2022; Flanagin et al., 2014; Keh et al., 2015; Langan et al., 2017; Le et al., 2022; Siddiqi et al., 2020) |

| S.No. | Outcome | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | References                                                                                                                                |
|-------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|       |         | Cheng et al., 2022; Poushneh & Rajabi, 2022). Various moderating factors like offline interpersonal influence, product price, and brand image further impact this relationship (Siddiqi et al., 2020; Casado-Díaz et al., 2017; Keh et al., 2015).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                           |
| 8     | WTP     | High star ratings significantly enhance consumers' willingness to pay more by fostering perceptions of a positive brand image and superior quality. This relationship is influenced by factors like customer involvement and rating volume, highlighting the impact of online reviews and ratings on consumer behavior and their readiness to pay for products and services.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | (Belarmino et al., 2021; Belarmino & Koh, 2021; Castro et al., 2016; Otto et al., 2018; Sangwichien & Jaroenwisarn, 2017; Schamel, 2012). |
| 9     | Loyalty | High star ratings foster customer trust and satisfaction, encouraging repeat purchases, while low ratings can tarnish product perception and deter customers from making future purchases.<br><br>While direct research on customer ratings and loyalty is limited, loyalty can theoretically arise from qualities associated with positive ratings, such as perceived quality, satisfaction, and trust (Tran et al., 2019; Tsao, 2018; J. J. Zhang & Mao, 2012). Online ratings can potentiate e-satisfaction's effect on continuance intention, implying a role in enhancing customer loyalty (Tran et al., 2019). Star ratings from the industry can strengthen service recovery efforts, suggesting a strategy for enhancing customer retention during service failure (Tsao, 2018). Furthermore, online hotel ratings can indirectly affect customers' revisit intentions, reflecting their influence on customer loyalty through the mediated perception of the hotel's image (J. J. Zhang & Mao, 2012). Thus, star ratings potentially impact the entire consumer behavior spectrum, from the search phase to post-purchase satisfaction and loyalty. | (Tran et al., 2019; Tsao, 2018; Zhang & Mao, 2012)                                                                                        |
| 10    | Sales   | Higher ratings are associated with increased sales. However, the effects of ratings on sales can vary depending on the competitive environment and the platform type.<br><br>High star ratings generally correlate positively with sales and revenue, although this relationship is complex, contingent on variables like rating volume, brand reputation, product nature, and competitive dynamics (Hyrynsalmi et al., 2015; Y.-J. Lee et al., 2019; B.-J. Jiang & Wang, 2008; C. Song et al., 2013). Positive valence products see a sales uplift with more reviews, while negative valence products experience the opposite effect, suggesting consumers' reliance on others' experiences for purchase decisions (Etzion & Awad, 2007). Live chat impacts sales positively where product information is scarce (H. Sun et al., 2021). For hotels, average rating and review variability influence sales (Lu et al., 2012). Studies of movie reviews reveal that sentiment and content change impact revenue and can predict ticket sales (L.-C. Cheng & Huang, 2020; Moon et al., 2014).                                                                  | (Hyrynsalmi et al., 2015; Jiang & Wang, 2008; Y.-J. Lee et al., 2019; Lu et al., 2012; Moon et al., 2014; C. Song et al., 2013)           |

| S.No. | Outcome                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | References                                                                                 |
|-------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|       |                               | Overall, ratings, reviews, and eWOM substantially impact consumer decisions and sales, though effects can vary per competitive environment and platform type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                            |
| 11    | Prices                        | <p>High star ratings enhance a product's perceived value, motivating consumers to pay more due to assumed superior quality. This effect can be influenced by rating volume, brand image, and consumer engagement. Even a few high ratings can boost product appeal and willingness to pay a premium in scenarios with few ratings. Furthermore, a good reputation, reflected through positive ratings, strengthens product credibility and value.</p> <p>Ratings and reviews significantly influence price determination, with reputable sellers commanding higher prices due to customer trust (Pavlou &amp; Dimoka, 2006). Hu et al. (2017) noted that businesses leverage inherent biases in rating systems, equating higher ratings with superior quality and justifying higher prices. In the hospitality sector, online reputation shapes pricing strategy (Abrate et al., 2012; Abrate &amp; Viglia, 2016), allowing hotels to demand higher rates in less competitive markets, although high competition may necessitate price reductions for even reputable hotels. Ögüt &amp; Onur Taş (2012) confirmed a correlation between high customer ratings and higher hotel prices, as ratings often reflect perceived value or quality. Ultimately, reviews enhance or diminish product value perception, impacting price acceptance, thus highlighting the role of ratings and reviews in shaping pricing strategies across industries.</p> | (Abrate et al., 2012; Abrate & Viglia, 2016; Ögüt & Onur Taş, 2012; Pavlou & Dimoka, 2006) |
| 12    | Search and browsing behavior. | The star ratings are instrumental in guiding search and browsing behaviors. Products or services with higher ratings enjoy greater visibility on online platforms, leading to increased click-through and conversion rates. This demonstrates that consumers are more likely to interact with highly rated items and more likely to complete a purchase, indicating the persuasive effect of star ratings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (Guan & Lam, 2019)                                                                         |

## Brand image

Initially coined by Gardner Levy (1955), the brand image concept has evolved through years of contributions from multiple scholars and researchers. Keller (1993) characterized brand image as consumers' beliefs about a brand's attributes and benefits. Aaker (1996a) introduced the concept of brand identity, a complement to brand image, encapsulating the desired perception marketers aim to instill in consumers. Today, brand image is understood as a complex construct that includes various perceptions, attitudes, and beliefs consumers hold about a brand.

## Brand knowledge, brand associations, and brand image

Brand knowledge, a fundamental concept in understanding consumer behavior and brand management, is underpinned by two core elements: brand image and brand awareness (Keller, 1993). Brand image, in particular, is intricately formed through brand associations, which are the mental links created between a brand and its attributes (D. A. Aaker, 1991). These associations, driven by factors like direct experiences, marketing efforts, and consumer perceptions, set a brand apart in the minds of consumers (Keller, 1991; Keller & Swaminathan, 2019; Koll & von Wallpach, 2014; Krishnan, 1996).

Brand associations, as further detailed by Osuna Ramírez et al. (2019), Simms & Trott (2006), Hayes et al. (2008), Y. Xie et al. (2020), Del Río et al. (2001), Kauppinen-Räsänen (2014), and Wells et al. (2007), range from generic to product-specific aspects, encompassing functional, emotional, user imagery, and design elements.

Empirical studies delve into various dimensions of these associations. Affective associations, as explored by Han et al. (2019) and Stojanovic et al. (2018), emphasize the emotional bonds between consumers and brands, while Escalas & Bettman (2017) focus on symbolic associations that reflect the deeper meanings and personal values consumers attach to brands. Bianchi et al. (2019) merge affective and cognitive aspects, acknowledging that brand associations are emotional and rational. Functional associations are examined by Zhao et al. (2021) and Chen et al. (2017), highlighting the tangible benefits of brands. Iyer et al. (2018) and Zhu et al. (2019) extend this to include functional and hedonic or symbolic elements.

The brand image can be conceptualized as either unidimensional, focusing on a single element, such as product quality or brand reputation (Keller, 1993), or multidimensional, considering a blend of cognitive and affective brand associations and perceived brand benefits (Dobni & Zinkhan, 1990). This multidimensionality is exemplified in models by

Keller (1993), Gardner and Levy (1955), and Aghekyan-Simonian et al. (2012), which highlight the complex nature of consumer perceptions, integrating cognitive, affective, and conative elements and focusing on both functional and symbolic brand associations.

This synthesis of literature and empirical studies demonstrates that brand image is a multifaceted construct shaped by various associations. These associations, whether functional, affective, or symbolic, are framed by direct experiences, marketing strategies, and the socio-cultural milieu, profoundly influencing consumer behavior, preferences, and, ultimately, the brand's position in the market.

Brand image is a core component of brand knowledge and is fundamentally crafted from brand associations. Functional, affective, or symbolic associations interweave to form a nuanced and comprehensive understanding of a brand image.

### **Antecedents of brand image**

Brand image, a significant driver of consumer perception and behavior, is shaped by various antecedents corroborated by extensive research (see Table 5 for a comprehensive list of references). These factors, encompassing brand attitude, authenticity, awareness, communication, personality, reputation, trust, country-of-origin image, corporate social responsibility (CSR), pricing strategies, and brand quality, synergistically contribute to the formation and management of brand image.

Brand attitude, encapsulating overall brand evaluation, is a fundamental brand association impacting brand image (Faircloth et al., 2001). Brand authenticity, characterized by heritage, nostalgia, and social commitment, significantly enriches brand image and influences consumer satisfaction and brand love (Rodrigues et al., 2022). Expanding its influence on perceived quality, brand associations, and brand loyalty, brand awareness further strengthens brand image (Azzari & Pelissari, 2020).

Brand communication through diverse platforms influences brand perception and, consequently, brand image (Chakraborty & Biswal, 2020). Brand personality also substantially impacts product evaluations and associations, shaping brand image (Freling & Forbes, 2005). The reputation of a brand, reflecting stakeholders' assessment of its performance, contributes to the formation of brand image (Foroudi et al., 2020).

Consumer trust in a brand's reliability and credibility enhances brand image (Wiedmann & von Mettenheim, 2021), while the country-of-origin image, offering cues for perceived quality, positively influences brand image (Hien et al., 2020). CSR activities, signifying a

company's ethical values, impact brand image positively (Bianchi et al., 2019), even though price deals, despite offering short-term consumer benefits, may negatively affect the brand image (Shen et al., 2007).

Finally, brand quality, indicating product superiority, fortifies brand image by fostering positive brand associations (Quoquab et al., 2021). Therefore, effectively managing these antecedents is crucial to maintaining a positive brand image.

### **Outcomes of brand image**

As corroborated by extensive research, brand image significantly shapes consumer perception and behavior (see Table 6 for a comprehensive list of references). As indicated by (Aaker, 1991) and (C. W. Park et al., 1986), brand image is a key construct enabling consumers to navigate the marketplace efficiently and make informed decisions. This strategic cognitive process, known as brand heuristics (Punj & Hillyer, 2004), uses the brand image as a shortcut to assess quality, value, and satisfaction, thus simplifying decision-making and reducing cognitive effort (Dawar & Parker, 1994; Erdem & Swait, 1998; Esch et al., 2006; Jacoby et al., 1971; Kang, 2023; Tian et al., 2022; Vahie & Paswan, 2015; Y. Wang & Tsai, 2014; P. C. S. Wu et al., 2011).

As an integral component of brand equity, brand image significantly influences key customer-centric outcomes. These include attitudes (Homer, 2008), perceived value (Nyadzayo & Khajehzadeh, 2016), perceived quality (Fragkogianni, 2019), satisfaction (Dash et al., 2021), trust (Erkmen & Hancer, 2019), brand loyalty (Brodie et al., 2009), purchase intention (Dash et al., 2021), and willingness to pay a premium (Anselmsson et al., 2014).

In essence, brand image shapes the attitude and enhances perceived value and quality while increasing satisfaction through expectation fulfillment. It bolsters trust by conveying brand reliability and fosters brand loyalty through emotional connections and consistent need fulfillment. Additionally, a strong brand image positively influences purchase intentions and increases the likelihood of customer's willingness to pay a premium, thanks to high-value and quality perceptions.

Table 5 - Summary of Research on Brand Image Antecedents

| S.No. | Antecedent          | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | References                                                                                                                                    |
|-------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Brand attitude      | brand attitude, which is consumers' overall evaluation, is also crucial in enhancing brand image (Low & Lamb, 2000). According to Keller (1993; 1998), brand attitude is an essential brand association that forms the brand image.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | (Faircloth et al., 2001; Low & Lamb, 2000)                                                                                                    |
| 2     | Brand authenticity  | Research suggests that brand authenticity enhances brand image. Rodrigues (2021) suggested that authenticity significantly influences brand image, affecting consumer satisfaction and brand love. Fritz (2017) identified brand authenticity antecedents, such as heritage, nostalgia, commercialization, clarity, social commitment, legitimacy, self-congruence, and employee passion, and found it positively impacts relationship quality and consumers' behavioral intentions in the luxury hotel industry.                                                                                                                                                                                                                           | (Rodrigues et al., 2022), (Fritz et al., 2017),                                                                                               |
| 3     | Brand awareness     | Brand awareness impacts - perceived quality, brand associations, and brand loyalty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | (Azzari & Pelissari, 2020; Esch et al., 2006)                                                                                                 |
| 4     | Brand communication | Brand communication, conveyed through advertising and marketing messages, is pivotal in shaping brand perception, presenting attributes, benefits, personality, user imagery, and emotional appeals (Dahlén et al., 2009; Yoo et al., 2000). The brand communication-image relationship extends from traditional to social media platforms (Braun et al., 2014; Bruhn et al., 2012; Chakraborty & Biswal, 2020; Chinomona, 2016; Kim & Lee, 2018). Brand-audience communication efficacy can enhance brand awareness and image (Esch et al., 2006). Additionally, brand image is influenced by personality—characteristics and traits that distinguish a brand from its competitors (Freling & Forbes, 2005), per Aaker's (1997) framework. | (Braun et al., 2014; Bruhn et al., 2012; Chakraborty & Biswal, 2020; Chinomona, 2016; Dahlén et al., 2009; Kim & Lee, 2018; Yoo et al., 2000) |
| 5     | Brand personality   | Brand personality positively impacts product evaluations. Exposure to a brand's personality increases the quantity and quality of brand associations, fostering unique, congruent, and robust connections with the brand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (Freling & Forbes, 2005)                                                                                                                      |
| 6     | Brand reputation    | Brand reputation is the overall evaluation of a brand's performance by its stakeholders. A positive brand reputation can enhance brand image, while a negative brand reputation can harm it. The two constructs are used interchangeably in literature (Foroudi et al., 2020).                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (Foroudi et al., 2020; Koubaa, 2008)                                                                                                          |
| 7     | Brand trust         | Brand trust is also essential for enhancing brand image. It refers to the extent to which consumers believe in the reliability and credibility of a brand. When brand trust is high, it could result in a more favorable brand image (Wiedmann & von Mettenheim, 2021).                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (Rakjit & Laohavichien, 2020; Wiedmann & von Mettenheim, 2021)                                                                                |
| 8     | Country of origin   | The country-of-origin image had a positive effect on brand image and brand evaluation. The country-of-origin image positively impacts brand image and evaluation as it offers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (Hien et al., 2020), (Pharr, 2005)                                                                                                            |

| S.No. | Antecedent    | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                          | References                                                                                                                                 |
|-------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|       |               | perceived quality cues, particularly when countries are associated with producing high-quality products, acting as a trust-enhancing heuristic for consumers.                                                                                                                                                                                                                                                                                         |                                                                                                                                            |
| 9     | CSR           | CSR positively affects a brand image by providing information about the company's values. However, the valence of this influence may vary by stakeholder, and different dimensions of CSR exert different degrees of influence. Additionally, brand image is strengthened by CSR if the company knows how to elicit trust, build credibility, and develop a solid reputation in the eyes of others.                                                   | (Bianchi et al., 2019)                                                                                                                     |
| 10    | Price         | Price has a significant relationship with perceived quality, which reflects brand image. The use of price deals negatively affects the perception of the brand's quality and image. Price deals have been considered to weaken brand equity despite the short-term benefit they provide to the consumer.                                                                                                                                              | (Hunt & Keaveney, 1994; Rao & Monroe, 1989; Shen et al., 2007; Villarejo-Ramos & Sánchez-Franco, 2005)                                     |
| 11    | Brand quality | Brand quality is another important element of brand image. Consumers associate high-quality products with a positive brand image (Quoquab et al., 2021).<br><br>Perceived quality amplifies brand image by assuring consumers of product excellence and fostering trust and satisfaction. This perception of quality translates into positive associations with the brand, enhancing its reputation and positioning it favorably in consumers' minds. | (Dam & Dam, 2021; Erkmen & Hancer, 2019; Nyadzayo & Khajehzadeh, 2016; Quoquab et al., 2021; Singh et al., 2021; P. C. S. Wu et al., 2011) |

Table 6 - Summary of Research on Brand Image Outcomes

| S.No. | Outcome           | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                                      | References                                                                                                                                                                                              |
|-------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Attitude          | Attitudes are driven by persuasive mechanisms that are image-based. Low brand image is more damaging than low perceived quality. Non-attribute types of brand beliefs make an incremental contribution to explaining the variance in hedonic attitudes but not utilitarian attitudes. Overall, brands with low perceived images are more vulnerable than those with low product quality.                                                                          | (Homer, 2008)                                                                                                                                                                                           |
| 2     | Perceived value   | Brand image contributes to the perceived value as customers often associate well-known brands with greater benefits. The overall perception of a brand can enhance the customers' belief that they receive more value for the price they pay.<br><br>Customer value can promote trust and commitment, promoting a positive brand image.                                                                                                                           | (Nyadzayo & Khajehzadeh, 2016)                                                                                                                                                                          |
| 3     | Perceived quality | A strong and positive brand image signals consumers that a product or service is high quality. Consumers often use the reputation and image of a brand as a heuristic or shortcut to gauge the quality of its offerings, especially when they lack the ability or resources to evaluate the inherent attributes of a product or service themselves. Therefore, brands with a positive image are often associated with superior quality in the minds of consumers. | (Chiang & Jang, 2007; Fragkogianni, 2019; Jacoby et al., 1971; Vranešević & Stančec, 2003; Yoo et al., 2000)                                                                                            |
| 4     | Satisfaction      | A positive brand image can lead to greater satisfaction as it sets up positive expectations, and when a brand consistently meets or exceeds these expectations, it results in a satisfying customer experience. Additionally, a strong brand image often correlates with quality and value, key determinants of customer satisfaction.                                                                                                                            | (Y. S. Chen, 2010; Dash et al., 2021; Fragkogianni, 2019; H. Song et al., 2019; Tian et al., 2022), (Erkmen & Hancer, 2019), (Esch et al., 2006), (Nyadzayo & Khajehzadeh, 2016), (Waluya et al., 2019) |
| 5     | Trust             | A positive brand image instills trust as it conveys the brand's credibility, reliability, and consistency in delivering quality products or services. Moreover, it can foster emotional connections, which leads to higher trust, as consumers are more likely to trust brands they perceive as familiar, reliable, and that align with their values and expectations.                                                                                            | (Y. S. Chen, 2010; Chiang & Jang, 2007; Lien et al., 2015; H. Song et al., 2019; Tian et al., 2022), (Erkmen & Hancer, 2019), (Esch et al., 2006)                                                       |
| 6     | Loyalty           | A positive brand image reinforces brand loyalty by creating emotional connections, fostering a sense of trust between the brand and the customer, and fulfilling customers' needs consistently. This familiarity and positive association lead to repeated purchases and loyalty towards the brand over time, even in the face of competition.                                                                                                                    | (Brodie et al., 2009; H. Song et al., 2019; Sürücü et al., 2019; Tian et al., 2022)                                                                                                                     |

|   |                    |                                                                                                                                                                                                                                         |                                                                                                                                      |
|---|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 7 | Purchase intention | A positive brand image enhances purchase intentions as consumers are more likely to buy from brands they perceive positively. It creates an attraction and a desire to associate with the brand, increasing the likelihood of purchase. | (Dash et al., 2021; Esch et al., 2006; Farzin & Fattahi, 2018; Hien et al., 2020; Pharr, 2005)                                       |
| 8 | WTPP               | A robust brand image often leads to a greater willingness to pay a premium. When customers perceive a brand as high-value, exclusive, or superior in quality, they are more willing to pay extra for its products or services.          | (Anselmsson et al., 2014; Del Río et al., 2001; Fragkogianni, 2019; Masuda & Kushiro, 2018; Rahimnia & Sarvari, 2019; Riefler, 2020) |

## Rating Volume

Rating volume (referred to simply as volume) is the number of previous buyers who rated the product. It reflects the product's total number of users (or frequency) and popularity. The influence of rating volume is not well-documented, so we draw upon research concerning the impact of review volume.

Several arguments support the influence of rating and review volume. First, individuals are sensitive to information frequency, which shapes preferences and choices (Hasher & Zacks, 1984). Second, the rating volume serves as social proof (Cialdini, 2021), representing the majority opinion. Such a majority opinion reflects the correctness of the position and its popularity (Baker & Petty, 1994) and is difficult to ignore (Weaver et al., 2007). Higher volume can suggest that consumers care about the brand or product because they took the time to write a review about it (Maslowska et al., 2017).

In turn, the perception of the majority opinion reduces purchase uncertainty based on the theory that an individual's susceptibility to others' influence is a multiplicative function of strength, immediacy, and number (Latané, 1981).

Third, drawing on message repetition research, a higher eWoM volume affects consumer attention (Cacioppo & Petty, 1989; Tellis, 1988), increases observability (Cheung & Thadani, 2010), and enhances persuasiveness (Chevalier & Mayzlin, 2006). In extreme cases, the influence of majority opinion can lead to herding behavior and bandwagon effects where consumers are swayed merely by the availability of others' opinions, regardless of positivity or negativity (Anantharaman et al., 2022; Huang & Chen, 2006).

Review volume's impact varies depending on consumer involvement; low-involvement consumers are more influenced by volume, while high-involvement consumers rely on the quality of core arguments in reviews.

## Research Findings on Volume

The literature shows mixed findings on the interaction between star ratings and review volume. Several studies have investigated their influence on different aspects of consumer behavior, leading to some contradictory conclusions. Table 7 summarizes the key findings in the domain.

For instance, de Langhe et al. (2016) found that average ratings impact consumers' quality perceptions more than the volume of reviews. In contrast, Khare et al. (2011) discovered that

the volume of reviews strongly influences the perception of the reviewed product more than the valence or the average rating.

Regarding sales and revenue, De Pelsmacker et al. (2018) suggest that review volume drives sales, whereas review valence affects revenue. Interestingly, Hong and Pittman (2020) and Ren et al. (2018) found that review volume significantly influences consumers' purchasing decisions, but only when reviews are negative.

Moreover, a study by Flanagan et al. (2014) indicates that consumers favor products with fewer high ratings than those with a high volume of reviews. However, Watson et al. (2018) counter this by stating that consumers' preference for higher-rated options with fewer reviews is weaker than that for lower-rated options with more reviews.

The relationship between review volume and trust also varies, with Gavilan et al. (2018) suggesting that positive ratings strengthen this relationship more than negative ones. This relationship is also moderated by factors such as the desire to be different from others (Khare et al., 2011), regulatory focus, and product category (Kordrostami et al., 2021).

Regarding the influence of rating and volume on sales, the findings differ, too. For instance, You et al. (2015) and Yang et al. (2018) found that ratings had a greater influence on sales than review volume, with Floyd et al. (2014) also sharing similar views. Conversely, Rosario et al. (2016) reported in their meta-analytic study that review volume was more strongly related to sales than review valence. For movie box office performance, some researchers argue that volume has the most significant effect (Kim et al., 2019; Liu, 2006), while others believe review valence is the primary driver (Chintagunta et al., 2010). In conclusion, the literature has a diversity of findings concerning the interplay between review volume and star ratings, demonstrating that their influence on consumer behavior can be complex and multifaceted.

Table 7 – Summary of Research on Rating Volume

| S. No. | Outcome           | Description                                                                                                                          | References                               |
|--------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 1      | Quality           | Average ratings impact consumers' quality perceptions more than the volume of reviews.                                               | (de Langhe et al., 2016)                 |
|        |                   | The volume of reviews strongly influences the perception of the reviewed product more than the valence or the average rating.        | (Khare et al., 2011)                     |
| 2      | Sales and Revenue | Review volume drives sales, whereas review valence affects revenue.                                                                  | (De Pelsmacker et al., 2018)             |
|        |                   | Ratings had a greater influence on sales than review volume.                                                                         | (Y. Yang et al., 2018; You et al., 2015) |
|        |                   | Review volume was more strongly related to sales than review valence.                                                                | (Rosario et al., 2016)                   |
|        |                   | For movie box office performance, the volume has the most significant effect.                                                        | (K. Kim et al., 2019; Liu, 2006)         |
|        |                   | For movie box office performance, review valence is the primary driver.                                                              | (Chintagunta et al., 2010)               |
| 3      | Purchase decision | Review volume significantly influences consumers' purchasing decisions, but only when reviews are negative.                          | (Hong & Pittman, 2020; Ren et al., 2018) |
|        |                   | Consumers favor products with fewer high ratings over those with a high volume of reviews.                                           | (Flanagin et al., 2014)                  |
|        |                   | Consumers' preference for higher-rated options with fewer reviews is weaker than that for lower-rated options with more reviews.     | (Watson et al., 2018)                    |
| 4      | Trust             | The relationship between review volume and trust also varies; positive ratings strengthen this relationship more than negative ones. | (Gavilan et al., 2018b)                  |
|        |                   | This relationship is also moderated by the desire to be different.                                                                   | (Khare et al., 2011)                     |
|        |                   | Regulatory focus and product category factors also moderate this relationship.                                                       | (Kordrostami et al., 2021)               |

## **Purchase involvement**

Purchase involvement refers to the degree of consumer engagement in the decision-making process for a particular purchase. This engagement, characterized by the effort, time, and thought invested in decision-making, reflects the perceived significance of the decision and its associated risks (Mittal, 1989; Zaichkowsky, 1985a). Factors contributing to high purchase involvement include financial and time concerns, perceived risks, the product's perceived importance, and whether the consumer is a first-time buyer. Product involvement influences purchase involvement, shaping how customers perceive and engage with products and services.

## **Outcomes of High vs. Low Purchase Involvement**

High purchase involvement typically results in extensive research, careful evaluation, and thoughtful consideration of options, whereas low involvement often leads to impulsive or habitual purchases. However, the level of involvement significantly impacts consumer decision-making, affecting aspects such as product evaluation, brand perceptions, willingness to pay, and electronic word-of-mouth.

### *Impacts of High Purchase Involvement*

High purchase involvement has been linked with increased satisfaction, trust, loyalty, and commitment (Sanchez-Franco, 2009; Van Tuan, 2021), leading to positive brand perceptions (Lang et al., 2022) and a greater willingness to pay (Dominique-Ferreira et al., 2016). Even lesser-known brands can benefit from high purchase involvement, gaining support for high-involvement items (Parkvithee & Miranda, 2012). Furthermore, high-involvement consumers are likelier to share their negative experiences, impacting electronic word-of-mouth (E. E. K. Kim, 2017).

### *Influence of Purchase Involvement on Consumer Behavior*

Individual traits like uncertainty orientation (Smith & Bristor, 1994), materialism (Rahman et al., 2017), emotional awareness, and internal locus of control (Bateman & Valentine, 2021) can alter the level of purchase involvement. This involvement further influences the depth of information processing during purchase decisions, with more detailed processing seen in high-involvement situations (Chuanlei et al., 2019).

### *Purchase Involvement as a Moderator in Consumer Behavior*

Purchase involvement can moderate various relationships between variables and consumer behavior. For instance, it can impact the relationship between the country of origin and purchase intention (Parkvithee & Miranda, 2012) and the link between informative influence and purchase intention (Ding et al., 2020). Moreover, it can influence the efficacy of messages from high and low-involvement brands (Coursaris et al., 2016). Low involvement often leads to more brand-switching and resistance to factors like price and preferred brand stockouts (Jensen & Hansen, 2006).

Overall, purchase involvement significantly influences consumer behavior. Its role as a situational variable is key to answering research question #4, detailed in Section 1.7. In contrast, Lang et al. (2022) did not find a positive relationship between advertising, brand associations, and brand equity for low-involvement products, highlighting the complexity of this relationship and providing further avenues for research.

In conclusion, purchase involvement has a significant impact on consumer behavior. This research investigates the role of purchase involvement as a situational variable.

## **Ratings and WTPP**

Star ratings directly affect how much consumers are willing to pay and how much extra they are willing to pay. The higher the star ratings, the more consumers are willing to pay (Belarmino et al., 2021). For instance, guests are willing to pay a premium for high-rated hotels as they associate these high ratings with a better experience (Belarmino et al., 2021). Conversely, lower star ratings necessitate discounts to retain product appeal (Belarmino et al., 2021). Research shows that consumers generally pay more for higher-rated goods or services, indicating a positive influence of star ratings on WTPP (Israeli, 2002).

Consumer ratings also reflect satisfaction regarding the cost-benefit ratio of their experiences, such as hotel stays, and can significantly influence their WTP. A higher rating equates to increased WTP, emphasizing the role of customer satisfaction as a signal in decision-making (Castro et al., 2016). Conversely, lower star ratings necessitate discounts to retain product appeal, indicating a nuanced relationship between star ratings and price effects (Israeli, 2002; Li & Hitt, 2010).

Additionally, several attributes, including star rating, brand, and green responsibility, significantly influence travelers' WTP. For example, hotel attributes can strongly influence WTP (Sangwichien & Jaroenwisan, 2017). The study thus corroborates the substantial influence of consumer and star ratings, brand, and other attributes on consumers' WTP. However, price effects can bias unidimensional ratings, implying that firms should factor these effects into their marketing strategies (Li & Hitt, 2010).

Table 8 provides details of the findings from different studies, offering a comprehensive summary of the research discussed.

In conclusion, reviews and star ratings significantly shape consumers' WTP and WTPP, influencing perceptions and acting as proxies for quality.

## **Reviews and WTPP**

Reviews and star ratings substantially influence consumers' Willingness to Pay (WTP) and Willingness to Pay Premium (WTPP), with higher ratings translating into greater WTP. High star ratings significantly enhance consumers' willingness to pay more by fostering perceptions of a positive brand image and superior quality (Flanagin et al., 2014; Boden et al., 2020).

The role of reviews extends beyond simple ratings. The content and valence of reviews significantly influence WTP (Book et al., 2016; Belarmino et al., 2021). Reviews containing positive and negative information were more persuasive and increased consumer product purchase intention, moderated by the importance, proportion, and position of negative information (Fengjun et al., 2020). Furthermore, additional information, such as high expert ratings, can enhance WTP, as observed in the context of wine (Ribeiro et al., 2020).

Studies indicate that sentiment in Electronic Word of Mouth (EWOM) is pivotal in driving WTP. Positive sentiment increases WTP, whereas negative sentiment reduces it.

Interestingly, the sheer volume of EWOM does not impact WTP as significantly as sentiment does, signifying that popularity alone is not a primary WTP determinant (Nieto-García et al., 2017). However, high EWOM volumes can intensify sentiment's influence on WTP.

Interestingly, the dynamics of these influences change in the presence of uncertain information. Uncertain information in reviews can decrease WTP due to perceived risk (Wu & Gaytán, 2013), but this effect can be counterbalanced by a history of positive seller behavior, highlighting the importance of maintaining a good online reputation (Pavlou & Dimoka, 2006). Moreover, engagement with EWOM positively impacts commitment, brand trust, and WTP (Lis & Horst, 2013).

Also, fewer reviews do not significantly lower how much consumers are willing to pay. However, when a product garners numerous reviews, especially over 100 or between 51 and 100, it increases consumers' willingness to pay. This suggests that having many reviews can boost consumers' perceived value of a product or service (Belarmino et al., 2021).

Table 8 provides details of the findings from different studies, offering a comprehensive summary of the research discussed.

Table 8 - Summary of Research on Star Ratings / Reviews and WTP / WTPP / Price

| Study                              | Predictor                     | Outcome       | Findings                                                                                                                                                               |
|------------------------------------|-------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Abrate and Viglia (2016)           | Online rating                 | Price         | Online ratings have a larger impact on the actual price than the catalog price, indicating that increasing the value of online reviews improves price positioning.     |
| Abrate et al. (2012)               | WTPM, Last minute             | Price         | Hotel pricing varies with the hotel's star rating and last-minute bookings; high-star hotels can increase margins when prices rise more than those of low-star hotels. |
| Israeli (2002)                     | Star rating                   | Price         | The hotel's star rating significantly explains the price variation in room prices.                                                                                     |
| Kocas and Akkan (2016)             | Online ratings                | Price         | Positive online ratings and reviews can increase sales by converting more visitors into actual buyers, thereby affecting product pricing.                              |
| Öğüt and Onur Taş (2012)           | Consumer rating               | Price         | Higher customer ratings increase hotel prices and sales, but higher star ratings do not increase sales.                                                                |
| X. Hu et al. (2019)                | WTP, Online ratings           | Price         | The effect of online ratings on prices decreases over time, and guests in high-end hotels are more sensitive to price changes.                                         |
| Zimmermann et al. (2018)           | WTP, Rating variance          | Price         | Lower quality variance leads to higher prices due to fewer associated quality issues.                                                                                  |
| Li and Hitt (2010)                 | Rating                        | Product Value | Unidimensional ratings, affected by price, are more related to product value than product quality.                                                                     |
| Belarmino et al. (2021)            | User ratings                  | WTP           | User-generated star ratings and reviews significantly impact WTP; more reviews and higher star ratings increase WTP.                                                   |
| Book et al. (2016)                 | Review valence                | WTP           | The WTP for positively reviewed resorts increases with the price up to 50%, but for negatively reviewed resorts, a lower price increases perceived quality.            |
| Castro et al. (2016)               | Consumer rating               | WTP           | Higher consumer ratings increase customers' WTP for a hotel stay.                                                                                                      |
| Lis and Horst (2013)               | EWOM                          | WTP           | Customer integration with eWoM positively affects commitment, brand trust, and WTP.                                                                                    |
| Nieto-García et al. (2017)         | EWOM Valence                  | WTP           | WTP is most influenced by eWoM valence. Positive eWoM scenarios lead to higher WTP. Volume moderates the effect of valence on WTP.                                     |
| Otto et al. (2018)                 | Many factors                  | WTP           | Various factors, such as income and product attributes, influence WTP.                                                                                                 |
| Sangwichien and Jaroenwisai (2017) | Star rating, Brand            | WTP           | Star rating, brand, and green responsibility significantly affect the traveler's WTP.                                                                                  |
| Schamel (2012)                     | Reputation                    | WTP           | WTP is significantly impacted by reputation within the wine industry, such as producer, regional, and grape variety reputation.                                        |
| Wu and Gaytán (2013)               | Risk, Price                   | WTP           | Risk assessments and product price influence WTP.                                                                                                                      |
| Nikhashemi et al. (2019)           | EWOM Commitment               | WTPM          | Customers' commitment to spreading positive word of mouth non-linearly affects their WTPM. High commitment increases WTPM.                                             |
| Pavlou and Dimoka (2006)           | Extraordinary feedback, Trust | WTPP          | Exceptional past seller behavior creates price premiums (WTPP) by engendering buyers' trust in the sellers' benevolence and credibility.                               |

## **Brand image and WTPP**

Several studies have delved into the influence of brand image, an amalgamation of different brand associations, on consumers' willingness to pay (WTP) and a premium (WTPP).

Anselmsson et al. (2014) conceptualized brand image as a composite of awareness, perceived quality, loyalty, uniqueness, social image, origin, and corporate social responsibility (CSR). According to information processing theory, consumers use these factors as heuristic cues to reduce the complexity of decision-making (Petty et al., 1983). Consequently, these associations significantly determine customers' WTP for food brands.

Persson (2010) studied brand image in a B2B context, focusing on familiarity, product solution, service, distribution, relationship, and company reputation. They found that these elements, essential in building trust (Morgan & Hunt, 1994), positively correlate with a higher price premium, reinforcing the trust-commitment theory in B2B relationships.

Rahimnia Sarvari (2019) studied brand image through the lens of brand globalness, perceived quality, and brand prestige. They highlighted how consumers' perceived value and cognitive evaluations, driven by these elements, influence their WTP more, substantiating Zeithaml's (1988) perceived value model.

Yodpram Intalar (2020) considered brand attitude, brand image, and brand loyalty as key components of brand image. Their study resonates with the Attitude-Behavior-Context theory (Guadagno & Cialdini, 2010), suggesting that emotional perception towards a brand, the customer's long-term assessment, and brand loyalty drive WTPP.

Masuda Kushiro (2018) focused on private-label vegetables and identified brand name, brand awareness, and perceived quality as critical aspects of brand image. In line with the Signal theory (Spence, 2002), they noted that consumers would pay a premium when they perceived a difference in quality, using these cues to infer product quality.

In conclusion, these studies reinforce that brand image, viewed as a composite measure encompassing various brand associations, significantly impacts WTP and WTPP. While each study emphasizes different brand image dimensions, they collectively underscore the influence of a robust and positive brand image in encouraging consumers to pay more.

## **Brand associations and WTPP**

Various studies underscore the influence of individual brand associations on consumers' willingness to pay (WTP) and willingness to pay a premium (WTPP) for a brand.

Del Río et al. (2001) highlighted brand functions, including guarantee, personal identification, social identification, and status, as significant factors influencing consumers' readiness to pay a premium. Here, the guarantee is conceptualized as a company's commitment to product reliability and performance, stimulating consumers to pay more for its perceived security. Personal identification represents the consumers' emotional attachment to a brand, influencing WTP due to the brand's alignment with their self-image. Social identification stems from a brand's role in reflecting group affiliations, leading consumers to pay a premium to either associate or dissociate with certain social groups. The status reflects the prestige and admiration associated with a brand, which can induce a premium price.

Similarly, Delmas & Lessem (2017) emphasized the role of price, quality, and brand, including eco-friendliness, in driving WTPP. These associations highlight the influence of sustainability on consumers' pricing decisions.

Studies by Winit et al. (2014) and Davvetas et al. (2015) established the link between perceived brand globalness and higher WTP, demonstrating the value consumers place on brands with international recognition and widespread appeal. However, Riefler (2020) suggested that perceived globalness does not independently impact WTP without brand authenticity, indicating the importance of genuine, consistent brand experiences in pricing decisions.

Brand novelty and heritage also play critical roles in consumers' WTP and WTPP, as suggested by Liu et al. (2020) and Pecot et al. (2018). Consumers will pay more for novel experiences or brands with a rich, familiar history.

Yin et al. (2022) and Yahua Zhang (2012) demonstrated the power of brand reputation, including product safety and punctuality, in affecting consumers' WTP. Rashid Byun (2018) stressed the role of brand trust, demonstrating that consumers are willing to endure price increases to maintain a relationship with trusted brands.

The influence of brand awareness and attitude on consumers' WTPP is emphasized by Phong et al. (2021) and Augusto & Torres (2018). Brand awareness enhances familiarity, while positive brand attitudes build a preference that can justify premium prices.

Lastly, Zhang et al. (2020) and Rahman & Reynolds (2019) found that consumers and the brand's perceived value significantly impact WTPP. This suggests consumers weigh a brand's perceived benefits and value alignment when considering premium prices.

Table 9 summarizes the findings from an exhaustive review of WTPP's relationship with different brand constructs and brand associations.

The impact of brand constructs on willingness to pay (WTP) and willingness to pay a premium (WTPP) has been widely studied. Based on the table provided, it is evident that brand constructs can be broadly categorized into functional, affective, symbolic associations, and brand image, each impacting consumers' WTP and WTPP differently.

Table 9 – Summary of Research on Brand Constructs and WTPP

| Brand construct                            | Studies                                                                                   | Description                                                                                           |
|--------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Affective brand associations               |                                                                                           |                                                                                                       |
| Brand attitude                             | O'Cass & Choy (2008); Augusto & Torres (2018); Yodpram & Intalar (2020)                   | Consumers' overall evaluation or feeling of favorability towards a brand.                             |
| Brand authenticity (emotional)             | Riefler (2020)                                                                            | Brand's genuineness and truthfulness form the emotional connection.                                   |
| Brand CSR (emotional connection)           | Anselmsson et al. (2014); Kucukusta et al. (2013)                                         | Emotionally driven perception of the brand's commitment to social and environmental responsibilities. |
| Brand trust                                | Albert et al. (2013); Rashid & Byun (2018); Wiedmann & von Mettenheim (2021)              | Confidence consumers have in a brand's reliability and integrity.                                     |
| Functional brand associations              |                                                                                           |                                                                                                       |
| Brand attributes and benefits associations | Zhang (2012); Yin et al. (2022)                                                           | Associations are made about specific advantages or characteristics of the brand.                      |
| Brand novelty                              | Liu et al. (2020)                                                                         | Perception of brand's innovativeness and distinctiveness.                                             |
| Brand quality                              | Anselmsson et al. (2014); Chung & Lee (2017); Delmas & Lessem (2017); Winit et al. (2014) | Perceived excellence or superiority of a product.                                                     |
| Brand reputation                           | Schamel & Anderson (2003)                                                                 | Perception of the brand's standing is often linked to product or service reliability.                 |
| Perceived fit                              | Sattler et al. (2010)                                                                     | The degree to which consumers see the brand as compatible with their needs or its intended use.       |
| Safety, health image associations          | Masuda & Kushiro (2018)                                                                   | Perceptions of the brand's impact on consumer health and safety.                                      |
| Symbolic brand associations                |                                                                                           |                                                                                                       |
| Brand globalness                           | Winit et al. (2014); Davvetas et al. (2015); Rahimnia & Sarvari (2019)                    | Perception of the brand's international presence and status.                                          |
| Brand heritage                             | Pecot et al. (2018); Scarpi (2021)                                                        | Perception of the brand's legacy, history, and longstanding traditions.                               |
| Brand origin                               | Anselmsson et al. (2014); Cappelli et al. (2017)                                          | Associations consumers make based on where the brand originates or is manufactured.                   |
| Brand uniqueness                           | Phong et al. (2021)                                                                       | Perception of the brand as being distinct and different from competitors.                             |
| Green brand image                          | Mutlu & Yilmaz (2017); Namkung & Jang (2017); Trivedi et al. (2015)                       | Consumer perceptions of the brand's environmental friendliness and sustainable practices.             |
| Personal values                            | Rahman et al. (2021)                                                                      | The degree to which a brand aligns with or reflects a consumer's beliefs and principles.              |

| <b>Brand construct</b>   | <b>Studies</b>                                                                            | <b>Description</b>                                                                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Brand image              | Del Río et al. (2001); Anselmsson et al. (2014); Yodpram & Intalar (2020)                 | The brand image typically includes functional, affective, and symbolic aspects. However, specific classification would depend on the exact definition used in a given context. |
| Other brand constructs   |                                                                                           |                                                                                                                                                                                |
| Brand engagement         | Wallace et al. (2022)                                                                     | The level of emotional connection and involvement a consumer has with a brand.                                                                                                 |
| Brand love               | Rahman et al. (2021); Santos & Schlesinger (2021); Wong (2023)                            | Consumers form deep affectionate attachments and emotional bonds with a brand.                                                                                                 |
| Brand loyalty            | Kandampully et al. (2015); Masuda & Kushiro (2018); Pourazad et al. (2019)                | Consumers' commitment to repurchase or continue using the brand.                                                                                                               |
| Brand equity             | Hutton (1997); Netemeyer et al. (2004); Sethuraman & Cole (1999); Augusto & Torres (2018) | The added value a brand provides to a product or service, beyond functional aspects, often encompassing affective and symbolic associations.                                   |
| Perceived value          | Li et al. (2012); Pihlström & Brush (2008); Zhang et al. (2020)                           | The consumer's assessment of the brand's overall worth often weighs cost against benefits (both tangible and intangible).                                                      |
| Sociodemographic factors | Gulseven (2018)                                                                           | Consumer perceptions of the brand are based on societal and demographic aspects, often tied to image or status.                                                                |

## **Theories used in this research**

This section discusses the various theoretical perspectives that can potentially explain how ratings influence shoppers' brand image perceptions and WTPP. We also discuss the theories that can explain how rating volume and purchase involvement may affect these relationships. The theoretic foundation of the relationships between ratings with brand image and WTPP and the influence of purchase involvement and rating volume on these relationships is drawn from several theories: (1) consumer decision-making theory and consumer behavior model, (2) signaling theory, (3) social influence theory, (4) elaboration likelihood model and heuristic-systematic model.

The next section discusses star ratings in the context of consumer decision-making and consumer behavior, the two closely related but separately studied streams of literature.

### **Consumer decision-making models and star rating**

Information search and evaluation of alternatives are integral components of consumer decision-making models, as highlighted in various studies (Engel, Kollat, & Blackwell, 1978; Sheth, 2020).

The EKB model, proposed by Engel, Kollat, and Blackwell (1978), describes two critical stages: information search and evaluating alternatives. Initially, during the information search stage, consumers actively seek information to bridge their knowledge gaps, reduce uncertainty and risks (Berger & Calabrese, 2007), gain confidence in their purchase, and make informed decision that the purchase decision aligns with their values and goals (Bettman, 1979; Engel, Kollat, & Blackwell, 1978). This stage involves internal recall of past experiences and external sourcing from various channels like friends, family, ratings, reviews, and commercial media (Hulland & Kleinmuntz, 1994; Schmidt & Spreng, 1996). In online shopping, the process frequently involves consulting ratings and reviews (as detailed in Chapter 1) and other information such as product specifications, prices, and availability. The ratings and reviews offer valuable insights into product quality and customer satisfaction. The process concludes when consumers feel they have enough information to form an 'awareness set' of potential choices, transitioning from information gathering to evaluation and final decision-making (Sheth, 2020). Several other factors, such as – the amount of information available, time pressure, and monetary cost of information search, also influence the extent of information search (Mata & Nunes, 2010).

The second stage, evaluating alternatives, involves consumers assessing and comparing the available options based on various criteria such as features, prices, benefits, and costs. The process involves organizing and using the information from the search process and relating it meaningfully to the consumer's recognized need, want, or desire (Vanhonacker, 1985).

It is argued that star ratings as initial pieces of information presented to a shopper on a product search page and the individual product page (in the information search phase) at any e-commerce platform can significantly influence shoppers perception and later product evaluation and comparisons (primacy effect as a part of serial position effects in memory) (Murdock, 1962; Murphy et al., 2006). Such evaluations can influence shoppers' willingness to pay and purchase intention because higher star ratings and rating volumes reflect product quality and popularity. This results in a greater likelihood of shoppers adding high star ratings and higher rating volumes of products to their awareness set. Further, ratings, by being the first few information items displayed on the product page, are more likely to be encoded into long-term memory and set a context or framework within which later information, such as product benefits and reviews, are interpreted.

### **Consumer behavior theories and star ratings**

Several positivist approaches based on attitude, behavior, cognition, economics, motivations, traits, and situations also explain how ratings and rating volume might influence consumer behavior.

#### Attitude theory

The Attitudinal Approach, as outlined by (Fishbein & Ajzen, 1975)

Fishbein and Ajzen (1975) connect attitudes toward products with beliefs about outcomes and subjective norms. Here, star ratings and their volumes serve as cues for product quality and social proof, influencing consumer purchasing behavior. High ratings foster positive product attitudes, and a high rating volume can signify strong subjective norms, affecting purchase intentions.

#### Behavioral theories

Behavioral theories by Ivan Pavlov (1849–1936) and Burrhus Frederic Skinner (1904–1990) regarding classical and operant conditioning (Akpan, 2020) suggest that star ratings may trigger conditioned responses in purchasing decisions. Particularly, operant conditioning (Bandura, 1977; Skinner, 1965) explains star rating and purchase behavior as a result of

learned associations between actions and outcomes. When consumers repeatedly experience satisfaction from purchasing highly rated products, this satisfaction is a positive reinforcement, increasing the likelihood of relying on star ratings for future purchases. Conversely, dissatisfaction from poorly-rated products acts as a negative reinforcement, discouraging reliance on these ratings.

### Cognitive theories

From a cognitive standpoint, several theories shed light on how star ratings influence consumer behavior:

#### *Attention theory*

Attention theory suggests that human attention is selective, focusing on a limited aspect of the environment while filtering out other stimuli. Key arguments include the limitations of cognitive processing capacity, leading to the prioritization of certain stimuli based on salience and relevance (HONG et al., 2004; Reisberg, 1997). Applied to star ratings, attention theory implies that because star ratings are typically designed to be visually prominent, they are more likely to attract consumer attention amidst a myriad of online information, thereby influencing perceptions and purchase decisions by standing out in the crowded digital landscape.

#### *Information Processing theories*

Theories of information processing, such as the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) and the Heuristic-Systematic Model (HSM) (Bohner et al., 1995; Chaiken, 1980), help elucidate how personal characteristics may guide the route shoppers take when processing information like star ratings.

The ELM addresses how persuasive messages can change an individual's attitudes and beliefs. It distinguishes between two routes to persuasion – the central route and the peripheral route. The central route involves thoughtful consideration of the arguments presented in a message, leading to attitude changes that are more likely to be enduring and predictive of behavior. Conversely, the peripheral route involves less cognitive effort and relies on superficial cues, resulting in more temporary and less predictive attitude changes. This model helps explain why some persuasive messages are more effective than others, depending on the audience's involvement and ability to process the message.

The ELM posits that individuals with a high need for cognition or involvement—both enduring and situational—are likely to process information via the central route (C. Cheung et al., 2012; C. M. K. Cheung & Thadani, 2012). These individuals might delve into detailed reviews, specifications, or other comprehensive information about the product rather than depending solely on the heuristic of star ratings. Conversely, shoppers with low involvement, need for cognition, or limited cognitive resources may opt for the peripheral route, relying heavily on the star rating as a simplified shortcut to gauge product quality (Baek et al., 2012; C. Cheung et al., 2012). This dichotomy underscores the significant role of individual characteristics in information processing and decision-making, suggesting that the same star rating may be processed differently depending on the shopper's cognitive style and level of involvement.

The HSM, developed by Shelly Chaiken, is similar in that it describes two modes of processing persuasive messages: systematic and heuristic. In systematic processing, individuals engage deeply with the content of the message, while in heuristic processing, individuals rely on simple decision rules or cues. This model is particularly useful in understanding how people form judgments and make decisions when unable or unwilling to process information in depth.

In this research on how star ratings influence consumer behavior, these theories can provide a framework for understanding how online ratings persuade consumers. For instance, a consumer highly involved in the purchase might engage in central or systematic processing of detailed reviews (as per ELM or HSM), while another might rely on the heuristic cue of a simple star rating, indicative of peripheral or heuristic processing. These theories can thus enrich the analysis of the roles of brand image, consumer involvement, and review volume in influencing consumers' willingness to pay a premium.

#### *Bounded rationality theory*

Herbert A. Simon's Bounded Rationality Theory (Simon, 1957) posits that while individuals strive to make rational decisions, their cognitive limitations and the constraints of the environment often result in "satisficing" rather than optimizing solutions. This means that people aim for a decision that is good enough under the circumstances, given their inability to process all available information or foresee all outcomes.

Applied to star ratings, bounded rationality suggests that consumers use these ratings as a heuristic to simplify decision-making. Since evaluating every aspect of a product is

cognitively demanding, star ratings provide a manageable way to assess product quality quickly. Consumers satisfice by accepting the aggregated judgment of star ratings as an adequate basis for their purchase decision rather than seeking comprehensive information.

#### *Schema theory*

Star ratings also activate consumers' beliefs about quality, according to schema theory (Neisser, 1976). Schemas about product quality are formed and modified based on a consumer's experiences and knowledge. High star ratings become part of a 'quality product' schema, where the brain organizes and interprets these ratings as indicators of quality, reliability, or customer satisfaction. This schema guides consumers in interpreting star ratings and influences their purchasing decisions (Wu et al., 2018).

#### Economics theories

Economic theories, particularly those informed by Muth (1961), can potentially explain how consumers might use star ratings to rapidly assess value and utility. Similarly, Kahneman & Tversky's (1973) Prospect Theory can be applied to understand how consumers utilize star ratings as heuristics for a subjective evaluation of gains (such as quality and popularity) and losses (like poor performance or dissatisfaction), thereby aiding in their complex economic decision-making processes.

#### Motivation theories

Motivation theories, such as Maslow's Hierarchy of Needs (Maslow, 1958) and Self-Determination Theory (Ryan & Deci, 2000), offer insights into how star ratings influence consumer behavior. According to Maslow's model, star ratings address needs for safety (by reducing risk and uncertainty in online shopping), esteem (offering social validation through popular choices), and self-actualization (aiding in the fulfillment of personal goals, like fitness or self-improvement). Self-Determination Theory suggests that star ratings can enhance feelings of autonomy (offering choice), competence (making informed decisions), and relatedness (connecting with others through shared product preferences). These theories suggest that star ratings tap into fundamental human needs and motivations, guiding and reassuring consumers in their online purchasing decisions.

#### Social influence theories

The potential influence of star ratings on consumer behavior can be explored through the lens of social influence (Festinger, 1954). Cialdini's concept of Social Proof, alongside

Informational and Normative Social Influence theories. Social Proof posits that individuals look to others' actions to guide their behavior in uncertain situations (Cialdini, 1984, 2001). High star ratings could serve as a form of social proof, indicating a product's acceptance and endorsement by others, which might sway consumers' decisions.

Informational Social Influence involves looking to others when in doubt, particularly in ambiguous situations, to make decisions (Deutsch & Gerard, 1955; Flanagin & Metzger, 2013). It is based on the assumption that others' behavior is correct. Regarding star ratings, consumers might interpret high ratings as a collective endorsement of product quality, influencing their purchase decisions.

Normative Social Influence relates to conforming to the expectations of others to be liked or accepted (Baek et al., 2015; Deutsch & Gerard, 1955). In the context of star ratings, choosing products with high ratings can be seen as aligning with the popular choice, thereby adhering to perceived social norms.

Both theories underscore how perceptions of others' choices and opinions, as reflected in star ratings, can significantly impact consumer behavior. People learn what is right or appropriate by observing others' behavior and assuming they can access accurate information.

In summary, these theoretical frameworks collectively highlight the complex role of star ratings and rating volume in online consumer decision-making, illustrating how they shape consumer attitudes, behaviors, and cognitive processes and guide online purchasing.

### *Signaling Theory*

Signaling theory is built upon the principle of information asymmetry, where one party possesses more or superior information than the other (Spence, 1973). To bridge this gap, the well-informed party transmits informational cues signals to the less-informed party. These signals come in three forms: index, conventional, and handicap (Zahavi, 1975). Index signals are cost-free for those possessing the signaled attribute and costly for others to imitate.

Conventional signals lack a direct connection with the represented attribute, and their interpretation largely depends on social norms. Handicap signals are expensive, thus assuring the receiver of the signaler's quality. However, the potential for false or misleading signals exists, especially when the cost of sending false signals is low. Despite this, signaling theory is instrumental in reducing uncertainty and facilitating decision-making in contexts of information asymmetry (Connelly et al., 2011).

Signaling's importance is amplified in online commerce due to the information asymmetry between buyers and sellers. Consumers rely on signals merchants provide to judge product quality and trustworthiness (Agrawal et al., 2011; Tsao et al., 2011). Website characteristics, product information, warranty terms, and brand perceptions are clear signals (Boulding & Kirmani, 1993; Koh et al., 2012; Meents & Verhagen, 2018; Oghazi et al., 2018). Empirical findings validate the efficacy of these signals in fostering buyer trust (Guo et al., 2017).

This research proposes that star rating signals past customers' product quality evaluation for potential buyers. These ratings are trusted because they come from customers who have bought and used the product.

### *Behavioral Decision Theory*

The behavioral decision theory (BDT) (Einhorn & Hogarth, 1981) complements these theoretical models, which provides a more nuanced view of decision-making. Contrary to the rational choice theory, which assumes individuals always maximize their self-interest (Herfeld, 2020; Zejda, 2015), BDT accepts that people's decisions can be influenced by cognitive biases, heuristics, and emotions (Kahneman & Tversky, 1973; Thaler, 1980; Tversky & Kahneman, 1975). BDT acknowledges the complexity of the online shopping environment and recognizes that consumers may adopt satisficing rather than optimizing strategies (Simon, 1990), with emotions significantly impacting the evaluation of potential outcomes (Kennedy et al., 2014; Lerner et al., 2015).

### *Functional attitude theory*

Finally, the Functional Attitude Theory (FAT) postulates that for a message or argument to be accepted, it must address one or more of the attitude functions - utilitarian, social-adjustive, value-expressive, defensive, and knowledge (Herek, 1986; Katz, 1960; Potter et al., 2020). Regarding star ratings, the utilitarian function is addressed through the practical information it provides about a product, the social-adjustive function is satisfied by aligning the shopper with other satisfied customers, and the knowledge function is met by giving shoppers information to form an opinion about the product.

In conclusion, while personal factors determine the information processing route, social influence plays a powerful role in accepting star ratings. Thus, star ratings are a significant factor in shaping shoppers' attitudes and purchasing decisions.

## Research gaps

The literature review identifies many research gaps, as discussed in this section.

### *Brand image*

Comprehensive studies directly evaluating the relationship between star ratings and brand image are scarce. For instance, Casado-Díaz et al. (2017) explored how brand image moderates the relationship between global hotel ratings and consumer booking intentions. Another study by Bradshaw (2022) suggested that a physician's brand image, as represented by ratings, influences patients' trust and recruitment efforts. However, these studies do not fully capture the direct effect of star ratings on brand image. This gap in the literature highlights the need for more focused research on how star ratings directly influence brand image, especially considering consumers' increasing reliance on star ratings for purchase decisions and their impact on brand promotion strategies and investments, as discussed in Chapter 1.

### *Brand association versus brand image*

The extant literature on the relationship between star ratings and brand image has been predominantly unidimensional, primarily exploring ratings' influence on associations like product quality, brand reputation, and brand trust (Casado-Díaz et al., 2017; Flanagan et al., 2014; Noone & McGuire, 2014; Sparks & Browning, 2011). However, modern scholarship universally recognizes the brand image as a multidimensional construct (Aghekyan-Simonian et al., 2012; Bian & Moutinho, 2011; Kevin Lane Keller, 1993; Lien et al., 2015; Martínez Salinas & Pina Pérez, 2009; Reza Jalilvand & Samiei, 2012; P. C. S. Wu et al., 2011). The unidimensional conceptualization of brand image can be oversimplified, as the brand image is a multifaceted construct with diverse attributes and benefits (Keller, 1993). Contrarily, a multidimensional approach encapsulates numerous cognitive and emotional brand associations, addressing the complex nature of consumer perceptions and brand-related constructs. This multidimensional perspective, widely accepted in academic and industry research, offers a comprehensive and detailed analysis of brand dynamics.

Given this discrepancy, there is a compelling need for comprehensive research that examines the impact of star ratings using a multidimensional brand image model, encompassing both cognitive and affective brand associations, providing a richer and more nuanced insight. This study aims to address this research gap.

### *Willingness to pay a premium*

Examining the correlation between star ratings and Willingness to Pay a Price Premium (WTPP) during purchase decision-making is critical for various reasons. On the consumer front, star ratings are increasingly being used as an evaluation tool, aiding shoppers in weighing benefits against price, affecting their willingness to pay a premium. From a marketer's perspective, understanding this relationship is crucial for crafting effective strategies. They aim to achieve a product price premium, elevate their brand's perceived value, and maximize profitability (Namkung & Jang, 2017; Phong et al., 2021; Y. Zhang et al., 2020). Hence, understanding the impact of star ratings on WTPP is integral to consumer behavior study and effective business strategy formulation.

### *Rating volume*

Four, the existing literature reports differing findings on the impact of ratings and review volume on quality perception, sales, and purchasing decisions.

Concerning quality perception, de Langhe et al. (2016) found average ratings to be more influential, whereas Khare et al. (2011) reported a stronger effect of review volume. Mixed results exist for sales and revenue. De Pelsmacker et al. (2018) found review volume to drive sales, while review valence affected revenue. Conversely, Yang et al. (2018) and You et al. (2015) identified ratings as a more influential factor in sales. However, Rosario et al. (2016) noted a stronger correlation between review volume and sales than review valence. When examining movie box office performance, research differs, with Kim et al. (2019) and Liu (2006) attributing significant effects to volume, while Chintagunta et al. (2010) identified review valence as the primary driver. As for purchase decisions, both Hong Pittman (2020) and Ren et al. (2018) found review volume to significantly influence consumers' purchasing decisions, but only in the presence of negative reviews. Flanagin et al. (2014) found consumers favoring products with fewer but higher ratings over those with a high volume of reviews, whereas Watson et al. (2018) observed a weaker preference for higher-rated options with fewer reviews compared to lower-rated options with more reviews.

In summary, these divergent findings highlight the complexity of review volume's impact across various contexts, indicating the need for further investigation. The rating volume and reviews determine the strength of 'social proof' that affects individuals' knowledge and social-adjustive attitude functions (Herek, 1986; Katz, 1960; Potter et al., 2020). Therefore, it is important to study the role of rating volume on consumers' purchase decisions.

### *Purchase involvement*

Scholarly literature provides ample evidence underscoring the significant impact of high purchase involvement on various facets of consumer behavior. High purchase involvement has been shown to bolster key outcomes such as customer satisfaction, trust, loyalty, commitment, positive brand perceptions, and a greater willingness to pay. Additionally, it wields influence over product evaluations and preferences, offering potential benefits for lesser-known brands, especially in the realm of high-involvement items (Sanchez-Franco, 2009; Van Tuan, 2021; Dominique-Ferreira et al., 2016; Parkvithee & Miranda, 2012; Lang et al., 2022).

Further, the research also indicates that highly involved customers are more likely to share their experiences, particularly negative ones, enhancing the importance of their electronic word-of-mouth (E. E. K. Kim, 2017). Moreover, such involvement also influences the connection between word-of-mouth communication and product attitudes (Martin & Lueg, 2013).

In stark contrast, a significant void exists in our understanding of the implications of low purchase involvement, given the paucity of research in this area. This disparity underscores the need for increased scholarly focus on this relatively new aspect of consumer behavior. It is crucial to study the impact of low involvement as it provides comprehensive insights into consumer behavior, particularly relating to every day, low-involvement purchases such as groceries or cleaning products. These insights are valuable for marketers in tailoring effective strategies for low-involvement products, which might require approaches different from those used for high-involvement products, such as repetitive advertising or point-of-sale promotions. Moreover, understanding low involvement is instrumental in addressing brand loyalty and switching issues, as this buying behavior often leads to less brand loyalty. From a business perspective, even low-involvement products significantly contribute to a company's revenue, especially if they are frequently purchased items. Therefore, a deeper understanding of low involvement can strategically influence sales and profitability.

Finally, while high-involvement buying behavior has been extensively studied, the same is not true for low-involvement behavior. Investigating this area can provide a more comprehensive understanding of consumer behavior.

## Chapter 3 Hypotheses development and conceptual model

Star ratings serve as a source of information for potential buyers (Kaermingk, 2022; Mican & Sitar-Taut, 2020; Pitman, 2022; A. Smith & Anderson, 2016), conveying the summarized opinions of previous purchasers' perception of quality, perceived value, and satisfaction (Peng et al., 2019), which significantly influence their brand attitude, trust, credibility (Al-Adwan & Al-Horani, 2019; Zablocki et al., 2019), and purchase intention (Le et al., 2022).

### The theoretical framework of the study

This study draws on numerous theories discussed in chapter 2 (pp. 66).

In the context of the overarching Cognitive Consumer Behavior Model, this research study incorporates a multifaceted theoretical approach to understand how star ratings in e-commerce influence consumer behavior, particularly concerning brand image and willingness to pay a premium:

**Information Search and Decision Making:** The Engel-Kollat-Blackwell (EKB) model (Engel, Kollat, & Blackwell, 1968) explains the consumer decision-making process, emphasizing the importance of information search. Star ratings, as signals, play a pivotal role in this stage, helping consumers to reduce perceived risk and uncertainty associated with online purchases.

**Signaling Theory and Star Ratings:** Building on the Information Search aspect of the Engel-Kollat-Blackwell (EKB) model, the Signaling Theory (Spence, 1973) plays a pivotal role in this research framework. This theory posits that certain indicators serve as signals to reduce uncertainty in situations of information asymmetry, such as in e-commerce. Star ratings, in this context, serve as signals to consumers, conveying essential information about product quality, customer satisfaction, and the overall experience associated with a product or service (Flanagin et al., 2014; Gavilan et al., 2019; Pavlou & Dimoka, 2006). These ratings are instrumental in shaping consumer perceptions and aiding decision-making processes.

**Information Processing:** Through the lens of the Elaboration Likelihood Model (ELM) by Petty & Cacioppo (1986) and the Heuristic-Systematic Model (HSM) by Chaiken et al. (1989), the study examines how consumers process the information signaled by star ratings. Consumers may engage in a detailed analysis or rely on heuristic shortcuts based on their cognitive capacity and level of involvement. Consumers, particularly those with lower involvement in their purchasing decisions, tend to rely more on these ratings in situations of

uncertainty, viewing them as a consensus that guides their decision-making (Fu et al., 2020; Lee et al., 2011).

**Social Influence and Risk Reduction:** In e-commerce, star ratings are influenced by social factors, encapsulated in the Social Impact Theory (Latané, 1981) and Informational Social Influence Theory (Deutsch & Gerard, 1955). Consumers often rely on these ratings, especially in uncertain situations, reflecting a consensus that guides their purchasing decisions (Fu et al., 2020; Lee et al., 2011). The ratings act as social proof (Cialdini, 1984, 2001), where high ratings signal product quality (Roethke et al., 2020), and a large volume enhances credibility (Cheung & Thadani, 2012). The combined effect of rating volume and average score significantly sway consumer behavior in online shopping.

**Attitude Formation and Change:** The Cognitive Consumer Behavior Model incorporates insights from the Functional Attitude Theory (Katz, 1960), Cognitive Dissonance Theory (Harmon-Jones & Mills, 2019), and Latitude of Rejection (Crocker et al., 1984). These theories collectively elucidate the influence of star ratings on consumers' attitudes toward products, considering psychological functions, alignment with expectations, and the range of acceptable opinions (Cialdini, 2021; Khare et al., 2011).

**Impact on Brand Perception and Willingness to Pay:** Behavioral Decision Theory (BDT) (Einhorn & Hogarth, 1981) explicates the role of cognitive and emotional factors in consumer decision-making. This aspect of the model illuminates how star ratings influence brand perception and the consumer's willingness to pay a premium, considering the cognitive biases and emotional influences in the decision-making process.

Star ratings, in e-commerce, encapsulate a range of brand associations such as product quality, reliability, satisfaction, and overall brand reputation. As identified by Chevalier & Mayzlin (2006) and Hu et al. (2019), higher star ratings often translate into more positive brand associations. Effectively, these ratings serve as a crowd-sourced brand image, aggregating diverse individual perceptions of a brand. They play a crucial role in signaling specific brand attributes to potential customers.

Furthermore, the impact of star ratings extends to influencing a customer's willingness to pay a premium (WTPP). Studies like those by Nieto-García et al. (2017) have shown that both the ratings and their volume contribute to signaling the perceived value of a product or service, which is intrinsically linked to a product's perceived value and the customer's overall satisfaction.

This enriched Cognitive Consumer Behavior Model, incorporating the Signaling Theory, EKB model, and other information processing, social influence, and attitude formation theories, provides a comprehensive and scholarly understanding of the multifaceted impact of star ratings in e-commerce.

#### **Impact of star ratings on WTPP:**

Consider a scenario where a consumer is shopping for headphones online. They come across two similar models, one with an average star rating of 4.8 based on 500 reviews and the other with a 3.5 rating from 500. Despite the higher price of the first model, the consumer leans towards purchasing it, influenced by the high star rating, which signals superior quality and value.

Existing research suggests that brand communication significantly influences consumer WTP and WTPP (Dai et al., 2019; Eisend, 2019; Kim & Lennon, 2020). This influence stems from the ability of effective brand communication to enhance perceived product or service value, leading to increased WTP (Chen et al., 2023; Eustice et al., 2019; Garaus et al., 2021; Yu et al., 2022; Zheng et al., 2022). WTPP, in turn, is influenced by various brand communication techniques, including promotional messages, public relations, advertising, branding, and product information transparency, which collectively create a consistent and persuasive brand image that suggests superior value, justifying a higher price (Chen et al., 2023; Eustice et al., 2019; Garaus et al., 2021; Yu et al., 2022; Zheng et al., 2022).

Furthermore, research indicates that star ratings, as key indicators of brand-related information such as quality and value, significantly influence perceived value (Noone & McGuire, 2014) and perceived quality (Flanagin et al., 2014), both of which are critical determinants of WTP (Bairrada et al., 2018; Zhang, Y. et al., 2020). Additionally, a correlation exists between star ratings and price levels, shaping consumers' readiness to accept the given price (Abrate & Viglia, 2016; Pavlou & Dimoka, 2006).

Given the established influence of star ratings on perceptions of quality, value, and subsequently on WTP, the following hypothesis is proposed:

**H1: A high (versus low) star rating leads to a greater (versus lesser) willingness to pay a premium.**

This hypothesis emphasizes the directionality of the relationship and specifies the dependent and independent variables, making it clearer and more testable.

### Impact of star ratings on brand image:

Imagine a consumer researching smartphones online. They encounter Brand A's latest model, which boasts a 4.9-star rating from over 1000 reviews. Another model, from Brand B, has a 3.2-star rating from similar reviews. Despite comparable technical specifications, the consumer perceives Brand A's smartphone as superior, associating it with higher quality and reliability due to its high star rating. This perception significantly enhances Brand A's image in the consumer's mind, while Brand B's image suffers due to its lower rating.

Star ratings have emerged as a crucial channel for brand communication. They provide potential customers with a condensed evaluation of a product's attributes and benefits as perceived by previous buyers, influencing the formation of brand associations (Braun et al., 2014; Bruhn et al., 2012; Chakraborty & Biswal, 2020; Chinomona, 2016; Dahlén et al., 2009; Kim & Lee, 2018). Star ratings reflect the collective opinion of prior purchasers about perceived quality, value, trust, and satisfaction (Alalwan, 2020; Flanagan et al., 2014; Noone & McGuire, 2014; Sparks & Browning, 2011).

Moreover, star ratings significantly influence consumers' perceptions of quality (Filieri et al., 2021; Flanagan et al., 2014; Küsgen et al., 2016; Pascucci et al., 2022; Resnick & Montania, 2003; Zhao et al., 2016), which plays a pivotal role in shaping the overall brand image (Dam & Dam, 2021; Erkmen & Hancer, 2019; Nyadzayo & Khajehzadeh, 2016; Singh et al., 2021; Wu et al., 2011; Quoquab et al., 2021). Thus, high star ratings could enhance a brand's image by improving perceived quality, while lower ratings could harm it.

Based on this understanding, the following hypothesis is proposed:

**H2: A high (versus low) star rating leads to a more positive (versus negative) brand image.**

### Impact of rating volume

A consumer is browsing for a new laptop on a popular online retail site. They come across two models with identical star ratings of 4.5. However, one model has received this rating from over 10,000 reviews, while the other has just 200 reviews. Despite similar ratings, the consumer perceives the laptop with the higher review volume as a more reliable and popular choice, influenced by the sheer number of people who have rated it. This perception extends to the brand image and their willingness to pay a premium for the laptop with more reviews, showcasing the impact of rating volume.

Rating volume, encompassing the total number of reviews a product receives, plays a pivotal role in the digital marketplace. Serving as a robust form of social proof, it reflects the consensus opinion and popularity of a product, influencing consumer perceptions and behaviors (Cheung, Xiao, and Liu, 2014; Flanagin & Metzger, 2013; Maslowska et al., 2017; Zhang et al., 2022). This phenomenon aligns with the principles outlined by Cialdini (2021) and Baker & Petty (1994), emphasizing the psychological impact of social proof where the majority opinion, mirrored in rating volume, shapes consumer views. A product with a high rating volume is often perceived as more trustworthy and popular, enhancing its brand image.

The concept of herd mentality and its influence on consumer behavior is highlighted by the research of Sung et al. (2023), Shin et al. (2019), and Ghose and Ipeiritis (2011). They demonstrate how a substantial number of reviews can reduce perceived risk and influence purchasing decisions, especially when product quality is difficult to assess directly. This effect is further underscored by Anantharaman et al. (2022) and Huang and Chen (2006), who discuss how consumers follow the majority, particularly when a high rating volume indicates a consensus.

In decision-making processes, aggregated ratings significantly impact consumer trust and perceptions. As Gavilan et al. (2018) and Zhang et al. (2022) observe, many reviews can be a major source of social influence, streamlining consumer choices. This is echoed by Ren et al. (2021), who suggest that a high volume of reviews can evoke positive emotions, such as confidence, thereby reducing decision-making anxiety. The extensive number of reviews suggests a product's reliability, thus influencing perceived risk and trust, affecting brand image and consumers' willingness to pay a premium (Duan et al., 2008; Liu, 2006).

The relationship between star ratings and brand image is nuanced and moderated by the rating volume. This moderation effect, rooted in the psychology of information processing, is highlighted by Hasher and Zacks (1984). A high rating volume not only confirms a product's quality but also elevates its perceived value, contributing to a stronger brand image and potentially increasing consumers' willingness to pay a premium, as discussed by Chevalier & Mayzlin (2006) and De Pelsmacker et al. (2018).

In light of these insights, we propose two hypotheses:

**H3: Volume moderates the positive relationship between star rating and brand image so that when the volume is high, the relationship between star rating and the brand image becomes stronger than when the volume is low.**

**H4: Volume moderates the positive relationship between star rating and willingness to pay a premium so that when the volume is high, the relationship between star rating and willingness to pay a premium becomes stronger than when the volume is low.**

These hypotheses aim to explore how rating volume, acting as a social consensus and proof marker, amplifies the impact of star ratings on the perceived value and attractiveness of a product or service. The interplay of psychological factors, social proof, and risk and uncertainty reduction is crucial in understanding the persuasive power of rating volume in shaping consumer decisions and perceptions.

### **Impact of brand image on WTPP**

Imagine a customer choosing between two coffee brands at a supermarket. Brand X is widely recognized for its ethical sourcing and unique flavor profiles, boasting a strong positive brand image. In contrast, despite similar pricing and product offerings, Brand Y lacks a distinct brand identity and consumer trust. Influenced by Brand X's strong image and associations of quality and authenticity, the customer is more inclined to pay a premium for it over Brand Y.

Consumers' willingness to pay a premium (WTPP) is the gold standard of successful branding. It signifies a powerful alignment of brand value, quality, and consumer experience, reflecting a premium brand perception. While brand loyalty and equity are often analyzed, the influence of brand image and its associated benefits should not be underestimated.

A growing body of research demonstrates that a positive brand image, alongside its multifaceted associations, directly enhances WTP and WTPP (Belén del Río et al., 2001; Anselmsson et al., 2014; Yodpram & Intalar, 2020). These relationships are deeply intertwined with consumer perceptions of quality and value (Anselmsson et al., 2014; Chung & Lee, 2017; Bairrada et al., 2018; Fragkogianni, 2019; Pihlström & Brush, 2008).

A strong brand image cultivates a rich tapestry of associations, encompassing both functional aspects like trust and quality (Delmas & Lessem, 2017; Wiedmann & von Mettenheim, 2021; Yin et al., 2022) and emotional drivers like authenticity and uniqueness (Riefler, 2020; Phong et al., 2021; Scarpi, 2021). These interwoven elements significantly influence WTP and WTPP.

Theories such as brand equity (Aaker, 1991; Keller, 1993), perceived value (Zeithaml, 1988), signaling (Connelly et al., 2011), and social identity (Tajfel & Turner, 1986) all converge on the notion that a robust brand image strengthens consumer perception and ultimately drives

WTPP. Conversely, a weak or negative brand image can erode these positive influences. Therefore, it is hypothesized:

**H5: A positive (versus negative) brand image leads to a greater (versus lesser) willingness to pay a premium.**

### **Purchase Involvement**

In preparation for a significant anniversary, Consumer A buys a high-quality coffee machine as a thoughtful gift for their spouse, a coffee enthusiast. This purchase is laden with emotional significance, as it is not just a utility item but a gesture of affection. Consumer A conducts extensive research, exploring various models and comparing features like brewing technology, brand reputation, and customer reviews. They seek a machine with the best functionality, design, and quality combination, reflecting their spouse's passion for coffee. This thorough process of selecting the perfect coffee machine exemplifies a high purchase involvement scenario. While star ratings are considered, they form just a part of a more comprehensive evaluation, where the decision is influenced by an in-depth understanding of the product's performance and aesthetic appeal.

In a different situation, Consumer A must replace their basic coffee machine that has stopped working quickly. The priority here is functionality and value without the emotional weight of the previous scenario. Consumer A quickly browses through options, primarily relying on star ratings and a few user reviews to gauge the reliability and efficiency of the machines within their budget. This decision-making process, driven by the need for a practical and swift replacement, represents a low purchase involvement scenario. The high star rating in this context becomes a significant factor, heavily influencing Consumer A's perception of the coffee machine's brand image and quality. Consequently, the reliance on these readily available metrics increases Consumer A's willingness to pay a premium for a machine that is perceived as better in quality despite the limited research.

Purchase involvement is critical in understanding consumer behavior, particularly in how it influences product evaluation, brand perceptions, willingness to pay (WTP), and electronic word-of-mouth (eWOM). The level of purchase involvement essentially refers to the degree of interest and personal relevance a consumer perceives in a particular purchase situation. It shapes not only the decision-making process but also the post-purchase outcomes.

### High vs. Low Purchase Involvement

In high-involvement situations, consumers are typically making decisions about products or services that are expensive, risky, or highly significant on a personal level. Examples include purchasing a car or a house or choosing a university for education. These decisions usually involve extensive information search and thorough evaluation of alternatives (Smith & Bristol, 1994). For instance, when buying a car, a consumer might research various models, compare features, read expert reviews, and seek recommendations before deciding.

On the other hand, low-involvement purchases carry less financial risk, are routine, and are often considered low priority in terms of personal significance. Buying household items like cleaning supplies or choosing a brand of bread are examples of low-involvement decisions. In these cases, consumers tend to rely more on peripheral cues such as brand familiarity, packaging, price, or star ratings, as the motivation to research and evaluate these products extensively is low (Chuanlei et al., 2019; Maikšteniene & Auruškevičiene, 2008).

#### The Role of Star Ratings in Purchase Involvement

Star ratings, commonly seen on e-commerce and review platforms, serve as a significant peripheral cue, especially in low-involvement situations (Chuanlei et al., 2019; Maikšteniene & Auruškevičiene, 2008). For example, a consumer choosing a phone case on an online marketplace may not engage in detailed research but will likely be influenced by high star ratings, viewing them as a quick indicator of quality and popularity. Conversely, while star ratings are still considered in high-involvement situations, they are often supplemented with more detailed information. For example, a family choosing a vacation resort may look at star ratings as a starting point but will delve deeper into specific reviews, resort amenities, location advantages, and personal preferences before booking.

#### Impact on Consumer Outcomes

Research shows that high purchase involvement generally leads to more favorable outcomes, such as increased satisfaction, trust, loyalty, and commitment (Sanchez-Franco, 2009; Van Tuan, 2021). For instance, a consumer who extensively researches and purchases a high-end camera will likely experience greater satisfaction and brand loyalty, partly due to the effort and time invested in decision-making.

Furthermore, high purchase involvement can lead to stronger brand perceptions, increased WTP (Dominique-Ferreira et al., 2016; Lang et al., 2022), and heightened purchase intentions (Ding et al., 2020; Parkvithee & Miranda, 2012). For example, in the luxury goods market,

consumers are not just buying a product but also the associated prestige and status. Their high involvement in choosing a luxury brand often translates into a willingness to pay a premium.

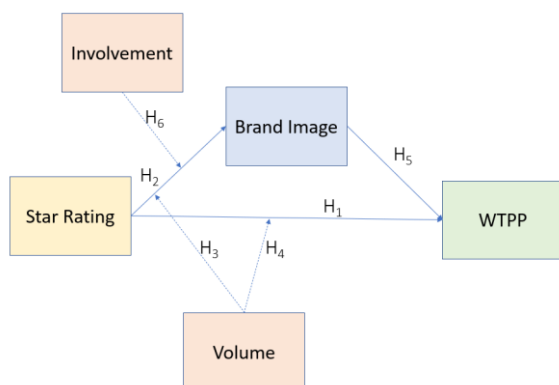
Additionally, purchase involvement significantly influences eWOM. Consumers who are highly involved in their purchases tend to share their experiences and opinions more actively online (Martin & Lueg, 2013). For example, a consumer passionate about organic skincare products is likelier to post detailed reviews and recommendations on social media, influencing others' perceptions and purchase decisions.

Given the varying degrees of information processing and reliance on peripheral cues in high versus low involvement situations, it is logical to hypothesize that the influence of star ratings on brand image varies depending on the level of purchase involvement. Therefore, we propose the following hypothesis:

**H6: Purchase involvement moderates the positive relationship between star rating and brand image so that when involvement is low, the relationship between star rating and brand image becomes stronger than when involvement is high.**

Based on hypothesis development, we present the conceptual model in Figure 1.

Figure 1 - Proposed conceptual model.



The conceptual model integrates various theoretical perspectives to elucidate how star ratings influence consumer behavior, particularly regarding brand image and willingness to pay a premium (WTPP). Hypotheses H1 and H2 are central to this model, posing that higher star ratings lead to greater WTPP and more positive brand images. This aligns with the Functional Attitude Theory (FAT) (Katz, 1960), emphasizing that star ratings provide practical information and fulfill social-adjustive and knowledge functions.

Further complexity is introduced through the moderating roles of volume and consumer involvement (H3, H4, and H6), drawing on principles from Signaling Theory (Spence, 1973). The model suggests that the rating volume amplifies the impact of star ratings on brand image and WTPP, resonating with social proof concepts (Cialdini, 1984, 2001) and source credibility (Hovland et al., 1953). It indicates that a larger number of ratings enhance the persuasiveness and credibility of star ratings.

Consumer involvement's moderating effect on the relationship between star ratings and brand image is captured in H6. This is explained by the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) and the Heuristic-Systematic Model (HSM) (Chaiken, 1980), which propose that the level of consumer involvement influences the depth of information processing. Behavioral Decision Theory (BDT) (Einhorn & Hogarth, 1981) adds to this by highlighting the role of cognitive biases and emotions in decision-making, affecting consumers' reliance on star ratings.

Hypothesis H5, illustrating the direct relationship between brand image and WTPP, underscores the value of brand perception in consumer decision-making, aligning with broader marketing and consumer behavior theories.

This model weaves together insights from FAT, Signaling Theory, ELM, HSM, BDT, social proof, and communication theories. It provides a comprehensive framework for understanding how star ratings, their volume, and consumer involvement interplay to shape perceptions and behaviors in e-commerce. This synthesis of theories via the model highlights the multifunctional role of star ratings in influencing key outcomes like brand image and WTPP in electronic commerce.

## Chapter 4 Research Design and Methodology

This research explores the causal relationship between star rating and rating volume as independent variables and brand image and willingness to pay a premium (WTPP) as dependent variables. The study aims to uncover the underlying psychological mechanisms and conditions facilitating these relationships. To achieve this, we have adopted an experimental approach that allows for direct measurement of the main treatment effect while controlling for potential confounding variables (Bagozzi, 1977). Our research design also enables us to examine the role of potential moderators and mediators in shaping consumer decision-making processes (Mitchell & Jolley, 2014; Morales et al., 2017).

To ensure the validity of our findings, we conducted four pre-tests, a pilot study, and a main study with randomly selected participants from various US cities. The study adopted best procedural practices to minimize common method bias (CMB). Through our research, we aim to provide new insights into the causal relationships between star rating and rating volume, brand image, and WTPP and shed light on the psychological mechanisms and boundary conditions that drive these effects. The following sections detail the experiment design, manipulation design, sampling criteria, and experimental procedures employed in the study.

### Design of the study

This research evaluated the causal effect of star ratings on brand image and willingness to pay a premium (WTPP) and the moderating effects of purchase involvement and rating volume on these relationships. Experiment methodology was best suited to evaluate the causal effects as it allowed the control for extraneous variables and ensured that any changes in the dependent variable were due to the manipulation of the independent variable. Two separate studies were designed to accomplish this, adopting a between-subjects 2x2 factorial experimental design.

#### Study 1: The Moderating Effect of Purchase Involvement

The first study examined the relationships between star rating, brand image, and WTPP and the moderating effect of purchase involvement on these relationships. This study adopted a 2x2 factorial experimental design between subjects, with a star rating (high and low) and purchase involvement (high and low) as the independent variables.

Participants were randomly assigned to one of the four conditions created by combining the two levels of star rating and purchase involvement. Participants were exposed to only one condition to prevent potential carryover or learning effects. The dependent variables, brand image, and WTPP, were measured after exposure to the conditions.

The main and interaction effects of star rating and purchase involvement on brand image and WTPP were evaluated. This design examined whether the effect of star rating on brand image and WTPP changes under different levels of purchase involvement.

#### Study 2: The Moderating Effect of Rating Volume

The second study examined the relationships between star rating, brand image, and WTPP and the moderating effect of rating volume on these relationships. This study also utilized a between-subjects 2x2 factorial experimental design, with a star rating (high and low) and rating volume (high and low) as the independent variables.

As in Study 1, participants were randomly assigned to one of the four conditions created by combining the star rating and rating volume levels. The dependent variables, brand image, and WTPP, were measured after exposure to the conditions.

The main and interaction effects of star rating and rating volume on brand image and WTPP were evaluated. This design enabled the investigation of whether the effect of star rating on brand image and WTPP changes under different levels of rating volume.

The underlying rationale for the low and high values for the predictor variables in Study 1 and Study 2 is explained in Table 10.

Table 10 - Rationale for the low and high values of rating, volume, and purchase involvement

|                             | <b>Low</b>                                                                                                           | <b>High</b>                                                                                                       |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Star rating</b>          | A value that signals poor product quality or low customer satisfaction with the product or the purchase process.     | A value that signals high product quality or high customer satisfaction with the product or the purchase process. |
| <b>Rating Volume</b>        | A value that signals that either the product is not very popular (few people bought it) or few people rated it.      | A value that signals that either the product is very popular (many people bought it) or many people rated it.     |
| <b>Purchase Involvement</b> | A condition where the customer attaches little importance to the task and spends little time and effort on the task. | A condition where the customer attaches high importance to the task and spends considerable time and effort.      |

This study utilized an experimental approach with star rating and rating volume as independent variables (IV) and brand image, as well as the WTPP as the dependent variable (DV). The experiment featured a 2x2 factorial design, manipulating both star rating and rating volume at two levels (high and low). The study aimed to analyze the interaction effects between these two independent variables.

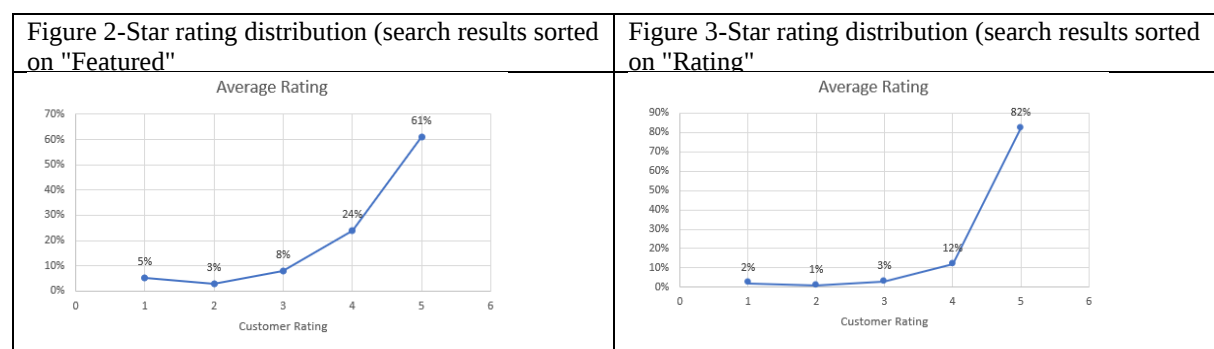
## Manipulation design

Designing appropriate manipulations for the independent variables, namely star rating and involvement (Study 1) and the star rating and volume (study 2), was essential to achieve the research objectives.

## Star rating manipulation

The first independent variable, star rating, was manipulated at low (1.5 stars) and high (4.5 stars). Research in this area has instances (e.g., Hong & Pittman, 2020) that used ratings of 1 (low) and 5 (high) to manipulate ratings in experimental procedures. These values ensure maximum discrepancy in participant perception of star ratings.

This study decided the specific values for low and high ratings after thoroughly analyzing the rating distribution for a similar product category (e.g., computer mouse) on a leading e-commerce platform. The researchers observed a "J" shaped distribution, with most products receiving high ratings (Figures 2 and 3).



Based on this observation, it was determined that a high star rating of 4.5 would be representative of a well-regarded product, whereas a low star rating of 1.5 would signify a poorly rated product. Additionally, the researchers conducted a pretest with a small sample of participants to ensure that the chosen low and high rating values were perceived as intended.

The pretest results confirmed that participants rated the 1.5-star rating as "low" or "very low" and the 4.5-star rating as "high" or "very high" on a 7-point Likert scale.

### **Purchase involvement manipulation**

The second independent variable, involvement, was also manipulated at low and high levels. To create the low and high involvement scenarios, the researchers developed two distinct purchase situations that emphasize different levels of personal relevance and importance attached to the product. For the low involvement scenario, the purchase situation involved buying a single computer mouse for the managers' office assistant, where the decision-making process is relatively quick and straightforward. The decision has low financial risk and limited consequences. As a result, the purchase involvement in this situation is likely to be low. In this case, the manager may be more inclined to trust the star rating and number of buyers who rated the mouse and decide based on the product description and price.

In contrast, the high involvement scenario involved purchasing 500,000 computer mice for the company where the manager worked, where the decision-making process is more complex and requires careful consideration of product features, performance, and value for money. The manager's reputation within the company depends on this decision, which increases the choice's perceived risk and personal relevance. Consequently, the purchase involvement in this situation is much higher. In this case, the manager may not rely solely on the star rating and the number of buyers who rated the mouse. Instead, he or she might engage in a more extensive information search, evaluate alternatives, and potentially seek expert opinions or conduct pilot testing before making a final decision.

The researchers used clear and concise descriptions of the purchase situations in the experimental stimuli to ensure that the low and high-involvement scenarios were perceived as intended (Table 11). The descriptions were intended to guide participants to adopt the appropriate mindset corresponding to the level of involvement in the experiment.

Table 11- Narrations of low and high Purchase involvement shopping situations

| <b>Purchase involvement Level</b> | <b>Purchase Scenario</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low                               | <p>Imagine you are an IT manager of a global consumer goods company with offices across 80 countries. Your assistant has requested you to get her a new computer mouse as the old one is giving her problems. Your powers allow you to buy one mouse without approval.</p> <p>In your online research, you come across the Quantum wireless mouse at the Super Electronica website (please see below). You have not heard of this brand, but the mouse description seems interesting, and the price is within your budget.</p> |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Please go through the page carefully. Based on the star rating and the number of buyers who rated this mouse, please answer the following questions about your image of the product, willingness to pay a premium and purchase intention.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| High | <p>Imagine you are an IT manager of a global consumer goods company with offices across 80 countries. Your boss has asked you to select a suitable computer mouse to replace the problematic mouse on all the 500,000 PCs across the company. Your reputation in the company depends on this important decision.</p> <p>In your online research, you come across the Quantum wireless mouse at the Super Electronica website (please see below). You have not heard of this brand, but the mouse description seems interesting, and the price is within your budget.</p> <p>Please go through the page carefully. Based on the star rating and the number of buyers who rated this mouse, please answer the following questions about your image of the product, willingness to pay a premium and purchase intention.</p> |

### Volume manipulation

In Study 2, we manipulated the volume of product ratings, representing the number of buyers who rated the product, using low (20) and high (10140). These initial values were determined based on the range of rating volumes observed for a similar computer mouse product on a leading e-commerce marketplace.

When sorted by average customer reviews, rating volumes on the first two pages of search results ranged from 118 to 55,467. Among the available products, the range was 201 to 44,866. When sorted by featured products or sales rank, the rating volume on the first two search result pages varied from 20 to 45,523. All featured products were available for purchase.

Based on these observations, we chose a value of 20 for the low rating volume. For the high volume, we selected 10140, as products with 10,000 to 11,000 ratings were on the market for one year or less. This condition aligned with our premise of presenting a relatively newer or lesser-known brand in our study stimuli.

For Study 1, we maintained a constant volume of 5000 customer ratings across all conditions, displayed alongside the star rating scale. This number was approximately the average of the low (20) and high (10140) volumes we derived from a separate pretest  $(20 + 10140 / 2)$ .

Careful selection of these manipulations was crucial for the success of the research study.

### Selection of computer mouse as the context

This study employed a computer mouse from a relatively obscure brand, priced at \$8, as the product context to minimize confounding effects and focus on the effects of the manipulated variables. Using an unknown brand eliminates the influence of pre-existing brand

associations on participants' perceptions and WTPP. A computer mouse as the product category provides a familiar context for most participants, being a commonly used device across various demographics, and represents a low-cost, low-risk purchase, reducing participants' hesitancy during the experiment.

The \$12.99 price point is low enough not to cause significant financial concerns for participants yet high enough to avoid trivializing the purchase. By keeping the price constant, the study can focus on the effects of star ratings and involvement on brand image and WTPP without the price as a confounding factor. Thus, this choice allows the researchers to understand better the impact of star ratings and involvement on brand image and WTPP without interference from factors like pre-existing brand associations, product unfamiliarity, or price sensitivity.

## The Participants

**Target Population:** The target population for this study consisted of online shoppers, both males and females aged 21 years or older, with a minimum high school education and experience in online shopping (Table 12). The demographic profile of the sample aligns with US census data.

Table 12 - Demographic Profile of the Sample

|                           |                                                                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Age                       | 21 to 75 years                                                                                                                                                       |
| Gender                    | The male and female ratio reflected in the US Census 2020                                                                                                            |
| Residents of              | United States                                                                                                                                                        |
| Education                 | Highest education level completed<br>Technical/community college, Undergraduate degree (BA/BSc/other), Graduate degree (MA/MSc/MPhil/other), Doctorate (Ph.D./other) |
| Student status            | No student                                                                                                                                                           |
| Online shopping frequency | Minimum once a month                                                                                                                                                 |

The study ensured that the sample was diverse and representative of various consumer segments based on age slabs, gender, education, and income.

In this study, we opted for a non-student sample to address some of the limitations often associated with student samples in research. By selecting a non-student sample, we aimed to avoid issues such as homogeneity (Sears, 1986), cognitive and experiential differences (Kardes et al., 2004), and demand characteristics (Orne, 1962), which have been shown to

affect the validity of research outcomes. By incorporating a more diverse and representative sample, we intended to enhance our findings' external validity and generalizability (Winer, 1999). Furthermore, considering that students comprise only about 10.6% of the target US population, using a non-student sample allowed us to capture better the perspectives and experiences of most of the population, thus providing more accurate and meaningful insights for our research objectives (Druckman & Kam, 2011; Lupton, 2019).

### Sampling Method

The study employed a convenient random sampling method. Specifically, the study conveniently utilized a population of 7,915 active participants at Prolific within the past 90 days from the data collection date. This method was chosen for its practicality, cost-effectiveness, and efficiency, as it allowed the researchers to quickly recruit many participants through Prolific, the online platform, while maintaining the desired diversity in the sample.

### Sample Size

Selecting an appropriate sample size is a fundamental aspect of experimental research, directly impacting the validity of results. This decision is closely linked to statistical power, effect size, and error rates.

#### *Statistical Power and Sample Size*

Statistical power, the probability of detecting a true effect in the study, is deeply influenced by sample size. A larger sample size typically increases statistical power, reducing the risk of Type II errors (missing true effects). As advocated by Ledolter and Kardon (2020), aiming for a statistical power of 80% or more is ideal to ensure the reliable detection of significant effects.

#### *Effect Size and its Influence on Sample Size and Errors*

Effect size, the measure of the magnitude of an effect, is crucial in determining the necessary sample size. A larger effect size can allow for a smaller sample while maintaining adequate statistical power. However, with smaller effect sizes, a larger sample is needed to achieve the same statistical power level and control for Type I errors (false positives) and Type II errors.

#### *The Challenge of Small Sample Sizes*

Working with a small sample size increases the likelihood of Type II errors, as it may not provide enough data to detect real effects. Additionally, small samples can lead to

exaggerated effect sizes, potentially leading to incorrect conclusions (Meyvis & van Osselaer, 2018; Schoemann, Boulton, & Short, 2017).

### *Mitigating Small Sample Size Issues*

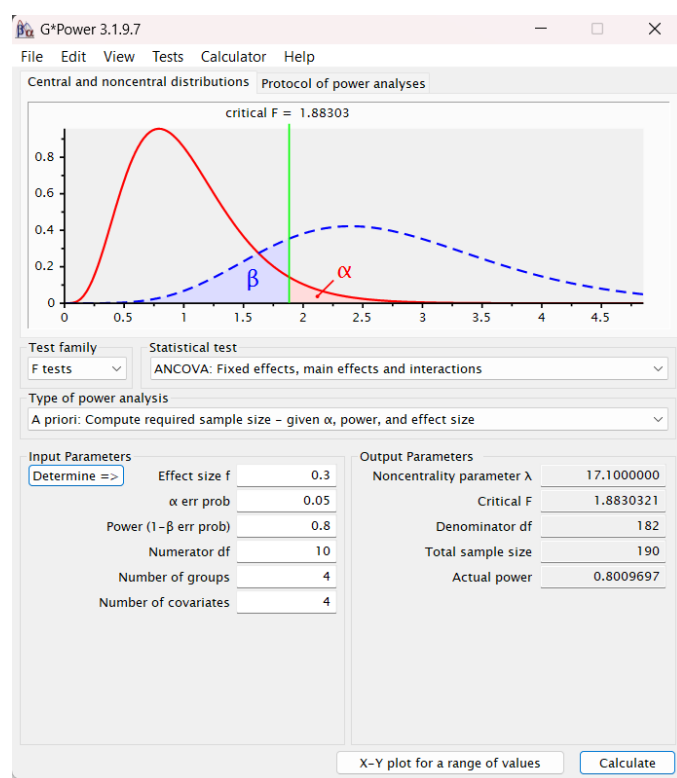
When faced with small sample sizes, researchers can use post-hoc power analysis to assess whether a larger sample size might have yielded different results (Ledolter & Kardon, 2020). Proper initial planning (a-priori) is also vital to avoid the pitfalls of small samples (Meyvis & van Osselaer, 2018). Adapting statistical methods for small sample sizes may also be necessary.

### *Determining Optimal Sample Size*

Determining the right sample size involves considering the expected effect size, desired statistical power, and acceptable error rates. Power analysis is a key method in this regard. Tools like G\*Power (Faul et al. 2007) and Monte Carlo simulations offer precise calculations for complex study designs.

This study uses G\*Power v 3.1 to calculate the a-priori minimum sample size for testing linear regression. The options used included the f-test family and ANCOVA: Fixed effects, main effects, and interactions for the statistical test. The additional parameters were set as a minimum power of 0.80, a medium effect size of 0.30, and an alpha level of 0.05. and then ran the power analysis. G\*Power analysis showed a required minimum sample size of 190 based on the input settings. The researcher collected an additional ten samples to account for attrition and incomplete data.

Figure 4 - Sample size calculation using G\*Power software



Fifty (50) responses were required for each experimental condition. We collected 60 responses to account for the invalid responses. The sample size of 50 for an experiment is

sufficient to limit sampling error to 5% on a population of 100 million (Mitchell & Jolley, 2010) and provides sufficient statistical power to detect meaningful effects and relationships among the variables of interest.

In summary, the resulting sample provided a solid foundation for analyzing the relationships among star ratings, involvement, brand image, and WTPP, ultimately contributing to a better understanding of these phenomena in online shopping.

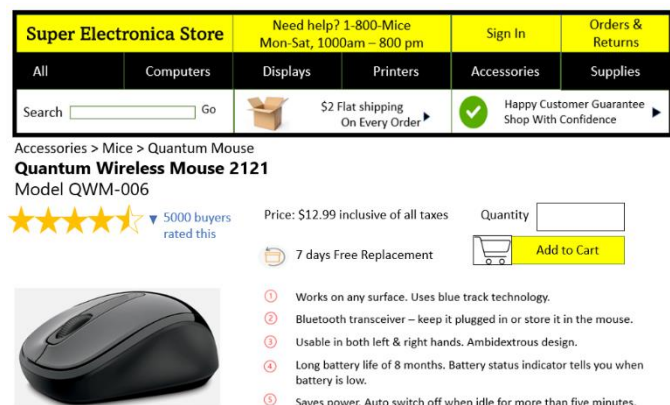
## Stimulus design

In the stimulus design for this study, we meticulously crafted a mock website page to resemble a typical e-commerce platform's product page, drawing upon guidelines from Mitchell and Jolley (2010). This approach was specifically chosen to bolster ecological validity, ensuring that the experimental setup closely mirrors real-world online shopping scenarios. By doing so, the likelihood that the study's findings can be generalized to actual consumer behavior in e-commerce settings is significantly enhanced.

In terms of experimental control, careful steps were taken to minimize unintended biases or cues that could influence participants' responses. The mock website was designed with a neutral aesthetic that aligns with general e-commerce website conventions rather than imitating specific identifiable features of any major e-commerce platform. This was crucial in preserving the ecological validity of the experiment while avoiding any brand-specific biases.

Furthermore, to maintain high levels of participant engagement and ensure that our manipulations did not overtly signal the study's aims to the participants, we seamlessly integrated the manipulated variables (like star ratings and review volumes) into the website's layout. This integration was executed as typical of how such information is presented on real e-commerce sites, thus maintaining the natural shopping experience. By embedding these elements in a realistic yet controlled manner, we could keep the participants' attention focused on the key aspects of the experiment without making them overly aware of the study's objectives.

Figure 5- Sample Shopping Webpage Stimuli



The design of the mock website also promoted a more immersive and engaging experience than traditional survey methods. This was instrumental in reducing social desirability bias and eliciting authentic responses, as participants interacted with the website like their regular online shopping behavior.

In conclusion, by adhering to the principles of ecological validity, experimental control, and participant engagement outlined by Mitchell and Jolley (2010), the design of the mock website page substantially contributed to the robustness and applicability of the study. This meticulous approach was key in exploring the effects of star ratings and involvement on brand image and willingness to pay a premium price (WTPP) in a simulated yet realistic e-commerce environment.

### **Selections of the measures**

The constructs and scales used were carefully selected and adapted from established literature.

#### **Brand image measure**

The brand image measurement in this study was facilitated by employing a multi-item 7-point Likert scale. This scale, originally developed by Martínez Salinas and Pina Pérez (2009), evaluates both functional (4 items) and affective (3 items) dimensions of the brand image. The scale demonstrated strong reliability with Cronbach's alpha values of 0.88 and 0.81 for the two dimensions.

This particular scale was chosen from a pool of twelve different techniques used for brand image measurement, including but not limited to brand concept maps, the constant-sum method, dichotomous scaling, focus group discussions, free-association techniques, and semantic differential scaling. The preference for the Likert scale-based measure emerged from its suitability for capturing participants' brand perceptions effectively in an online questionnaire format.

The Martínez Salinas & Pina Pérez (2009) scale is popular in prior research, being the most frequently used among Likert scale-based brand image measures. It is an all-encompassing measure that evaluates functional and affective brand images and the brand reputation, thus offering a holistic view of the brand image. The scale also integrates elements from notable scales such as those developed by Brown (1990) and Aaker (1996).

A decisive factor in selecting this scale was its emphasis on the generic brand image rather than specific product-related brand images. This distinction is crucial to this research, which aims to understand the overall perception and value attributed to the brand rather than individual products under its purview. Consequently, the scale captures consumer attitudes, impressions, and emotional responses toward the brand. This focus aligns with the research objective of assessing the impact of star ratings, which usually reflect overall brand performance rather than individual product performance. Therefore, the Martínez Salinas & Pina Pérez (2009) scale, with its comprehensive evaluation of the generic brand image, provides an appropriate and reliable measurement tool for this study.

### **WTPP measure**

The concept of Willingness to Pay a Premium (WTPP) is often measured using scales from two main studies in literature: Netemeyer et al. (2004) and Chaudhuri and Ligas (2009).

The five-item scale proposed by Netemeyer et al. (2004) was initially developed for and tested on products such as beverages, toothpaste, and sportswear. The items included in this scale pertain to brand preference with price changes and the amount one is willing to pay for a preferred brand over others. This scale demonstrated strong reliability, as evidenced by Cronbach's Alpha value ranging between 0.87 and 0.91 across the different product categories tested. The scale has been recognized extensively in academic literature, as shown by its citation count of 1591.

On the other hand, the two-item scale from Chaudhuri and Ligas (2009) was derived from the loyalty scale introduced by Chaudhuri and Holbrook (2001). The items in this scale express a willingness to pay a higher price at a preferred store, even when other stores offer lower prices (e.g., "I would be willing to pay a higher price at this store over other similar stores" and "I prefer to shop at this store, even if another store advertises a lower price.") Across three studies, the authors reported Cronbach's Alpha between 0.72 and 0.80, indicating satisfactory reliability. This Chaudhuri and Ligas (2009) scale has been cited 153 times and Ligas and Chaudhuri (2012) 70 times, attesting to its recognition in the field.

This research used the Chaudhuri and Ligas (2009) scale. Although it features fewer than the recommended minimum of three items, this scale has been consistently tested for robust reliability and validity. Compared to Netemeyer et al.'s (2004) scale, the Chaudhuri and Ligas (2009) scale was more concise, allowing us to maintain a shorter questionnaire. Furthermore, item #3 in Netemeyer et al.'s (2004) scale would have necessitated additional

measurements that were not relevant to our study. We adopted the Chaudhury and Ligas (2009) scale by modifying the items to fit our study: (1) "After seeing the star rating of this mouse, I would be willing to pay a higher price for this brand over other similar brands" and (2) "After seeing the star rating of this mouse, even if another brand advertises a lower price, I prefer to buy this brand." Finally, using this scale in our study yielded a Cronbach's Alpha greater than 0.75, confirming its reliability.

The values of rating, volume, and purchase involvement were manipulated in the stimuli, as previously discussed.

### **Questionnaire design**

A comprehensive questionnaire was designed to collect the necessary data, incorporating various sections to thoroughly understand participants' responses and opinions. This section describes the structure of the questionnaire. The complete questionnaire is presented in [Annexure 6](#).

1. Informed consent: The questionnaire began with an informed consent section outlining the purpose of the study, the rights of the participants, the confidentiality of the information provided, and the voluntary nature of participation ([Annexure 5](#)). Participants must acknowledge their understanding and agreement to the terms before completing the questionnaire.
2. Demographics: The demographics section collected information on participants' age, gender, education level, and other relevant factors to help understand the background of the sample population and allow for comparisons across different groups.
3. Rating involvement: This section measured participants' level of involvement with the product rating, assessing the degree to which they are engaged and interested in the product ratings.
4. Purchase involvement: This section measured participants' level of purchase involvement using the scale adapted from Mittal (1989), providing insight into their engagement and interest in the purchasing process.
5. Stimuli: In this section, participants were exposed to experimental stimuli, which included mock product listings with varying star ratings and involvement scenarios. These stimuli were designed to manipulate the independent star rating and involvement variables.

6. Manipulation checks: Following the presentation of the stimuli, manipulation checks were included to confirm that participants perceived the intended levels of star rating and involvement, ensuring the effectiveness of the experimental manipulations.
7. Brand image: The brand image section used the multi-dimensional scale from Martínez Salinas & Pina Pérez (2009) to measure participants' perceptions of the brand's functional and affective dimensions.
8. Attention check: An attention check item was included to ensure participants paid attention to the questionnaire and provided thoughtful responses.
9. Willingness to pay a premium: This section used the Netemeyer (2004) scale questions to measure participants' WTPP.
10. Purchase intention: This section assessed participants' intention to purchase the product, providing information on how likely they are to buy it.
11. Product knowledge, ownership, and purchase frequency: The final section of the questionnaire collected information on participants' prior knowledge of the product, their ownership of similar products, and their frequency of purchasing similar products, helping to understand their familiarity and experience with the product category.

In conclusion, the comprehensive questionnaire, encompassing various sections, allows for a thorough assessment of participants' responses and opinions regarding the influence of star ratings on brand image and WTPP, as well as the moderating role of involvement in the relationship between star ratings and brand image.

## **The Procedure**

This section describes the procedures we followed to fine-tune our final questionnaire by conducting four pre-tests and a pilot test.

### **Pretests and pilot study**

A two-stage pretesting process was conducted to ensure the effectiveness of the selected values for low and high star ratings, low and high volume, low and high involvement, and the overall questionnaire.

In stage one, we performed three pre-tests to check if manipulations for star rating, rating volume, and involvement were effective. The participants rated the level of rating, volume, and involvement from the low and high options. This process was crucial for validating the manipulations of the independent variables and improving the study's internal validity and the

reliability of the findings. The results from this initial pretest revealed that participants rated the 4.5-star rating as "high" or "very high" and the 1.5-star rating as "low" or "very low" on a 7-point Likert scale. They also rated a volume of 20 as "low" and a volume of 10,040 as "high" or "very high." However, the purchase involvement scenarios did not yield significant differences between low and high involvement levels. Based on these findings, the involvement scenarios were revised before moving on to stage two.

In the second stage, we conducted the full experimental procedure individually with 40 online shoppers per study. Ten participants were assigned to each of the four stimuli. Individual Zoom calls were conducted with each participant, during which they were presented with the stimuli and asked to complete a questionnaire sent to them in advance. The researcher observed the participants' body language to gauge any difficulties they might encounter while answering the questions and provided clarifications when needed. The language of a few questions was tweaked to improve their clarity.

Finally, a pilot study was conducted online using the Qualtrics platform. Over 50 participants received an email containing the link to the experiment and completed it independently, without any interaction with the researcher. The results from this pilot showed that the revised purchase involvement scenarios effectively created a significant differentiation between low and high involvement levels. The star rating and volume manipulations were also confirmed to be effective, as observed in the initial pretest. No flaws were detected in the questionnaire.

The iterative process of refining and retesting the questionnaire ensured that the final experimental design was robust and the results were more reliable, ultimately providing a stronger foundation for understanding the influence of star ratings on brand image and WTPP. In conclusion, successfully implementing the two-stage pretesting process and manipulation checks contributed to the internal validity and reliability of the study's findings.

### **Data collection**

The data collection process for this study was conducted using the Qualtrics website, a widely used online survey platform, and Prolific, a popular participant recruitment platform. This combination allowed for efficient data collection and access to a diverse pool of online shoppers. The use of online platforms for social science experiments is increasing (Bohannon, 2016), as the results from online experiments are considered as reliable as those from lab experiments (Palan & Schitter, 2018). Compared to lab experiments, online

experiments offer greater external validity due to the greater realism in the experimental setup and the sample's representativeness to the general population demographics (Horton et al., 2011). Prolific offers access to diverse participants, quick and efficient recruitment, monetary incentives, and pre-screening options, increasing generalizability and data quality. Qualtrics provides an intuitive interface, customization options, advanced features for improved internal validity, and robust data management tools. As a result, the findings from online experiments are claimed to be more generalizable compared to lab experiments conducted in artificial environments (Winer, 1999).

Participants were randomly selected from Prolific and directed to the Qualtrics survey, where they were presented with the experimental stimuli and asked to complete the questionnaire. Over three days, from July 14 to July 17, 2022, a total of 450 responses were collected. This relatively short data collection period highlights the efficiency and convenience of using online platforms for conducting experimental research.

Several measures were employed to identify and exclude invalid responses to ensure the quality of the data. Twenty-eight responses were rejected based on different criteria, such as failing the manipulation and attention checks or exhibiting straight-lining behavior (i.e., providing the same response for all questions in a section) or inconsistent answers (e.g., a response of 7 for "This product has high quality" when the rating was 1.5). These quality control measures helped to maintain the reliability and validity of the study's findings.

After filtering out the invalid responses, the final sample provided a solid foundation for analyzing the relationships among star ratings, involvement, brand image, and WTPP. The use of online platforms like Qualtrics and Prolific for data collection not only facilitated efficient recruitment and survey administration but also helped ensure the quality of the data by enabling the researchers to employ various quality control checks.

In conclusion, the data collection process employed in this study was efficient and effective, enabling the researchers to gather many valid responses quickly. By using online platforms like Qualtrics and Prolific, the study maintained a high data quality and validity level, ultimately contributing to a more robust understanding of the influence of star ratings and involvement on brand image and WTPP.

### **Common Method Bias**

Common method bias (CMB) or common method variance (CMV) refers to errors that can occur when you use the same method or source to measure multiple variables in a study.

CMB can cause the correlations between these variables to appear stronger than they are because of the shared measurement technique, not because of the actual relationship between the constructs being studied (Jordan & Troth, 2020).

This means the measurement process could influence the results and create misleading connections between variables (Podsakoff et al., 2003). This is especially likely when the components of individual measures tied to the measurement method are more related than the underlying relationships between the variables.

When big differences exist between the real relationships and those seen due to CMB, we call this method bias. As a result, CMB can create false relationships and potentially undermine the validity of research conclusions (Tehseen et al., 2017). Therefore, it is crucial to reduce CMB to ensure that a study's results are reliable and valid.

CMB can stem from several factors. – ambiguous or complex item characteristics, measurement context—including physical or psychological elements and the timing of the measurement (Podsakoff et al., 2003), social desirability bias (Tehseen et al., 2017), and mono-operation bias (Cook et al., 2002). Furthermore, respondent capabilities, task difficulty, motivation to respond accurately, and ease of satisficing can contribute to common method bias. The following sections discuss this study's procedural and statistical techniques to minimize and detect CMB.

### **Procedural techniques adopted to minimize CMB in this study**

In this study, we sought to minimize common method bias by implementing several procedural measures based on the recommendations by (Jordan & Troth, 2020; MacKenzie & Podsakoff, 2012; Malhotra et al., 2006; Podsakoff et al., 2012; Siemsen et al., 2010).

First, our respondent recruitment utilized a voluntary opt-in approach to counter biases from source data, attracting informed and motivated participants, which yielded more accurate and engaged responses and minimized artificial correlations. To encourage accurate responses and deter rushed or unreflective ones, we offered payment for participation. We mitigated potential self-selection downsides by emphasizing the absence of 'right' or 'wrong' responses, thus reducing social desirability bias.

Second, to combat item characteristic bias, we ensured our participants had an online shopping experience and familiarity with the product under investigation, a computer mouse. This choice was intended to make the task appropriately challenging and to reduce ambiguity in item interpretation, thus mitigating potential artificial correlations.

Next, we addressed potential measurement context and timing biases by conducting our study online, allowing participants to respond conveniently from their preferred location. This approach aimed to reduce the influence of temporary mood states or situational factors, which can lead to artificial covariation.

It is argued that presenting the star rating first, then questions on brand image and willingness to pay a premium, interspersed with attention and validation checks, introduces temporal sequence leading to reduced common method bias from simultaneous measurement. Using a lesser-known product brand in the experiment limits reverse causality, ensuring the star rating influences brand perception, not vice versa. This sequential method solidifies the argument that star ratings affect brand image perceptions.

Furthermore, we used an unknown brand and a low-priced product to avoid mono-operation bias, thereby minimizing biases related to pre-existing brand perceptions and price-related assumptions. We also randomized the questions to continuously break any potential automatic response patterns from using a common scale format.

Finally, we created an environment of trust and openness to minimize social desirability bias. This was achieved through our informed consent form, where we stressed the value of each participant's unique perspective, emphasized that there were no 'right' or 'wrong' answers, highlighted the significance of their sincere input, and ensured respondents of the anonymity and confidentiality of their responses.

We also conducted a focus group and two pretests to clarify our questions and constructs and ensure their distinctiveness, aiming to reduce item characteristic biases further.

In adopting this multi-pronged approach, we have taken substantial measures to address various sources of common method bias as identified in the literature. This approach aimed to enhance the quality and reliability of our data, thereby contributing to the validity of our findings.

### **Statistical techniques to test for CMB**

This study adopted two of the most widely used methods to detect CMB – Harman single factor test using confirmatory factor analysis (Podsakoff et al., 2003) and latent variables correlation test (Bagozzi et al., 1991).

Harman's one-factor test, widely adopted by researchers to tackle common method variance (CMV), is a post-data collection procedure. It evaluates if a singular factor explains the

variance in the data by loading all construct items into a factor analysis. If a single dominant factor does not emerge to account for most of the covariance, it suggests that CMV is not a significant concern in the study (Tehseen et al., 2017).

The Correlation Matrix Procedure, outlined by Bagozzi et al. (1991), evaluates common method bias (CMB) using a correlation matrix of latent variables. A significant correlation ( $r > 0.9$ ) among constructs indicates CMB, while correlations below 0.9 suggest CMB is not a significant issue. This method, adopted by Pavlou et al. (2007) in e-commerce research, scrutinizes the correlation matrix between all research constructs. Any pair of constructs with a correlation exceeding 0.9 is interpreted as a sign of CMB. Like Harman's single-factor test, this approach helps detect potential CMB presence.

## Chapter 5 Study One

Study 1 investigated how star rating affects shoppers' perception of a brand and how much premium they are willing to pay. The study also explored if shoppers' level of involvement in the purchase influenced this effect (Figure 5). The study tested four hypotheses, H1 through H5 and H6, shown again below.

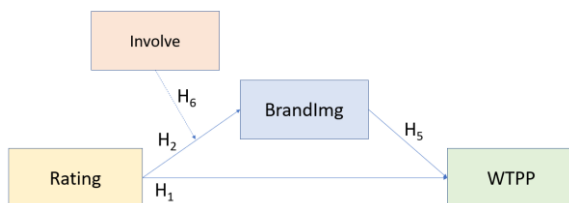
H1: A high star rating (versus low) will lead to a higher willingness to pay a premium (versus lower) for a product or service.

H2: A high star rating (versus low) will lead to a more positive (versus negative) brand image for a product or service.

H5: A positive brand image (versus negative) will lead to a higher willingness to pay a premium (versus lower).

H6: Purchase involvement moderates the positive relationship between star rating and brand image so that when involvement is low, the relationship between star rating and brand image becomes stronger than when involvement is high.

Figure 6-Conceptual Model for Study 1



### Methodology

The study design, manipulation, stimuli design, sampling, and measures follow from Chapter 4.

This study used a between-subjects factorial experiment design with a 2 (Star Rating: Low and High) x 2 (Purchase Involvement: Low and High) setup. The participants were US-based online shoppers, male and female, aged 21 – 75 with a minimum of high school education. The sample size was 50 per experiment.

The first independent variable, star rating, was manipulated at low (1.5 stars) and high (4.5 stars). The second independent variable, purchase involvement, was also manipulated at low and high levels using specially crafted purchase scenarios (section 4.2.2 - Table 11).

## Results

### Descriptive statistics

The demographic information and relevant characteristics of the 216 participants are summarized in [Annexure 7](#).

Two hundred sixteen participants (113 males, 102 females, and one non-binary) aged between 21 and 75 participated in the study. The participants were all residents of the United States, and their educational backgrounds varied, with 16.2% having completed high school, 55.1% holding an undergraduate degree, 18.1% having a graduate degree, and 3.7% possessing a doctorate (Ph.D.), 1.4% with a professional degree and 5.6% other forms of education. None of the participants were students.

82% of respondents reported understanding the mouse features well or 'very well' ( $M=4.1$ ,  $SD=1.08$ ). Furthermore, among the respondents, 91% owned a computer mouse ( $M=1.09$ ,  $SD=.28$ ), and of those, 57.9% purchased it online ( $M=2.06$ ,  $SD=.79$ ), with 83.3% engaging in online purchases more than 11 times a year ( $M=4.38$ ,  $SD=.96$ ). Frequency analyses for these results are presented in [Annexure 8](#). Additionally, as presented in Annexure 3, the respondents had a positive attitude toward the rating ( $M=5.58$ ,  $SD=1.13$ ).

The diverse and representative sample, encompassing various consumer segments based on age, gender, education, and income, facilitated a more accurate and meaningful analysis of the relationships under investigation.

### Manipulation and Other Checks

To ensure the validity of our study, we conducted three attention checks and two manipulation checks throughout the experiment.

First, we examined the participants' attention to the presented scenario by including three checks: 1) a volume check, where participants were asked to indicate the number of buyers who rated the mouse using a text box; 2) a rating check, where participants reported the star rating of the mouse using a text box, and 3) an attention check item in the questionnaire after the brand image questions, where participants rated their level of agreement with the statement, "I am randomly answering the questions without reading them," on a 7-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree."

In addition to these attention checks, we conducted two manipulation checks to assess the effectiveness of our experimental manipulations ([Annexure 9](#)). The first manipulation checks focused on the star rating. Participants were asked to rate the perceived star rating of the mouse in the scenario from "very low" to "very high." The mean ratings for 1.5 stars ( $M = 1.53$ ,  $SD = 0.5$ ) and 4.5 stars ( $M = 5.27$ ,  $SD = 1.17$ ) differed significantly, as confirmed by ANOVA analysis ( $F(1,214) = 905.78$ ,  $p < .001$ ).

The second manipulation check evaluated the participants' purchase involvement in the presented purchase situation. Using a 4-item scale, we observed a statistically significant difference in the "purchase involvement" between low and high-involvement participants. The mean responses for the low involvement group ( $M = 5.31$ ,  $SD = 1.13$ ) were significantly different from those in the high involvement group ( $M = 6.15$ ,  $SD = 1.07$ ), as confirmed by an ANOVA analysis ( $F(1) = 31.04$ ,  $p < .001$ ).

After these checks, we excluded responses that failed the manipulation and attention checks. Additionally, we filtered out responses that exhibited straight-lining or inconsistent answers (e.g., a response of 7 for "This product has high quality" when the rating was 1.5). The remaining 216 responses were then used for the final analysis.

### **Statistical test for common method bias (CMB)**

The common method bias was assessed for this study using Harmon's single-factor test. This test involves conducting a principal component analysis (PCA) on all the variables used in the study. If a substantial amount of the variance can be attributed to a single factor, it indicates potential common method bias.

The PCA resulted in the extraction of nine components (see Table 13). The first component accounted for 47.371% of the variance, below the 50% threshold typically indicative of significant common method bias. This suggests that the variables measured in this study are not overly influenced by a single factor, which would have been the case if common method bias had been present.

Furthermore, it is important to note that not one single factor, but nine factors, emerged from the analysis. This indicates that no single common method factor has significantly influenced responses across all measures used in the study.

Table 13 - Harman's Single Factor Test Variance Analysis (Study 1)

| <b>Total Variance Explained</b>                  |                     |               |              |                                     |               |              |
|--------------------------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| Component                                        | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              |
|                                                  | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % |
| 1                                                | 7.106               | 47.371        | 47.371       | 7.106                               | 47.371        | 47.371       |
| 2                                                | 1.854               | 12.361        | 59.732       | 1.854                               | 12.361        | 59.732       |
| 3                                                | 1.547               | 10.313        | 70.045       | 1.547                               | 10.313        | 70.045       |
| 4                                                | 1.309               | 8.729         | 78.774       | 1.309                               | 8.729         | 78.774       |
| 5                                                | 0.973               | 6.487         | 85.261       |                                     |               |              |
| 6                                                | 0.764               | 5.091         | 90.352       |                                     |               |              |
| 7                                                | 0.601               | 4.004         | 94.356       |                                     |               |              |
| 8                                                | 0.448               | 2.985         | 97.341       |                                     |               |              |
| 9                                                | 0.399               | 2.659         | 100.000      |                                     |               |              |
| Extraction Method: Principal Component Analysis. |                     |               |              |                                     |               |              |

Based on the results from Harmon's single-factor test, it can be confidently stated that common method bias is unlikely to be a substantial concern in our study. This bolsters the validity of the findings and assures that the relationships identified among the variables are not merely a product of methodological artifacts. Therefore, the interpretations and discussions based on the study results can be held with a high degree of confidence.

#### Latent variable correlation test

The latent variables correlation test showed that none of our latent constructs were highly correlated, suggesting that CMB is not a serious concern in our dataset (see Table 14). A significant correlation ( $r > 0.9$ ) among constructs indicates CMB, while correlations below 0.9 suggest CMB is not a significant issue (Bagozzi et al., 1991). The correlations of star rating with the brand image ( $r=.808$ ) and willingness to pay a premium ( $r=.673$ ), and brand image and willingness to pay a premium ( $r=.858$ ) were as theorized and supported in the literature.

Table 14 - Latent Variables Correlations (Study 1)

|                                      | <b>Brand Image</b> | <b>Purchase Involvement</b> | <b>Rating</b> | <b>WTPP</b> | <b>Purchase Involvement x Rating</b> |
|--------------------------------------|--------------------|-----------------------------|---------------|-------------|--------------------------------------|
| <b>Brand Image</b>                   | 1.000              | 0.128                       | 0.808         | 0.858       | 0.590                                |
| <b>Purchase Involvement</b>          | 0.128              | 1.000                       | -0.019        | 0.141       | 0.575                                |
| <b>Rating</b>                        | 0.808              | -0.019                      | 1.000         | 0.673       | 0.575                                |
| <b>WTPP</b>                          | 0.858              | 0.141                       | 0.673         | 1.000       | 0.503                                |
| <b>Purchase Involvement x Rating</b> | 0.590              | 0.575                       | 0.575         | 0.503       | 1.000                                |

### Construct reliability and validity.

In this study, I evaluated discriminant validity, reliability, Cronbach's Alpha, composite reliability (CR), and average variance extracted (AVE) for our measures, following the guidelines of (Bagozzi & Yi 1988; Fornell & Larcker, 1981). I also examined content validity. The results are summarized in Table 15.

The Brand Image construct exhibited a Cronbach's Alpha of 0.918 ( $> 0.7$  recommended minimum), suggesting a high level of internal consistency amongst the measurement items. Its composite reliability scores, 0.962 (rho\_a) and 0.943 (rho\_c), further affirmed this construct's reliability. Moreover, the Average Variance Extracted (AVE) for Brand Image was 0.720, indicating that a substantial proportion of the variance in the observed variables can be attributed to this construct.

Table 15 - Construct Reliability and Validity (Study 1)

|             | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | The average variance extracted (AVE) |
|-------------|------------------|-------------------------------|-------------------------------|--------------------------------------|
| Brand Image | 0.918            | 0.962                         | 0.943                         | 0.720                                |
| WTPP        | 0.852            | 0.852                         | 0.931                         | 0.871                                |

Similarly, the Willingness to Pay Premium (WTPP) construct demonstrated high internal consistency with a Cronbach's Alpha of 0.852 ( $> 0.7$  recommended minimum). For the two-item WTPP scale, we also calculated the Spearman-Brown coefficient (value = .858), which is considered more appropriate than  $\alpha$  for 2-item scales due to significant bias (Eisinga et al., 2013). Its composite reliability scores, 0.852 (rho\_a) and a notably higher 0.931 for rho\_c indicated that this construct is also very reliable. The AVE for WTPP stood at a robust 0.871, suggesting that the WTPP construct can account for most of the observed variables' variance. Thus, both constructs - Brand Image and Willingness to Pay Premium - exhibit strong reliability and validity in this context.

### Discriminant validity

Table 16 presents the Fornell-Larcker criterion, a commonly used method to assess discriminant validity. The diagonal elements are the square root of the average variance extracted (AVE) for each construct, while off-diagonal elements are the correlations between the constructs.

For the "Brand Image" construct, the square root of the AVE is 0.851, which is greater than its correlations with other constructs (0.132 with Involve, 0.801 with Rating, and 0.838 with WTPP). This indicates that Brand Image has good discriminant validity, meaning it is distinct from the other constructs.

Regarding the "Involve" construct, the square root of the AVE is 1.000, which exceeds its correlations with other constructs (0.132 with Brand Image, -0.019 with Rating, and 0.140 with WTPP). This demonstrates strong discriminant validity for the Involve construct, indicating that it is distinct.

Table 16 - Discriminant Validity – Study 1 (Fornell-Larcker Criterion)

|                      | Brand Image | Purchase Involvement | Rating | WTPP  |
|----------------------|-------------|----------------------|--------|-------|
| Brand Image          | 0.851       |                      |        |       |
| Purchase Involvement | 0.132       | 1.000                |        |       |
| Rating               | 0.801       | -0.019               | 1.000  |       |
| WTPP                 | 0.838       | 0.140                | 0.667  | 0.933 |

For the "rating" construct, the square root of the AVE is 1.000, which is greater than its correlations with other constructs (0.801 with Brand Image, -0.019 with Involve, and 0.667 with WTPP). Thus, the rating also exhibits good discriminant validity.

Finally, for the "Willingness To Pay Premium" (WTPP) construct, the square root of the AVE is 0.933, which is greater than its correlations with other constructs (0.838 with Brand Image, 0.140 with Involve, and 0.667 with Rating). This provides strong evidence for discriminant validity for the WTPP construct.

In summary, according to the Fornell-Larcker criterion, all four constructs - Brand Image, Involve, Rating, and Willingness To Pay Premium - demonstrate good discriminant validity, indicating that they are distinct.

### Content validity

Ensuring the content validity of a measurement instrument is crucial in any research study to ensure the accuracy of the results. The study involved expert review, literature review, pre-testing, and item analysis to ensure content validity. Three subject matter experts provided valuable feedback on the items' clarity, relevance, and comprehensiveness, and the instrument was refined to ensure it captured the dimensions of the construct under investigation. The instrument was developed based on an extensive review of relevant

literature and previous research to align with existing knowledge. The pilot test allowed the identification of unclear or irrelevant items for further refinement. An exploratory factor analysis was performed to examine the factor loadings and item-total correlations, which indicated that each item had strong loadings on the intended factors and contributed to the overall construct.

The evidence from the expert review, literature review, pre-testing, and item analysis supports the content validity of the measurement instrument used in the study, making it suitable for use in the research.

### Verification of data assumptions for parametric analysis (ANOVA analysis)

Before conducting the ANOVA analysis, we assessed the data for the assumptions required for this statistical technique, including normality, homogeneity of variances, and independence of observations Iacobucci (1994). The results of these assumption tests are reported below:

#### *Normality:*

Considering our data analysis plan, which included ANOVA analysis and the Hayes Process Model, we have carefully assessed the distribution of our dependent variables, *brand image* (shown as *brandimg* in SPSS tables), and *willingness to pay a premium* (shown as *WTPP* in SPSS tables). As presented in [Annexure 11](#), the two dependent variables (*brand image* and *WTPP*) failed the Shapiro-Wilks test for normality ( $p < .001$ ) and exhibited a right-skewed distribution (Annexures [12](#) & [13](#)). However, our examination revealed that these deviations from normality are only slight, as evidenced by the relatively low skewness and kurtosis values (Table 17).

Table 17- Skewness and Kurtosis of Dependent Variables: Brand Image and WTPP

#### *Descriptive Statistics*

|                    | N         | Range     | Mean      | Std. Deviation | Skewness  |            | Kurtosis  |            |
|--------------------|-----------|-----------|-----------|----------------|-----------|------------|-----------|------------|
|                    | Statistic | Statistic | Statistic | Statistic      | Statistic | Std. Error | Statistic | Std. Error |
| Brandimg           | 214       | 5.57      | 3.2964    | 1.51023        | .116      | .166       | -1.429    | .331       |
| Purlnt             | 214       | 6.00      | 3.3000    | 1.94604        | .158      | .166       | -1.555    | .331       |
| WTPP               | 214       | 5.50      | 2.7383    | 1.61543        | .447      | .166       | -1.159    | .331       |
| Valid N (listwise) | 214       |           |           |                |           |            |           |            |

It is essential to consider the robustness of our chosen analytical techniques when dealing with non-normal data. Research has consistently demonstrated the resilience of the F-test and ANOVA against deviations from normality. Studies conducted by (Blanca et al., 2017) and (Schmider et al., 2010) highlight the strength of these techniques in accommodating various sample sizes, distributional shapes, and effect sizes. These findings provide a solid foundation for continuing our analysis plan, even with slight non-normality in our dependent variables.

Furthermore, the Hayes Process Model, which utilizes ordinary least squares (OLS) regression, is known for its robustness against normality violations regarding Type I error rates and parameter estimation. To further strengthen the validity of our analysis, we will employ bootstrapping, a resampling method that estimates the sampling distribution using the data, making it even more resilient to non-normal data.

In summary, despite slightly non-normal data, the evidence from research and the robust nature of our chosen analytical techniques provide a compelling argument for continuing our analysis plan. This decision allows us to maintain the integrity of our data and draw valid conclusions from our study without resorting to remedial measures such as transformations.

#### *Homogeneity of variances:*

Levene's test assessed the equality of variances across groups (Table 18). The results

Table 18- Levene's Test of Variances: Brand Image and WTPP

*Tests of Homogeneity of Variances*

|          |                                         | Levene<br>Statistic | df1 | df2    | Sig.  |
|----------|-----------------------------------------|---------------------|-----|--------|-------|
| Brandimg | Based on Mean                           | 1.99                | 1   | 212    | .160  |
|          | Based on Median                         | 1.91                | 1   | 212    | .168  |
|          | Based on Median and<br>with adjusted df |                     | 1   |        | .168  |
|          |                                         | 1.91                |     | 207.09 |       |
|          | Based on trimmed mean                   | 2.15                | 1   | 212    | .144  |
| WTPP     | Based on Mean                           | 11.34               | 1   | 212    | <.001 |
|          | Based on Median                         | 12.71               | 1   | 212    | <.001 |
|          | Based on Median and<br>with adjusted df |                     | 1   |        | <.001 |
|          |                                         | 12.71               |     | 192.11 |       |
|          | Based on trimmed mean                   | 13.67               | 1   | 212    | <.001 |

\**BrandImg* denotes *Brand image*

Indicated that the assumption of homogeneity of variances was met for *brand image* ( $p > .05$ ). However, for *WTPP*, the test was statistically significant ( $p < .001$ ), suggesting that the assumption of homogeneity of variances was violated.

We computed the Welch statistic for *WTPP* to test for the significant difference in its low and high rating means. The results of the Welch test (Table 19) indicated a statistically significant difference between the two groups of *WTPP* ( $p < .001$ ) at low (1.5) and high (4.5) ratings, with a Welch statistic of 184.77.

Table 19 -Welch's Test: Brand Image and WTPP

*Robust Tests of Equality of Means*

|          |                | Statistic <sup>a</sup> | df1 | df2    | Sig.  |
|----------|----------------|------------------------|-----|--------|-------|
| BrandImg | Welch          | 368.93                 | 1   | 211.75 | <.001 |
|          | Brown-Forsythe | 368.93                 | 1   | 211.75 | <.001 |
| WTPP     | Welch          | 184.77                 | 1   | 207.89 | <.001 |
|          | Brown-Forsythe | 184.77                 | 1   | 207.89 | <.001 |

<sup>a</sup>. Asymptotically F distributed.

### *Homoscedasticity test*

Homoscedasticity refers to the presence of equal variance or uniformity of variance in the residuals, which are the differences between a regression model's observed and predicted values. The study used the Breusch-Pagan test to check for homoscedasticity in the dependent variables. The test involved regressing the squared residuals of *brand image* and *WTPP* against rating.

As shown in Tables 20 and 21, the results indicated no significant relationship between the square of the residuals and star rating for both variables brand image and *WTPP* ( $p > .05$ ), providing evidence that the data is homoscedastic for both variables *brand image* and *WTPP* ( $p > .05$ ), indicating that the data is homoscedastic.

Table 20- Breusch-Pagan Test: Brand Image

ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | 15.76          | 5   | 3.15        | .976 | .433 <sup>b</sup> |
|       | Residual   | 671.59         | 208 | 3.23        |      |                   |
|       | Total      | 687.35         | 213 |             |      |                   |

<sup>a</sup>. Dependent Variable: SQRES

<sup>b</sup>. Predictors: (Constant), Income, Rating, Age, Edu, Gender

Table 21- Breusch-Pagan Test: WTPP

ANOVA<sup>a</sup>

| Model |            | Sum of Squares | df  | Mean Square | F    | Sig.              |
|-------|------------|----------------|-----|-------------|------|-------------------|
| 1     | Regression | 24.25          | 5   | 4.850       | .805 | .547 <sup>b</sup> |
|       | Residual   | 1253.469       | 208 | 6.026       |      |                   |
|       | Total      | 1277.72        | 213 |             |      |                   |

<sup>a</sup>. Dependent Variable: SQRESWT

<sup>b</sup>. Predictors: (Constant), Income, Rating, Age, Edu, Gender

### *Independence of observations:*

The study design ensured the independence of observations by collecting data from individual participants who were not influenced by other participants' responses. Additionally, each participant was randomly assigned to one of the experimental conditions, ensuring the groups were independent. In addition, the presence of outliers should also be checked.

### *Random sampling*

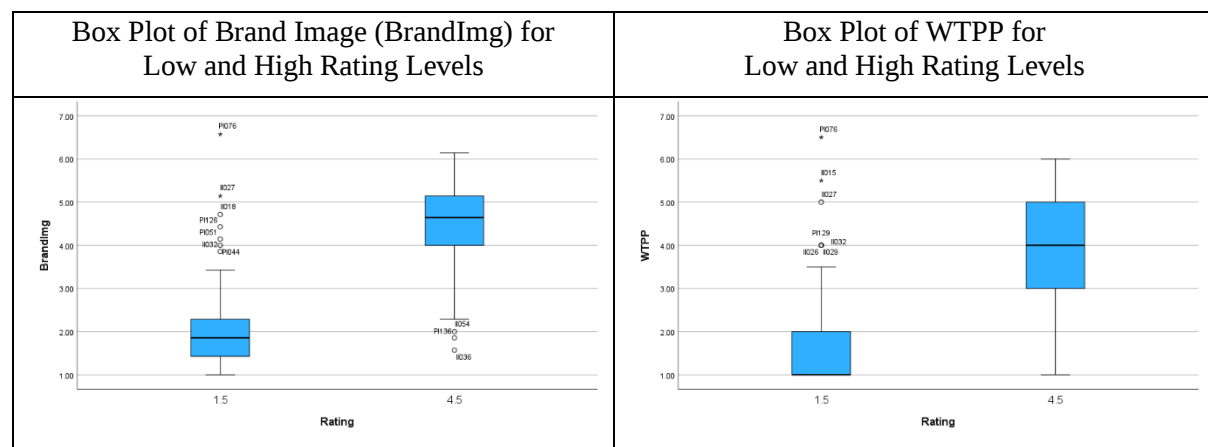
Since respondents are randomly assigned to each of the four treatments through Qualtrics' built-in randomization engine, the independence of the scores for the outcome variables

(brand image and WTPP) is ensured. Consequently, the error terms are likely to be independent.

#### *Presence of outliers:*

We analyzed for outliers, which can skew results and increase errors in statistical tests. (Zimmerman, 1994) highlighted that outliers could reduce Type I errors but increase Type II errors and reduce power. Outliers disproportionately influence means and variances, altering the probability of errors. The Box Plot for outcome variables (BrandImg and WTPP) showed outliers for low and high ratings (Table 22). We included these outliers in our analysis, believing they represent genuine extreme values in the population. Removing them may lead to biased results.

Table 22-Outlier Analysis: Brand Image and WTPP



### Hypotheses testing

**H1: A high star rating (versus low) will lead to a higher willingness to pay a premium (versus lower) for a product or service.**

A covariance (ANCOVA) analysis was undertaken to investigate the relationship between the *rating* and *WTPP* while controlling for covariates: age, gender, edu (education), and income.

The results of the ANCOVA analysis (Table 23) indicate a statistically significant relationship between *rating* and *WTPP*,  $F(1, 210) = 169.81$ ,  $p < .001$ . This finding suggests that *rating* strongly predicts *WTPP*, with higher *ratings* associated with higher *WTPP* values.

Table 23 -ANCOVA Analysis: *WTPP* (Study 1 - H1)

*Tests of Between-Subjects Effects*

| Dependent Variable: <i>WTPP</i> |                         |     |             |        |       |
|---------------------------------|-------------------------|-----|-------------|--------|-------|
| Source                          | Type III Sum of Squares | df  | Mean Square | F      | Sig.  |
| Corrected Model                 | 249.62 <sup>a</sup>     | 5   | 49.92       | 34.39  | <.001 |
| Intercept                       | 57.88                   | 1   | 57.88       | 39.87  | <.001 |
| Age                             | .02                     | 1   | .02         | .01    | .907  |
| Gender                          | .56                     | 1   | .56         | .39    | .534  |
| Edu                             | .49                     | 1   | .49         | .34    | .560  |
| Income                          | .36                     | 1   | .36         | .24    | .621  |
| Rating                          | 246.52                  | 1   | 246.52      | 169.81 | <.001 |
| Error                           | 304.86                  | 210 | 1.45        |        |       |
| Total                           | 2177.00                 | 216 |             |        |       |
| Corrected Total                 | 554.48                  | 215 |             |        |       |

<sup>a</sup>. R Squared = .450 (Adjusted R Squared = .437)

The covariates (age, gender, edu, and income) did not show any significant relationship with the outcome variable, *WTPP* ( $p > .05$  for all covariates).

The model accounted for 45.0% of the variance in *WTPP*, with an adjusted R squared of .437. The adjusted R squared better indicates the model's predictive power as it considers the number of predictors and sample size.

The grand mean of *WTPP* was 2.71, with a 95% confidence interval ranging from 2.55 to 2.87, implying that, on average, the *WTPP* values fall between 2.55 and 2.87. Furthermore, as presented in Table 24, the estimated means for different *rating* levels (1.5 and 4.5) were calculated, holding the covariates at constant values: Age = 2.79, gender = 1.48, Edu = 3.36, and Income = 4.14. For a *rating* of 1.5, the mean *WTPP* was 1.64, with a 95% confidence interval ranging from 1.41 to 1.87. In contrast, for a *rating* of 4.5, the mean *WTPP* was 3.78, with a 95% confidence interval ranging from 3.56 to 4.01.

In conclusion, the ANCOVA analysis revealed a significant positive relationship between *rating* and *WTPP*, indicating that higher *ratings* are associated with higher *WTPP* values. The covariates (Age, Gender, Edu, and Income) did not significantly influence the outcome variable, *WTPP*.

Table 24- EMM Report: WTPP

| Dependent Variable: WTPP |                   |            |                         |             |      |            |                                  |       |
|--------------------------|-------------------|------------|-------------------------|-------------|------|------------|----------------------------------|-------|
| Rating                   | Mean              | Std. Error | 95% Confidence Interval |             | Bias | Std. Error | Bootstrap for Mean <sup>ab</sup> |       |
|                          |                   |            | Lower Bound             | Upper Bound |      |            | 95% Confidence Interval          |       |
|                          |                   |            |                         |             |      |            | Lower                            | Upper |
| 1.5                      | 1.64 <sup>a</sup> | .12        | 1.41                    | 1.87        | -.01 | .11        | 1.44                             | 1.87  |
| 4.5                      | 3.78 <sup>a</sup> | .11        | 3.56                    | 4.01        | .00  | .12        | 3.56                             | 4.02  |

<sup>a</sup>. Covariates appearing in the model are evaluated at the following values: Age = 2.79, Gender = 1.48, Edu = 3.36, Income = 4.14.

<sup>ab</sup>. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

**H2: A high star rating (versus low) will lead to a more positive (versus negative) brand image for a product or service.**

Table 25- ANCOVA Analysis: Brand Image (Study 1-H2)

*Tests of Between-Subjects Effects*

| Dependent Variable: BrandImg |                         |     |             |        |       |
|------------------------------|-------------------------|-----|-------------|--------|-------|
| Source                       | Type III Sum of Squares | df  | Mean Square | F      | Sig.  |
| Corrected Model              | 308.17 <sup>a</sup>     | 5   | 61.63       | 69.35  | <.001 |
| Intercept                    | 77.33                   | 1   | 77.33       | 87.00  | <.001 |
| Age                          | .09                     | 1   | .09         | .10    | .750  |
| Gender                       | 1.88                    | 1   | 1.88        | 2.12   | .147  |
| Edu                          | .55                     | 1   | .55         | .62    | .431  |
| Income                       | .61                     | 1   | .61         | .68    | .410  |
| Rating                       | 302.56                  | 1   | 302.56      | 340.41 | <.001 |
| Error                        | 186.65                  | 210 | .89         |        |       |
| Total                        | 2870.12                 | 216 |             |        |       |
| Corrected Total              | 494.82                  | 215 |             |        |       |

<sup>a</sup>. R Squared = .623 (Adjusted R Squared = .614)

A covariance analysis (ANCOVA) was undertaken to investigate the relationship between the *rating* and *brand image* while controlling for covariates: age, gender, edu (education), and income.

The results of the ANCOVA analysis (Table 25) indicate a statistically significant relationship between *rating* and *brand image*,  $F(1, 210) = 340.41$ ,  $p < .001$ . This finding suggests that *rating* strongly predicts *brand image*, with higher *ratings* associated with higher *brand image* values. The covariates (Age, Gender, Edu, and Income) did not show any significant relationship with the outcome variable, *brand image* ( $p > .05$  for all covariates).

The model accounted for 62.3% of the variance in *brand image*, with an adjusted R squared of .614. The adjusted R squared better indicates the model's predictive power as it considers the number of predictors and sample size.

The grand mean of the *brand image* was 3.28, with a 95% confidence interval ranging from 3.16 to 3.41, implying that, on average, the *brand image* values fall between 3.16 and 3.41.

Table 26- EMM Report: Brand Image

*Estimates*

| Dependent Variable: Brandimg |                   |            |                         |             |      |            |                                   |       |
|------------------------------|-------------------|------------|-------------------------|-------------|------|------------|-----------------------------------|-------|
| Rating                       | Mean              | Std. Error | 95% Confidence Interval |             | Bias | Std. Error | Bootstrap for Mean <sup>all</sup> |       |
|                              |                   |            | Lower Bound             | Upper Bound |      |            | 95% Confidence Interval           |       |
|                              |                   |            |                         |             |      |            | Lower                             | Upper |
| 1.5                          | 2.10 <sup>a</sup> | .09        | 1.91                    | 2.28        | .00  | .10        | 1.89                              | 2.31  |
| 4.5                          | 4.47 <sup>a</sup> | .09        | 4.29                    | 4.65        | .00  | .09        | 4.29                              | 4.64  |

<sup>a</sup>. Covariates appearing in the model are evaluated at the following values: Age = 2.79, Gender = 1.48, Edu = 3.36, Income = 4.14.

<sup>all</sup>. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Furthermore, the estimated means for different *rating* levels (1.5 and 4.5) were calculated (Table 26), holding the covariates at constant values: Age = 2.79, gender = 1.48, Edu = 3.36, and Income = 4.14. For a *rating* of 1.5, the mean *brand image* was 2.10, with a 95% confidence interval ranging from 1.91 to 2.28. In contrast, for a *rating* of 4.5, the mean *brand image* was 4.47, with a 95% confidence interval ranging from 4.29 to 4.65.

In conclusion, the ANCOVA analysis revealed a significant positive relationship between *rating* and *brand image*, indicating that higher *ratings* are associated with higher *brand image*

values. The covariates (Age, Gender, Edu, and Income) did not significantly influence the outcome variable, *brand image*.

**H5: A positive brand image (versus negative) will lead to a higher willingness to pay a premium (versus lower).**

The primary goal of this analysis was to examine the relationship between the *brand image* and *WTPP* while controlling for covariates: Age, Gender, Edu (education), and Income. A linear regression was conducted to test the hypothesis, as the *brand image* was a continuous variable.

The results (Table 27) indicate that *brand image* significantly affected *WTPP* ( $\beta = 0.91$ ,  $t = 23.97$ ,  $p < .001$ ), suggesting that a unit increase in *brand image* was associated with a .91 unit increase in *WTPP*. The overall model was significant.

( $F(5, 210) = 115.776$ ,  $p < .001$ ), indicating that the predictor accounted for a significant proportion of variance in *WTPP*.

The covariates (Age, Gender, Edu, and Income) did not show any significant relationship with the outcome variable, *WTPP* ( $p > .05$  for all covariates).

Table 27- Regression of Brand Image on WTPP (Study 1)

*ANOVA<sup>a</sup>*

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.               |
|-------|------------|----------------|-----|-------------|--------|--------------------|
| 1     | Regression | 406.88         | 5   | 81.38       | 115.78 | <.001 <sup>b</sup> |
|       | Residual   | 147.60         | 210 | .70         |        |                    |
|       | Total      | 554.48         | 215 |             |        |                    |

<sup>a</sup>. Dependent Variable: WTPP

<sup>b</sup>. Predictors: (Constant), BrandImg, Edu, Gender, Age, Income

*Coefficients<sup>a</sup>*

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|------------|-----------------------------|------------|---------------------------|-------|-------|
|       |            | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant) | -.13                        | .31        |                           | -.42  | .673  |
|       | Age        | .02                         | .05        | .02                       | .50   | .617  |
|       | Gender     | -.07                        | .12        | -.02                      | -.59  | .554  |
|       | Edu        | -.08                        | .05        | -.06                      | -1.64 | .102  |
|       | Income     | .04                         | .03        | .06                       | 1.55  | .122  |
|       | BrandImg   | .91                         | .04        | .86                       | 23.97 | <.001 |

<sup>a</sup>. Dependent Variable: WTPP

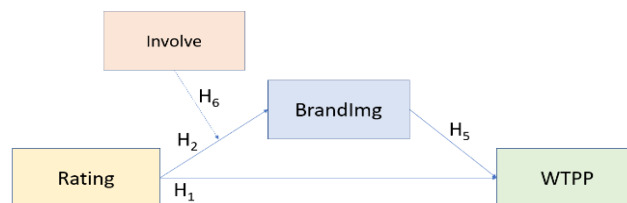
NOTE: Branding refers to brand image

In conclusion, the analysis pointed to a significant positive association between *brand image* and *WTPP*, indicating that higher *brand image* values are associated with higher *WTPP* values. The covariates (age, gender, edu, and income) did not significantly influence the outcome variable, *WTPP*.

**H6: Purchase involvement moderates the positive relationship between star rating and brand image so that when involvement is low, the relationship between star rating and brand image becomes stronger than when involvement is high.**

The hypothesized moderated mediation model (see Figure 7) was tested in three stages: model 1, model 4, and model 7, using a bootstrapping approach to assess the significance of the direct and indirect effects at differing levels of the moderator (Hayes, 2013). Age, education, gender, and income were used as covariates.

Figure 7-Conceptual Model (Study 1-H6)

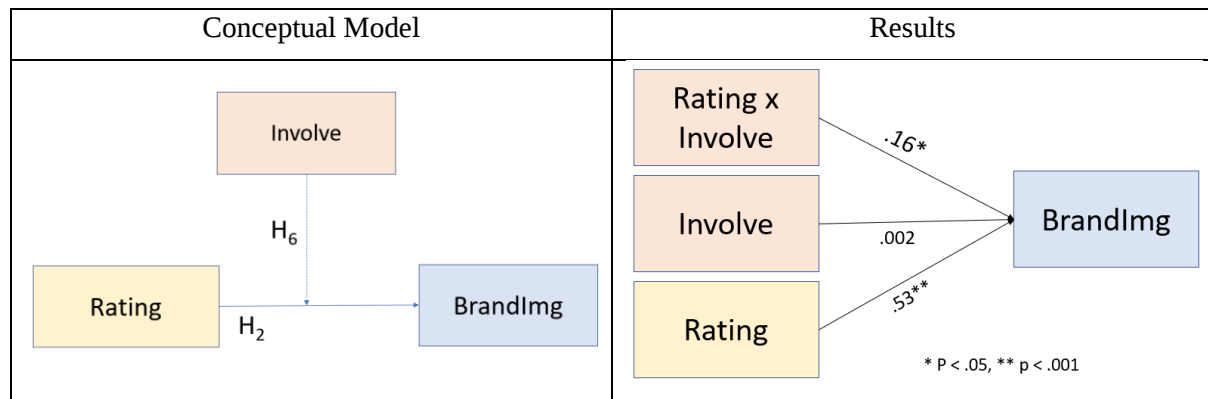


NOTE: Branding refers to brand image

### **Model 1: rating – brand image relationship moderated by purchase involvement**

A study using Process Model 1 examined the moderating role of "*purchase involvement*" (MOD) on the relationship between *rating* (IV) and *brand image* (DV) with age, education, gender, and income as covariates. The regression results and conceptual model are shown in Figure 8.

Figure 8-Conceptual model and results for BrandImg (Study 1-Model 1)



NOTE: Brandimg refers to brand image. Involve refers to purchase involvement.

The regression results are presented in Table 28, with a detailed report in [Annexure 14](#). The

Table 28 – Model 1 Analysis Results from Hayes  
Process Macro: Brand Image (Study 1)

| Variable         | Model a-path |     |       |
|------------------|--------------|-----|-------|
|                  | b            | SE  | p     |
| rating           | .53          | .14 | <.001 |
| involve          | -.09         | .30 | >.05  |
| Rating x involve | .18          | .09 | <.05  |
| age              | -.01         | .05 | >.05  |
| gender           | .16          | .16 | >.05  |
| edu              | .03          | .05 | >.05  |
| income           | -.02         | .03 | >.05  |

Note: N=216,  
Model for the Relationship  $R^2 = .65$ ,  
 $F(7,208) = 75.78$ ,  $p < .001$

Process Model 1 analysis showed a significant main effect of rating on the brand image ( $b = 0.53$ ,  $p < .001$ ), indicating that brand image tends to increase as rating increases. The covariate age, gender, education, and income did not significantly affect brand image. The interaction between rating and involvement was significant (Int\_1:  $b = 0.18$ ,  $p < .05$ ), indicating that involvement moderates the relationship between rating and brand image. The conditional effect analysis showed that the effect of rating on the brand image was stronger for low-involvement shoppers ( $b = 0.88$ ,  $p < .001$ ) compared to high-involvement

shoppers ( $b = 0.70$ ,  $p < .001$ ), suggesting that the impact of rating on brand image is dependent on the level of involvement.

In conclusion, the Process Model 1 analysis results indicate that rating significantly predicts brand image, and involvement moderates the relationship between them.

Figure 9 shows the interaction diagram, depicting the moderation effect of involvement on the *rating – brand image* relationship. The slope analysis revealed that the line for 'low' purchase involvement is steeper than for 'high', indicating that low involvement has a stronger impact on the *rating - brand image* relationship than high involvement. A one-unit increase in *rating* resulted in .88 and .72 unit increases in *brand image* for low and high-purchase involvement shoppers, respectively. In other words, involvement weakened the *rating-brand image* relationship.

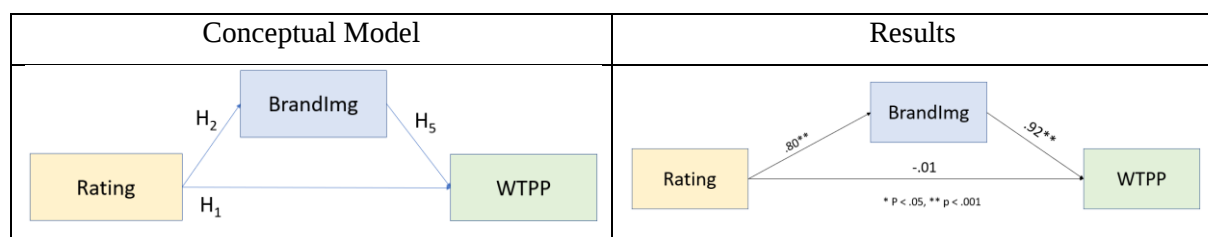
Figure 9-Interaction Diagram: Brand Image and Rating\*Purchase Involvement (Study 1)



#### Model 4: rating – WTPP relationship mediated by brand image

Next, we conducted a Hayes PROCESS Model 4 analysis to determine if brand image mediated the rating – WTPP relationship. Age, gender, education, and income were included as covariates in the analysis. The conceptual model and the results are presented in Figure 10.

Figure 10-Conceptual Model and Results: WTPP (Study 1-Model 4)



NOTE: Brandimg refers to brand image.

The regression results of the Hayes PROCESS Model 4 analysis are presented in Table 29. The detailed report is available in [Annexure 15](#).

Table 29 - Model 4 Analysis Results from Hayes Process  
Macro: WTPP (Study 1)

| Variable       | Model a-path |     |       | Model b/c' path |     |       |
|----------------|--------------|-----|-------|-----------------|-----|-------|
|                | b            | SE  | p     | b               | SE  | p     |
| rating (IV)    | .80          | .04 | <.001 | -.01            | .06 | >.05  |
| brandimg (MED) |              |     |       | .92             | .06 | <.001 |
| age            | -.02         | .05 | >.05  | .02             | .05 | >.05  |
| gender         | .20          | .13 | >.05  | -.07            | .12 | >.05  |
| edu            | .04          | .05 | >.05  | -.09            | .08 | >.05  |
| income         | -.24         | .03 | >.05  | .04             | .04 | >.05  |

Note. N = 216. Model for the a-path  $R^2 = .62$ ,  $F(5,210) = 69.35$ ,  $p < .001$ ,  
Model for b-path and c'-path  $R^2 = .73$ ,  $F(6,209) = 96.05$ ,  $p < .001$ .

NOTE: Brandimg refers to brand image. Involve refers to purchase involvement.

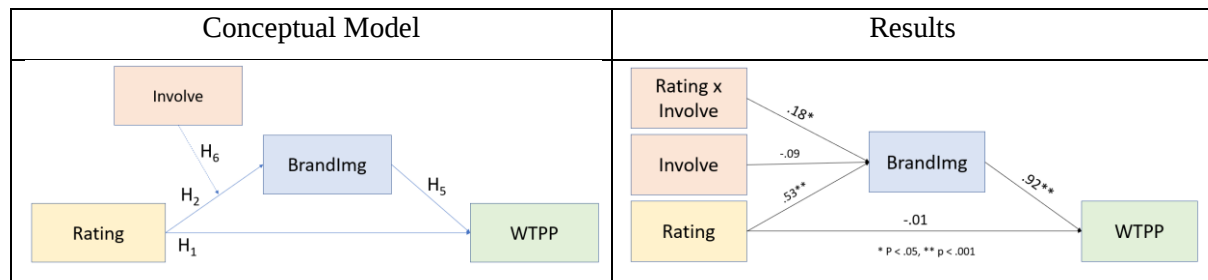
The overall model was statistically significant ( $R^2 = .73$ ,  $F(6,209) = 96.05$ ,  $p < .001$ ), indicating that the predictors accounted for a significant amount of variance in *WTPP*. *Brandimg* completely mediated the relationship between *rating* and *WTPP*. The total effect of *rating* on *WTPP* was significant ( $b = .71$ ,  $SE = .06$ ,  $t = 13.03$ ,  $p < .001$ , 95% CI [.61, .82]), as was the indirect effect of *rating* on *WTPP* through *brand image* ( $b = .73$ ,  $SE = .06$ , 95% CI [.62, .85]).

Further, the path from *rating* to *brandImg* was significant ( $B = .79$ ,  $SE = .04$ ,  $p < .001$ ), as was the path from *brandImg* to *WTPP* ( $B = .92$ ,  $SE = .06$ ,  $p < .001$ ).

#### **Model 7: rating – WTPP relationship with moderated mediation of the brand image**

Hayes' (2017) Process Model 7 was analyzed to investigate the indirect effect of *rating* on *WTPP* through the mediator *brand image* while controlling for the covariates age, gender, education, and income. The conceptual model and results are presented in Figure 11.

Figure 11 - Conceptual Model and Results: WTPP (Study 1-Model 7)



The summary regression results are presented in Table 30, and the detailed report is available in [Annexure 16](#).

After controlling for the effects of the covariates, the direct effect of *rating* on *WTPP* was found to be insignificant ( $b = -.01$ ,  $SE = .06$ ,  $t = -.2$ ,  $p > .05$ ). Furthermore, the indirect effect of *rating* on *WTPP* through brand image was found to be significant, with a higher effect observed for low involvement ( $b = 0.81$ , 95% percentile CI [0.68, 0.94]) compared to high involvement ( $b = 0.65$ , CI [0.51, 0.80]).

Table 30 - Model 8 Analysis Results from Hayes Process Macro: WTPP (Study 1-H6)

| Variable                | Model a-path |      |       | Model b/c' path |     |       |
|-------------------------|--------------|------|-------|-----------------|-----|-------|
|                         | b            | SE   | p     | b               | SE  | p     |
| <i>rating</i>           | .53          | .13  | <.001 | -.01            | .06 | >.05  |
| <i>involve</i>          | -.09         | .273 | >.05  |                 |     |       |
| <i>rating x involve</i> | .18          | .080 | <.05  |                 |     |       |
| <i>brandimg</i>         |              |      |       | .92             | .06 | <.001 |
| <i>age</i>              | -.08         | .049 | >.05  | .02             | .05 | >.05  |
| <i>gender</i>           | .17          | .13  | >.05  | -.07            | .12 |       |
| <i>edu</i>              | .03          | .05  | >.05  | -.08            | .05 | >.05  |
| <i>income</i>           | -.03         | .03  | >.05  | .04             | .03 | >.05  |

Note.  $N = 214$ . Model for the a-path  $R^2 = .65$ ,  $F(7,208) = 55.69$ ,  $p < .001$ , Model for b-path and c'-path  $R^2 = .73$ ,  $F(6,209) = 96.05$ ,  $p < .001$ .

There was evidence for a significantly moderated mediation, with the index of moderated mediation being significant ( $b = 0.16$ , 95% percentile CI [0.01, 0.31]). The conditional effect from *rating* on *brand image* (MED) was found to be significant at both the low value of *purchase involvement* ( $b = 0.88$ ,  $p < .001$ ) and the high value of *purchase involvement* ( $b = 0.70$ ,  $p < .001$ ). The mediator *brand image* was also significantly associated with *WTPP* ( $b =$

.92, SE = .06,  $t = 14.93$ ,  $p < .001$ ), indicating that higher levels of the *brand image* were associated with higher levels of *WTPP* while controlling for the effects of *rating* and the covariates. The effect of *rating* on *WTPP* is completely mediated by brand image.

In summary, our mediation analysis using Hayes' (2017) Process Model 7 indicated that the effect of *rating* on *WTPP* is completely mediated by *brand image* while controlling for the effects of covariates age, gender, education, and income. The direct effect of *rating* on *WTPP* was insignificant. The findings suggest that *brand image* plays a significant role in the relationship between *rating* and *WTPP*, and the level of involvement moderates the effect.

The interaction diagram (Figure 12) depicts the moderation effect of purchase *involvement* on the *rating* – *brand image* relationship. The slope analysis indicates that the line for 'low' *involvement* is steeper than the line for 'high' *involvement* – meaning low involvement has a stronger impact on the *rating* – *brand image* relationship than high involvement. One unit increase in *rating* results in a .88 and .72 unit increase in the *brand image* for the low and high-involvement shoppers, respectively. In other words, involvement weakens the *rating* – *brand image* relationship.

Figure 12 - Interaction of Brand Image and Rating\*Purchase Involvement (Study 1-Model 8)



### Summary of results (Study 1)

Table 31 presents a summary of the hypotheses tested in Study 1. All the hypotheses were supported. Star rating has a significant effect on the star rating and *WTPP*. Purchase involvement has a significant moderating effect on the star rating and *WTPP* relationship. The findings are discussed in Chapter 7.

Table 31 - Hypothesis Support Status (Study 1)

| Hypothesis No. | Hypothesis                                                                                                                                                                                                                         | Supported (Yes/No) |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| H1             | A high (versus low) star rating leads to a greater (versus lesser) willingness to pay a premium.                                                                                                                                   | Yes                |
| H2             | A high (versus low) star rating leads to a more positive (versus negative) brand image.                                                                                                                                            | Yes                |
| H5             | A positive (versus negative) brand image leads to a greater (versus lesser) willingness to pay a premium.                                                                                                                          | Yes                |
| H6             | Purchase involvement moderates the positive relationship between star rating and brand image so that when involvement is low, the relationship between star rating and brand image becomes stronger than when involvement is high. | Yes                |

## Chapter 6 Study Two

Study 2 investigated how star rating affects shoppers' perception of a brand and how much premium they are willing to pay. The study also explored whether the rating volume influenced these effects. The study tested five hypotheses, H1 through H5, shown again below.

H1: A high (versus low) star rating leads to a greater (versus lesser) willingness to pay a premium.

H2: A high (versus low) star rating leads to a more positive (versus negative) brand image.

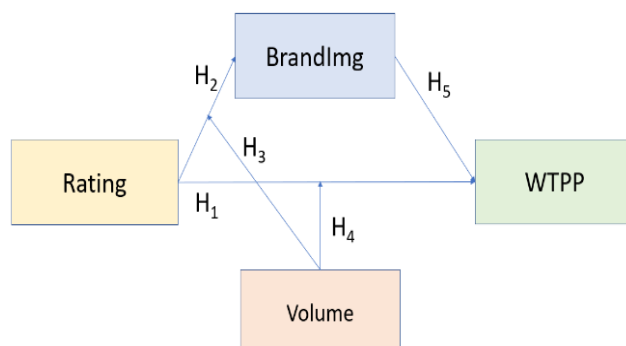
H3: Volume moderates the positive relationship between star rating and brand image so that when the volume is high, the relationship between star rating and brand image becomes stronger than when the volume is low.

H4: Volume moderates the positive relationship between star rating and willingness to pay a premium so that when the volume is high, the relationship between star rating and willingness to pay a premium becomes stronger than when the volume is low.

H5: A positive (versus negative) brand image leads to a greater (versus lesser) willingness to pay a premium.

The hypotheses are based on the conceptual model developed in Chapter 3, reproduced below (Figure 13). The variables for each of the constructs are mentioned in parentheses: star rating (*rating*), brand image (*brand image*), willingness to pay a premium (*WTPP*), and volume of rating (*vol*).

Figure 13 - Conceptual Model (Study 2)



NOTE: Brandimg refers to brand image. Volume refers to rating volume.

## Methodology

The detailed methodology is explained in Chapter 4. This study used a between-subjects factorial experiment design with a 2 (rating: Low and High) x 2 (volume: Low, High) setup. The participants were US-based online shoppers, male and female, aged 21 – 75, with a minimum of high school education. The sample size was 50 per experiment. The first independent variable, *rating*, was manipulated at low (1.5 stars) and high (4.5 stars). The second independent variable, *volume*, was also manipulated at low (20) and high (10,140) levels. The stimuli and measures are discussed in Chapter 4.

## Results

### Descriptive statistics of data

The participants' demographic information and relevant characteristics are summarized in [Annexure 17](#).

A total of 206 participants (110 males, 92 females, and four non-binary) aged between 21 and 75 years took part in the study. The participants were all residents of the United States, and their educational backgrounds varied, with 16.5% having completed high school, 62.6% holding an undergraduate degree, 7.3% having a graduate degree, 2.4% possessing a doctorate (Ph.D.), 4.4% with a professional degree and 6.8% other forms of education. None of the participants were students.

80.1% of respondents reported understanding the mouse features well or 'very well' ( $M=4$ ,  $SD=1.02$ ). Furthermore, among the respondents, 88.8% owned a computer mouse ( $M=1.11$ ,  $SD=.32$ ), and of those, 58.3% purchased it online ( $M=2.14$ ,  $SD=.82$ ), with 81.1% engaging in online purchases, more than 11 times a year ( $M=4.34$ ,  $SD=.98$ ). Frequency analyses for these results are presented in [Annexure 18](#). Additionally, as presented in Annexure 3, the respondents had a positive attitude toward the rating ( $M=5.58$ ,  $SD=1.08$ ).

The diverse and representative sample, encompassing various consumer segments based on age, gender, education, and income, facilitated a more accurate and meaningful analysis of the relationships under investigation.

## Manipulation and Other Checks

To ensure the validity of our study, we conducted three attention checks and two manipulation checks throughout the experiment.

First, we examined the participants' attention to the presented scenario by including three checks: 1) a volume check, where participants were asked to indicate the number of buyers who rated the mouse using a text box; 2) a rating check, where participants reported the star rating of the mouse using a text box, and 3) an attention check item in the questionnaire after the brand image questions, where participants rated their level of agreement with the statement, "I am randomly answering the questions without reading them," on a 7-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree."

In addition to these attention checks, we conducted two manipulation checks to assess the effectiveness of our experimental manipulations ([Annexure 19](#)). The first manipulation checks focused on the star rating. Participants were asked to rate the perceived star rating of the mouse in the scenario from "very low" to "very high." The mean ratings for 1.5 stars ( $M = 1$ ,  $SD = 0$ ) and 4.5 stars ( $M = 5.39$ ,  $SD = 1.12$ ) differed significantly, as confirmed by ANOVA analysis ( $F(1) = 1540.36$ ,  $p < .001$ ).

The second manipulation check focused on the rating volume. Participants were asked to rate the rating volume of the mouse in the scenario from "very low" to "very high." The mean ratings for low volume of 20 ( $M = 1.9$ ,  $SD = 0.89$ ) and high volume of 10,140 ( $M = 6.3$ ,  $SD = .72$ ) differed significantly, as confirmed by ANOVA analysis ( $F(1) = 1513.43$ ,  $p < .001$ ).

After these checks, we excluded responses that failed the manipulation and attention checks. Additionally, we filtered out responses that exhibited straight-lining or inconsistent answers (e.g., a response of 7 for "This product has high quality" when the rating was 1.5). The remaining 206 responses were then used for the final analysis.

## Statistical test for common method bias (CMB)

The common method bias was assessed for this study using Harmon's single-factor test. This test involves conducting a principal component analysis (PCA) on all the variables used in the study. If a substantial amount of the variance can be attributed to a single factor, it indicates potential common method bias.

The PCA performed resulted in extracting nine components (see Table 32). The first component accounted for 47.869% of the variance, below the 50% threshold typically indicative of significant common method bias. This suggests that the variables measured in this study are not overly influenced by a single factor, which would have been the case if common method bias had been present.

Table 32 - Harman's Single Factor Test Variance Analysis (Study 2)

| <b>Total Variance Explained</b>                  |                     |               |              |                                     |               |              |
|--------------------------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| Component                                        | Initial Eigenvalues |               |              | Extraction Sums of Squared Loadings |               |              |
|                                                  | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % |
| 1                                                | 7.180               | 47.869        | 47.869       | 7.180                               | 47.869        | 47.869       |
| 2                                                | 1.853               | 13.733        | 61.602       | 1.853                               | 13.733        | 61.602       |
| 3                                                | 1.100               | 8.689         | 70.291       | 1.100                               | 8.689         | 70.291       |
| 4                                                | 1.062               | 8.116         | 78.407       | 1.062                               | 8.116         | 78.407       |
| 5                                                | 0.970               | 7.308         | 85.715       |                                     |               |              |
| 6                                                | 0.755               | 5.659         | 91.374       |                                     |               |              |
| 7                                                | 0.513               | 3.964         | 95.338       |                                     |               |              |
| 8                                                | 0.407               | 2.716         | 98.054       |                                     |               |              |
| 9                                                | 0.292               | 1.946         | 100.000      |                                     |               |              |
| Extraction Method: Principal Component Analysis. |                     |               |              |                                     |               |              |

Furthermore, it is important to note that not one single factor, but nine factors, emerged from the analysis. This indicates that no single common method factor has significantly influenced responses across all measures used in the study.

Based on the results from Harmon's single-factor test, it can be confidently stated that common method bias is unlikely to be a substantial concern in our study. This bolsters the validity of the findings and assures that the relationships identified among the variables are not merely a product of methodological artifacts. Therefore, the interpretations and discussions based on the study results can be held with a high degree of confidence.

#### Latent variable correlation test

The latent variables correlation test showed that none of our latent constructs were highly correlated, suggesting that CMB is not a serious concern in our dataset (see Table 33). A significant correlation ( $r > 0.9$ ) among constructs indicates CMB, while correlations below 0.9 suggest CMB is not a significant issue (Bagozzi et al., 1991). The correlations of star rating with the brand image ( $r=.808$ ) and willingness to pay a premium ( $r=.673$ ), and brand image and willingness to pay a premium ( $r=.820$ ) were as theorized and supported in the literature.

Table 33 - Latent Variables Correlations (Study 2)

|                               | <b>Brand Image</b> | <b>Rating Volume</b> | <b>Rating</b> | <b>WTPP</b> | <b>Rating Volume x Rating</b> |
|-------------------------------|--------------------|----------------------|---------------|-------------|-------------------------------|
| <b>Brand Image</b>            | 1.000              | 0.088                | 0.808         | 0.820       | 0.557                         |
| <b>Rating Volume</b>          | 0.088              | 1.000                | -0.009        | 0.103       | 0.587                         |
| <b>Rating</b>                 | 0.808              | -0.009               | 1.000         | 0.653       | 0.564                         |
| <b>WTPP</b>                   | 0.820              | 0.103                | 0.653         | 1.000       | 0.478                         |
| <b>Rating Volume x Rating</b> | 0.557              | 0.587                | 0.564         | 0.478       | 1.000                         |

### Construct reliability and validity.

In this study, I evaluated discriminant validity, reliability, Cronbach's Alpha, composite reliability (CR), and average variance extracted (AVE) for our measures, following the guidelines of (Bagozzi & Yi 1988; Fornell & Larcker, 1981). I also examined content validity. The results are summarized in Table 34.

The Brand Image construct exhibited a Cronbach's Alpha of 0.925(> 0.7 recommended minimum), suggesting a high level of internal consistency among the measurement items. Its composite reliability scores, 0.961 (rho\_a) and 0.946 (rho\_c), further affirmed this construct's reliability. Moreover, the Average Variance Extracted (AVE) for Brand Image was 0.730, indicating that a substantial proportion of the variance in the observed variables can be attributed to this construct.

Table 34 - Construct Reliability and Validity (Study 2)

|             | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | The average variance extracted (AVE) |
|-------------|------------------|-------------------------------|-------------------------------|--------------------------------------|
| Brand Image | 0.925            | 0.961                         | 0.946                         | 0.730                                |
| WTPP        | 0.894            | 0.894                         | 0.950                         | 0.905                                |

Similarly, the Willingness to Pay Premium (WTPP) construct demonstrated high internal consistency with a Cronbach's Alpha of 0.894 (> 0.7 recommended minimum). For the two-item WTPP scale, we also calculated the Spearman-Brown coefficient (value = .858), which is considered more appropriate than  $\alpha$  for 2-item scales due to significant bias (Eisinga et al.,

2013). Its composite reliability scores, 0.894 (rho\_a) and a notably higher 0.950 for rho\_c indicated that this construct is also very reliable. The AVE for WTPP stood at a robust 0.905, suggesting that the WTPP construct can account for most of the observed variables' variance. Thus, both constructs - Brand Image and Willingness To Pay Premium - exhibit strong reliability and validity in this context.

### Discriminant validity

Table 35 presents the Fornell-Larcker criterion, a commonly used method to assess discriminant validity. The diagonal elements are the square root of the average variance extracted (AVE) for each construct, while off-diagonal elements are the correlations between the constructs.

In the case of the "Brand Image" construct, the square root of the AVE was 0.855, which was higher than its highest correlation with any other construct (0.820 with WTPP). This suggests good discriminant validity for the "Brand Image" construct.

Table 35 - Discriminant Validity – Study 2 (Fornell-Larcker criterion)

|               | Brand Image | Rating | Rating Volume | WTPP  |
|---------------|-------------|--------|---------------|-------|
| Brand Image   | 0.855       |        |               |       |
| Rating        | 0.808       | 1.000  |               |       |
| Rating Volume | 0.088       | -0.009 | 1.000         |       |
| WTPP          | 0.820       | 0.653  | 0.103         | 0.951 |

For the "Rating" construct, the square root of the AVE was 1.000, which exceeded its highest correlation with any other construct (0.808 with Brand Image). This indicates strong discriminant validity for the "Rating" construct.

In the case of the "Volume" construct, the square root of the AVE was 1.000. All the correlations of "Volume" with the other constructs (0.088 with Brand Image, -0.009 with Rating, and 0.103 with WTPP) were less than the square root of the AVE, supporting discriminant validity for the "Volume" construct.

Finally, for the "Willingness to Pay Premium" (WTPP) construct, the square root of the AVE was 0.951, which exceeded its highest correlation with any other construct (0.820 with Brand Image). This evidence supports strong discriminant validity for the WTPP construct.

Based on the Fornell-Larcker criterion, all four constructs - Brand Image, Rating, Volume, and Willingness to Pay Premium - demonstrate good discriminant validity.

### **Content validity**

Ensuring the content validity of a measurement instrument is crucial in any research study to ensure the accuracy of the results. The study involved expert review, literature review, pre-testing, and item analysis to ensure content validity. Three subject matter experts provided valuable feedback on the items' clarity, relevance, and comprehensiveness, and the instrument was refined to ensure it captured the dimensions of the construct under investigation. The instrument was developed based on an extensive review of relevant literature and previous research to align with existing knowledge. The pilot test allowed the identification of unclear or irrelevant items for further refinement. An exploratory factor analysis was performed to examine the factor loadings and item-total correlations, which indicated that each item had strong loadings on the intended factors and contributed to the overall construct.

The evidence from the expert review, literature review, pre-testing, and item analysis supports the content validity of the measurement instrument used in the study, making it suitable for use in the research.

### **Verification of data assumptions for parametric analysis (ANOVA analysis)**

Before conducting the ANOVA analysis, we assessed the data for the assumptions required for this statistical technique, including normality, homogeneity of variances, and independence of observations Iacobucci (1994). The results of these assumption tests are reported below:

#### *Normality:*

In light of our data analysis plan, which included ANOVA analysis and the Hayes Process Model, we have carefully assessed the distribution of our dependent variables, *brand image* and *WTPP*. As presented in [Annexure 20](#), the two dependent variables (*brand image* and *WTPP*) did not pass the Shapiro-Wilks test for normality ( $p < .001$ ) at a low rating (1.5) and exhibited a right-skewed distribution (Annexures [21](#) & [22](#)). However, the skewness and kurtosis values for brand image and WTPP (Table 36) are significantly lower than the respective values of 2 and 7, which are associated with moderate and severe skews, indicating that these distributions are not substantially skewed.

Table 36- Skewness and Kurtosis: Brand Image and WTPP

*Descriptive Statistics*

|                    | N         | Range     | Mean      | Std.<br>Deviation | Skewness  |            | Kurtosis  |            |
|--------------------|-----------|-----------|-----------|-------------------|-----------|------------|-----------|------------|
|                    | Statistic | Statistic | Statistic | Statistic         | Statistic | Std. Error | Statistic | Std. Error |
| Brandimg           | 206       | 5.57      | 3.4119    | 1.45677           | .043      | .169       | -1.210    | .337       |
| WTPP               | 206       | 5.0       | 2.745     | 1.4615            | .522      | .169       | -.739     | .337       |
| Valid N (listwise) | 206       |           |           |                   |           |            |           |            |

It is essential to consider the robustness of our chosen analytical techniques when dealing with non-normal data. Research has consistently demonstrated the resilience of the F-test and ANOVA against deviations from normality. Studies conducted by (Blanca et al., 2017) and (Schmider et al., 2010) highlight the strength of these techniques in accommodating various sample sizes, distributional shapes, and effect sizes. These findings provide a solid foundation for continuing our analysis plan, even with slight non-normality in our dependent variables.

Furthermore, the Hayes Process Model, which utilizes ordinary least squares (OLS) regression, is known for its robustness against normality violations regarding Type I error rates and parameter estimation. To further strengthen the validity of our analysis, we will employ bootstrapping, a resampling method that estimates the sampling distribution using the data, making it even more resilient to non-normal data.

In summary, despite slightly non-normal data, the evidence from research and the robust nature of our chosen analytical techniques provide a compelling argument for continuing our analysis plan. This decision allows us to maintain the integrity of our data and draw valid conclusions from our study without resorting to remedial measures such as transformations.

*Homogeneity of variances:*

A Levene's test was performed to assess the equality of variances across groups (Table 37). The results indicated that the assumption of homogeneity of variances was met for *brand image* ( $p > .05$ ). However, for *WTPP*, the test was statistically significant ( $p < .001$ ), suggesting that the assumption of homogeneity of variances was violated.

Table 37- Levene's Test of Variances: Brand Image and Willingness to Pay Premium

*Test of Homogeneity of Variance*

|          |                                      | Levene Statistic | df1 | df2     | Sig.  |
|----------|--------------------------------------|------------------|-----|---------|-------|
| BrandImg | Based on Mean                        | .819             | 1   | 204     | .366  |
|          | Based on Median                      | .516             | 1   | 204     | .473  |
|          | Based on Median and with adjusted df | .516             | 1   | 194.289 | .473  |
|          | Based on trimmed mean                | .580             | 1   | 204     | .447  |
| WTPP     | Based on Mean                        | 24.794           | 1   | 204     | <.001 |
|          | Based on Median                      | 20.694           | 1   | 204     | <.001 |
|          | Based on Median and with adjusted df | 20.694           | 1   | 154.347 | <.001 |
|          | Based on trimmed mean                | 24.722           | 1   | 204     | <.001 |

We computed the Welch statistic for *WTPP* to test for the significant difference in its low and high rating means. The results of the Welch test (Table 38) indicated a statistically significant difference ( $p < .001$ ) between the two groups of *WTPP* at low (1.5) and high (4.5) ratings, with a Welch statistic of 118.13.

Table 38 -Welch's Test: Brand Image and WTPP

*Robust Tests of Equality of Means*

|                              |       | Statistic <sup>a</sup> | df1 | df2     | Sig.  |
|------------------------------|-------|------------------------|-----|---------|-------|
| Brand Image                  | Welch | 360.975                | 1   | 196.791 | <.001 |
| Willingness to pay a premium | Welch | 118.129                | 1   | 203.667 | <.001 |

<sup>a</sup>. Asymptotically F distributed.

### *Homoscedasticity test*

Homoscedasticity refers to the presence of equal variance or uniformity of variance in the residuals, which are the differences between a regression model's observed and predicted

values. The study used the Breusch-Pagan test to check for homoscedasticity in the dependent variables. The test involved regressing the squared residuals of *brand image* and *WTPP* against rating.

As shown in Tables 39 and 40, the results indicated no significant relationship between the square of the residuals and star rating for both variables brand image and WTPP ( $p > .05$ ), providing evidence that the data is homoscedastic for *brand image* ( $p > .05$ ) but heteroscedastic for *WTPP* ( $p < .05$ ).

Table 39- Breusch-Pagan Test: Brand Image

*ANOVA<sup>a</sup>*

| Model |            | Sum of Squares | df  | Mean Square | F     | Sig.              |
|-------|------------|----------------|-----|-------------|-------|-------------------|
| 1     | Regression | 16.886         | 5   | 3.377       | 1.429 | .215 <sup>b</sup> |
|       | Residual   | 472.754        | 200 | 2.364       |       |                   |
|       | Total      | 489.640        | 205 |             |       |                   |

<sup>a</sup>. Dependent Variable: SQRESBI

<sup>b</sup>. Predictors: (Constant), Income, Gender, Age group, Edu, Rating

Table 40- Breusch-Pagan Test: WTPP

*ANOVA<sup>a</sup>*

| Model |            | Sum of Squares | df  | Mean Square | F     | Sig.               |
|-------|------------|----------------|-----|-------------|-------|--------------------|
| 1     | Regression | 60.233         | 5   | 12.047      | 6.420 | <.001 <sup>b</sup> |
|       | Residual   | 375.258        | 200 | 1.876       |       |                    |
|       | Total      | 435.491        | 205 |             |       |                    |

<sup>a</sup>. Dependent Variable: SQRESWTP

<sup>b</sup>. Predictors: (Constant), Income, Gender, Age group, Edu, Rating

#### *Independence of observations:*

The study design ensured the independence of observations by collecting data from individual participants who were not influenced by other participants' responses.

Additionally, each participant was randomly assigned to one of the experimental conditions, ensuring the groups were independent. In addition, the presence of outliers should also be checked.

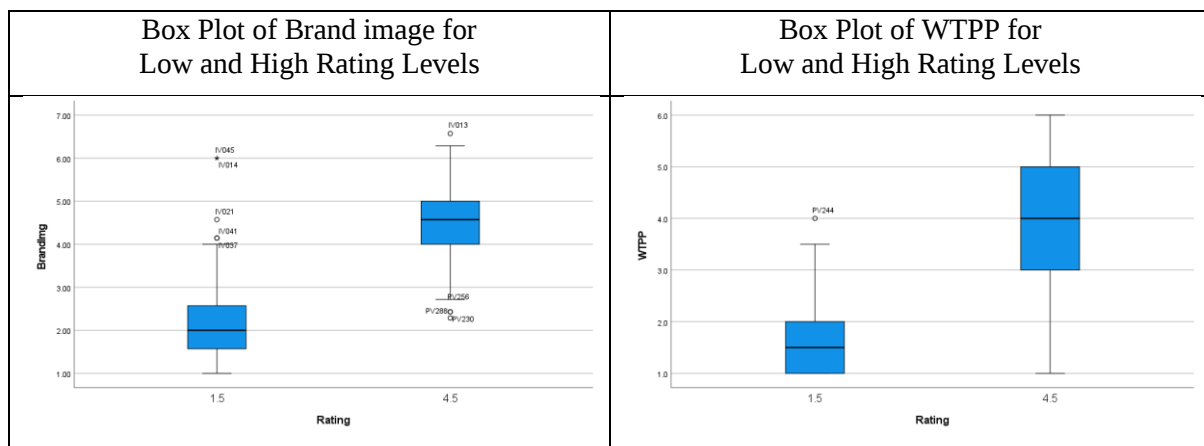
### *Random sampling*

Since respondents are randomly assigned to each of the four treatments through Qualtrics' built-in randomization engine, the independence of the scores for the outcome variables (brand image and WTPP) is ensured. Consequently, the error terms are likely to be independent.

### *Presence of outliers:*

We analyzed for outliers, which can skew results and increase errors in statistical tests. (Zimmerman, 1994) highlighted that outliers could reduce Type I errors but increase Type II errors and reduce power. Outliers disproportionately influence means and variances, altering the probability of errors. The Box Plot for outcome variables (Brand image and WTPP) showed outliers for low and high ratings (Table 41). We included these outliers in our analysis, believing they represent genuine extreme values in the population. Removing them may lead to biased results.

Table 41-Outlier Analysis: Brand Image and WTPP



## Hypotheses testing

**H1: A high (versus low) star rating leads to a greater (versus lesser) willingness to pay a premium.**

A covariance (ANCOVA) analysis was undertaken to investigate the relationship between the

Table 42- ANCOVA Analysis: WTPP (Study 2-H1)

### *Tests of Between-Subjects Effects*

Dependent Variable: Willingness to pay a premium

| Source          | Type III Sum of Squares | df  | Mean Square | F       | Sig.  | Partial Eta Squared |
|-----------------|-------------------------|-----|-------------|---------|-------|---------------------|
| Corrected Model | 187.36 <sup>a</sup>     | 5   | 37.47       | 24.273  | <.001 | .378                |
| Intercept       | 116.88                  | 1   | 116.88      | 75.712  | <.001 | .275                |
| Age             | .13                     | 1   | .13         | .085    | .771  | .000                |
| Gender          | 3.38                    | 1   | 3.38        | 2.192   | .140  | .011                |
| Edu             | 1.77                    | 1   | 1.77        | 1.144   | .286  | .006                |
| Income          | .00                     | 1   | .00         | .000    | .993  | .000                |
| Rating          | 185.83                  | 1   | 185.83      | 120.374 | <.001 | .376                |
| Error           | 308.76                  | 200 | 1.54        |         |       |                     |
| Total           | 2160.25                 | 206 |             |         |       |                     |
| Corrected Total | 496.12                  | 205 |             |         |       |                     |

<sup>a</sup>. R Squared = .378 (Adjusted R Squared = .362)

rating and WTPP while controlling for covariates: age, gender, edu (education), and income.

Table 42 presents the results of the analysis.

The results of the ANCOVA analysis indicate a statistically significant relationship between *rating* and *WTPP*,  $F(1, 200) = 120.37$ ,  $p < .001$ . This finding suggests that *rating* strongly predicts *WTPP*, with higher *ratings* associated with higher *WTPP* values. The covariates (age, gender, edu, and income) did not show any significant relationship with the outcome variable, *WTPP* ( $p > .05$  for all covariates).

The model accounted for 37.8% of the variance in *WTPP*, with an adjusted R squared of .362. The adjusted R squared better indicates the model's predictive power as it considers the number of predictors and sample size. The grand mean of *WTPP* was 2.81, with a 95% confidence interval ranging from 2.64 to 2.98, implying that, on average, the *WTPP* values fall between 2.64 and 2.98. Furthermore, as presented in Table 43, the estimated means for

different *rating* levels (1.5 and 4.5) were calculated, holding the covariates at constant values: Age = 2.58, gender = 1.49, Edu = 3.36, and Income = 4.20.

For a *rating* of 1.5, the mean *WTPP* was 1.85, with a 95% confidence interval ranging from 1.6 to 2.09. In contrast, for a *rating* of 4.5, the mean *WTPP* was 3.78, with a 95% confidence interval ranging from 3.54 to 4.02.

In conclusion, the ANCOVA analysis revealed a significant positive relationship between *rating* and *WTPP*, indicating that higher *ratings* are associated with higher *WTPP* values. The covariates (Age, Gender, Edu, and Income) did not significantly influence the outcome variable, *WTPP*.

Table 43- EMM Report: *WTPP*

*Estimates*

Dependent Variable: Willingness to pay a premium

| Rating | Mean              | Std. Error | 95% Confidence Interval |             |
|--------|-------------------|------------|-------------------------|-------------|
|        |                   |            | Lower Bound             | Upper Bound |
| 1.5    | 1.85 <sup>a</sup> | .13        | 1.60                    | 2.09        |
| 4.5    | 3.78 <sup>a</sup> | .12        | 3.54                    | 4.02        |

<sup>a</sup>. Covariates appearing in the model are evaluated at the following values: Age group = 2.58, Gender = 1.49, Edu = 3.36, Income = 4.20.

## **H2: A high (versus low) star rating leads to a more positive (versus negative) brand image.**

A covariance (ANCOVA) analysis was undertaken to investigate the relationship between the *rating* and *brand image* while controlling for covariates: age, gender, edu (education), and income.

The results of the ANCOVA analysis (Table 44) indicate a statistically significant relationship between *rating* and *brand image*,  $F(1, 200) = 363.79$ ,  $p < .001$ . This finding suggests that *rating* strongly predicts *brand image*, with higher *ratings* associated with higher *brand image* values. The covariates (age, gender, edu, and income) did not show any significant relationship with the outcome variable, *brand image* ( $p > .05$  for all covariates).

Table 44- ANCOVA Analysis: Brand Image (Study 2- H2)

*Tests of Between-Subjects Effects*

Dependent Variable: Brand Image

| Source          | Type III Sum of Squares | df  | Mean Square | F      | Sig.  | Partial Eta Squared |
|-----------------|-------------------------|-----|-------------|--------|-------|---------------------|
| Corrected Model | 282.99 <sup>a</sup>     | 5   | 56.60       | 74.46  | <.001 | .651                |
| Intercept       | 154.01                  | 1   | 154.01      | 202.60 | <.001 | .503                |
| Age             | .11                     | 1   | .11         | .14    | .708  | .001                |
| Gender          | 2.23                    | 1   | 2.23        | 2.93   | .089  | .014                |
| Edu             | .21                     | 1   | .21         | .27    | .603  | .001                |
| Income          | 1.43                    | 1   | 1.43        | 1.88   | .172  | .009                |
| Rating          | 276.53                  | 1   | 276.53      | 363.79 | <.001 | .645                |
| Error           | 152.03                  | 200 | .76         |        |       |                     |
| Total           | 2832.94                 | 206 |             |        |       |                     |
| Corrected Total | 435.02                  | 205 |             |        |       |                     |

<sup>a</sup>. R Squared = .651 (Adjusted R Squared = .642)

The model accounted for 65.1% of the variance in *brand image*, with an adjusted R squared of .642. The adjusted R squared better indicates the model's predictive power as it considers the number of predictors and sample size.

The grand mean of the *brand image* was 3.38, with a 95% confidence interval ranging from 3.26 to 3.5, implying that, on average, the *brand image* values fall between 3.26 and 3.5. Furthermore, as presented in Table 45, the estimated means for different *rating* levels (1.5

Table 45- EMM Report: Brand Image

*Estimates*

| Dependent Variable: Brandimg |                    |            |                         |             |       |            |                                   |       |
|------------------------------|--------------------|------------|-------------------------|-------------|-------|------------|-----------------------------------|-------|
| Rating                       | Mean               | Std. Error | 95% Confidence Interval |             | Bias  | Std. Error | Bootstrap for Mean <sup>all</sup> |       |
|                              |                    |            | Lower Bound             | Upper Bound |       |            | 95% Confidence Interval           |       |
| 1.5                          | 2.198 <sup>a</sup> | .088       | 2.024                   | 2.371       | -.001 | .091       | 2.026                             | 2.392 |
| 4.5                          | 4.557 <sup>a</sup> | .085       | 4.389                   | 4.726       | .005  | .085       | 4.394                             | 4.733 |

<sup>a</sup>. Covariates appearing in the model are evaluated at the following values: Age group = 2.58, Gender = 1.49, Edu = 3.36, Income = 4.20.

<sup>all</sup>. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

and 4.5) were calculated, holding the covariates at constant values: Age = 2.58, gender = 1.49, Edu = 3.36, and Income = 4.20. For a *rating* of 1.5, the mean *brand image* was 2.2, with a 95% confidence interval ranging from 2.02 to 2.37. In contrast, for a *rating* of 4.5, the mean *brand image* was 4.56, with a 95% confidence interval ranging from 4.39 to 4.73.

In conclusion, the ANCOVA analysis revealed a significant positive relationship between *rating* and *brand image*, indicating that higher *ratings* are associated with higher *brand image* values. The covariates (Age, Gender, Edu, and Income) did not significantly influence the outcome variable, *brand image*.

#### **H5: A positive (versus negative) brand image leads to a greater (versus lesser) willingness to pay a premium.**

The primary goal of this analysis was to examine the relationship between the *brand image* and *WTPP* while controlling for covariates: age, gender, edu (education), and income. A linear regression was conducted to test the hypothesis, as the *brand image* was a continuous variable.

The results (Table 46) indicate that *brand image* significantly affected *WTPP* ( $\beta = 0.88$ ,  $t = 20.38$ ,  $p < .001$ ), suggesting that a unit increase in brand image was associated with a .88 units increase in *WTPP*. The overall model was significant ( $F(5, 200) = 83.87$ ,  $p < .001$ ), indicating that the predictor accounted for a significant proportion of variance in *WTPP*.

Table 46- Regression of Brand Image on WTPP (Study 2-H5)

*ANOVA<sup>a</sup>*

| Model |            | Sum of Squares | df  | Mean Square | F     | Sig.               |
|-------|------------|----------------|-----|-------------|-------|--------------------|
| 1     | Regression | 335.39         | 5   | 67.08       | 83.47 | <.001 <sup>b</sup> |
|       | Residual   | 160.73         | 200 | .80         |       |                    |
|       | Total      | 496.12         | 205 |             |       |                    |

<sup>a</sup>. Dependent Variable: Willingness to pay a premium

<sup>b</sup>. Predictors: (Constant), Income, Gender, Age group, Brand Image, Edu

*Coefficients<sup>a</sup>*

| Model |             | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.  |
|-------|-------------|-----------------------------|------------|---------------------------|-------|-------|
|       |             | B                           | Std. Error | Beta                      |       |       |
| 1     | (Constant)  | -.01                        | .31        |                           | -.04  | .965  |
|       | Brand Image | .88                         | .04        | .83                       | 20.38 | <.001 |
|       | Age group   | .01                         | .05        | .00                       | .10   | .919  |
|       | Gender      | -.09                        | .12        | -.03                      | -.79  | .429  |
|       | Edu         | -.05                        | .05        | -.04                      | -1.08 | .281  |
|       | Income      | .03                         | .03        | .05                       | 1.25  | .212  |

<sup>a</sup>. Dependent Variable: Willingness to pay a premium

The covariates (Age, Gender, Edu, and Income) did not show any significant relationship with the outcome variable, *WTPP* ( $p > .05$  for all covariates).

In conclusion, the analysis pointed to a significant positive association between *brand image* and *WTPP*, indicating that higher *brand image* values are associated with higher *WTPP* values. The covariates (Age, Gender, Edu, and Income) did not significantly influence the outcome variable, *WTPP*.

### H3 and H4

*H3: Volume moderates the positive relationship between star rating and brand image so that when the volume is high, the relationship between star rating and brand image becomes stronger than when the volume is low.*

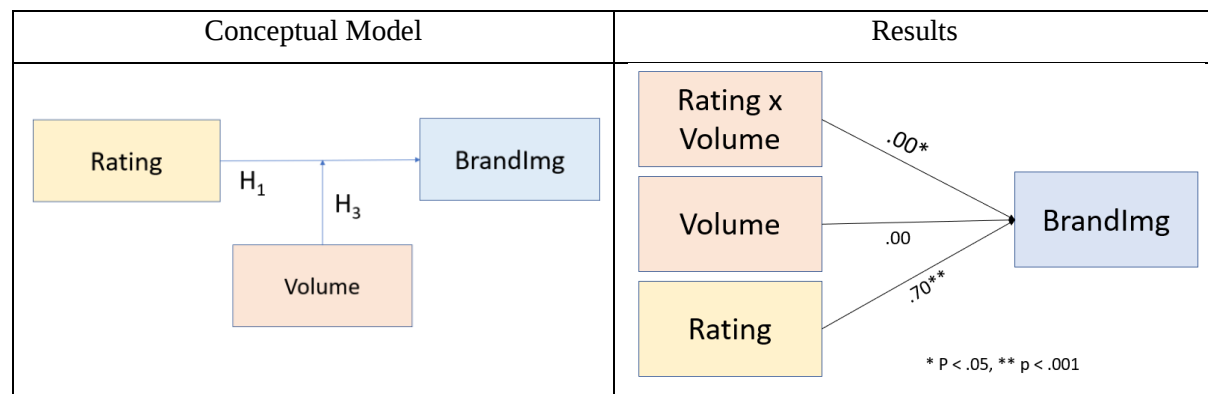
*H4: Volume moderates the positive relationship between star rating and willingness to pay a premium so that when the volume is high, the relationship between star rating and willingness to pay a premium becomes stronger than when the volume is low.*

We tested hypotheses H3 and H4 separately using Hayes Process model 1 and together using Hayes Process model 8.

#### *Report from Hayes Process Model 1 for H3*

A Process Model 1 analysis (Hayes, 2018) was undertaken to investigate the effect of *rating* (X) on the *brand image* (Y) while considering the role of moderator *volume* (M), with age, education, gender, and income as covariates. The conceptual model and the regression results are presented in Figure 14.

Figure 14-Conceptual model and results for brand image (Study 2-Model 1)



NOTE: Brandimg refers to brand image. Volume refers to rating volume.

The regression results are presented in Table 47, with a detailed report in [Annexure 23](#).

Results indicated that the direct effect of *rating* on *brand image* was significant ( $b = .70$ ,  $se = .05$ ,  $p < .001$ ). Additionally, the interaction between *rating* and *vol* was significant (Int\_1:  $b = .00$ ,  $se = .00$ ,  $p < .001$ ), indicating that the relationship between star rating and brand image was moderated by volume.

Table 47 - Model 4 Analysis Results from Hayes Process Macro: Brand Image (Study 2-H3)

| Variable        | Model a-path |     |        |
|-----------------|--------------|-----|--------|
|                 | b            | SE  | p      |
| Rating (IV)     | .70          | .06 | <.001  |
| Volume (MOD)    | .00          | .00 | > .05  |
| Rating x Volume | .00          | .00 | < .001 |
| Age             | .02          | .05 | >.05   |
| Gender          | -.20         | .11 | >.05   |
| Education       | -.04         | .05 | >.05   |
| Income          | -.04         | .03 | >.05   |

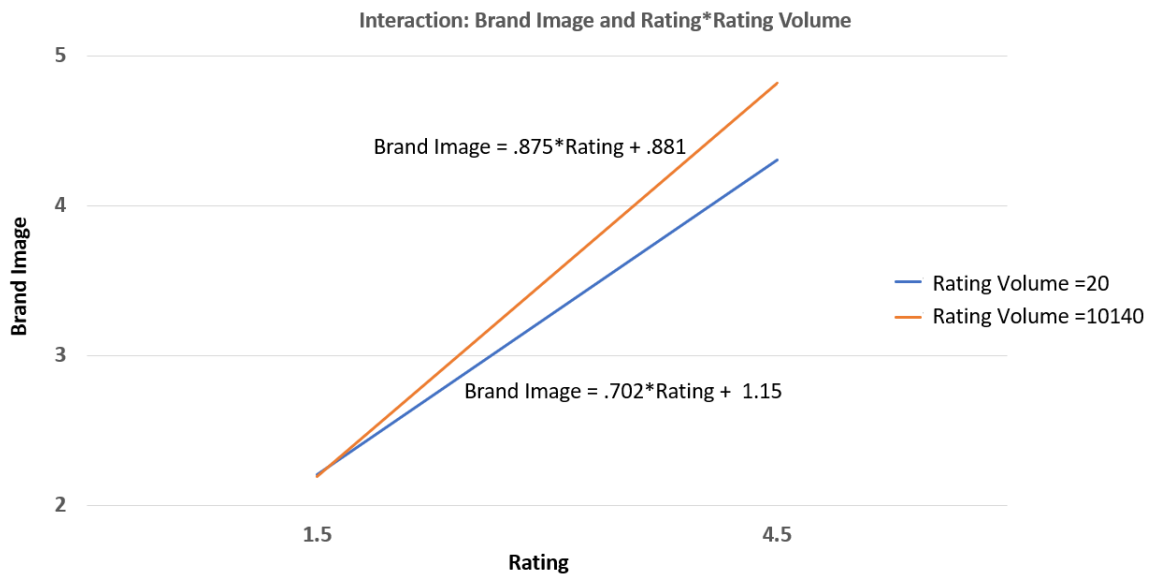
Note.  $N = 206$ . Model for the relationship  
 $R^2 = .67$ ,  $F(7, 198) = 56.44$ ,  $p < .001$

The conditional effect analysis showed that the effect of *rating* on *brand image* was stronger for high-vol ( $b = 0.88$ ,  $p < .001$ ) compared to low-vol ( $b = 0.70$ ,  $p < .001$ ), suggesting that the impact of star rating on brand image is dependent on the level of volume.

Figure 15 shows the interaction diagram, depicting the moderation effect of volume on the rating–brand image relationship. The slope analysis revealed that the line for 'high' *volume* is steeper than for 'low' *volume*, indicating that high involvement has a stronger impact on the *rating - brand image* relationship than low volume. A one-unit increase in *rating* resulted in .88 and .72 unit increases in the *brand image* for high and low volume, respectively. In other words, volume strengthened the *rating-brand image* relationship.

In conclusion, the Process Model 1 analysis results indicate that rating significantly predicts brand image, and involvement moderates the relationship between them.

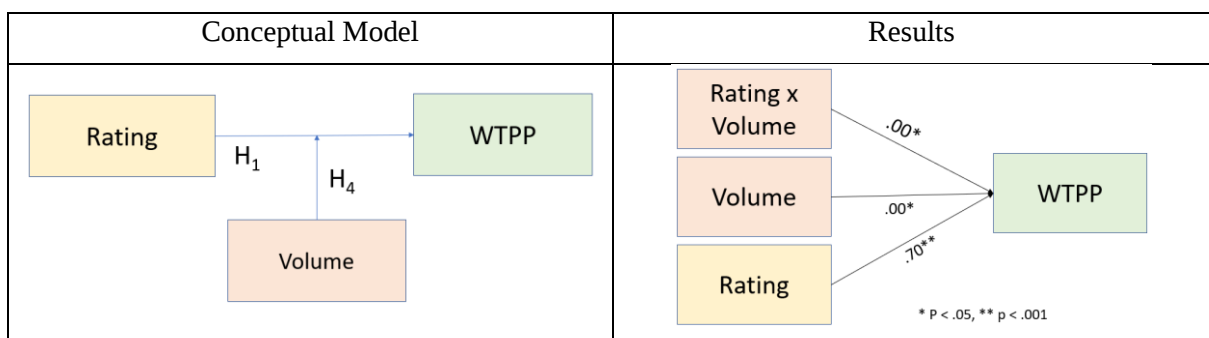
Figure 15-Interaction Diagram: Branding and Rating\*Volume (Study 2-H3)



#### Report from Hayes Process Model 1 for H4

A Process Model 1 analysis (Hayes, 2018) was undertaken to investigate the effect of rating (X) on WTPP (Y) while considering the role of moderator volume (M), with age, education, gender, and income as covariates. The conceptual model and the regression results are presented in Figure 16.

Figure 16-Conceptual Model and Results: WTPP (Study 2-Model 1)



The regression results are presented in Table 48, with a detailed report in [Annexure 24](#).

Results indicated that the direct effect of star rating ( $b = .65$ ,  $se = .08$ ,  $p < .001$ ) and volume ( $b = .0001$ ,  $SE = .0000$ ,  $p < .05$ ) on WTPP was significant. Additionally, the interaction between rating and volume was significant ( $b = .0000$ ,  $se = .0000$ ,  $p < .05$ ), indicating that the relationship between star rating and WTPP was moderated by volume.

Table 48 - Model 1 Analysis Results from Hayes Process Macro: Brand Image (Study 2-H4)

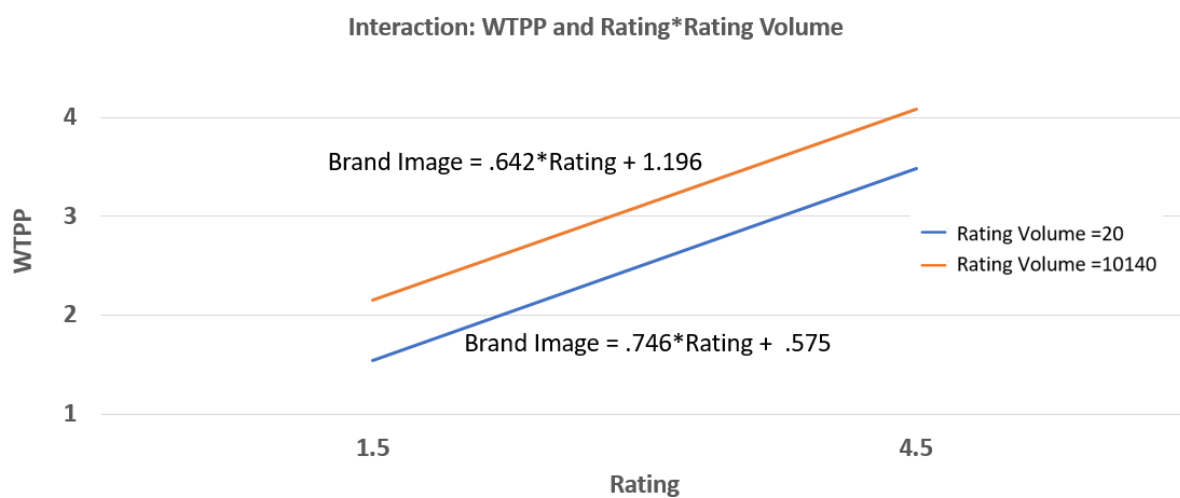
| Variable        | Model a-path |     |       |
|-----------------|--------------|-----|-------|
|                 | b            | SE  | p     |
| Rating (IV)     | .65          | .08 | <.001 |
| Volume (MOD)    | .00          | .00 | <.05  |
| Rating x Volume | .00          | .00 | < .05 |
| Age             | .02          | .07 | >.05  |
| Gender          | -.20         | .16 | >.05  |
| Edu             | -.09         | .07 | >.05  |
| Income          | -.00         | .04 | >.05  |

Note.  $N = 206$ . Model for the relationship  $R^2 = .42$ ,  $F(7,198) = 20.12$ ,  $p < .001$

The conditional effect analysis showed that the effect of *rating* on *WTPP* was stronger for high-vol ( $b = 0.79$ ,  $p < .001$ ) compared to low-vol ( $b = 0.61$ ,  $p < .001$ ), suggesting that the impact of rating on WTPP is dependent on the level of volume.

Figure 17 shows the interaction diagram, depicting the moderation effect of volume on the

Figure 17-- Interaction Diagram: WTPP and Rating\*Volume (Study 2-Model 1)



rating–brand image relationship. The slope analysis revealed that the line for 'high' *volume* is steeper than for 'low' *volume*, indicating that high involvement has a stronger impact on the

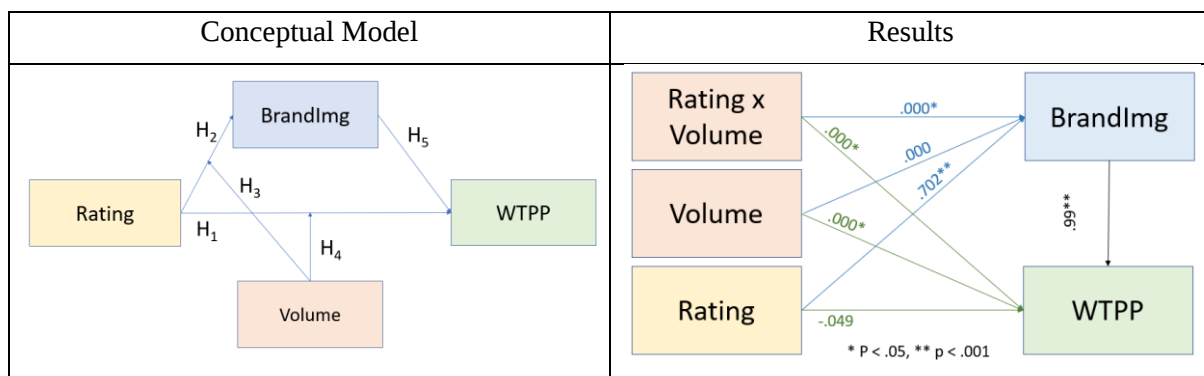
*rating - brand image* relationship than low volume. A one-unit increase in *rating* resulted in .88 and .72 unit increases in *brand image* for high and low volume, respectively. In other words, volume strengthened the *rating-brand image* relationship.

In conclusion, the Process Model 1 analysis results indicate that rating significantly predicts WTPP, and volume moderates the relationship between them.

#### *Report from Hayes Process Model 8 for H3 and H4*

An analysis using Hayes' (2017) Process Model 8 was undertaken to investigate the relationship between *rating* (X) and willingness to pay a premium (WTPP, Y), with the brand image (*brand image*, M) as a mediator and *volume* (W) as a moderator. The sample size was 206, and the model included age, gender, education, and income as covariates. The conceptual model and results are presented in Figure 18.

Figure 18-Conceptual Model and Results: WTPP (Study 2-Model 8)



The summary regression results are presented in Table 49, and the detailed report is available in [Annexure 25](#).

For the outcome variable brand image, the model summary showed a significant R-squared value of .67,  $F(7, 198) = 56.44$ ,  $p < .001$ , indicating that the model explained 67% of the variance in brand image. The rating significantly affected brand image ( $b = .70$ ,  $p < .001$ ). Additionally, there was a significant interaction between rating and volume ( $b = .00$ ,  $p = .032$ ), suggesting that the effect of rating on the brand image was moderated by volume.

At low volume (20 units), the effect of rating on the brand image was positive and significant ( $b = .70$ ,  $p < .001$ ). At high volume (10,140 units), the effect of rating on brand image remained positive and significant ( $b = .88$ ,  $p < .001$ ).

For the outcome variable WTPP, the model summary showed a significant R-squared value of .70,  $F(8, 197) = 58.03$ ,  $p < .001$ , indicating that the model explained 70% of the variance in WTPP. The brand image had a significant positive effect on WTPP ( $b = .99$ ,  $p < .001$ ), and there was a significant interaction between rating and volume ( $b = .00$ ,  $p = .034$ ), suggesting that the effect of rating on WTPP was moderated by volume.

At low volume (20 units), the direct effect of rating on WTPP was not significant ( $b = -.05$ ,  $p = .522$ ). At high volume (10,140 units), the direct effect of rating on WTPP was negative and significant ( $b = -.22$ ,  $p = .010$ ).

Table 49 - Model 8 Analysis Results from Hayes Process  
Macro: Brand Image (Study 2-H3/H4)

| Variable               | Model a-path |     |       | Model b/c' path |     |       |
|------------------------|--------------|-----|-------|-----------------|-----|-------|
|                        | b            | SE  | p     | b               | SE  | p     |
| <i>rating</i>          | .70          | .06 | <.001 | -.05            | .08 | <.001 |
| <i>volume</i>          | .00          | .00 | >.05  | .00             | .00 | <.05  |
| <i>rating x volume</i> | .00          | .00 | <.05  | .00             | .00 | <.05  |
| <i>brandimg</i>        |              |     |       | .99             | .07 | <.001 |
| <i>age</i>             | .02          | .05 | >.05  | .00             | .05 | >.05  |
| <i>gender</i>          | -.20         | .11 | >.05  | .00             | .12 | >.05  |
| <i>edu</i>             | -.04         | .05 | >.05  | -.05            | .05 | >.05  |
| <i>income</i>          | -.04         | .03 | >.05  | .04             | .03 | >.05  |

Note.  $N = 205$ . Model for the a-path  $R^2 = .67$ ,  $F(7,198) = 56.44$ ,  $p < .001$ ,  
Model for b-path and c'-path  $R^2 = .70$ ,  $F(8,197) = 58.05$ ,  $p < .001$ .

Regarding the indirect effects of rating on WTPP through the brand image at low volume (20 units), the indirect effect was positive and significant ( $b = .70$ ,  $SE = .07$ , 95% CI [.56, .84]). At high volume (10,140 units), the indirect effect remained positive and significant ( $b = .87$ ,  $SE = .09$ , 95% CI [.69, 1.04]). The index of moderated mediation was significant ( $b = .17$ ,  $SE$

= .08, 95% CI [.01, .33]), suggesting that the indirect effect of rating on WTPP through brand image was moderated by volume.

In conclusion, the results suggest that brand image mediates the relationship between rating and willingness to pay a premium, and this mediation is moderated by volume. The direct effect of rating on WTPP is negative for high-volume products but not significant for low-volume products. The indirect effect through brand image is positive and significant for both low- and high-volume products.

### Summary of results

Table 50 presents a summary of the hypotheses tested in Study 2. All the hypotheses were supported. Star rating has a significant effect on the star rating and WTPP. Purchase involvement has a significant moderating effect on the star rating and WTPP relationship. The findings are discussed in Chapter 7.

Table 50 - Hypotheses Support Status (Study 2)

| Hypothesis No. | Hypothesis                                                                                                                                                                                                                                           | Supported (Yes/No) |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| H1             | A high (versus low) star rating leads to a greater (versus lesser) willingness to pay a premium.                                                                                                                                                     | Supported          |
| H2             | A high (versus low) star rating leads to a more positive (versus negative) brand image.                                                                                                                                                              | Supported          |
| H3             | Volume moderates the positive relationship between star rating and brand image so that when the volume is high, the relationship between star rating and brand image becomes stronger than when the volume is low.                                   | Supported          |
| H4             | Volume moderates the positive relationship between star rating and willingness to pay a premium so that when the volume is high, the relationship between star rating and willingness to pay a premium becomes stronger than when the volume is low. | Supported          |
| H5             | A positive (versus negative) brand image leads to a greater (versus lesser) willingness to pay a premium.                                                                                                                                            | Supported          |

## Chapter 7 Discussion and Conclusions

The importance of studying user-generated content as a major factor in consumers' decision-making is well-established in the literature. Moreover, electronic commerce has brought forth unforeseen challenges. With the increasing significance of user-generated content, notably ratings and reviews, the control marketers once exercised over brand communication has been substantially diluted. The ratings and reviews have increasingly influenced consumer perceptions, leading to a critical shift in power toward consumers. Faced with these shifts, marketers need to adopt strategies that factor in the significant influence of ratings and reviews on consumers' brand perception and willingness to pay premiums. This involves understanding the influence of ratings and monitoring and responding to ratings and reviews.

Although numerous studies have tried to investigate the impact of online reviews, the research on star ratings has focused primarily on shoppers rating behavior and the correlation of ratings with purchase intention and sales. The literature is sparse on rating influence on other critical marketing outcomes such as brand image and willingness to pay a premium. Further, the literature is marked with inconsistent findings on the shoppers' reliance on ratings and the number of ratings (Hajli, 2020; Kordrostami et al., 2021; D.-H. Park et al., 2007; D. Park & Kim, 2008; Jing Yang et al., 2016; Y. Yang et al., 2018); and the effect of ratings and the number of ratings on marketing outcomes such as quality perception (de Langhe et al., 2016; De Pelsmacker et al., 2018; Flanagin et al., 2014; Hong & Pittman, 2020; S. Park & Nicolau, 2015; Ren et al., 2018; Watson et al., 2018). Similarly, the findings are inconsistent regarding the moderating role of involvement on the star rating influence (J. Lee et al., 2008; Mahapatra & Mishra, 2017; D.-H. Park et al., 2007; D. Park & Lee, 2008).

The current research attempts to fill the research gap in the area of star rating relationship with brand image and WTPP and explain some of these inconsistencies in the literature by investigating the interaction between rating and volume and introducing the moderating effect of purchase involvement. The findings of this study directly address the research questions formulated at the beginning of the research.

### Star rating and WTPP

The first research question of this thesis aimed to investigate the impact of star ratings on consumers' willingness to pay a premium (WTPP). Our studies 1 and 2 revealed a significant positive causal relationship between star ratings and WTPP, confirming our initial hypothesis

(see sections 5.2.9, 6.2.7). These findings suggest that a higher star rating positively correlates with a higher WTPP.

To the best of our knowledge, there is a paucity of research on the direct effect of star ratings on WTPP. Despite this, our findings resonate with existing literature that, while not directly investigating this specific relationship, supports analogous correlations.

Past research by Abrate and Viglia (2016), Kocas and Akkan (2016), and X. Hu et al. (2019) has established a relationship between star ratings and pricing. This indirectly endorses our assertion that higher star ratings may increase WTPP. Their work suggests that star ratings could influence price points, which mirrors the concept of our study that higher ratings increase consumers' WTPP.

Moreover, the connection between star ratings and willingness to pay (WTP), identified by Belarmino et al. (2021) and Castro et al. (2016), indirectly endorses our research. While they focus on WTP in general, our study narrows the focus to WTPP, but both research threads agree on the positive influence of star ratings.

The link between star ratings and quality perception, demonstrated by Flanagan et al. (2014) and Küsgen et al. (2016), and the connection between quality perception and WTPP, proposed by Chung & Lee (2017) and Delmas & Lessem (2017), together form a logical pathway that supports our results. These studies suggest that high star ratings enhance perceived quality, increasing WTPP.

The link between star ratings and brand image, supported by Belarmino et al. (2021), combined with the correlation between brand image and WTPP, highlighted by Anselmsson et al. (2014) and Fragkogian (2019), helps explain our findings. Hypothesis 2 of this research confirms that better star ratings boost the brand image, influencing consumers to pay a premium.

Finally, Noone and McGuire (2014) found a positive relationship between star ratings and perceived value, which aligns with our research. The relationship between perceived value and WTP, as proposed by Han et al. (2011), Li et al. (2012), and Zhang et al. (2020), strengthens the argument that higher star ratings could lead to higher perceived value, which could increase WTPP.

In summary, despite the absence of a direct precedent, our findings align with and build upon the fabric of related studies, contributing to a more holistic understanding of how star ratings can influence consumers' willingness to pay a premium.

## Theoretical perspective

Many theories argue that a consumer's willingness to pay more for a product or service is often guided by their perception of its quality and the perceived value they would derive from it. Further, quality perceptions are known to add to the overall perceived value. Since star ratings impact quality perceptions, these theories can be extended to explain star rating influence on WTPP. A discussion follows.

**Valence-Instrumentality-Expectancy (VIE) theory:** The expectancy-instrumentality-valence framework of the Expectancy theory (Vroom, 1964) explains the research finding. High star ratings increase consumers' expectations (Expectancy) of product quality. Believing this quality will lead to satisfaction (Instrumentality), which they highly value (Valence), consumers exhibit a greater willingness to pay a premium (WTPP).

**Means-End Chain Theory:** The attribute-consequence-value chain concept of the Means-End Chain (MEC) theory (Gutman, 1982) can be applied to understand the influence of star ratings. Through this attribute-consequence-value chain, shoppers mentally link star ratings (attributes) with product quality, functional, experiential, or symbolic benefits (consequences), and ultimately, their values (e.g., efficiency, reliability, or status -depending on the product). Consumers' values affect their willingness to pay a premium (Gao et al., 2016). Furthermore, a high star rating leads to a perception of high quality and value, positively affecting consumers' WTPP (Kirmani & Zeithaml, 1993; Zeithaml, 1988).

**Pricing Theory:** The finding aligns with the pricing theory. Monroe's pricing theory asserts a strong correlation between perceived quality, perceived value, and price (Rao & Monroe, 1989, 1996). This perspective is reinforced by various scholars, including (Kirmani & Zeithaml, 1993) and (Sethuraman & Cole, 1999). Extending Monroe's pricing theory, we can make connections to consumers' willingness to pay a premium (WTPP). When a product's perceived quality and value are high, consumers will likely see the product as worth a higher price. This increased worthiness or value perception, in turn, elevates consumers' WTPP. Therefore, strategies that elevate perceived quality and value can effectively increase consumers' WTPP, creating an advantageous scenario for consumers who perceive they are getting high value for their money and sellers who can profit from the premium pricing.

## Star rating – brand image

The second research question aimed to investigate the impact of ratings on consumers' brand image. Both studies 1 & 2 reported a significant positive causal relationship between star

rating and brand image, thus confirming our initial hypothesis H2 (sections 5.2.9, 6.2.7). This indicates that consumers view brands with higher ratings more favorably.

To our knowledge, no prior research investigates the direct effect of star rating on a composite multi-dimensional brand image. However, our research, demonstrating a positive relationship between star rating and brand image, is in harmony with a body of existing research, which, although not focusing directly on the relationship we investigated, offers compelling evidence for related correlations.

Our study found a positive correlation between star ratings and brand image, composed of seven brand associations: quality, characteristics, attractiveness, personality, trustworthiness, reputation, and price. Prior research has similarly indicated a positive impact of star ratings on individual brand associations such as quality, reputation, and trustworthiness (Flanagin & Metzger, 2013; Flanagin et al., 2014; Guo et al., 2017; Shin & Darpy, 2020; Sparks & Browning, 2011; Sun, 2012; Willems et al., 2019). Therefore, our findings align with existing literature, affirming the influence of star ratings on various brand image dimensions.

Higher-rated products or services typically receive greater visibility on online platforms, leading to more user interactions (Guan & Lam, 2019). This enhanced visibility often results in increased brand awareness among shoppers. Given that brand awareness positively correlates with brand associations and perceived quality (Azzari & Pelissari, 2020), this is another indirect way star ratings enhance brand image.

Star ratings have a significant impact on shaping consumers' perceptions of product quality, as reported by Belver-Delgado et al. (2020), Flanagin et al. (2014), and Küsgen et al. (2016). High-quality products are typically associated with a strong brand image (Quoquab et al., 2021). Therefore, we can deduce that star ratings primarily contribute to the brand image by enhancing perceived product quality.

The study's findings also underscore the role of star ratings in fostering brand trust (Han et al., 2021; Lu & Rui, 2018). Brand trust, denoting consumers' belief in a brand's reliability and credibility, can greatly enhance the brand image (Wiedmann & von Mettenheim, 2021). Star ratings act as social proof, assuring consumers of the product or brand's trustworthiness.

Lastly, this study confirms the role of star ratings as 'reputation cues' or 'reputation scores' (Rosenthal et al., 2020), which are crucial in shaping brand reputation – a key component of brand image. This aligns with findings from Abdel-Hafez et al. (2015), where reputation score, comprising factors such as customer ratings, sales volume, and return rates,

substantially influenced brand reputation. Positive brand reputation, often derived from high star ratings, can significantly enhance brand image, affirming the interrelated nature of these constructs (Foroudi et al., 2020).

### **The moderating effect of volume**

The third research question was - How does rating volume affect the perception of star rating? Study 2 investigated the moderating effect of volume on the star rating and brand image relationship. Both the hypotheses, H3 and H4, were supported. The star rating impacts WTPP through the brand image for low and high rating volumes. Specifically, for high volume, the relationship is stronger than for low volume.

Our research reveals a positive correlation between the rating volume and the strength of the relationship between ratings and brand image. Though no prior studies, to our knowledge, directly explore the impact of rating volume, we can draw some parallels with research investigating the effects of review volume, a closely related concept.

Review volume, the number of reviews, substantially influences various consumer outcomes, often even outstripping the effects of review valence or average rating (Khare et al., 2011). Similarly, a large rating volume, like many reviews, likely signals a higher level of consumer engagement and interest, which can foster a more favorable brand image.

Prior research has linked review volume directly to sales (De Pelsmacker et al., 2018; Rosario et al., 2016). The implication of the volume of feedback is further exemplified in the film industry, where review volume significantly impacts box office performance more than other factors (K. Kim et al., 2019; Liu, 2006). Analogously, a greater rating volume might correspond to more robust sales figures by enhancing the rating-brand image relationship, a premise supported by our findings.

However, the impact of review volume is not always straightforward and likely applies to rating volume. For instance, review volume significantly influences consumers' purchasing decisions, primarily when reviews are negative (Hong & Pittman, 2020; Ren et al., 2018). This suggests that consumers might perceive a larger rating volume more favorably when associated with higher-rated products, reinforcing the rating-brand image relationship.

Moreover, the relationship between review volume and consumer trust varies based on the nature of the review. Positive ratings strengthen this relationship more than negative ones (Gavilan et al., 2018). We can propose a similar dynamic for rating volume, where many positive ratings can amplify consumer trust and, consequently, the brand image.

The rating volume is crucial in shaping consumer behavior and decision-making processes, influencing customers through various psychological and social mechanisms.

Psychological mechanisms of purchase involvement and cognitive processes affect an individual's perception and decision-making. In the context of volume, first, a higher rating volume captures the attention of potential customers, making the product or service more noticeable (Cacioppo & Petty, 1989; Tellis, 1988). Customers are sensitive to information frequency, which shapes preferences and choices (Hasher & Zacks, 1984). Second, a larger number of ratings can make a product or service more persuasive, as consumers are more likely to be convinced by the aggregated opinions of others (Chevalier & Mayzlin, 2006). Third, a higher rating volume can help alleviate uncertainty in the purchase decision, as the opinions of others provide additional information about the product or service (Latané, 1981).

Social mechanisms, on the other hand, involve the influence of social factors on an individual's behavior and decision-making. These mechanisms include: (1) serving as social proof: A high rating volume acts as social proof, suggesting that a product or service is popular and widely accepted by others (Cialdini, 2021; Neo, 2020), (2) representing majority opinion: The majority opinion, reflected in a large number of ratings, indicates the correctness and popularity of a product or service, further influencing consumers' decisions (Baker & Petty, 1994), (3) exerting informational social influence: The aggregated opinions of others in the form of ratings create an informational social influence that can guide consumers towards a specific product or service (Deutsch & Gerard, 1955), (4) increasing observability: A higher rating volume increases the observability of a product or service, making it more likely for potential customers to consider it (Cheung & Thadani, 2010).

In extreme cases, the influence of majority opinion can lead to herding behavior and bandwagon effects where consumers are swayed merely by the availability of others' opinions, regardless of positivity or negativity (Anantharaman et al., 2022; J.-H. Huang & Chen, 2006). In conclusion, the rating volume significantly impacts consumer behavior and decision-making through psychological and social mechanisms. These mechanisms work together to influence customers to trust and purchase products or services with a higher volume of positive ratings. Therefore, the role of volume in the relationship between rating, brand image, and WTPP should not be overlooked. Marketers should consider the volume of their products when strategizing their marketing efforts, as it may affect how consumers perceive and value the brand.

In conclusion, although our study is among the first to explore the influence of rating volume, it is reasonable to consider that it might echo the patterns seen in review volume. Thus, rating volume significantly influences consumer outcomes, including brand image. However, its impact likely interacts with other factors like rating valence and the nature of the product or service.

### **Brand image - WTPP**

The fourth research question aimed to investigate the impact of brand image perception on their willingness to pay a premium. Both studies 1 and 2 indicate a significant positive causal relationship between brand image and WTPP, thus confirming our initial hypothesis H5 (see sections 5.2.9, 6.2.7). The finding indicates that consumers are willing to pay more for brands with favorable brand images than other brands. Another implication of this finding is that consumers are willing to pay more for products or services with positive brand associations.

The results of this study are consistent with previous research on brand image and willingness-to-pay relationships. The finding aligns with previous research that has demonstrated the impact of brand image on consumers' willingness to pay a premium (Anselmsson et al., 2014; Parry & Kawakami, 2015; Wiedmann & von Mettenheim, 2021).

Theoretically, brand image can influence WTPP directly or indirectly through several interconnected cognitive and affective processes such as loyalty (Kandampully et al., 2015), satisfaction (Martenson, 2007), perceived value (Bairrada et al., 2018), perception of quality (Anselmsson et al., 2014; Bairrada et al., 2018), emotional associations (Elsässer & Wirtz, 2017), social influence (Alvarado-Karste & Guzmán, 2020), and risk reduction (Aghekyan-Simonian et al., 2012).

Research reports both the direct and mediated effects of brand image on WTPP. For example, the direct relationship between brand associations and brand image with WTPP is reported by (Anselmsson et al., 2014; Namkung & Jang, 2017; Persson, 2010; Sethuraman & Cole, 1999). On the other hand, perceived value has been identified as a key mediator of the relationship between brand image and WTPP (Chiang & Jang, 2007; Lien et al., 2015; Tian et al., 2022).

The means-end theory provides a comprehensive approach to understanding how brand image, as an extrinsic cue, can influence a consumer's willingness to pay a premium price (WTPP). As Zeithaml (1988) proposed, consumers perceive value as a trade-off between what they give (e.g., price, time, effort) and what they receive (e.g., product benefits, brand

image, quality) in an exchange. This trade-off is particularly salient in the context of brand image. A strong, positive brand image can signal high quality, trustworthiness, and reliability. These qualities, in turn, are highly valued by consumers and contribute to their perception of overall value.

In the context of means-end theory, brand image, an extrinsic cue, becomes the 'means' through which consumers infer their desired 'end' states. If consumers value reliability, quality, and trustworthiness (the ends), they may perceive a brand with a strong, positive image (the means) as valuable, increasing their willingness to pay a premium price.

Furthermore, according to the theory, consumers' decision-making processes are influenced by their perceptions of product attributes, consumption consequences, and personal values. When consumers perceive that a brand's image aligns with their values and anticipate positive consumption consequences (for instance, they expect a high-quality product or positive social recognition), this enhances their perception of value. As a result, they might be willing to pay a premium price for the product.

In this scenario, the perceived quality and perceived value are higher-level abstractions derived from the consumer's interpretation of the brand's image. However, it is important to note that situational or contextual factors can influence these perceptions. For instance, the same brand might have different perceived values in different cultural contexts or personal circumstances.

Overall, Zeithaml's means-end theory provides a framework that explains how a brand's image can influence a consumer's perceived value and willingness to pay a premium price. It highlights that consumers are goal-directed and use product or service attributes, including brand image, to achieve desired end states.

Furthermore, the role of brand image, a component of brand equity, in influencing Willingness to Pay (WTP) and Willingness to Pay a Price Premium (WTPP) is well-established in the literature. Studies confirm that brand equity significantly contributes to these effects (Augusto & Torres, 2018; Hutton, 1997; G. Li et al., 2012; Netemeyer et al., 2004a; Pihlström & Brush, 2008; Y. Zhang et al., 2020). Brand equity refers to the value premium a company realizes from a product with a recognizable name compared to its generic equivalent (Aaker, 1991; Keller, 1993). Perceived quality and positive brand associations, both key components of brand image, contribute to brand equity. Increased brand equity, fostered by a positive brand image, enhances the perceived value and increases

consumers' WTPP. Essentially, a strong brand image boosts brand equity, increasing the value perceived by consumers and making them more willing to pay a premium price.

### **Moderating effect of Purchase involvement**

Our fifth research question was designed to assess how consumers' purchase involvement impacts the influence of star ratings on brand image. Study 1 probed the moderating role of purchase involvement in the relationship between star ratings and brand image. The data confirmed our initial hypothesis, H6, indicating a significant moderation effect of involvement on this relationship (see sections 5.2.9 and 6.2.7). Our findings suggested that star ratings influence low-involvement consumers more substantially in shaping their brand perceptions than those with high involvement.

The volume of information and processing needs significantly differ between consumers with low and high purchase involvement. Shoppers with high involvement typically seek comprehensive and detailed information to meticulously scrutinize product features, performance, and user reviews. In contrast, low-involvement shoppers lean on heuristic cues, such as star ratings, for decision-making (Nakhata & Kuo, 2014; Ranganathan, 2012).

According to the Elaboration Likelihood Model (ELM) proposed by Petty & Cacioppo (1986), the information processing strategies differ between low and high-involvement shoppers. The ELM posits that high-involvement individuals engage in central route processing, which involves a thorough evaluation of detailed information. On the other hand, low-involvement consumers employ peripheral route processing, relying on easily accessible cues or heuristics—such as star ratings or brand reputation—for their decision-making.

Shoppers who rely more heavily on ratings in low purchase involvement situations exhibit a stronger relationship between ratings and brand image. Conversely, consumers with high purchase involvement, who are more motivated to process information thoroughly and consider multiple factors before making a decision, tend to show a weakened direct relationship between ratings and brand image due to their comprehensive evaluation process.

The literature shows inconsistent impacts of involvement on outcomes. Some studies suggest involvement weakens the effect of independent variables on outcomes (De Pelsmacker et al., 2018; Doh & Hwang, 2009; Lis, 2013), while others indicate it strengthens this effect (D.-H. Park et al., 2007).

These discrepancies may arise from varying involvement measurements and manipulation methods (Aureliano-Silva et al., 2021; De Pelsmacker et al., 2018; Doh & Hwang, 2009; Lis,

2013). External involvement manipulation is difficult due to its intrinsic nature as a personality trait and the interaction between different involvement types (W. C. Park & Mittal, 1985). Involvement as a personality trait varies among consumers, and net involvement results from the combined influence of product, purchase, situational, and enduring involvement. This complex interplay makes external manipulation challenging in controlled settings.

### The mediating role of brand image

The study found that brand image completely mediated the relationship between star rating and willingness to pay a premium, thereby rendering the direct influence of star ratings on the willingness to pay a premium statistically insignificant. The finding has implications for well-known brands.

For example, when a brand has a strong and positive image, consumers may be more likely to trust it and perceive its products as high-quality, regardless of individual product ratings. In this case, consumers may still be willing to pay a premium for the brand's products even if the ratings are not outstanding. Therefore, the effect of ratings on willingness to pay a premium becomes insignificant when brand image is considered. Additionally, as product ratings increase, their marginal effect on willingness to pay a premium may decrease, exhibiting a law of diminishing returns as they approach the top of the scale. For example, the difference between a 4.5-star and a 5-star rating might not be substantial enough to justify a significant premium, especially if the brand image is strong. In this case, the brand image could overshadow the importance of product ratings in consumers' willingness to pay a premium. Finally, a strong brand image can create a halo effect, where consumers attribute positive qualities to the products associated with the brand, regardless of actual product ratings.

A strong brand image may lead consumers to place more importance on the overall brand reputation rather than individual product ratings, reducing the impact of ratings on their willingness to pay a premium.

### Role of covariates

The covariates (age, gender, education, and income) effects in all the hypotheses across studies 1 and 2 were statistically insignificant. This can be attributed largely to Qualtrics, the online platform used for the experiment. Qualtrics ensures unbiased and unpredictable participant assignment to experimental conditions by employing a robust random number

generation algorithm, preventing predictable patterns, and safeguarding against participant influence on their condition allocation.

Random assignment of participants to the experimental cells ensured low variability among samples on any demographic variable. Therefore, a lack of significant effect of the covariates (age, gender, education, and income) was anticipated.

### **Contributions and Significance of the Research**

This research contributes to a better understanding of how online ratings influence brand image and WTPP and the role of purchase involvement and volume in these relationships. The study's generalized brand image measure contributes novel findings to the domain.

First, the study establishes a significant positive relationship between star ratings and WTPP, signifying that consumers are more willing to pay a premium for superior-quality products. Interestingly, when brand image mediates the relationship, the impact of star rating on WTPP becomes insignificant, emphasizing the critical role brand image plays in explaining the influence of star rating on WTPP.

Second, the research demonstrates the positive association between star ratings and brand image, highlighting that higher star ratings contribute to a more favorable brand image. Remarkably, star ratings account for 61.4% - 64.2% of the variance in brand image, further stressing the importance of star ratings in shaping brand perceptions.

Third, the study confirms that consumers with a positive brand image exhibit a higher WTPP, underscoring the significance of brand image in consumers' decision-making processes.

Fourth, the study uncovers how purchase involvement shapes the link between star ratings and brand image. Specifically, it shows that customers with low involvement rely more on star ratings to form their view of the brand, while those with high involvement base their perceptions on other elements, like previous knowledge or experience with the brand.

Fifth, the research recognizes the rating volume as a moderating factor in the relationship between star rating, brand image, and WTPP. The positive impact of star rating on WTPP through brand image is evident for both low and high rating volume, with a stronger relationship observed for high volume. This finding suggests that marketers should not disregard the role of rating volume in their marketing strategies, as it may significantly influence how consumers perceive and value a brand.

Moreover, the research establishes causal relationships using an experimental method, offering greater internal validity than perceptual surveys. This approach helps researchers understand the cause-and-effect relationships between variables, leading to more accurate and reliable conclusions.

The findings of this research have cross-disciplinary relevance, extending beyond marketing to disciplines such as psychology, sociology, and economics. The study's results can be useful for researchers interested in exploring consumer decision-making processes, brand equity, and pricing strategies from various perspectives. For instance, the insights gained from this research can inform studies on the cognitive processes behind consumer decisions, the role of online communities and social influence in shaping consumer behavior, and the development of economic models that account for the role of online ratings and reviews in determining product value.

In conclusion, this research contributes to the literature on consumer behavior, brand image, product ratings, and rating volume by advancing our understanding of the complex interplay between these factors. Through its experimental methodology and rigorous statistical approach, this study emphasizes the importance of incorporating moderated mediation analysis and causal inference when investigating the effects of product ratings, brand image, and rating volume on WTPP. It serves as a valuable methodological reference for future research. The insights gained from this research hold relevance for multiple disciplines, providing a more comprehensive understanding of consumer behavior in the digital age and informing future studies across psychology, sociology, and economics.

### **Theoretical implications**

This research offers valuable insights into consumer behavior, with several theoretical implications that can shape future studies in this field. The findings support several theories in the domain of consumer behavior and marketing.

Firstly, the significant interaction between rating and volume in predicting brand image highlights the necessity of considering contextual factors when analyzing the relationship between product ratings and brand image. So, researchers should focus on individual factors and explore their interconnections to comprehend consumer behavior dynamics better. These findings also suggest that ratings could serve as indicators of 'perceived quality' or 'value,' improving brand image and potentially leading to an increased willingness to pay a premium, thus aligning with the perceived value theory (Zeithaml, 1988).

Secondly, the moderating role of volume on the relationship between star ratings, brand image, and the willingness to pay a premium (H3 & H4) supports the theory of social proof due to the reflective, persuasive power of collective opinion.

Thirdly, the positive and significant indirect effect of rating on WTPP through brand image (H5) aligns with the brand equity theory, demonstrating how a strong brand image can increase consumers' readiness to pay a premium (Aaker, 1991; Keller, 1993).

Lastly, the moderating role of involvement in the relationship between star ratings and brand image (H6) resonates with the elaboration likelihood model and involvement theories (Petty & Cacioppo, 1986), suggesting that lower involvement may amplify the effects of star ratings on brand image.

Lastly, the results emphasize the importance of examining conditional indirect effects in consumer behavior research, contributing to a more comprehensive understanding of the relationships between variables.

Overall, the findings and hypotheses of this research deepen our understanding of the intricate interplay between key consumer behavior and marketing factors, such as ratings, volume, brand image, and involvement, and their impact on willingness to pay a premium. This study, therefore, supports and extends existing theories in these domains.

### **Managerial implications**

The findings of this study have practical implications for businesses seeking to optimize their marketing strategies and communication efforts. Understanding the complex interplay between product ratings, volume, and brand image can help companies make informed decisions and tailor their approach to maximize the benefits of positive ratings on consumers' WTPP.

We first discuss star rating implications on businesses' advertising and pricing strategies, followed by several other areas where managers can leverage star ratings.

#### **Star rating and advertising**

Online star ratings have substantial implications for a seller's advertising strategy and spending, primarily due to their pivotal role in shaping consumer brand perceptions and driving purchase decisions. Limited empirical evidence supports this argument.

A higher star rating generates a positive brand image in shoppers' minds. For sellers, this can reduce the need for extensive brand-related advertising and result in cost savings. On the

other hand, a low star rating requires sellers to invest more in brand advertising to improve the brand image and address negative perceptions. The advertising strategy should align with the star rating, highlighting positive reviews or actively addressing concerns. Ultimately, the goal is to build a strong brand image that resonates with customers and enhances the seller's reputation.

Ratings generate both substitutive and complementary effects on a seller's advertising spending. They reduce the need for advertising information among consumers but also impact the effectiveness of a firm's advertising efforts. The strength and direction of these effects depend on various product/market/review/media conditions (Chen and Xie, 2005). For example, (Lei, 2017) found that higher ratings for relatively weaker brand restaurants led to increased advertising spend, potentially due to the reinforcement of positive messaging. On the other hand, stronger restaurant brands substituted advertising for higher ratings, spending less on advertising. This could be attributed to the higher displayed rating acting as a form of advertising, reducing the need for additional advertising expenditure. Similarly, (Hollenbeck et al., 2019), in a study from the hotel industry, reported that higher-rated hotels tend to spend less on advertising, suggesting a substitution relationship between ratings and ad spending. Independent hotels show a stronger effect, indicating that a strong brand name provides some resilience against the impact of reviews.

Furthermore, sellers can use star ratings to devise various advertising strategies, as discussed here. For example, the magnitude of star rating can influence the choice of advertising channel; for example, Sun et al. (2016) found that when faced with low ratings, sponsored search advertising is more effective than social media endorsements (H. Sun et al., 2016).

A cornerstone of this influence lies in targeting and personalizing advertising efforts. Sellers can use high star ratings to pinpoint their most satisfied customers. These customers, who have expressed satisfaction through ratings, are potential repeat buyers and may be converted into brand advocates. By leveraging these ratings, sellers can formulate personalized advertisements, potentially boosting customer retention and acquisition.

Further, the advertising narrative can be largely driven by these ratings. A product or service with a high star rating can be advertised primarily on quality and customer satisfaction. Conversely, a product with a lower rating offers an opportunity for the seller to highlight any improvements or changes made in response to customer feedback, thus reflecting the brand's commitment to customer satisfaction.

The influence of star ratings extends to the tactical aspects of advertising strategy, particularly in budget allocation. A high-rated product may justify a larger share of the advertising budget, capitalizing on positive customer sentiment to promote the product further. In contrast, a product with a lower rating might necessitate a more conservative approach, where the focus may need to be redirected to product improvement before substantial advertising resources are committed.

Furthermore, star ratings can provide direction for retargeting efforts. High-rating customers can be retargeted with advertisements for complementary products or upselling opportunities, while customers who leave lower ratings may be retargeted with advertisements outlining product enhancements or special offers designed to rebuild their trust.

Finally, superior product ratings can offer a distinct advantage in a competitive context. Sellers can underscore these higher ratings in advertising to set their product apart and assert it as a superior choice.

In essence, star ratings, indicators of customer satisfaction and preferences, become vital informants for shaping an effective advertising strategy, making them indispensable in today's data-driven marketing landscape.

### **Star rating and pricing**

Pricing and willingness to pay premiums (WTPP) are closely linked. Marketers set prices to optimize surplus from sales, with increased profitability reliant on augmenting consumer WTPP. Despite the dearth of literature on the relationship between ratings and WTPP, significant research exists on the association between ratings and pricing, forming the focus of this discussion.

The role of ratings in pricing strategies is a crucial aspect of online commerce, providing valuable insights for sellers to optimize their pricing decisions and enhance their market positioning. Ratings can be used as product quality and customer satisfaction indicators, influencing shoppers' willingness to pay a premium and thus affecting pricing decisions in several ways.

Firstly, sellers can optimize pricing decisions based on the average ratings of a product (F. Huang et al., 2019; Kocas & Akkan, 2016; Li et al., 2020). Higher average ratings signal quality and customer satisfaction, justifying a higher price point. Conversely, lower average ratings may necessitate a lower price to stimulate purchases and improve the product's rating over time. This approach allows sellers to align prices with perceived product value,

leveraging the trust and credibility associated with positive ratings. For example, the hotel industry is best known for dynamic room pricing based on star ratings, with hotels with high star ratings associated with premium pricing and a greater ability to maintain a more stable pricing policy over time when the general price trend is decreasing (Abrate et al., 2012; Israeli, 2002).

Sellers can launch promotional campaigns that respond to positive rating trends to further capitalize on ratings. When a product achieves a high rating milestone or receives a significant influx of positive reviews, limited-time discounts or special offers can be introduced. This utilizes social proof to attract more customers and encourages the continuation of favorable ratings, fostering positive customer sentiment and driving demand.

Dynamic pricing strategies based on ratings can also be employed (Q.-C. He & Chen, 2018; Kocas & Akkan, 2016). During high volatility in ratings, indicating mixed customer opinions, temporary price reductions can be implemented to incentivize purchases and buffer against potential negative ratings. Conversely, stable rating periods suggest consistent product performance, potentially justifying price increases to capture the perceived value and maintain profitability.

(Yan & Han, 2022) report how ratings and reviews guide OEM pricing strategies. OEMs are inclined to adopt a penetration pricing strategy for high-quality (high rating) products, setting lower initial prices to speed up market penetration. However, if the ratings are low (product quality is not high enough), they tend to opt for a skimming pricing strategy, setting high prices initially to skim the market. These strategies contrast with the uniform pricing approach typically used in the absence of online reviews.

Moreover, sellers can explore personalized pricing models considering individual customers' rating patterns and preferences (Adelnia Najafabadi et al., 2022; Kamishima & Akaho, 2011). Sellers can foster loyalty and drive repeat purchases by tailoring prices to enhance customer satisfaction. This approach acknowledges customers' unique preferences and creates a personalized pricing experience that aligns with their needs and preferences.

The integration of ratings into pricing strategies allows sellers to gain valuable insights into customer perceptions and behaviors, manage their online reputation, and optimize profitability in the competitive online marketplace. By strategically adjusting prices based on ratings, launching targeted promotional campaigns, and implementing dynamic and

personalized pricing models, sellers can enhance their market positioning, attract customers, and build long-term success.

### **Star rating and operations strategy**

Some empirical evidence exists on the influence of online reviews on manufacturers' operational strategies. The rationale can be extended to ratings as a source of information without much loss of context. For instance, (Yan & Han, 2022) suggested that online reviews influence the manufacturer's decision on the second-period remanufacturing entry strategy. (M. Sun et al., 2021) considered the impact of online ratings on return policy, and (Y. Li et al., 2019) explored the integration of online reviews into physical stores.

In conclusion, by leveraging star ratings in advertising and pricing decisions, businesses can enhance brand image, influence consumers' willingness to pay a premium, and optimize market positioning. Incorporating star ratings into operational strategies can also inform manufacturers' decisions and improve overall performance. Star ratings guide effective marketing and operational strategies in the competitive online marketplace.

### **Implications for public policy**

The increased dependency of consumers on online ratings and reviews for purchase decisions has inadvertently contributed to a burgeoning industry of fraudulent activity, primarily revolving around the creation of fake or deceptive reviews (Malbon, 2013). It is estimated that a simple one-star increase in a Yelp review can enhance revenues by 5-9% (Luca, 2011), highlighting the substantial incentive for malicious actors. Astoundingly, over 80% of consumers use online reviews before purchasing (Smith and Anderson, 2016), demonstrating the large-scale influence of these potentially counterfeit ratings.

The consequences of these fake reviews are multifold, profoundly impacting consumers, businesses, and the overall market dynamics. Fraudulent reviews can significantly mislead consumers, eroding their confidence in the online marketplace. These deceptive practices also distort market competition by offering an unfair advantage to businesses employing unscrupulous tactics, leading to an inefficient allocation of economic resources (Malbon, 2013).

A strong need for robust public policy measures has emerged to tackle this escalating issue. Enforcement agencies must take proactive steps, such as identifying and publicly censuring offenders, levying stringent fines, and imposing legal action against entities creating fake reviews. New York has set a precedent by making astroturfing – the deceptive act of creating

falsified reviews that seem unbiased – illegal (Schneiderman, 2013). Such measures highlight the severity of this problem and underline the need for more widespread regulatory intervention.

However, regulation alone might not suffice in addressing this multifaceted problem. Businesses also need to shoulder some responsibility by implementing intelligent reputation systems capable of identifying deceptive reviews. Advanced technologies like artificial intelligence and machine learning can facilitate this process (Malbon, 2013; Petrescu et al., 2023).

In conclusion, fake reviews are a significant concern that demands comprehensive action. An alliance approach involving consumers, businesses, regulators, academics, and technology providers may effectively combat this issue. A deeper understanding of the motivations behind creating fake reviews and the impact of such reviews on consumer behavior is crucial for developing effective measures to tackle this pervasive problem.

### **Limitations**

Two likely limitations of this research are generalizability and self-reported measures. Additionally, potential discrepancies in measuring and manipulating involvement should be considered.

1. **Generalizability:** The research was conducted for a computer mouse on an e-commerce platform with US resident online shoppers as participants, which may limit the generalizability of the findings to other contexts. Future research should explore various product categories, consumer groups, and alternative platforms, including social commerce and mobile commerce, to expand the applicability of the findings.
2. **Self-reported measures:** The study relied on self-reported measures of willingness to pay a premium, which may be subject to social desirability bias and not accurately represent actual consumer behavior. The participants may report a higher willingness to pay a premium for products with better ratings or brand image because they believe it is the more socially acceptable response, even if their behavior might not align with their reported willingness. Future research could benefit from using objective measures, such as purchase data, to examine the influence of star ratings on actual consumer spending.

With these limitations, this study can serve as a valuable starting point for future research, providing insights into the complex relationships between star ratings, brand image, consumer involvement, review volume, and willingness to pay a premium.

### **Future research directions**

To further advance our understanding of the complex interplay between star ratings, brand image, WTPP, and rating volume, future research should address the limitations of the current study and explore additional avenues:

1. **Increase generalizability:** Replicate the study with a larger and more diverse sample, examine different product categories, and explore various online platforms and contexts (e.g., e-commerce websites, social media platforms, B2B, and B2C) to ensure the findings are applicable across diverse industries and settings.
2. **Examine additional factors:** Investigate the interplay of other factors, such as product quality, customer reviews, price, review content, reviewer credibility, and cultural differences, in conjunction with star ratings, on consumer perceptions of brand image and willingness to pay a premium.
3. **Explore different types of star ratings:** Assess the impact of expert ratings versus user-generated ratings on the relationships between star ratings, brand image, WTPP, and rating volume.
4. **Assess the dynamic nature of the relationships:** Conduct longitudinal analyses to understand how the impact of star ratings, brand image, and rating volume on WTPP changes, allowing businesses to adapt their strategies accordingly.
5. **Improve measurement and manipulation:** Develop more robust ways to measure and manipulate purchase involvement and further examine its impact on outcomes.
6. **Investigate the role of algorithms and user interfaces:** Explore how different algorithmic and interface designs affect the relationships between star ratings, brand image, WTPP, and rating volume, helping businesses optimize their online presence.
7. **Establish causal relationships:** Employ experimental designs to determine causality between variables and explore the effectiveness of interventions to improve star ratings, brand image, and WTPP.
8. **Examine the theoretical underpinnings:** Investigate the role of social influence, the Elaboration Likelihood Model (ELM), and the Heuristic-Systematic Model (HSM) in explaining consumers' reliance on ratings.

By exploring these future research directions, scholars can advance our understanding of the complex interplay between star ratings, brand image, WTPP, and rating volume, ultimately helping businesses develop more effective strategies and succeed in the competitive online marketplace.

## **Conclusion**

In conclusion, this study found that higher star ratings significantly influence consumers' willingness to pay a premium for products or services and their brand image perception. Furthermore, the effect of star ratings on the brand image was found to be more significant for buyers with low involvement than those with high involvement. The findings highlight the importance of star ratings in shaping consumer behavior and the need for businesses to strategically manage their ratings and brand image to drive consumer willingness to pay a premium.

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## Annexures

### *Annexure 1- Literature review – star rating*

#### 1. Introduction

A Star rating is an aggregate numerical customer evaluation of products, services, brands, or businesses. It is usually represented by a number and a visual comprising stars on a scale of 0 – 5. It is computed from individual customer ratings as a simple average or using an algorithm that considers multiple criteria (e.g., Amazon uses recency of rating and verification of rating provider). The star rating is also referred to as average, aggregate, consumer, product, or online rating, and it is a prominent feature on e-commerce and consumer review sites. It is based on factors such as product quality, value, and customer service, and it serves as a tool for evaluating and comparing products, services, brands, or businesses (Willemssen et al., 2011). There are three parts to star rating – ratings or valence (an average numerical customer rating), volume (the total number of customer ratings), and variance (the variation in customer ratings along the rating scale). This research focuses on the rating and the volume.

While previous literature mainly explores the effects of textual reviews, there is less research on the effects of summary ratings and volume and the interaction of these factors. The reviewed literature mostly finds positive effects of valence and volume on marketing outcomes, but there are mixed results that require further investigation. The rest of the chapter reviews the existing literature on rating, volume, and their interactions and moderating factors while examining each variable individually.

#### 2. How is a star rating useful?

Online shopping often brings about uncertainties for consumers due to information asymmetry, where sellers have more detailed knowledge about products than buyers. This uncertainty can pertain to product quality, shipping costs, return policies, and the reputation of the seller (Dimoka et al., 2012).

To lessen this uncertainty and make better decisions, shoppers actively look for information about the brands, products, sellers, and the overall shopping experience (Nicosia, 1966; Yaniv & Milyavsky, 2007). A common strategy for consumers to overcome this information gap is consulting ratings and reviews (Manes & Tchetichik, 2018).

Star ratings provide a succinct, objective summary of a product's pros and cons, making product comparison easier (Filieri et al., 2021; Guan & Lam, 2019). Star ratings also serve as easy-to-understand cues, reducing the mental effort required to process complex information, especially for consumers who lack the motivation or ability to process in-depth details (De Pelsmacker et al., 2018; S. Park & Nicolau, 2015; Sparks & Browning, 2011).

Consumers are motivated to use these ratings for a variety of reasons, including seeking social validation, economic benefits, entertainment, avoiding a fear of missing out, fulfilling cognitive needs, and reducing perceived online transaction risks (Hennig-Thurau & Walsh, 2003; Shao, 2009; Beyens et al., 2016; Gupta & Harris, 2010; Ba & Pavlou, 2002).

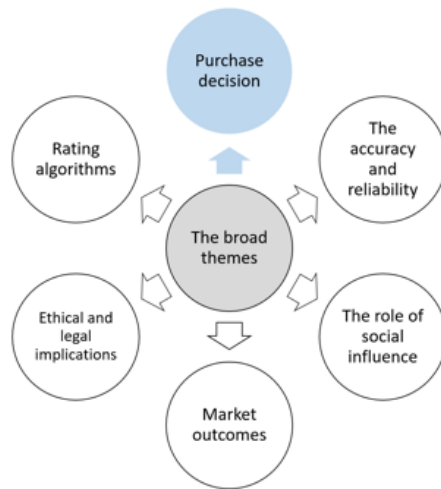
### 3. Themes in star rating research

To obtain an understanding of the broad themes and streams in star rating literature, we used VOS Viewer for co-word analysis (also known as keyword co-occurrence analysis), which constructs a conceptual map of a domain by evaluating keyword pairs' co-occurrence frequency across documents (Callon et al., 1983; van Eck & Waltman, 2014). The analysis uses keywords from titles, abstracts, author-supplied keywords, or document text, with author-supplied keywords, considered the best source of conceptual information (H.-N. Su & Lee, 2010). The outputs of this analysis are the co-occurrence map and network files and the visualization of the results. The analysis uses weights to measure keywords' frequency, association, and centrality within a data set. The keyword Occurrences (KO) counts how many times a keyword appears in the data set, indicating its popularity. The number of links (LINKS) shows how often a keyword is linked to other keywords, indicating its level of association. The total link strength (LS) measures the strength of all links between a keyword and others, indicating its centrality and importance in the network of concepts. Overall, the analysis provides insights into the relationships between keywords. The themes revealed by co-word analysis are presented in the ensuing discussion.

Rating research is a multi-faceted and dynamic field that encompasses a range of themes and topics related to consumer behavior and decision-making.

The broad themes revealed by the co-word analysis include the purchase decision, accuracy and reliability of ratings, the role of social influence in ratings, the effect of ratings on market outcomes, the ethical and legal implications of ratings, and the development and use of rating algorithms (Figure 18). Each theme offers a unique perspective on rating research and provides valuable insights into the factors contributing to ratings' quality and usefulness.

Figure 19- Broad themes in ratings research



Six broad themes in ratings research

Figure 20- Subthemes in ratings research



Sub-themes in ratings – purchase decision research

#### 4. Star rating broad themes

##### *Purchase Decision*

Star ratings are crucial to consumers' purchase decisions. These ratings, essentially aggregates of past customers' feedback, provide a straightforward and quick reference for gauging product quality. High star ratings often signify superior product quality, leading to increased trust and a higher likelihood of purchase. Conversely, low star ratings may deter consumers, making them reconsider their decision or seek alternatives (Cheung et al., 2014; Wang et al., 2016)

##### *Accuracy and Reliability of Ratings*

The accuracy and reliability of star ratings are vital in ensuring their effectiveness in shaping consumer behavior. However, fake reviews, biased ratings, or even vendor manipulation may undermine these ratings' trustworthiness. Ensuring the accuracy of ratings thus requires full review and rating systems and strict monitoring and verification processes. Future research could focus on developing more reliable rating systems and identifying markers of trustworthiness in star ratings (Centeno et al., 2015; de Langhe et al., 2016; Hu et al., 2009).

### *Role of Social Influence in Ratings*

Social influence plays a significant role in star ratings. Consumers often rely on others' opinions when making purchase decisions, and star ratings act as a form of social proof, influencing consumers' perceptions of a product or service. This influence can be conformity, where individuals align their opinions with the majority, or informational influence, where star ratings provide valuable information that shapes consumers' decisions (Cherng et al., 2022; Sridhar & Srinivasan, 2012).

### *Market Outcomes such as Sales and Prices*

Star ratings significantly influence market outcomes. High star ratings often translate into increased sales due to enhanced consumer trust and perceived quality. Furthermore, they allow businesses to command higher prices, as consumers are willing to pay a premium for highly-rated goods or services. Therefore, star ratings impact sales volumes and pricing strategies (Jiang & Wang, 2008; Li et al., 2020)

### *Ethical and Legal Implications*

While invaluable in e-commerce, Star ratings also raise ethical and legal concerns. Issues such as fake or incentivized reviews, rating manipulation, and bias can breach ethical norms and, in some jurisdictions, may violate legal standards. The ethical and legal dimensions of star ratings necessitate clear guidelines for their use, stringent monitoring mechanisms, and appropriate penalties for violations (He et al., 2022; Ivanova & Scholz, 2017)

### *Rating Algorithms*

Star rating algorithms play a pivotal role in determining the final rating displayed to consumers. These algorithms generally aggregate individual ratings but may also consider factors like reviews' recency or reviewers' credibility. However, these algorithms can sometimes be complex and opaque, making it difficult for consumers to understand how the final star rating is computed fully. Hence, there is a need for more transparency and clarity in the operation of these algorithms to ensure that star ratings continue to be a trusted and reliable source of information for consumers (Rezvani & Rezvani, 2020; Thakur, 2019).

In conclusion, rating research is a complex and multi-faceted field that offers a rich and diverse array of opportunities for exploration and inquiry.

## 5. Star rating sub-themes under purchase decision-making

The deeper analysis of the impact of ratings on consumer purchase decision-making helped reveal nine subthemes on the role of ratings on trust, perception of quality, brand image, satisfaction, purchase intention, willingness to pay a premium (WTPP), pricing, sales, and information search behavior (Figure 19). These themes are interconnected, revealing the cumulative influence of star ratings on consumer decision-making processes. The subthemes are summarized in Table 51.

Table 51 - Subthemes in star rating research

| Subtheme                        | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Trust</b>                    | Trust is a fundamental factor in e-commerce interactions. Given the remote nature of these transactions, consumers rely on cues to ascertain the credibility and trustworthiness of products or services and the seller. In this context, star ratings serve as trust signals, giving consumers a heuristic to gauge product quality and seller reliability. High star ratings often indicate positive experiences by previous customers, thereby bolstering trust in the product or service (Sparks & Browning, 2011; Gong et al., 2021). |
| <b>Quality Perception</b>       | Consumers' perception of quality is often inferred from available information, with star ratings playing a key role. Higher star ratings typically suggest better quality, representing positive evaluations from other customers. Therefore, the star rating system can influence consumers' quality perceptions and expectations about a product or service (Flanagin et al., 2014; Küsgen et al., 2016).                                                                                                                                |
| <b>Brand Image</b>              | Star ratings can significantly influence a brand's image. High ratings can enhance brand reputation, indicating superior product quality and customer satisfaction, which may differentiate a brand from its competitors. Thus, star ratings can significantly shape a brand's image in the consumers' eyes (Belarmino et al., 2021).                                                                                                                                                                                                      |
| <b>Satisfaction</b>             | Star ratings can reflect previous customers' satisfaction levels and thus indicate prospective customers' likely satisfaction should they choose to purchase. High star ratings and subsequent high satisfaction levels can increase customer retention and loyalty, which is crucial for long-term success in e-commerce (Alalwan, 2020; Martin-Fuentes, 2016)                                                                                                                                                                            |
| <b>Purchase Intention</b>       | Star ratings have a substantial impact on purchase intention. The higher the ratings, the more likely consumers will purchase a product or service due to the inferred quality and satisfaction. Therefore, star ratings influence consumers' decision-making (Casado-Díaz et al., 2017).                                                                                                                                                                                                                                                  |
| <b>Willingness to Pay (WTP)</b> | Star ratings influence consumers' willingness to pay more for a product or service. High ratings can lead to a perceived increase in value, which can justify a higher price point from the consumer's perspective. This willingness to pay a premium is particularly significant as it directly impacts a firm's profitability (Belarmino et al., 2021; Castro et al., 2016)                                                                                                                                                              |
| <b>Pricing</b>                  | Star ratings provide consumers with a reference point to evaluate whether the price of a product or service is justified. Higher ratings may allow sellers to command higher prices, while lower ratings may require discounts or other value-adding strategies. Therefore, star ratings are pivotal in pricing strategies (Abrate & Viglia, 2016; Kocas & Akkan, 2016)                                                                                                                                                                    |
| <b>Sales</b>                    | High star ratings can stimulate sales by attracting customers and encouraging purchase behavior. This is because star ratings serve as social proof of product quality and customer satisfaction, making consumers more likely to buy (Hyrynsalmi et al., 2015; Y.-J. Lee et al., 2019).                                                                                                                                                                                                                                                   |

| Subtheme        | Brief Description                                                                                                                                                                                                                                                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Search Behavior | Star ratings can influence consumers' information search behavior on e-commerce platforms. High ratings can make products more noticeable and attractive, increasing their likelihood of being considered and potentially purchased. Therefore, star ratings can significantly affect how consumers navigate and interact with e-commerce platforms (Guan & Lam, 2019). |

In summary, these themes collectively demonstrate the impact of star ratings on consumers' perceptions, behaviors, and decision-making processes.

## 6. Star rating perceptions and outcomes

Star ratings play a critical role in the online marketplace, guiding consumer behaviors and influencing a multitude of outcomes, from perceived product quality to actual sales. This section discusses the key the star rating perceptions and outcomes (see table 52 for a summary).

Firstly, star ratings substantially shape consumer perceptions of product quality, playing into the human tendency to interpret higher numbers as indicative of better quality (Filieri et al., 2021). Notably, the average product ratings significantly influence these perceptions more than the sheer number of ratings (Flanagin et al., 2014; Küsgen et al., 2016).

Ratings also enhance the perceived value of products, marking them as more credible and reliable (Peiyu Chen et al., 2021). However, the effect of ratings on perceived value is notably less compared to the impact of reviews (Noone & McGuire, 2014).

The perceived risk of online purchasing decisions is mitigated by high ratings, establishing them as reliable indicators of product quality and customer satisfaction (Gavilan et al., 2019; Nakhata & Kuo, 2014; F. Wang et al., 2021).

Trust, a cornerstone in the online marketplace, is cultivated by high ratings, signaling seller reliability and enhancing consumer confidence (Gong et al., 2021; Pavlou & Dimoka, 2006; Sparks & Browning, 2011). A complex interplay of factors like rating volume, variance, reviewer credibility, and individual consumer characteristics nuanced this trust.

Star ratings are directly linked to customer satisfaction by setting pre-purchase expectations in alignment with actual product performance (Alalwan, 2020; Martin-Fuentes, 2016).

Brand image, a key element in consumer decision-making, is significantly shaped by star ratings. High ratings enhance trust, credibility, and perceived quality, while low ratings may damage brand image (Casado-Díaz et al., 2017; Zablocki et al., 2019).

Purchase intention is also influenced by star ratings, with optimal influence observed between 4.2 and 4.5 stars (Maslowska et al., 2017). This relationship is affected by factors like rating variance, reviewer credibility, brand equity, and conflicting reviews (Keh et al., 2015; Siddiqi et al., 2020).

High star ratings encourage a greater willingness to pay, mainly by fostering perceptions of positive brand image and superior quality (Belarmino et al., 2021; Belarmino & Koh, 2021; Castro et al., 2016; Otto et al., 2018; Sangwichien & Jaroenwisan, 2017; Schamel, 2012).

While there is limited direct research on ratings and customer loyalty, high ratings are linked to attributes that foster loyalty, such as perceived quality, satisfaction, and trust (Tran et al., 2019; Tsao, 2018; J. J. Zhang & Mao, 2012).

In terms of sales, higher ratings generally correlate with increased sales and revenue, although this relationship depends on various factors like rating volume, brand reputation, product nature, and competitive dynamics (Hyrynsalmi et al., 2015; Y.-J. Lee et al., 2019; B.-J. Jiang & Wang, 2008; C. Song et al., 2013).

High star ratings also enhance a product's perceived value, encouraging consumers to pay more (Pavlou & Dimoka, 2006; Hu et al., 2017; Abrate et al., 2012; Abrate & Viglia, 2016; Ögüt & Onur Taş, 2012).

Lastly, star ratings guide search and browsing behaviors, with higher-rated items enjoying increased visibility and conversion rates, indicating the persuasive effect of star ratings (Guan & Lam, 2019).

Overall, these studies reflect the role star ratings play, impacting every step of the consumer decision-making process, from browsing behavior to post-purchase satisfaction and loyalty.

Table 52 - Star rating perceptions and outcomes

| S.No. | Outcome           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | References                                                                                                                             |
|-------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Perceived quality | <p>Online ratings substantially influence consumer perception of product quality and subsequent purchase decisions. This is partly due to the neurological predisposition of humans to interpret higher numbers as indicators of better quality and desirability.</p> <p>According to Flanagin et al. (2014), consumers rely heavily on web-based information compared to other channels, especially in electronic commerce environments. While average product ratings significantly influence perceptions of product quality and purchase intention, their number carries a smaller weight, suggesting a suboptimal use of rating information (Flanagin et al., 2014). Küsgen et al. (2016) corroborate these findings, emphasizing the significant impact of review valence and average ratings on quality perception.</p> | (Filieri et al., 2021; Flanagin et al., 2014; Küsgen et al., 2016; Pascucci et al., 2022; Resnick & Montania, 2003; Zhao et al., 2016) |
| 2     | Perceived value   | <p>High star ratings enhance perceived value by creating the perception that the products are more dependable, credible, and superior to lower-rated counterparts. Rating had a small effect on perceived value compared to a larger effect of reviews.</p> <p>There were not many studies that studied rating and perceived value relationships. An experimental study (Noone &amp; McGuire, 2014) reported that rating had a small effect on perceived value compared to a larger effect of reviews.</p>                                                                                                                                                                                                                                                                                                                    | (P. Chen et al., 2021; Noone & McGuire, 2014)                                                                                          |
| 3     | Perceived risk    | <p>This sense of assurance from other consumers' positive experiences (higher ratings) reduces the perceived risk, making the online purchasing decision easier and safer.</p> <p>Star ratings mitigate perceived risks in online shopping by acting as reliable indicators of product quality and customer satisfaction (Gavilan et al., 2019; Nakhata &amp; Kuo, 2014). This, in turn, facilitates safer online purchasing decisions. Wang et al. (2016) further emphasized that product ratings influence risk perception and alter consumer behavior. Importantly, the influence of ratings extends to various aspects of online consumer behavior, such as app downloads, signifying their overarching role in digital decision-making processes (Wang, 2017).</p>                                                       | (Gavilan et al., 2019; Nakhata & Kuo, 2014; F. Wang et al., 2021; Q. Wang et al., 2016)                                                |
| 4     | Trust             | <p>Ratings alleviate concerns in an environment of information asymmetry and indicate a seller's reliability. They reflect others' assessments of the product's quality, influencing consumers' trust in the product or the seller.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | (Belanger et al., 2002; Chang et al., 2015; Gong et al., 2021; Pavlou & Dimoka, 2006; Sparks & Browning, 2011)                         |

| S.No. | Outcome            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | References                                                                                                                |
|-------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|       |                    | High ratings cultivate trust in online commerce by signaling seller reliability and customer satisfaction, thereby alleviating concerns in environments marked by information asymmetry (Gong et al., 2021; Pavlou & Dimoka, 2006; Sparks & Browning, 2011). This trust is nuanced, affected by factors like rating volume, variance, reviewer credibility, and individual consumer characteristics. Studies confirm that high ratings increase trust and shape consumer decisions, with numerical ratings coupled with positive information boosting trust and booking intentions (Sparks & Browning, 2011). While consumers prioritize security features (Belanger et al., 2002), feedback text and numerical ratings enrich a seller's reputation (Pavlou & Dimoka, 2006). High scores alongside social proximity amplify trust values (Chang et al., 2015), and physician's ratings significantly influence patient selection (Gong et al., 2021), highlighting the pivotal role of star ratings in various online contexts.                                                                                              |                                                                                                                           |
| 5     | Satisfaction       | Star ratings are often interpreted by potential buyers as a measure of previous customers' satisfaction with a product. Moreover, online reviews and ratings can positively influence customer satisfaction by aligning pre-purchase expectations with the actual performance of the product.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | (Alalwan, 2020; Martin-Fuentes, 2016)                                                                                     |
| 6     | Brand image        | Star ratings notably shape brand perceptions; high ratings enhance trust, credibility, and perceived quality, while low ratings can damage brand image and customer loyalty. The quantity and distribution of these ratings further bolster consumer confidence or generate uncertainty, emphasizing the significant role star ratings play in shaping brand image.<br><br>The literature on the impact of star ratings on shoppers' perceptions of the brand image or other brand characteristics is sparse. One study in the literature search reported the impact of industry-conferred star ratings on the perceived brand image of hotels in China (J. Jiang et al., 2014). Another China-based study (J. J. Zhang & Mao, 2012) reported that online reviews impacted the brand image of the hotels. Finally, one study found that brand image moderated the relationship between ratings and hotel booking intentions Casado-Díaz et al. (2017). More specifically, ratings had a more substantial effect on purchase intentions for hotels with poorer brand image and less impact on those with a better brand image. | (Casado-Díaz et al., 2017; Zablocki et al., 2019)                                                                         |
| 7     | Purchase intention | An individual's perception of product quality, influenced by various ratings and reviews, plays a crucial role in shaping purchase intentions<br><br>Purchase likelihood increases with ratings up to 4.2-4.5 stars, then decreases (Maslowska et al., 2017). Review elements, such as ratings, variance, reviewer credibility, brand equity, and conflicting reviews, impact purchase intentions (Keh et al., 2015; Siddiqi et                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (Cheng et al., 2022; Flanagan et al., 2014; Keh et al., 2015; Langan et al., 2017; Le et al., 2022; Siddiqi et al., 2020) |

| S.No. | Outcome | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | References                                                                                                                                |
|-------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|       |         | al., 2020). Attitude ambivalence, product usage/appearance, and numerical ratings' correlations with dominant reviews also influence purchase intentions (Le et al., 2022; Z. Cheng et al., 2022; Poushneh & Rajabi, 2022). Various moderating factors like offline interpersonal influence, product price, and brand image further impact this relationship (Siddiqi et al., 2020; Casado-Díaz et al., 2017; Keh et al., 2015).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                           |
| 8     | WTP     | High star ratings significantly enhance consumers' willingness to pay more, primarily by fostering perceptions of a positive brand image and superior quality. This relationship is influenced by factors like customer involvement and rating volume, highlighting the impact of online reviews and ratings on consumer behavior and their readiness to pay for products and services.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (Belarmino et al., 2021; Belarmino & Koh, 2021; Castro et al., 2016; Otto et al., 2018; Sangwichien & Jaroenwisana, 2017; Schamel, 2012). |
| 9     | Loyalty | High star ratings foster customer trust and satisfaction, encouraging repeat purchases, while low ratings can tarnish product perception and deter customers from making future purchases.<br><br>While direct research on customer ratings and loyalty is limited, loyalty can theoretically arise from qualities associated with positive ratings, such as perceived quality, satisfaction, and trust (Tran et al., 2019; Tsao, 2018; J. J. Zhang & Mao, 2012). Online ratings can potentiate e-satisfaction's effect on continuance intention, implying a role in enhancing customer loyalty (Tran et al., 2019). Star ratings from industry can strengthen service recovery efforts, suggesting a strategy for enhancing customer retention during service failure (Tsao, 2018). Furthermore, online hotel ratings can indirectly affect customers' revisit intentions, reflecting their influence on customer loyalty through the mediated perception of the hotel's image (J. J. Zhang & Mao, 2012). Thus, star ratings potentially impact the entire consumer behavior spectrum, from the search phase to post-purchase satisfaction and loyalty. | (Tran et al., 2019; Tsao, 2018; Zhang & Mao, 2012)                                                                                        |
| 10    | Sales   | Higher ratings are associated with increased sales. However, the effects of ratings on sales can vary depending on the competitive environment and the platform type.<br><br>High star ratings generally correlate positively with sales and revenue, although this relationship is complex, contingent on variables like rating volume, brand reputation, product nature, and competitive dynamics (Hyrynsalmi et al., 2015; Y.-J. Lee et al., 2019; B.-J. Jiang & Wang, 2008; C. Song et al., 2013). Positive valence products see a sales uplift with more reviews, while negative valence products experience the opposite effect, suggesting consumers' reliance on others' experiences for purchase decisions (Etzion & Awad, 2007). Live chat impacts sales positively where product information is scarce (H. Sun et al., 2021). For hotels, both average rating and review variability influence sales                                                                                                                                                                                                                                          | (Hyrynsalmi et al., 2015; Jiang & Wang, 2008; Y.-J. Lee et al., 2019; Lu et al., 2012; Moon et al., 2014; C. Song et al., 2013)           |

| S.No. | Outcome                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | References                                                                                 |
|-------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|       |                              | (Lu et al., 2012). Studies of movie reviews reveal sentiment and content changes impact revenue and can predict ticket sales (L.-C. Cheng & Huang, 2020; Moon et al., 2014). Overall, ratings, reviews, and eWOM substantially impact consumer decisions and sales, though effects can vary per competitive environment and platform type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                            |
| 11    | Prices                       | <p>High star ratings enhance a product's perceived value, motivating consumers to pay more due to assumed superior quality. This effect can be influenced by rating volume, brand image, and consumer engagement. In scenarios with few ratings, even a small number of high ratings can boost product appeal and willingness to pay a premium. Furthermore, a good reputation, reflected through positive ratings, strengthens product credibility and value.</p> <p>Ratings and reviews significantly influence price determination, with reputable sellers commanding higher prices due to customer trust (Pavlou &amp; Dimoka, 2006). Hu et al. (2017) noted businesses leverage inherent biases in rating systems, equating higher ratings with superior quality, justifying higher prices. In the hospitality sector, online reputation shapes pricing strategy (Abrate et al., 2012; Abrate &amp; Viglia, 2016), allowing hotels to demand higher rates in less competitive markets, although high competition may necessitate price reductions for even reputable hotels. Ögüt &amp; Onur Taş (2012) confirmed a correlation between high customer ratings and higher hotel prices, as ratings often reflect perceived value or quality. Ultimately, reviews enhance or diminish product value perception, impacting price acceptance, thus highlighting the role of ratings and reviews in shaping pricing strategies across industries.</p> | (Abrate et al., 2012; Abrate & Viglia, 2016; Ögüt & Onur Taş, 2012; Pavlou & Dimoka, 2006) |
| 12    | Search and browsing behavior | The star ratings are instrumental in guiding search and browsing behaviors. Products or services with higher ratings enjoy greater visibility on online platforms, leading to increased click-through and conversion rates. This demonstrates that consumers are more likely to interact with highly rated items and more likely to complete a purchase, indicating the persuasive effect of star ratings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | (Guan & Lam, 2019)                                                                         |

## *Annexure 2- Literature review – rating volume*

### *1. Introduction*

Rating volume (referred to simply as volume) is the number of previous buyers who rated the product. It reflects the product's total number of users (or frequency) and, therefore, its popularity. The influence of rating volume is not well-documented, so we draw upon research concerning the impact of review volume.

Several arguments support the influence of rating and review volume. First, individuals are sensitive to information frequency, which shapes preferences and choices (Hasher & Zacks, 1984). Second, the rating volume serves as social proof (Cialdini, 2021) that represents the majority opinion. Such majority opinion reflects the correctness of the position and its popularity (Baker & Petty, 1994) and is difficult to ignore (Weaver et al., 2007). Higher volume can suggest that consumers care about the brand or product because they took the time to write a review about it (Maslowska et al., 2017).

In turn, the perception of the majority opinion reduces purchase uncertainty based on the theory that an individual's susceptibility to others' influence is a multiplicative function of strength, immediacy, and number (Latané, 1981).

Third, drawing on message repetition research, a higher eWoM volume affects consumer attention (Cacioppo & Petty, 1989; Tellis, 1988), increase observability (Cheung & Thadani, 2010), and enhances persuasiveness (Chevalier & Mayzlin, 2006). In extreme cases, the influence of majority opinion can lead to herding behavior and bandwagon effects where consumers are swayed merely by the availability of others' opinions, regardless of positivity or negativity (Anantharaman et al., 2022; Huang & Chen, 2006).

Review volume's impact varies depending on consumer involvement; low-involvement consumers are more influenced by volume, while high-involvement consumers rely on the quality of core arguments in reviews.

### *2. Research Findings on Volume*

The literature shows mixed findings on the interaction between star ratings and review volume (see Table 53). Several studies have investigated their influence on different aspects of consumer behavior, leading to some contradictory conclusions.

For instance, de Langhe et al. (2016) found that average ratings impact consumers' quality perceptions more than the volume of reviews. In contrast, Khare et al. (2011) discovered that

the volume of reviews strongly influences the perception of the reviewed product more than the valence or the average rating.

Regarding sales and revenue, De Pelsmacker et al. (2018) suggest that review volume drives sales, whereas review valence affects revenue. Interestingly, Hong and Pittman (2020) and Ren et al. (2018) found that review volume significantly influences consumers' purchasing decisions, but only when reviews are negative.

Moreover, a study by Flanagan et al. (2014) indicates that consumers favor products with fewer high ratings than those with a high volume of reviews. However, Watson et al. (2018) counter this by stating that consumers' preference for higher-rated options with fewer reviews is weaker than that for lower-rated options with more reviews.

The relationship between review volume and trust also varies, with Gavilan et al. (2018) suggesting that positive ratings strengthen this relationship more than negative ones. This relationship is also moderated by factors such as the desire to be different from others (Khare et al., 2011), regulatory focus, and product category (Kordrostami et al., 2021).

Regarding the influence of rating and volume on sales, the findings differ too. For instance, You et al. (2015) and Yang et al. (2018) found that ratings had a greater influence on sales than review volume, with Floyd et al. (2014) also sharing similar views. Conversely, Rosario et al. (2016) reported in their meta-analytic study that review volume was more strongly related to sales than review valence. For movie box office performance, some researchers argue that volume has the most significant effect (Kim et al., 2019; Liu, 2006), while others believe review valence is the primary driver (Chintagunta et al., 2010). In conclusion, the literature has a diversity of findings concerning the interplay between review volume and star ratings, demonstrating that their influence on consumer behavior can be complex and multifaceted.

Table 53 - Summary review of the rating volume research

| S. No. | Outcome           | Description                                                                                                                               | References                               |
|--------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 1      | Quality           | Average ratings have a greater impact on consumers' quality perceptions than the volume of reviews.                                       | (de Langhe et al., 2016)                 |
|        |                   | The volume of reviews strongly influences the perception of the reviewed product than the valence or the average rating.                  | (Khare et al., 2011)                     |
| 2      | Sales and revenue | Review volume drives sales, whereas review valence affects revenue.                                                                       | (De Pelsmacker et al., 2018)             |
|        |                   | Ratings had a greater influence on sales than review volume.                                                                              | (Y. Yang et al., 2018; You et al., 2015) |
|        |                   | Review volume was more strongly related to sales than review valence.                                                                     | (Rosario et al., 2016)                   |
|        |                   | For movie box office performance, volume has the most significant effect.                                                                 | (K. Kim et al., 2019; Liu, 2006)         |
|        |                   | For movie box office performance, review valence is the primary driver.                                                                   | (Chintagunta et al., 2010)               |
| 3      | Purchase decision | Review volume significantly influences consumers' purchasing decisions, but only when reviews are negative.                               | (Hong & Pittman, 2020; Ren et al., 2018) |
|        |                   | Consumers favor products with a smaller number of high ratings over those with a high volume of reviews.                                  | (Flanagin et al., 2014)                  |
|        |                   | Consumers' preference for higher-rated options with fewer reviews is weaker than that for lower-rated options with more reviews.          | (Watson et al., 2018)                    |
| 4      | Trust             | The relationship between review volume and trust also varies, with positive ratings strengthen this relationship more than negative ones. | (Gavilan et al., 2018b)                  |
|        |                   | This relationship is also moderated by factors such as the desire to be different from others                                             | (Khare et al., 2011)                     |
|        |                   | This relationship is also moderated by factors such as regulatory focus, and product category.                                            | (Kordrostami et al., 2021)               |

### 3. Problems with ratings

Various human biases can impact a person's product rating. These include Anchoring Bias (Adomavicius et al., 2016), Confirmation Bias (Yin et al., 2016), Domestic Bias (Stamolampros et al., 2020), Extremity Bias (Brandes et al., 2022), Halo Effect (Ozanne et al., 2019), Negativity Bias (Filieri et al., 2021; Fox et al., 2018), Non-Response Bias (Smironva et al., 2020), Self-Selection Bias (Smironva et al., 2020), and Sequential Bias (Sikora & Chauhan, 2012). A summary of these biases is provided in Table 3. Within online consumer ratings, these biases may lead to skewed rating distributions and consequently mislead consumers about the actual quality of a product.

Additionally, online ratings could be marred by fake ratings, herding effects, and information cascades (S. He et al., 2022). Fake, intentionally falsified ratings can distort rating distribution and mislead consumers. The herding effect denotes the tendency of individuals to conform to others' opinions, often resulting in similar ratings without independent evaluation. Persuasion cascades may trigger a chain reaction of similar opinions, further skewing rating distributions.

Despite these potential issues, consumers continue to trust online ratings due to their convenience, large sample size, the wisdom of the crowd, and the absence of feasible alternatives. Thus, online ratings persist as a popular and trusted source of information despite the inherent biases and problems they may contain.

### 4. Other effects

Star ratings have demonstrated their influence on the perceived usefulness of reviews (Liu & Park, 2015) and the adoption of information by travelers (Filieri & McLeay, 2014). This is facilitated by confirming or disconfirming their expectations about the product in question (Guan & Lam, 2019). An experiment by Flanagin et al. (2014) reported that consumers ranked ratings as the fourth most important criterion (among 23 factors) for judging the credibility of online information.

Figure 21 - Different types of human biases

|                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Anchoring Bias:</b> Initial information significantly influences subsequent judgments or decisions.                      |
| <b>Confirmation Bias:</b> People <u>favor</u> information that supports their beliefs and ignore contradicting information. |
| <b>Domestic Bias:</b> Preference for products or services that are domestically produced or located.                        |
| <b>Extremity Bias:</b> Tendency to give extreme ratings without considering nuances.                                        |
| <b>Halo Effect:</b> One positive aspect of a product influences overall evaluation.                                         |
| <b>Negativity Bias:</b> More weight is given to negative information or experiences than positive ones.                     |
| <b>Non-Response Bias:</b> Neutral or average experiences are underrepresented in rating data.                               |
| <b>Self-Selection Bias:</b> Those who leave ratings do not represent the general population.                                |
| <b>Sequential Bias:</b> Prior experiences or expectations influence subsequent product or service ratings.                  |

### Annexure 3- Literature review – brand image

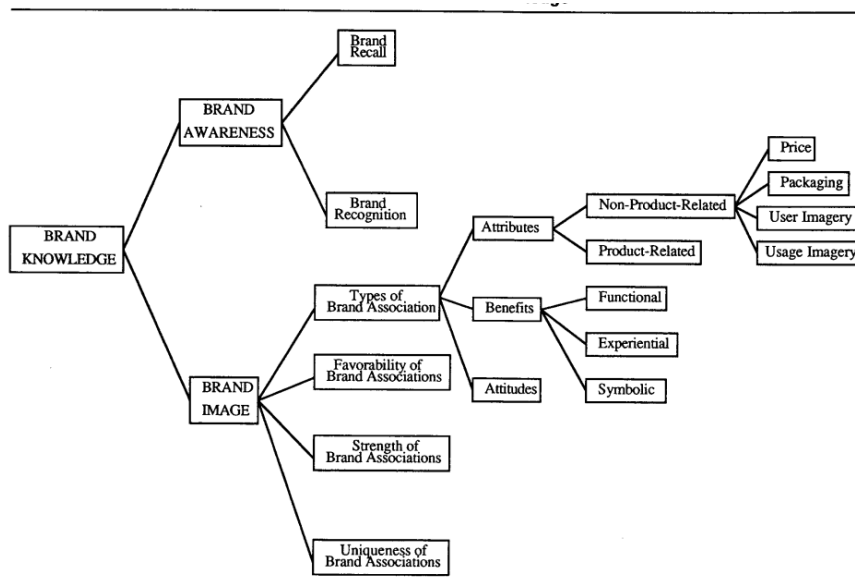
Initially coined by Gardner & Levy (1955), brand image concept has evolved through years of contributions from multiple scholars and researchers. Keller (1993) characterized brand image as the beliefs consumers hold about a brand's attributes and benefits. Aaker (1996a) introduced the concept of brand identity, a complement to brand image, encapsulating the desired perception marketers aim to instill in consumers. Today, brand image is understood as a complex construct that includes a wide range of perceptions, attitudes, and beliefs consumers hold about a brand.

This section aims to provide a synthesis of the brand image literature covering brand knowledge, brand associations, their types, and conceptualizations of brand image.

#### 1. Brand image

As presented in Figure 4, brand image is one of the components of brand knowledge, the other being brand awareness Keller (1993). Brand knowledge encompasses all brand-related thoughts, feelings, perceptions, images, experiences, beliefs, and attitudes that become linked to the brand node in memory. It plays a vital role in determining a brand's success and its perception in consumers' minds (Keller, 1993). Brand awareness refers to consumers'

Figure 22-Dimensions of Brand Knowledge (Keller, 1993)



recognition and recall performance, established through various marketing interventions like advertising and promotion. In contrast, brand image represents consumers' perception of a brand's identity, shaped significantly by brand associations (Keller, 1993).

## 2. Brand image influence

As suggested by (Aaker, 1991) and (C. W. Park et al., 1986), a strong brand image helps consumers to efficiently navigate through the vast array of options available in the marketplace and make informed purchase decisions without expending excessive cognitive effort. This highlights the importance of brand image as a key factor shaping consumer behavior in today's complex and information-rich environment.

Brand image plays a pivotal role in the consumer's evaluation process. Consumers often use brand name, brand image and brand equity as a heuristic to assess quality, value, and satisfaction rather than engaging in extensive information search and evaluation (Dawar & Parker, 1994; Erdem & Swait, 1998; Esch et al., 2006; Jacoby et al., 1971; Kang, 2023; Tian et al., 2022; Vahie & Paswan, 2015; Y. Wang & Tsai, 2014; P. C. S. Wu et al., 2011). (Punj & Hillyer, 2004) introduced the concept of brand heuristics as a cognitive shortcuts or rules of thumb that consumers use to simplify their decision-making process allowing them to make quick judgments about products and services.

## 3. Brand Associations

Brand image is made up of individual brand associations. Brand associations are critical elements that differentiate a brand from its competitors. They are mental links consumers make between a brand and its attributes. These associations are formed through various influences, including direct experiences, marketing efforts, word of mouth, and other external factors (D. A. Aaker, 1991). These associations, both positive and unique, help shape consumers' attitudes and behaviors towards a brand (Keller, 1991; Keller & Swaminathan, 2019). These associations can influence brand strength (Koll & von Wallpach, 2014; Krishnan, 1996) and contribute to brand uniqueness, which might even warrant a price premium (Zaichkowsky, 2010). However, the positive effect of uniqueness is mixed (Broniarczyk & Gershoff, 2003; Romaniuk & Gaillard, 2007), as excessive focus on it may detract from core category attributes (K. L. Keller et al., 2002). They also play a crucial role in consumers' perception of quality, brand satisfaction, and influencing brand attitude and choice (Alalwan, 2020; Jia, 2019; Martin-Fuentes et al., 2018; J. Otto et al., 2009; Ling Peng et al., 2019; Al-Adwan & Al-Horani, 2019; Zablocki et al., 2019).

## 4. A Typology of Brand Associations

Brand associations can be multifaceted and diverse. Keller (1993) and Aaker (1991) provided a classification of these associations into nine and eleven types, respectively. Some of these

associations are generic, applicable to the brand as a whole, while others are product-specific or product-category-specific.

For instance, generic associations may include qualities like trust and reliability, while product-specific associations may relate to the attributes and benefits of a particular product offered by the brand. This typology, ranging from functional, emotional, personal, and social cause associations to user imagery, usage scenario, price, value, packaging, and design associations, underscores the diversity and depth of brand associations (Osuna Ramírez et al., 2019; Simms & Trott, 2006; Hayes et al., 2008; Y. Xie et al., 2020; Del Río et al., 2001; Kauppinen-Räsänen, 2014; Wells et al., 2007).

## 5. Brand image conceptualizations

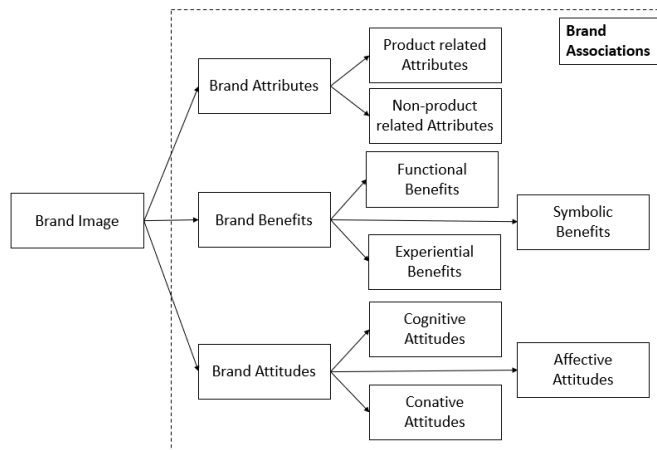
Brand image encapsulates the impressions consumers harbor about a brand. Scholars have conceptualized it as either unidimensional—emphasizing one key element—or multidimensional, considering multiple interrelated factors.

Unidimensional brand image conceptualizations focus on a single dimension, such as product quality, brand reputation, or consumer trust (Keller, 1993). Product quality pertains to consumer perceptions of a brand's goods or services, whereas brand reputation and trust explore perceptions of a brand's reliability, credibility, and promise fulfillment.

Conversely, multidimensional brand image conceptualizations scrutinize several intertwined aspects. These include cognitive and affective brand associations, brand personality, brand attitudes, and perceived brand benefits (Dobni & Zinkhan, 1990). Cognitive brand associations reflect consumers' beliefs about a brand—its attributes, reputation, price, and perceived value—while affective brand associations capture the emotional responses a brand triggers. Brand personality embodies human traits ascribed to a brand (Aaker's Brand Personality Dimensions), and brand attitudes refer to consumers' evaluations and preferences, even encompassing their willingness to recommend the brand. Finally, brand benefits embody the perceived value consumers gain from a brand, considering functional (product utility), emotional (consumer sentiment), and symbolic (consumer signaling) benefits.

Several robust multidimensional brand image conceptualizations have been proposed. Keller's (1993) model integrates attributes, benefits, and attitudes, with the former two leading to the latter (Figure 22).

Figure 23- Conceptualization of Brand Image (Keller, 1993)



Gardner and Levy (1955) incorporate cognitive, affective, and conative components—knowledge and beliefs, emotions and feelings, and intentions and behaviors respectively—establishing a holistic view of the brand. Aghekyan-Simonian et al.'s (2012) framework focuses on functional and symbolic brand associations, offering practical and emotional benefits, thereby shaping the overall brand perception. Finally, another multidimensional approach dissects functional and affective brand images, differentiating between practical and emotional benefits to provide a comprehensive view of the brand image (Aghekyan-Simonian et al., 2012; Bian & Moutinho, 2011; Kevin Lane Keller, 1993; Lien et al., 2015; Martínez Salinas & Pina Pérez, 2009; Reza Jalilvand & Samiei, 2012; P. C. S. Wu et al., 2011).

In summary, brand associations can be classified into three main types: functional, affective, and symbolic.

**Functional brand associations:** These are related to the utilitarian, performance-related aspects of a brand. They arise from the objective, tangible, and concrete product or service characteristics such as quality, price, features, and usability. For example, a functional association with a smartphone might be its camera quality or battery life.

**Affective brand associations:** These are tied to the emotional benefits that the brand delivers. They concern feelings, emotions, and attitudes elicited by a brand. These associations might be derived from the product itself, its use, or its marketing communications. For example, a brand might be associated with feelings of joy, comfort, or excitement.

**Symbolic brand associations:** These relate to the extrinsic properties of the product or service, including the broader meanings that consumers attach to the brand's image. They are

often linked to the psychological or social benefits that consumers derive from the brand. Symbolic associations can include things like self-concept, personal expression, social status, or belonging to a group. For example, a luxury car brand might be symbolically associated with prestige and high social status.

These approaches reveal the multifaceted nature of consumer perceptions and highlight the interconnectedness among various brand-related constructs, ultimately offering a nuanced understanding of brand image.

## 6. Antecedents of brand image

Brand image, a determinant of consumers' perception, decision-making, and behavior, is influenced by numerous antecedents, as demonstrated by extensive research. Several factors contribute to the formation of brand image, including brand communication, brand awareness, brand quality, brand personality, brand reputation, brand trust, and brand attitude (Table 54).

Firstly, brand attitude, the overall evaluation of a brand, is instrumental in crafting brand image, suggesting its pivotal role as a brand association (Faircloth et al., 2001). Brand authenticity, which encapsulates attributes such as heritage, nostalgia, and social commitment, significantly enhances brand image and influences consumer satisfaction and brand love (Rodrigues et al., 2022).

The reach of brand awareness extends to perceived quality, brand associations, and brand loyalty, impacting brand image (Azzari & Pelissari, 2020). Furthermore, brand communication, delivered via various platforms, shapes brand perception and, by extension, brand image (Chakraborty & Biswal, 2020).

Brand personality also impacts product evaluations, leading to a quantity and quality increase in brand associations, thereby influencing brand image (Freling & Forbes, 2005). Brand reputation, which encompasses stakeholders' performance evaluation of a brand, likewise affects brand image (Foroudi et al., 2020).

Brand trust, reflecting consumer belief in a brand's reliability and credibility, enhances brand image (Wiedmann & von Mettenheim, 2021). The country-of-origin image can also positively impact brand image, providing cues for perceived quality (Hien et al., 2020).

Corporate social responsibility, indicating company values, affects brand image positively (Bianchi et al., 2019), while price deals negatively impact brand image despite providing short-term benefits to consumers (Shen et al., 2007).

Lastly, brand quality, signifying product excellence, enhances brand image by fostering positive associations with the brand (Quoquab et al., 2021). Therefore, these antecedents should be effectively managed to craft a positive brand image.

## 7. Outcomes of brand image

Brand image, a crucial aspect of brand equity, holds significant influence over several key customer-centric outcomes (see Table 55)..

First, attitudes are notably shaped by the image-based persuasive mechanisms, with poor brand image proving to be more detrimental than poor perceived quality (Homer, 2008).

The perceived value, another outcome, is enhanced by a strong brand image, as customers often associate familiar brands with superior benefits, leading to an increase in perceived value for the price paid (Nyadzayo & Khajehzadeh, 2016).

Moreover, perceived quality is often gauged by consumers through the brand image, particularly when consumers lack resources to evaluate the product or service attributes, thereby associating positive brand image with superior quality (Fragkogianni, 2019).

Satisfaction, an essential determinant of customer loyalty, is influenced by brand image as well. A positive brand image sets high expectations, and consistent fulfilment of these expectations results in increased customer satisfaction (Dash et al., 2021).

Brand image also significantly impacts trust, with a positive image conveying brand reliability, credibility, and consistency, fostering emotional connections and leading to enhanced trust (Erkmen & Hancer, 2019).

Brand loyalty is reinforced by a positive brand image, which creates emotional connections, fosters trust, and consistently fulfils customers' needs, leading to repeated purchases and loyalty over time (Brodie et al., 2009).

Purchase intention is also positively influenced by brand image, enhancing the likelihood of purchase as customers are more inclined to buy from brands they perceive positively (Dash et al., 2021).

Lastly, a strong brand image increases customers' willingness to pay a premium (WTPP), with high-value, exclusive, or superior quality perception making customers more inclined to pay extra for products or services (Anselmsson et al., 2014).

Table 54 - Antecedents of brand image

| S.No. | Antecedent          | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | References                                                                                                                                    |
|-------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Brand attitude      | brand attitude, which is consumers' overall evaluation of a brand, is also crucial in enhancing brand image (Low & Lamb, 2000). According to Keller (1993; 1998), brand attitude is an essential brand association that forms the brand image.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (Faircloth et al., 2001; Low & Lamb, 2000)                                                                                                    |
| 2     | Brand authenticity  | Research suggests that brand authenticity enhances brand image. Rodrigues (2021) suggested that authenticity significantly influences brand image, affecting consumer satisfaction and brand love. Fritz (2017) identified brand authenticity antecedents, such as heritage, nostalgia, commercialization, clarity, social commitment, legitimacy, self-congruence, and employee passion, and found it positively impacts relationship quality and consumers' behavioral intentions. In the luxury hotel industry.                                                                                                                                                                                                                                | (Rodrigues et al., 2022), (Fritz et al., 2017),                                                                                               |
| 3     | Brand awareness     | Brand aware impacts - perceived quality, brand associations, and brand loyalty.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (Azzari & Pelissari, 2020; Esch et al., 2006)                                                                                                 |
| 4     | Brand communication | Brand communication, conveyed through advertising and marketing messages, is pivotal in shaping brand perception, presenting attributes, benefits, personality, user imagery, and emotional appeals (Dahlén et al., 2009; Yoo et al., 2000). The brand communication-image relationship extends from traditional to social media platforms (Braun et al., 2014; Bruhn et al., 2012; Chakraborty & Biswal, 2020; Chinomona, 2016; Kim & Lee, 2018). Brand-audience communication efficacy can enhance brand awareness and image (Esch et al., 2006). Additionally, brand image is influenced by brand personality—characteristics and traits that distinguish a brand from its competitors (Freling & Forbes, 2005), per Aaker's (1997) framework. | (Braun et al., 2014; Bruhn et al., 2012; Chakraborty & Biswal, 2020; Chinomona, 2016; Dahlén et al., 2009; Kim & Lee, 2018; Yoo et al., 2000) |
| 5     | Brand personality   | Brand personality positively impacts product evaluations. Exposure to a brand's personality increases the quantity and quality of brand associations, fostering unique, congruent, and robust connections with the brand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | (Freling & Forbes, 2005)                                                                                                                      |
| 6     | Brand reputation    | Brand reputation is the overall evaluation of a brand's performance by its stakeholders. A positive brand reputation can enhance brand image, while a negative brand reputation can harm it. The two constructs are used interchangeably in literature (Foroudi et al., 2020).                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (Foroudi et al., 2020; Koubaa, 2008)                                                                                                          |
| 7     | Brand trust         | Brand trust is also essential for enhancing brand image. It refers to the extent to which consumers believe in the reliability and credibility of a brand. When brand trust is high, it could result in a more favorable brand image (Wiedmann & von Mettenheim, 2021).                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (Rakjit & Laohavichien, 2020; Wiedmann & von Mettenheim, 2021)                                                                                |

| S.No. | Antecedent        | Key findings                                                                                                                                                                                                                                                                                                                                                                                                                                               | References                                                                                                                                 |
|-------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 8     | Country of origin | The country-of-origin image had a positive effect on brand image, brand evaluation. The country-of-origin image positively impacts brand image and evaluation as it offers perceived quality cues, particularly when countries are associated with producing high-quality products, acting as a trust-enhancing heuristic for consumers.                                                                                                                   | (Hien et al., 2020), (Pharr, 2005)                                                                                                         |
| 9     | CSR               | CSR affects brand image positively, as it provides information about the company's values. However, the valence of this influence may vary by stakeholder, and different dimensions of CSR exert different degrees of influence. Additionally, brand image is strengthened by CSR if the company knows how to elicit trust, build credibility, and develop a solid reputation in the eyes of others.                                                       | (Bianchi et al., 2019)                                                                                                                     |
| 10    | Price             | Price has a significant relationship with perceived quality which reflects brand image. The use of price deals has a negative effect on the perception of the brand's quality and its image. Price deals, including sales deals and especially price deals, have been considered to weaken brand equity in spite of the short-term benefit they provide to the consumer.                                                                                   | (Hunt & Keaveney, 1994; Rao & Monroe, 1989; Shen et al., 2007; Villarejo-Ramos & Sánchez-Franco, 2005)                                     |
| 11    | Brand quality     | Brand quality is another important element of brand image. Consumers associate high-quality products with a positive brand image (Quoquab et al., 2021).<br><br>Perceived quality amplifies brand image by assuring consumers of product excellence, thereby fostering trust and satisfaction. This perception of quality translates into positive associations with the brand, enhancing its reputation and positioning it favorably in consumers' minds. | (Dam & Dam, 2021; Erkmen & Hancer, 2019; Nyadzayo & Khajehzadeh, 2016; Quoquab et al., 2021; Singh et al., 2021; P. C. S. Wu et al., 2011) |

Table 55 - Outcomes of brand image

| S.No. | Outcome           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | References                                                                                                                                                                                              |
|-------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Attitude          | Attitudes are driven by persuasive mechanisms that are image-based. Low brand image is more damaging than low perceived quality. Non-attribute types of brand beliefs make an incremental contribution to explaining the variance in hedonic attitudes, but not utilitarian attitudes. Overall, brands with low perceived image are in a more vulnerable position than brands judged to suffer from low product quality.                                                | (Homer, 2008)                                                                                                                                                                                           |
| 2     | Perceived value   | Brand image contributes to the perceived value as customers often associate well-known brands with greater benefits. The overall perception of a brand can enhance the customers' belief that they receive more value for the price they pay.<br><br>Customer value can promote trust and commitment leading to positive brand image.                                                                                                                                   | (Nyadzayo & Khajehzadeh, 2016)                                                                                                                                                                          |
| 3     | Perceived quality | A strong and positive brand image signals to consumers that a product or service is of high quality. Consumers often use the reputation and image of a brand as a heuristic or shortcut to gauge the quality of its offerings, especially when they lack the ability or resources to evaluate the inherent attributes of a product or service themselves. Therefore, brands with a positive image are often associated with superior quality in the minds of consumers. | (Chiang & Jang, 2007; Fragkogianni, 2019; Jacoby et al., 1971; Vranešević & Stančec, 2003; Yoo et al., 2000)                                                                                            |
| 4     | Satisfaction      | A positive brand image can lead to greater satisfaction as it sets up positive expectations, and when a brand consistently meets or exceeds these expectations, it results in a satisfying customer experience. Additionally, a strong brand image often correlates with quality and value, key determinants of customer satisfaction.                                                                                                                                  | (Y. S. Chen, 2010; Dash et al., 2021; Fragkogianni, 2019; H. Song et al., 2019; Tian et al., 2022), (Erkmen & Hancer, 2019), (Esch et al., 2006), (Nyadzayo & Khajehzadeh, 2016), (Waluya et al., 2019) |
| 5     | Trust             | A positive brand image instills trust as it conveys the brand's credibility, reliability, and consistency in delivering quality products or services. Moreover, it can foster emotional connections, which leads to higher trust, as consumers are more likely to trust brands they perceive as familiar, reliable, and that align with their values and expectations.                                                                                                  | (Y. S. Chen, 2010; Chiang & Jang, 2007; Lien et al., 2015; H. Song et al., 2019; Tian et al., 2022), (Erkmen & Hancer, 2019), (Esch et al., 2006)                                                       |
| 6     | Loyalty           | A positive brand image reinforces brand loyalty by creating emotional connections, fostering a sense of trust between the brand and the customer, and fulfilling customers' needs consistently. This familiarity and positive association lead to repeated purchases and loyalty towards the brand over time, even in the face of competition.                                                                                                                          | (Brodie et al., 2009; H. Song et al., 2019; Sürücü et al., 2019; Tian et al., 2022)                                                                                                                     |

|   |                    |                                                                                                                                                                                                                                               |                                                                                                                                      |
|---|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 7 | Purchase intention | A positive brand image enhances purchase intentions as consumers are more likely to buy from brands they perceive positively. It creates an attraction and a desire to associate with the brand, leading to increased likelihood of purchase. | (Dash et al., 2021; Esch et al., 2006; Farzin & Fattahi, 2018; Hien et al., 2020; Pharr, 2005)                                       |
| 8 | WTPP               | A robust brand image often leads to a greater willingness to pay a premium. When customers perceive a brand as high-value, exclusive, or superior in quality, they are more willing to pay extra for its products or services.                | (Anselmsson et al., 2014; Del Río et al., 2001; Fragkogianni, 2019; Masuda & Kushiro, 2018; Rahimnia & Sarvari, 2019; Riefler, 2020) |

#### *Annexure 4- Literature review – purchase involvement*

Purchase involvement refers to the degree of consumer engagement in the decision-making process for a particular purchase. This engagement, characterized by the effort, time, and thought invested in decision-making, reflects the perceived significance of the decision and its associated risks (Mittal, 1989; Zaichkowsky, 1985a). Factors contributing to high purchase involvement include financial and time concerns, perceived risks, the product's perceived importance, and whether the consumer is a first-time buyer. Product involvement influences purchase involvement, shaping how customers perceive and engage with products and services.

#### *8. Outcomes of High vs. Low Purchase Involvement*

High purchase involvement typically results in extensive research, careful evaluation, and thoughtful consideration of options, whereas low involvement often leads to impulsive or habitual purchases. However, the level of involvement significantly impacts consumer decision-making, affecting aspects such as product evaluation, brand perceptions, willingness to pay, and electronic word-of-mouth.

#### *Impacts of High Purchase Involvement*

High purchase involvement has been linked with increased satisfaction, trust, loyalty, and commitment (Sanchez-Franco, 2009; Van Tuan, 2021), leading to positive brand perceptions (Lang et al., 2022) and a greater willingness to pay (Dominique-Ferreira et al., 2016). Even lesser-known brands can benefit from high purchase involvement, gaining support for high-involvement items (Parkvithee & Miranda, 2012). Furthermore, high-involvement consumers are likelier to share their negative experiences, impacting electronic word-of-mouth (E. E. K. Kim, 2017).

#### *Influence of Purchase Involvement on Consumer Behavior*

Individual traits like uncertainty orientation (Smith & Bristor, 1994), materialism (Rahman et al., 2017), emotional awareness, and internal locus of control (Bateman & Valentine, 2021) can alter the level of purchase involvement. This involvement further influences the depth of information processing during purchase decisions, with more detailed processing seen in high-involvement situations (Chuanlei et al., 2019).

### *Purchase Involvement as a Moderator in Consumer Behavior*

Purchase involvement can moderate various relationships between variables and consumer behavior. For instance, it can impact the relationship between the country of origin and purchase intention (Parkvithee & Miranda, 2012) and the link between informative influence and purchase intention (Ding et al., 2020). Moreover, it can influence the efficacy of messages from high and low-involvement brands (Coursaris et al., 2016). Low involvement often leads to more brand-switching and resistance to factors like price and preferred brand stockouts (Jensen & Hansen, 2006).

Overall, purchase involvement significantly influences consumer behavior. Its role as a situational variable is key to answering research question #4 detailed in Section 1.7.

Contrastingly, Lang et al. (2022) did not find a positive relationship between advertising, brand associations, and brand equity for low-involvement products, highlighting the complexity of this relationship and providing further avenues for research.

In conclusion, purchase involvement has a significant impact on consumer behavior. **This research investigates the role of purchase involvement as the situational variable that addresses the research question (section 1.7).**

### *Annexure 5-Informed Consent Form*

You are invited to participate in a research study titled “Online Shopping Behavior.” This study is being done by Arun Saxena from the Jindal Global University, India. You were selected to participate in this study because you are an avid online shopper.

#### **Why are we doing this research study?**

This research aims to understand how the product star rating displayed on product pages of online shopping websites influences shoppers’ brand image perceptions and willingness to pay a premium for a given product.

#### **Who can participate in this research study?**

Working professionals of all genders aged 21 or above who shop online at least once a month can participate in this study.

#### **What will I be asked to do, and how long will it take?**

If you agree to participate in this study, we will show you a typical product page on a fictitious online shopping website. We request that you imagine yourself in the given situation and answer the questions accordingly. The whole process will take up to 10 minutes.

#### **Will being in this research study help me in any way?**

You may not personally benefit from your participation in this research study. However, your participation will enhance our understanding of people's perceptions, attitudes, and behaviors toward online shopping. We hope that, in the future, governments and companies will benefit from this study through an improved understanding of star ratings.

#### **What are my risks of being in this research study?**

There are no known risks associated with your participation in this research activity.

#### **How will my personal information be protected?**

To the best of our ability, your responses to this study will remain anonymous and confidential. We will minimize risk by storing the collected data in aggregate form on password-protected computers. Only researchers on this project have access to the information. After completing the study, we will keep the information for five years after publishing the research findings.

#### **What happens if I say yes, but change my mind later?**

You do not have to be in this study if you do not want to. If you agree to be in the study but later change your mind, you may drop out at any time. There are no penalties or consequences if you decide you do not want to participate.

#### **Who can I talk to if I have questions?**

If you have questions about this project, contact the researcher, Arun Saxena, at [asaxena@jgu.edu.in](mailto:asaxena@jgu.edu.in). If you have any questions concerning your rights as a research subject, you may contact my supervisor, Dr. Diptiman Banerji, at [Diptiman@jgu.edu.in](mailto:Diptiman@jgu.edu.in).

If you choose to go ahead, please click on the "Yes, I agree to participate in this survey" button to go ahead. By clicking "I agree" below, you indicate that you are at least 21, have read this consent form, and agree to participate in this research study. Please print a copy of this page for your records.

We thank you for your time and efforts!

- ☐ Yes, I agree to participate in this survey (1)
- ☐ Exit (2)

End of Block: Informed Consent Form

Please provide your unique prolific ID in the box below.

### *Annexure 6-Questionnaire*

#### Question Block 1: Demographic

Thank you for agreeing to participate in this research. Before we proceed to the main questionnaire, please help us with some basic information about you. This is required only for categorizing your responses and will not be used for any other purpose.

|                                               |                           |                         |                         |                                     |                             |                                                     |                   |
|-----------------------------------------------|---------------------------|-------------------------|-------------------------|-------------------------------------|-----------------------------|-----------------------------------------------------|-------------------|
|                                               |                           |                         |                         |                                     |                             |                                                     |                   |
| 1. Which age group do you belong to           | 18-20 years               | 21-30 years             | 31-40 years             | 41-50 years                         | 51-60 years                 | More than 60 years                                  |                   |
| 2. Your gender is                             | Male                      | Female                  | Non-binary/third gender | Prefer not to say                   |                             |                                                     |                   |
| 3. What is your educational qualification     | Less than high school (1) | High school (2)         | Bachelor's degree (3)   | Postgraduate or Master's degree (4) | Doctoral (Ph.D.) degree (5) | Professional degree (Law, Medicine, and others) (6) | Other (7)         |
| 4. Please indicate your average annual income | Under \$20,000 (1)        | \$20,000 – \$29,999 (2) | \$30,000 – \$39,999 (3) | \$40,000 – \$49,999 (4)             | \$50,000 – \$59,999 (5)     | \$60,000 – \$69,999 (6)                             | Over \$70,000 (7) |

### Question Block 2: Rating Involvement

|                                                                                                                                                   | Strongly<br>Disagree | Disagree | Somewhat<br>disagree | Neither<br>Agree nor<br>Disagree | Somewhat<br>Agree | Agree | Strongly<br>Agree |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------|----------------------|----------------------------------|-------------------|-------|-------------------|
| 5. I have little or no interest in online star ratings when shopping.                                                                             |                      |          |                      |                                  |                   |       |                   |
| 6. I am not interested in online star ratings.                                                                                                    |                      |          |                      |                                  |                   |       |                   |
| 7. I am not really committed to using online star ratings.                                                                                        |                      |          |                      |                                  |                   |       |                   |
| 8. I am inclined to use the volume of the reviews ((number of buyers who rated the product)) as an indicator when making my purchasing decisions. |                      |          |                      |                                  |                   |       |                   |
| 9. I intend to use the online star ratings for my purchase decisions.                                                                             |                      |          |                      |                                  |                   |       |                   |

### Question Block 3: Informational social influence

|                                                                           | Strongly Disagree | Disagree | Some what disagree | Neither Agree nor Disagree | Some What Agree | Agree | Strongly Agree |
|---------------------------------------------------------------------------|-------------------|----------|--------------------|----------------------------|-----------------|-------|----------------|
| 10. When I make a choice, I often consult others for helpful information. |                   |          |                    |                            |                 |       |                |
| 11. When I make a choice, I often search for feedback from others.        |                   |          |                    |                            |                 |       |                |
| 12. When I make a choice, I frequently gather information from others.    |                   |          |                    |                            |                 |       |                |

### Question Block 4: Introduction to the scenario

Hi there!

On the next screen, we will show you an imaginary scenario. **Please read the scenario on the next screen carefully, and while reading, imagine yourself in that scenario.** All the following questions relate to this imaginary scenario and not your actual circumstances. For easy reference, please screenshot the scenario on the next screen.

**The NEXT button will appear in 5 seconds before you can proceed further. This is to allow you time to read this instruction completely.**

### Question Block 5: Scenario

Imagine you want to purchase a computer mouse. In your online search, you land at the website of Super Electronica, where you are presented with the product page of the Quantum wireless mouse (please see below). You have not heard of this brand, but the mouse description seems interesting, and the price is within your budget. Please go through the page carefully.

Based on the star rating and the number of buyers who rated this mouse, please answer the following questions about your image of the product, willingness to pay a premium and purchase intention.

Note: Please take a screenshot of this page, and refer to it while answering the following questions. The NEXT button will appear after 20 seconds at the bottom right.

### Question Block 6: Attention and Rating and Volume manipulation check questions

|                                                                               |          |     |              |                      |               |      |           |
|-------------------------------------------------------------------------------|----------|-----|--------------|----------------------|---------------|------|-----------|
|                                                                               |          |     |              |                      |               |      |           |
| 13. The number of buyers who rated the mouse in the scenario shown to you was | 5000     | 20  | 10140        |                      |               |      |           |
| 14. The star rating of the mouse in the scenario shown to you was             | Very low | Low | Somewhat low | Neither low nor high | Somewhat high | High | Very high |
| 15. The number of buyers who rated the mouse in this scenario is              | Very low | Low | Somewhat low | Neither low nor high | Somewhat high | High | Very high |
| 16. The rating of the mouse in this scenario is                               | Very low | Low | Somewhat low | Neither low nor high | Somewhat high | High | Very high |

Question Block 7: Purchase involvement manipulation check questions

|                                                                                                                                            |                         |                 |                          |                                       |                        |               |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|--------------------------|---------------------------------------|------------------------|---------------|--------------------|
|                                                                                                                                            |                         |                 |                          |                                       |                        |               |                    |
| 17. In this scenario, how important would it be to you to make the right choice for this product?                                          | Very unimportant (1)    | Unimportant (2) | Somewhat unimportant (3) | Neither important nor unimportant (4) | Somewhat important (5) | Important (6) | Very important (7) |
| 18. In making your selection of this product, how concerned would you be about the outcome of your choice?                                 | Very unconcerned (1)    | Unconcerned (2) | Somewhat unconcerned (3) | Neither concerned nor unconcerned (4) | Somewhat concerned (5) | Concerned (6) | Very concerned (7) |
| 19. Do you think the various types and brands of computer mice available in the market are all very alike or very different?               | Very different (1)      | Different (2)   | Somewhat different (3)   | Neither similar nor different (4)     | Somewhat similar (5)   | Similar (6)   | Very similar (7)   |
| 20. In selecting from the many types and brands of computer mice available in the market, how much would you care about which one you buy? | 1 - Not care at all (1) | 2               | 3                        | 4                                     | 5                      | 6             | 7 - Care a lot (7) |

Question Block 8: brand image questions

Hi there! Please keep in mind the scenario that you read earlier while answering the following questions. Please refer to the screenshot to recall the scenario.

|                                                                                                                                      | Strongly Disagree | Disagree | Somewhat disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|-------------------|----------------------------|----------------|-------|----------------|
| 21. After seeing the star rating of this mouse, I think this brand has high quality.                                                 |                   |          |                   |                            |                |       |                |
| 22. After seeing the star rating of this mouse, I think this brand has better characteristics than competitor brands.                |                   |          |                   |                            |                |       |                |
| 23. After seeing the star rating of this mouse, I think the competitors' brands are usually cheaper.                                 |                   |          |                   |                            |                |       |                |
| 24. After seeing the star rating of this mouse, I think this brand is nice.                                                          |                   |          |                   |                            |                |       |                |
| 25. After seeing the star rating of this mouse, I think this brand has a personality that distinguishes it from competitors' brands. |                   |          |                   |                            |                |       |                |
| 26. After seeing the star rating of this mouse, I think this is a brand that does not disappoint its customers.                      |                   |          |                   |                            |                |       |                |

|                                                                                                       | Strongly Disagree | Disagree | Somewhat disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
|-------------------------------------------------------------------------------------------------------|-------------------|----------|-------------------|----------------------------|----------------|-------|----------------|
| 27. After seeing the star rating of this mouse, I think this is one of the best brands in the sector. |                   |          |                   |                            |                |       |                |
| 28. I am randomly answering the questions without reading them.                                       |                   |          |                   |                            |                |       |                |

#### Question Block 9: WTPP

|                                                                                                                                    | Strongly Disagree | Disagree | Somewhat disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
|------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|-------------------|----------------------------|----------------|-------|----------------|
| 29. After seeing the star rating of this mouse, I would be willing to pay a higher price for this brand over other similar brands. |                   |          |                   |                            |                |       |                |
| 30. After seeing the star rating of this mouse, even if another brand advertises a lower price, I prefer to buy this brand.        |                   |          |                   |                            |                |       |                |

Question Block 8: Product Knowledge and Online shopping behavior

|                                                                          |                |           |                          |                                 |                    |   |                  |
|--------------------------------------------------------------------------|----------------|-----------|--------------------------|---------------------------------|--------------------|---|------------------|
| 31. I understand computer mouse features                                 | Not at all (1) | 2         | 3                        | 4                               | 5                  | 6 | Very well<br>(7) |
| 32. How many times have you purchased a product online in the last year? | Never          | 1-4 times | 5-10 times               | 11-20 times                     | More than 20 times |   |                  |
| 33. Do you own a computer mouse at present?                              | Yes            | No        |                          |                                 |                    |   |                  |
| 34. Where did you purchase your current computer mouse?                  | At a store     | Online    | Got it with the computer | Do not own a computer mouse (4) |                    |   |                  |

**1. Your study completion ID is: xyxyxyxyxyxy**

Please note your completion ID. You will need it to enter it at Prolific to complete the process

## Annexure 7-Study 1: demographics

| Statistics     |         |       |        |           | Age    |   |  |
|----------------|---------|-------|--------|-----------|--------|---|--|
|                |         | Age   | Gender | Education | Income | N |  |
| N              | Valid   | 216   | 216    | 216       | 216    |   |  |
|                | Missing | 0     | 0      | 0         | 0      |   |  |
| Mean           |         | 2.79  | 1.48   | 3.36      | 4.14   |   |  |
| Std. Deviation |         | 1.250 | .510   | 1.176     | 2.273  |   |  |
| Minimum        |         | 1     | 1      | 2         | 1      |   |  |
| Maximum        |         | 5     | 3      | 7         | 7      |   |  |

| Age                |  |  | N  |       |
|--------------------|--|--|----|-------|
|                    |  |  |    | %     |
| 21-30 years        |  |  | 34 | 15.7% |
| 31-40 years        |  |  | 66 | 30.6% |
| 41-50 years        |  |  | 56 | 25.9% |
| 51-60 years        |  |  | 32 | 14.8% |
| More than 60 years |  |  | 28 | 13.0% |

| Education                                       |  |  | N   |       |
|-------------------------------------------------|--|--|-----|-------|
|                                                 |  |  |     | %     |
| High school                                     |  |  | 35  | 16.2% |
| Bachelor's degree                               |  |  | 119 | 55.1% |
| Postgraduate or Master's degree                 |  |  | 39  | 18.1% |
| Doctoral (Ph.D.) degree                         |  |  | 8   | 3.7%  |
| Professional degree (Law, Medicine, and others) |  |  | 3   | 1.4%  |
| 7                                               |  |  | 12  | 5.6%  |

| Income              |  |  | N  |       |
|---------------------|--|--|----|-------|
|                     |  |  |    | %     |
| Under \$20,000      |  |  | 33 | 15.3% |
| \$20,000 – \$29,999 |  |  | 38 | 17.6% |
| \$30,000 – \$39,999 |  |  | 30 | 13.9% |
| \$40,000 – \$49,999 |  |  | 18 | 8.3%  |
| \$50,000 – \$59,999 |  |  | 19 | 8.8%  |
| \$60,000 – \$69,999 |  |  | 17 | 7.9%  |
| Over \$70,000       |  |  | 61 | 28.2% |

## Annexure 8-Study 1: product knowledge, ownership, and online shopping frequency

| Statistics     |         |                                       |                                                                          |                                         | I understand computer mouse features.      |   |  |
|----------------|---------|---------------------------------------|--------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------|---|--|
|                |         | I understand computer mouse features. | How many times have you purchased a product online in the last one year? | Do you own a computer mouse at present? | Where did you purchase your current mouse? | N |  |
| N              | Valid   | 216                                   | 216                                                                      | 216                                     | 216                                        |   |  |
|                | Missing | 0                                     | 0                                                                        | 0                                       | 0                                          |   |  |
| Mean           |         | 4.10                                  | 4.38                                                                     | 1.09                                    | 2.06                                       |   |  |
| Std. Deviation |         | 1.080                                 | .961                                                                     | .284                                    | .793                                       |   |  |

| I understand computer mouse features. |  |  | N  |       |
|---------------------------------------|--|--|----|-------|
|                                       |  |  |    | %     |
| Not at all                            |  |  | 3  | 1.4%  |
| Somewhat                              |  |  | 31 | 14.4% |
| Can't say                             |  |  | 5  | 2.3%  |
| Well                                  |  |  | 80 | 37.0% |
| Very well                             |  |  | 97 | 44.9% |

| How many times have you purchased a product online in the last one year? |                    |           |         |               | Do you own a computer mouse at present? |   |  |
|--------------------------------------------------------------------------|--------------------|-----------|---------|---------------|-----------------------------------------|---|--|
|                                                                          |                    | Frequency | Percent | Valid Percent | Cumulative Percent                      | N |  |
| Valid                                                                    | Never              | 2         | .9      | .9            | .9                                      |   |  |
|                                                                          | 1-4 times          | 14        | 6.5     | 6.5           | 7.4                                     |   |  |
|                                                                          | 5-10 times         | 20        | 9.3     | 9.3           | 16.7                                    |   |  |
|                                                                          | 11-20 times        | 45        | 20.8    | 20.8          | 37.5                                    |   |  |
|                                                                          | More than 20 times | 135       | 62.5    | 62.5          | 100.0                                   |   |  |
| Total                                                                    |                    | 216       | 100.0   | 100.0         |                                         |   |  |

| Do you own a computer mouse at present? |  |  | N   |       |
|-----------------------------------------|--|--|-----|-------|
|                                         |  |  |     | %     |
| Yes                                     |  |  | 197 | 91.2% |
| No                                      |  |  | 19  | 8.8%  |

| Where did you purchase your current mouse? |  |  | N   |       |
|--------------------------------------------|--|--|-----|-------|
|                                            |  |  |     | %     |
| At a store                                 |  |  | 46  | 21.3% |
| Online                                     |  |  | 125 | 57.9% |
| Got it with the computer                   |  |  | 30  | 13.9% |
| Do not own a computer mouse                |  |  | 15  | 6.9%  |

## Annexure 9-Study 1: ANOVA analysis of manipulation checks

| Descriptives      |     |      |                |            |                                  |      |         |         |
|-------------------|-----|------|----------------|------------|----------------------------------|------|---------|---------|
| Rating perception |     |      |                |            |                                  |      |         |         |
|                   | N   | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |      | Minimum | Maximum |
| 1.5               | 105 | 1.53 | .501           | .049       | 1.44                             | 1.63 | 1       | 2       |
| 4.5               | 111 | 5.27 | 1.175          | .112       | 5.05                             | 5.49 | 4       | 7       |
| Total             | 216 | 3.45 | 2.082          | .142       | 3.17                             | 3.73 | 1       | 7       |

| ANOVA             |                |     |             |         |       |
|-------------------|----------------|-----|-------------|---------|-------|
| Rating perception |                |     |             |         |       |
|                   | Sum of Squares | df  | Mean Square | F       | Sig.  |
| Between Groups    | 753.512        | 1   | 753.512     | 905.779 | <.001 |
| Within Groups     | 178.025        | 214 | .832        |         |       |
| Total             | 931.537        | 215 |             |         |       |

| Descriptives         |     |        |                |            |                                  |        |         |         |
|----------------------|-----|--------|----------------|------------|----------------------------------|--------|---------|---------|
| Purchase Involvement |     |        |                |            |                                  |        |         |         |
|                      | N   | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |        | Minimum | Maximum |
| 1                    | 105 | 5.3143 | 1.13494        | .11076     | 5.0946                           | 5.5339 | 2.00    | 7.00    |
| 2                    | 111 | 6.1502 | 1.07001        | .10156     | 5.9489                           | 6.3514 | 2.00    | 7.00    |
| Total                | 216 | 5.7438 | 1.17652        | .08005     | 5.5860                           | 5.9016 | 2.00    | 7.00    |

| ANOVA                |                |     |             |        |       |
|----------------------|----------------|-----|-------------|--------|-------|
| Purchase Involvement |                |     |             |        |       |
|                      | Sum of Squares | df  | Mean Square | F      | Sig.  |
| Between Groups       | 37.699         | 1   | 37.699      | 31.041 | <.001 |
| Within Groups        | 259.904        | 214 | 1.215       |        |       |
| Total                | 297.603        | 215 |             |        |       |

## Annexure 10-Study 1: Construct reliabilities

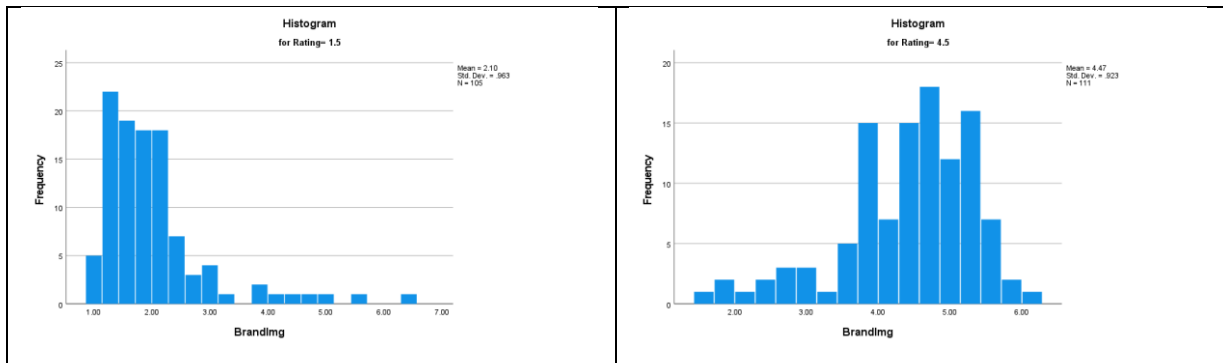
|                    | No. of Items | No. of cases | Mean | SD.  | Cronbach Alpha | AVE   |
|--------------------|--------------|--------------|------|------|----------------|-------|
| Brand image        | 7            | 216          | 3.32 | 1.52 | 0.918          | 0.720 |
| Willingness to pay | 2            | 216          | 2.74 | 1.60 | 0.852          | 0.871 |

## Annexure 11-Study 1: Shapiro-Wilks test for brand image and WTPP

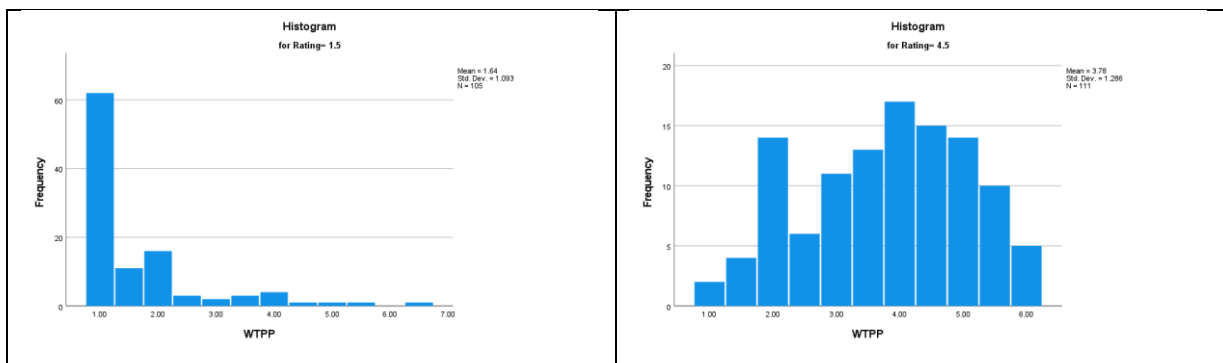
| Tests of Normality |        |                                 |     |       |              |     |       |
|--------------------|--------|---------------------------------|-----|-------|--------------|-----|-------|
|                    | Rating | Kolmogorov-Smirnov <sup>a</sup> |     |       | Shapiro-Wilk |     |       |
|                    |        | Statistic                       | df  | Sig.  | Statistic    | df  | Sig.  |
| Brandimg           | 1.5    | .203                            | 105 | <.001 | .789         | 105 | <.001 |
|                    | 4.5    | .120                            | 111 | <.001 | .940         | 111 | <.001 |
| WTPP               | 1.5    | .311                            | 105 | <.001 | .648         | 105 | <.001 |
|                    | 4.5    | .116                            | 111 | <.001 | .959         | 111 | .002  |

a. Lilliefors Significance Correction

### Annexure 12-Study 1: Histogram for brand image



### Annexure 13-Study 1: Histogram for WTPP



## Annexure 14-Study 1: Hypothesis #6 - Haye's PROCESS Macro Model 1 Output

Run MATRIX procedure:

```
***** PROCESS Procedure for SPSS Version 4.1 *****

      Written by Andrew F. Hayes, Ph.D.      www.afhayes.com
      Documentation available in Hayes (2022). www.guilford.com/p/hayes3

*****

Model   : 1
  Y     : BrandImg
  X     : Rating
  W     : Involve

Covariates:
  Age      Gender   Edu      Income

Sample
Size: 216

*****
OUTCOME VARIABLE:
  BrandImg

Model Summary
      R      R-sq      MSE      F (HC4)      df1      df2      p
      .808      .652      .828      75.776      7.000      208.000      .000

Model
      coeff      se (HC4)      t      p      LLCI      ULCI
constant      .810      .664      1.221      .223      -.498      2.119
Rating         .527      .136      3.891      .000      .260      .794
Involve        -.089      .305      -.293      .770      -.691      .513
Int_1          .176      .086      2.055      .041      .007      .346
Age            -.008      .052      -.154      .878      -.111      .095
Gender         .165      .156      1.060      .290      -.142      .473
Edu            .032      .052      .620      .536      -.070      .135
Income         -.025      .032      -.780      .436      -.088      .038

Product terms key:
  Int_1      :      Rating x      Involve

Test(s) of highest order unconditional interaction(s):
      R2-chng      F (HC4)      df1      df2      p
X*W      .008      4.224      1.000      208.000      .041
-----
      Focal predict: Rating (X)
      Mod var: Involve (W)

Conditional effects of the focal predictor at values of the moderator(s):

      Involve      Effect      se (HC4)      t      p      LLCI      ULCI
      1.000      .880      .060      14.674      .000      .762      .998
      2.000      .704      .060      11.706      .000      .585      .822

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
  Rating      Involve      BrandImg .
BEGIN DATA.
  1.500      1.000      2.004
  4.500      1.000      4.115
  1.500      2.000      2.179
  4.500      2.000      4.819
END DATA.
GRAPH/SCATTERPLOT=
  Rating WITH      BrandImg BY      Involve .

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
95.0000

NOTE: A heteroscedasticity consistent standard error and covariance matrix estimator was used.

----- END MATRIX -----
```

## Annexure 15- Study 1: Hypothesis #5 - Haye's PROCESS Macro Model 4 Output

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 4.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
Documentation available in Hayes (2022). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 4  
Y : WTPP  
X : Rating  
M : BrandImg

Covariates:  
Age Gender Edu Income

Sample  
Size: 216

\*\*\*\*\*

OUTCOME VARIABLE:  
BrandImg

| Model Summary |      |      |      |        |       |         |      |
|---------------|------|------|------|--------|-------|---------|------|
|               | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|               | .789 | .623 | .889 | 69.347 | 5.000 | 210.000 | .000 |

| Model    |       |      |        |      |       |       |
|----------|-------|------|--------|------|-------|-------|
|          | coeff | se   | t      | p    | LLCI  | ULCI  |
| constant | .628  | .352 | 1.787  | .075 | -.065 | 1.321 |
| Rating   | .791  | .043 | 18.450 | .000 | .707  | .876  |
| Age      | -.017 | .052 | -.318  | .750 | -.119 | .086  |
| Gender   | .190  | .130 | 1.455  | .147 | -.067 | .447  |
| Edu      | .043  | .055 | .788   | .431 | -.065 | .152  |
| Income   | -.024 | .029 | -.826  | .410 | -.081 | .033  |

\*\*\*\*\*

OUTCOME VARIABLE:  
WTPP

| Model Summary |      |      |      |        |       |         |      |
|---------------|------|------|------|--------|-------|---------|------|
|               | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|               | .857 | .734 | .706 | 96.045 | 6.000 | 209.000 | .000 |

| Model    |       |      |        |      |       |       |
|----------|-------|------|--------|------|-------|-------|
|          | coeff | se   | t      | p    | LLCI  | ULCI  |
| constant | -.122 | .316 | -.387  | .699 | -.745 | .500  |
| Rating   | -.012 | .062 | -.196  | .845 | -.134 | .110  |
| BrandImg | .918  | .062 | 14.925 | .000 | .797  | 1.039 |
| Age      | .023  | .047 | .495   | .621 | -.069 | .115  |
| Gender   | -.070 | .117 | -.603  | .547 | -.301 | .160  |
| Edu      | -.081 | .049 | -1.646 | .101 | -.178 | .016  |
| Income   | .040  | .026 | 1.557  | .121 | -.011 | .092  |

| Test(s) of X by M interaction: |      |       |         |      |
|--------------------------------|------|-------|---------|------|
|                                | F    | df1   | df2     | p    |
|                                | .050 | 1.000 | 208.000 | .823 |

\*\*\*\*\* TOTAL EFFECT MODEL \*\*\*\*\*

OUTCOME VARIABLE:  
WTPP

| Model Summary |      |      |       |        |       |         |      |
|---------------|------|------|-------|--------|-------|---------|------|
|               | R    | R-sq | MSE   | F      | df1   | df2     | p    |
|               | .671 | .450 | 1.452 | 34.389 | 5.000 | 210.000 | .000 |

| Model    |       |      |        |      |       |       |
|----------|-------|------|--------|------|-------|-------|
|          | coeff | se   | t      | p    | LLCI  | ULCI  |
| constant | .454  | .449 | 1.011  | .313 | -.431 | 1.340 |
| Rating   | .714  | .055 | 13.031 | .000 | .606  | .822  |
| Age      | .008  | .067 | .117   | .907 | -.124 | .139  |
| Gender   | .104  | .167 | .622   | .534 | -.225 | .432  |
| Edu      | -.041 | .070 | -.584  | .560 | -.180 | .098  |
| Income   | .018  | .037 | .495   | .621 | -.055 | .092  |

\*\*\*\*\* TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y \*\*\*\*\*

Total effect of X on Y

| Effect | se   | t      | p    | LLCI | ULCI |
|--------|------|--------|------|------|------|
| .714   | .055 | 13.031 | .000 | .606 | .822 |

Direct effect of X on Y

| Effect | se   | t     | p    | LLCI  | ULCI |
|--------|------|-------|------|-------|------|
| -.012  | .062 | -.196 | .845 | -.134 | .110 |

Indirect effect(s) of X on Y:

|          | Effect | BootSE | BootLLCI | BootULCI |
|----------|--------|--------|----------|----------|
| BrandImg | .726   | .056   | .620     | .841     |

\*\*\*\*\* ANALYSIS NOTES AND ERRORS \*\*\*\*\*

Level of confidence for all confidence intervals in output:

95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

----- END MATRIX -----

## Annexure 16-Study 1: Hypothesis #6 - Haye's PROCESS Macro Model 7 Output

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 4.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
Documentation available in Hayes (2022). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 7  
Y : WTPP  
X : Rating  
M : BrandImg  
W : Involve

Covariates:  
Age Gender Edu Income

Sample  
Size: 216

\*\*\*\*\*

OUTCOME VARIABLE:  
BrandImg

| Model Summary | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|---------------|------|------|------|--------|-------|---------|------|
|               | .808 | .652 | .828 | 55.689 | 7.000 | 208.000 | .000 |

| Model    | coeff | se   | t     | p    | LLCI  | ULCI  |
|----------|-------|------|-------|------|-------|-------|
| constant | .810  | .544 | 1.489 | .138 | -.263 | 1.884 |
| Rating   | .527  | .132 | 3.982 | .000 | .266  | .788  |
| Involve  | -.089 | .282 | -.317 | .752 | -.646 | .467  |
| Int_1    | .176  | .083 | 2.119 | .035 | .012  | .340  |
| Age      | -.008 | .051 | -.159 | .874 | -.108 | .092  |
| Gender   | .165  | .126 | 1.311 | .191 | -.083 | .414  |
| Edu      | .032  | .053 | .605  | .546 | -.073 | .137  |
| Income   | -.025 | .028 | -.885 | .377 | -.080 | .031  |

Product terms key:  
Int\_1 : Rating x Involve

| Test(s) of highest order unconditional interaction(s): | R2-chng | F     | df1   | df2     | p    |
|--------------------------------------------------------|---------|-------|-------|---------|------|
| X*W                                                    | .008    | 4.492 | 1.000 | 208.000 | .035 |

-----  
Focal predict: Rating (X)  
Mod var: Involve (W)

Conditional effects of the focal predictor at values of the moderator(s):

| Involve | Effect | se   | t      | p    | LLCI | ULCI |
|---------|--------|------|--------|------|------|------|
| 1.000   | .880   | .058 | 15.163 | .000 | .766 | .995 |
| 2.000   | .704   | .059 | 11.855 | .000 | .587 | .821 |

Data for visualizing the conditional effect of the focal predictor:  
Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  Rating   Involve   BrandImg .
BEGIN DATA.
  1.500    1.000    2.004
  4.500    1.000    4.115
  1.500    2.000    2.179
  4.500    2.000    4.819
END DATA.
GRAPH/SCATTERPLOT=
  Rating WITH BrandImg BY Involve .
```

\*\*\*\*\*

OUTCOME VARIABLE:  
WTPP

Model Summary

|  | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|--|------|------|------|--------|-------|---------|------|
|  | .857 | .734 | .706 | 96.045 | 6.000 | 209.000 | .000 |

Model

|          | coeff | se   | t      | p    | LLCI  | ULCI  |
|----------|-------|------|--------|------|-------|-------|
| constant | -.122 | .316 | -.387  | .699 | -.745 | .500  |
| Rating   | -.012 | .062 | -.196  | .845 | -.134 | .110  |
| BrandImg | .918  | .062 | 14.925 | .000 | .797  | 1.039 |
| Age      | .023  | .047 | .495   | .621 | -.069 | .115  |
| Gender   | -.070 | .117 | -.603  | .547 | -.301 | .160  |
| Edu      | -.081 | .049 | -1.646 | .101 | -.178 | .016  |
| Income   | .040  | .026 | 1.557  | .121 | -.011 | .092  |

Test(s) of X by M interaction:

|  | F    | df1   | df2     | p    |
|--|------|-------|---------|------|
|  | .050 | 1.000 | 208.000 | .823 |

\*\*\*\*\* DIRECT AND INDIRECT EFFECTS OF X ON Y \*\*\*\*\*

Direct effect of X on Y

|  | Effect | se   | t     | p    | LLCI  | ULCI |
|--|--------|------|-------|------|-------|------|
|  | -.012  | .062 | -.196 | .845 | -.134 | .110 |

Conditional indirect effects of X on Y:

INDIRECT EFFECT:

| Rating  | ->     | BrandImg | ->       | WTPP     |
|---------|--------|----------|----------|----------|
| Involve | Effect | BootSE   | BootLLCI | BootULCI |
| 1.000   | .808   | .064     | .686     | .940     |
| 2.000   | .646   | .071     | .513     | .791     |

Index of moderated mediation (difference between conditional indirect effects):

|         | Index | BootSE | BootLLCI | BootULCI |
|---------|-------|--------|----------|----------|
| Involve | .162  | .077   | .012     | .308     |

---

\*\*\*\*\* ANALYSIS NOTES AND ERRORS \*\*\*\*\*

Level of confidence for all confidence intervals in output:  
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:  
5000

NOTE: Standardized coefficients not available for models with moderators.

----- END MATRIX -----

## Annexure 17 - Study 2: Demographics

| Statistics |         |        |     |        |     | Gender                  |           |
|------------|---------|--------|-----|--------|-----|-------------------------|-----------|
| Age group  |         | Gender | Edu | Income |     | N                       | %         |
| N          | Valid   | 206    | 206 | 206    | 206 | Male                    | 110 53.4% |
|            | Missing | 0      | 0   | 0      | 0   | Female                  | 92 44.7%  |
|            |         |        |     |        |     | Non-binary/Third gender | 4 1.9%    |

| Age group          |          | Edu                 |           | Income              |          |
|--------------------|----------|---------------------|-----------|---------------------|----------|
| N                  | %        | N                   | %         | N                   | %        |
| 21-30 years        | 42 20.4% | High school         | 34 16.5%  | Under \$20,000      | 36 17.5% |
| 31-40 years        | 73 35.4% | Bachelor's degree   | 129 62.6% | \$20,000 - \$29,999 | 29 14.1% |
| 41-50 years        | 41 19.9% | Masters degree      | 15 7.3%   | \$30,000 - \$39,999 | 25 12.1% |
| 51-60 years        | 31 15.0% | Doctoral degree     | 5 2.4%    | \$40,000 - \$49,999 | 16 7.8%  |
| More than 60 years | 18 8.7%  | Professional degree | 9 4.4%    | \$50,000 - \$59,999 | 24 11.7% |
| 18-20 years        | 1 0.5%   | Other               | 14 6.8%   | \$60,000 - \$69,999 | 19 9.2%  |
|                    |          |                     |           | \$70,000 or more    | 57 27.7% |

## Annexure 18 - Study 2: Product knowledge, ownership, and online shopping frequency

| Statistics                            |         |                                                                          |                                         |                                            | Where did you purchase your current mouse? |           |
|---------------------------------------|---------|--------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------|--------------------------------------------|-----------|
| I understand computer mouse features. |         | How many times have you purchased a product online in the last one year? | Do you own a computer mouse at present? | Where did you purchase your current mouse? | N                                          | %         |
| N                                     | Valid   | 206                                                                      | 206                                     | 206                                        | At a store                                 | 38 18.4%  |
|                                       | Missing | 0                                                                        | 0                                       | 0                                          | Online                                     | 120 58.3% |
| Mean                                  | 4.00    | 4.34                                                                     | 1.11                                    | 2.14                                       | Got it with computer                       | 30 14.6%  |
| Std. Deviation                        | 1.017   | .983                                                                     | .316                                    | .815                                       | Do not own computer mouse                  | 18 8.7%   |

| I understand computer mouse features. |          | How many times have you purchased a product online in the last one year? |           | Do you own a computer mouse at present? |           |
|---------------------------------------|----------|--------------------------------------------------------------------------|-----------|-----------------------------------------|-----------|
| N                                     | %        | N                                                                        | %         | N                                       | %         |
| Not at all                            | 1 0.5%   | Never                                                                    | 1 0.5%    | Yes                                     | 183 88.8% |
| Somewhat                              | 30 14.6% | 1-4 times                                                                | 16 7.8%   | No                                      | 23 11.2%  |
| Can't say                             | 10 4.9%  | 5-10 times                                                               | 22 10.7%  |                                         |           |
| Well                                  | 92 44.7% | 11-20 times                                                              | 40 19.4%  |                                         |           |
| Very well                             | 73 35.4% | More than 20 times                                                       | 127 61.7% |                                         |           |

## Annexure 19 - Study 2: ANOVA analysis of manipulation checks

| Descriptives      |      |                |            |                                  |      |         |         |  |
|-------------------|------|----------------|------------|----------------------------------|------|---------|---------|--|
| Rating perception |      |                |            |                                  |      |         |         |  |
| N                 | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |      | Minimum | Maximum |  |
| 1.5               | 100  | 1.00           | .000       | 1.00                             | 1.00 | 1       | 1       |  |
| 4.5               | 106  | 5.39           | 1.118      | .109                             | 5.17 | 5.60    | 4 7     |  |
| Total             | 206  | 3.26           | 2.339      | .163                             | 2.94 | 3.58    | 1 7     |  |

| ANOVA             |                |     |             |          |       |
|-------------------|----------------|-----|-------------|----------|-------|
| Rating perception |                |     |             |          |       |
|                   | Sum of Squares | df  | Mean Square | F        | Sig.  |
| Between Groups    | 990.223        | 1   | 990.223     | 1540.362 | <.001 |
| Within Groups     | 131.142        | 204 | .643        |          |       |
| Total             | 1121.364       | 205 |             |          |       |

| Descriptives      |      |                |            |                                  |      |         |         |  |
|-------------------|------|----------------|------------|----------------------------------|------|---------|---------|--|
| Volume perception |      |                |            |                                  |      |         |         |  |
| N                 | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |      | Minimum | Maximum |  |
| 20                | 104  | 1.91           | .893       | .088                             | 1.74 | 2.09    | 1 4     |  |
| 10140             | 102  | 6.30           | .715       | .071                             | 6.16 | 6.44    | 4 7     |  |
| Total             | 206  | 4.09           | 2.344      | .163                             | 3.77 | 4.41    | 1 7     |  |

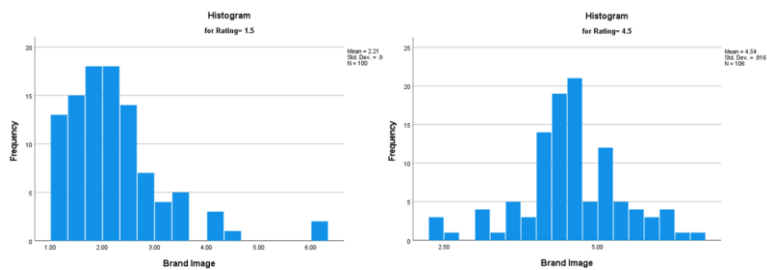
| ANOVA             |                |     |             |          |       |
|-------------------|----------------|-----|-------------|----------|-------|
| Volume perception |                |     |             |          |       |
|                   | Sum of Squares | df  | Mean Square | F        | Sig.  |
| Between Groups    | 992.628        | 1   | 992.628     | 1513.428 | <.001 |
| Within Groups     | 133.800        | 204 | .656        |          |       |
| Total             | 1126.427       | 205 |             |          |       |

## Annexure 20 - Study 2: Shapiro-Wilks test for brand image and WTPP

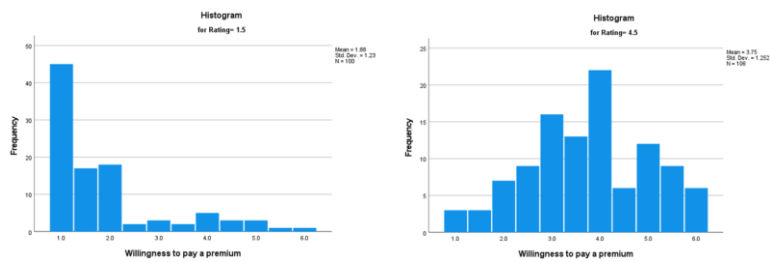
| Tests of Normality           |        |                                 |     |       |              |     |       |
|------------------------------|--------|---------------------------------|-----|-------|--------------|-----|-------|
|                              | Rating | Kolmogorov-Smirnov <sup>a</sup> |     |       | Shapiro-Wilk |     |       |
|                              |        | Statistic                       | df  | Sig.  | Statistic    | df  | Sig.  |
| Brand Image                  | 1.5    | .132                            | 100 | <.001 | .871         | 100 | <.001 |
|                              | 4.5    | .093                            | 106 | .024  | .975         | 106 | .040  |
| Willingness to pay a premium | 1.5    | .260                            | 100 | <.001 | .731         | 100 | <.001 |
|                              | 4.5    | .111                            | 106 | .003  | .968         | 106 | .013  |

a. Lilliefors Significance Correction

## Annexure 21 - Study 2: Histogram for brand image



## Annexure 22 - Study 2: Histogram for WTPP



## Annexure 23 - Study 2: Hypothesis #3 - Haye's PROCESS Macro Model 1 Output

Run MATRIX procedure:

```
***** PROCESS Procedure for SPSS Version 4.1 *****

      Written by Andrew F. Hayes, Ph.D.      www.afhayes.com
      Documentation available in Hayes (2022). www.guilford.com/p/hayes3

*****

Model   : 1
  Y     : BrandImg
  X     : Rating
  W     : Volume

Covariates:
  Age      Gender   Edu      Income

Sample
Size: 206

*****
OUTCOME VARIABLE:
  BrandImg

Model Summary
      R      R-sq      MSE      F      df1      df2      p
      .816      .666      .734     56.438      7.000     198.000     .000

Model
      coeff      se      t      p      LLCI      ULCI
constant     1.673     .321     5.208     .000     1.039     2.306
Rating        .702     .056    12.470     .000     .591     .813
Volume        .000     .000     -.986     .325     .000     .000
Int_1         .000     .000     2.155     .032     .000     .000
Age           .018     .049     .376     .707    -.078     .114
Gender       -1.197     .114    -1.726     .086    -.421     .028
Edu          -.037     .047     -.793     .429    -.129     .055
Income       -.037     .026    -1.387     .167    -.089     .015

Product terms key:
  Int_1      :      Rating   x      Volume

Test(s) of highest order unconditional interaction(s):
      R2-chng      F      df1      df2      p
X*W      .008      4.646      1.000     198.000     .032
-----
      Focal predict: Rating   (X)
      Mod var: Volume   (W)

Conditional effects of the focal predictor at values of the moderator(s):

      Volume      Effect      se      t      p      LLCI      ULCI
      20.000      .702      .056    12.500     .000     .591     .813
     10140.000      .875      .058    15.157     .000     .761     .989

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/
  Rating      Volume      BrandImg   .
BEGIN DATA.
  1.500      20.000      2.202
  4.500      20.000      4.308
  1.500     10140.000      2.192
  4.500     10140.000      4.817
END DATA.
GRAPH/SCATTERPLOT=
  Rating      WITH      BrandImg BY      Volume   .

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
  95.0000

----- END MATRIX -----
```

## Annexure 24 - Study 2: Hypothesis # 4 - Haye's PROCESS Macro Model 1 Output

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 4.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
Documentation available in Hayes (2022). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 1  
Y : WTPP  
X : Rating  
W : Volume

Covariates:  
Age Gender Edu Income

Sample  
Size: 206

\*\*\*\*\*

OUTCOME VARIABLE:  
WTPP

| Model Summary | R    | R-sq | MSE   | F      | df1   | df2     | p    |
|---------------|------|------|-------|--------|-------|---------|------|
|               | .645 | .416 | 1.464 | 20.124 | 7.000 | 198.000 | .000 |

| Model    | coeff | se   | t      | p    | LLCI  | ULCI  |
|----------|-------|------|--------|------|-------|-------|
| constant | 1.113 | .454 | 2.454  | .015 | .219  | 2.008 |
| Rating   | .646  | .080 | 8.121  | .000 | .489  | .803  |
| Volume   | .000  | .000 | 1.614  | .018 | .000  | .000  |
| Int_1    | .000  | .000 | -.033  | .034 | .000  | .000  |
| Age      | .019  | .069 | .273   | .785 | -.117 | .154  |
| Gender   | -.193 | .161 | -1.199 | .232 | -.510 | .124  |
| Edu      | -.088 | .066 | -1.328 | .186 | -.218 | .043  |
| Income   | -.002 | .037 | -.042  | .966 | -.075 | .072  |

Product terms key:  
Int\_1 : Rating x Volume

Test(s) of highest order unconditional interaction(s):

|     | R2-chng | F    | df1   | df2     | p    |
|-----|---------|------|-------|---------|------|
| X*W | .000    | .001 | 1.000 | 198.000 | .974 |

-----

Focal predict: Rating (X)  
Mod var: Volume (W)

Data for visualizing the conditional effect of the focal predictor:  
Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  Rating Volume WTPP .
BEGIN DATA.
  1.500 20.000 1.544
  4.500 20.000 3.481
  1.500 10140.000 2.159
  4.500 10140.000 4.085
END DATA.
GRAPH/SCATTERPLOT=
  Rating WITH WTPP BY Volume .
```

\*\*\*\*\* ANALYSIS NOTES AND ERRORS \*\*\*\*\*

Level of confidence for all confidence intervals in output:  
95.0000

----- END MATRIX -----

## Annexure 25 - Study 2: Hypothesis # 3 and # 4 - Haye's PROCESS Macro Model 8 Output

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 4.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
Documentation available in Hayes (2022). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 8  
Y : WTPP  
X : Rating  
M : BrandImg  
W : Volume

Covariates:  
Age Gender Edu Income

Sample  
Size: 206

\*\*\*\*\*

OUTCOME VARIABLE:  
BrandImg

| Model Summary | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|---------------|------|------|------|--------|-------|---------|------|
|               | .816 | .666 | .734 | 56.438 | 7.000 | 198.000 | .000 |

| Model    | coeff | se   | t      | p    | LLCI  | ULCI  |
|----------|-------|------|--------|------|-------|-------|
| constant | 1.673 | .321 | 5.208  | .000 | 1.039 | 2.306 |
| Rating   | .702  | .056 | 12.470 | .000 | .591  | .813  |
| Volume   | .000  | .000 | -.986  | .325 | .000  | .000  |
| Int_1    | .000  | .000 | 2.155  | .032 | .000  | .000  |
| Age      | .018  | .049 | .376   | .707 | -.078 | .114  |
| Gender   | -.197 | .114 | -1.726 | .086 | -.421 | .028  |
| Edu      | -.037 | .047 | -.793  | .429 | -.129 | .055  |
| Income   | -.037 | .026 | -1.387 | .167 | -.089 | .015  |

Product terms key:  
Int\_1 : Rating x Volume

Test(s) of highest order unconditional interaction(s):

|     | R2-chng | F     | df1   | df2     | p    |
|-----|---------|-------|-------|---------|------|
| X*W | .008    | 4.646 | 1.000 | 198.000 | .032 |

-----

Focal predict: Rating (X)  
Mod var: Volume (W)

Conditional effects of the focal predictor at values of the moderator(s):

| Volume    | Effect | se   | t      | p    | LLCI | ULCI |
|-----------|--------|------|--------|------|------|------|
| 20.000    | .702   | .056 | 12.500 | .000 | .591 | .813 |
| 10140.000 | .875   | .058 | 15.157 | .000 | .761 | .989 |

Data for visualizing the conditional effect of the focal predictor:  
Paste text below into a SPSS syntax window and execute to produce plot.

```
DATA LIST FREE/
  Rating Volume BrandImg .
BEGIN DATA.
  1.500 20.000 2.202
  4.500 20.000 4.308
  1.500 10140.000 2.192
  4.500 10140.000 4.817
END DATA.
GRAPH/SCATTERPLOT=
  Rating WITH BrandImg BY Volume .
```

\*\*\*\*\*

OUTCOME VARIABLE:  
WTPP

Model Summary

|  | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|--|------|------|------|--------|-------|---------|------|
|  | .838 | .702 | .750 | 58.032 | 8.000 | 197.000 | .000 |

Model

|          | coeff | se   | t      | p    | LLCI   | ULCI  |
|----------|-------|------|--------|------|--------|-------|
| constant | -.541 | .346 | -1.562 | .120 | -1.224 | .142  |
| Rating   | -.048 | .076 | -.637  | .525 | -.198  | .102  |
| BrandImg | .989  | .072 | 13.761 | .000 | .847   | 1.131 |
| Volume   | .000  | .000 | 3.211  | .002 | .000   | .000  |
| Int_1    | .000  | .000 | -2.129 | .034 | .000   | .000  |
| Age      | .001  | .049 | .014   | .989 | -.096  | .098  |
| Gender   | .001  | .116 | .012   | .990 | -.227  | .230  |
| Edu      | -.051 | .047 | -1.077 | .283 | -.144  | .042  |
| Income   | .035  | .027 | 1.291  | .198 | -.018  | .088  |

Product terms key:

Int\_1 : Rating x Volume

Test(s) of X by M interaction:

|  | F     | df1   | df2     | p    |
|--|-------|-------|---------|------|
|  | 4.619 | 1.000 | 196.000 | .033 |

Test(s) of highest order unconditional interaction(s):

|     | R2-chng | F     | df1   | df2     | p    |
|-----|---------|-------|-------|---------|------|
| X*W | .007    | 4.532 | 1.000 | 197.000 | .034 |

-----

Focal predict: Rating (X)  
Mod var: Volume (W)

Conditional effects of the focal predictor at values of the moderator(s):

| Volume    | Effect | se   | t      | p    | LLCI  | ULCI  |
|-----------|--------|------|--------|------|-------|-------|
| 20.000    | -.049  | .076 | -.642  | .522 | -.199 | .101  |
| 10140.000 | -.223  | .086 | -2.601 | .010 | -.392 | -.054 |

Data for visualizing the conditional effect of the focal predictor:  
Paste text below into a SPSS syntax window and execute to produce plot.

```

DATA LIST FREE/
  Rating Volume WTPP .
BEGIN DATA.
  1.500 20.000 2.741
  4.500 20.000 2.594
  1.500 10140.000 3.365
  4.500 10140.000 2.695
END DATA.
GRAPH/SCATTERPLOT=
  Rating WITH WTPP BY Volume .
***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Conditional direct effect(s) of X on Y:
  Volume Effect se t p LLCI ULCI
  20.000 -.049 .076 -.642 .522 -.199 .101
  10140.000 -.223 .086 -2.601 .010 -.392 -.054

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
  Rating -> BrandImg -> WTPP

  Volume Effect BootSE BootLLCI BootULCI
  20.000 .695 .072 .561 .836
  10140.000 .865 .091 .691 1.040

Index of moderated mediation (difference between conditional indirect effects):
  Volume Index BootSE BootLLCI BootULCI
  ---
  .171 .082 .014 .333
  ---

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

NOTE: Standardized coefficients not available for models with moderators.

----- END MATRIX -----

```

## Annexure 26 - Study 2: Hypothesis # 4 - Haye's PROCESS Macro Model 4 Output

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 4.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
Documentation available in Hayes (2022). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 4  
Y : WTPP  
X : Rating  
M : BrandImg

Covariates:  
Age Gender Edu Income

Sample  
Size: 206

\*\*\*\*\*

OUTCOME VARIABLE:  
BrandImg

| Model Summary |      |      |      |        |       |         |      |
|---------------|------|------|------|--------|-------|---------|------|
|               | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|               | .807 | .651 | .760 | 74.458 | 5.000 | 200.000 | .000 |

| Model    |       |      |        |      |       |       |
|----------|-------|------|--------|------|-------|-------|
|          | coeff | se   | t      | p    | LLCI  | ULCI  |
| constant | 1.501 | .287 | 5.222  | .000 | .934  | 2.068 |
| Rating   | .786  | .041 | 19.073 | .000 | .705  | .868  |
| Age      | .019  | .049 | .375   | .708 | -.079 | .116  |
| Gender   | -.197 | .115 | -1.712 | .089 | -.424 | .030  |
| Edu      | -.025 | .047 | -.522  | .603 | -.118 | .069  |
| Income   | -.037 | .027 | -1.370 | .172 | -.090 | .016  |

Standardized coefficients

|        | coeff |
|--------|-------|
| Rating | .540  |
| Age    | .016  |
| Gender | -.073 |
| Edu    | -.022 |
| Income | -.058 |

\*\*\*\*\*

OUTCOME VARIABLE:  
WTPP

| Model Summary |      |      |      |        |       |         |      |
|---------------|------|------|------|--------|-------|---------|------|
|               | R    | R-sq | MSE  | F      | df1   | df2     | p    |
|               | .826 | .682 | .792 | 71.209 | 6.000 | 199.000 | .000 |

| Model    |       |      |        |      |       |       |
|----------|-------|------|--------|------|-------|-------|
|          | coeff | se   | t      | p    | LLCI  | ULCI  |
| constant | -.068 | .313 | -.216  | .829 | -.684 | .549  |
| Rating   | -.139 | .071 | -1.972 | .051 | -.279 | .000  |
| BrandImg | .997  | .072 | 13.811 | .000 | .855  | 1.139 |
| Age      | .002  | .051 | .041   | .967 | -.098 | .102  |
| Gender   | -.046 | .118 | -.392  | .695 | -.280 | .187  |
| Edu      | -.048 | .048 | -.983  | .327 | -.143 | .048  |
| Income   | .037  | .028 | 1.344  | .180 | -.017 | .092  |

Standardized coefficients

|          | coeff |
|----------|-------|
| Rating   | -.090 |
| BrandImg | .934  |
| Age      | .002  |
| Gender   | -.016 |
| Edu      | -.040 |
| Income   | .054  |

Test(s) of X by M interaction:

|  | F     | df1   | df2     | p    |
|--|-------|-------|---------|------|
|  | 3.712 | 1.000 | 198.000 | .055 |

\*\*\*\*\* TOTAL EFFECT MODEL \*\*\*\*\*

OUTCOME VARIABLE:

WTPP

Model Summary

| R    | R-sq | MSE   | F      | df1   | df2     | p    |
|------|------|-------|--------|-------|---------|------|
| .615 | .378 | 1.544 | 24.273 | 5.000 | 200.000 | .000 |

Model

|          | coeff | se   | t      | p    | LLCI  | ULCI  |
|----------|-------|------|--------|------|-------|-------|
| constant | 1.429 | .410 | 3.489  | .001 | .621  | 2.237 |
| Rating   | .645  | .059 | 10.972 | .000 | .529  | .761  |
| Age      | .021  | .071 | .292   | .771 | -.118 | .160  |
| Gender   | -.243 | .164 | -1.480 | .140 | -.566 | .081  |
| Edu      | -.072 | .068 | -1.070 | .286 | -.205 | .061  |
| Income   | .000  | .038 | .009   | .993 | -.075 | .076  |

Standardized coefficients

|        | coeff |
|--------|-------|
| Rating | .414  |
| Age    | .016  |
| Gender | -.084 |
| Edu    | -.060 |
| Income | .000  |

\*\*\*\*\* TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y \*\*\*\*\*

Total effect of X on Y

| Effect | se   | t      | p    | LLCI | ULCI | c_ps |
|--------|------|--------|------|------|------|------|
| .645   | .059 | 10.972 | .000 | .529 | .761 | .414 |

Direct effect of X on Y

| Effect | se   | t      | p    | LLCI  | ULCI | c'_ps |
|--------|------|--------|------|-------|------|-------|
| -.139  | .071 | -1.972 | .051 | -.279 | .000 | -.090 |

Indirect effect(s) of X on Y:

|          | Effect | BootSE | BootLLCI | BootULCI |
|----------|--------|--------|----------|----------|
| BrandImg | .784   | .070   | .650     | .929     |

Partially standardized indirect effect(s) of X on Y:

|          | Effect | BootSE | BootLLCI | BootULCI |
|----------|--------|--------|----------|----------|
| BrandImg | .504   | .041   | .430     | .589     |

\*\*\*\*\* ANALYSIS NOTES AND ERRORS \*\*\*\*\*

Level of confidence for all confidence intervals in output:

95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

NOTE: Standardized coefficients for dichotomous or multicategorical X are in partially standardized form.

----- END MATRIX -----