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**EXAMINING PSYCHOLOGICAL MECHANISMS  
UNDERLYING SYNERGISTIC COMMUNICATION EFFECTS:  
THE CASE OF ONLINE REVIEWS AND DISPLAY  
ADVERTISING**

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Rishi Dwesar*	Department of Marketing and Strategy, IBS, ICFAI Foundation for Higher Education, Hyderabad, India	<a href="mailto:rishidwesar@gmail.com">rishidwesar@gmail.com</a>
Ankita Sharma	School of Management, IILM University, Greater Noida, India	<a href="mailto:dr.ankitasharma912@gmail.com">dr.ankitasharma912@gmail.com</a>
Megha Tyagi	ICFAI Business School, The ICFAI University, Dehradun, India	<a href="mailto:meghatyagi@iudehradun.edu.in">meghatyagi@iudehradun.edu.in</a>

\* Corresponding author

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**ABSTRACT**

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Aim/Purpose	This study aims to evaluate the dual impact of online reviews and display advertising on consumer purchase behavior, addressing a critical gap in understanding how these multi-source communications interact and concurrently persuade consumers. Specifically, it examines the psychological mechanisms of skepticism toward advertising and priming, exploring their combined influence on the effectiveness of these communications.
Background	Integrated Marketing Communication (IMC) emphasizes the effectiveness of delivering consistent messages through multiple channels, creating a synergistic impact beyond individual messages. Studies reveal stronger persuasive effects when combining sources like social media, traditional marketing, and various media platforms, compared to single-source exposure, possibly due to the integration of psychological mechanisms involved in processing information from multiple sources.
Methodology	Two experimental studies were conducted. The first study used a 2x2x2 between-subjects design with 317 participants exposed to eight media

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	conditions, varying message sources, sequence, and content. Self-reported data was collected on established scales to measure skepticism toward advertising and priming. The second study involved 123 participants and used eye-tracking technology to assess their attention to the stimuli across four media conditions.
Contribution	This research highlights how combining online reviews with display advertising creates powerful synergies, surpassing single-source communication. Examining psychological mechanisms like skepticism toward advertising and priming uncovers how multi-source messaging enhances consumer trust and engagement. The study provides a deeper understanding of consumer attention and behavior by exploring the impact of message sequence and variation, supported by eye-tracking insights. Extending IMC literature demonstrates how integrating marketer-controlled and consumer-driven sources boosts ad credibility and effectiveness. The findings empower marketers with actionable strategies to craft balanced, trust-driven communication while fostering informed consumer decision-making.
Findings	Results show that combining online reviews and ads reduced skepticism, leading to stronger attitudes toward the ad and the brand and higher purchase intention. Participants exposed to reviews first were less skeptical and more influenced by ads. Eye-tracking in Study 2 showed that varied messages led to greater attention on product headlines, while similar messages made participants focus more on review credibility, indicating higher skepticism.
Recommendations for Practitioners	Marketers must leverage online reviews alongside advertising to reduce skepticism, enhance priming, and strategically integrate consumer-generated content to improve ad effectiveness and brand trust.
Recommendations for Researchers	The research shows that underlying psychological mechanisms have an important role in creating media synergies. Nevertheless, examining such mechanisms is often challenging. Using novel approaches can help in uncovering such mechanisms.
Impact on Society	Marketers have primarily focused on using outbound (advertising lead) communication channels in communication. Using inbound (consumer-led) marketing channels, such as online reviews, testimonials, etc., can bring more credibility and help society at large make more conscious buying choices.
Future Research	Future research should explore similar phenomena in real-world settings, examine hedonic products, include online reviews with negative valence, and investigate additional psychological mechanisms using robust techniques like thought listing.
Keywords	integrated marketing communication, persuasiveness, cross-media integration, psychological mechanisms, eye-tracking

## INTRODUCTION

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The emergence of new information sources has dramatically transformed how consumers integrate and utilize information today. No longer playing the role of passive receivers of advertising, consumers have become brand advocates who actively share their experiences through online word of mouth (eWOM) (Babić Rosario et al., 2016; Zhang et al., 2023). Moreover, consumers are increasingly integrating marketing-driven and consumer-driven sources of information to form product judgments and make purchase decisions (Batra & Keller, 2016; Daowd et al., 2021). Myriad

information sources are increasingly influencing the paths that lead consumers to the purchases they make and have made the journey down those paths more complex (Court et al., 2009; Ngarmwongnoi et al., 2020; Srinivasan et al., 2016).

In recent years, eWOM has emerged as a popular information source. Researchers have examined various types of eWOM communication, such as blogs (Pan et al., 2007), expert and consumer reviews (Vermeulen & Seegers, 2009), social network sites (Johnson Jorgensen & Ha, 2019), and online influencers (Borau-Boira et al., 2023). Unlike advertising, eWOM is not a marketer-supported source of information, and it is considered more credible than advertising (López & Sicilia, 2014). Consumer reviews are considered legitimate and trustworthy, as they are posted mainly by shoppers who have experienced the product or service of interest and share their opinions for the benefit of others (Hennig-Thurau et al., 2004; Hussain et al., 2017; K. H. Yoo & Gretzel, 2008). Statistics suggest that more than 84% of global consumers trust online reviews, whereas online advertising is trusted by only 42% of consumers (Bloem, 2017). Examining the integration of these information sources is crucial, as each source uniquely shapes consumer perceptions, yet consumers often perceive them as elements of a cohesive brand narrative. By unraveling these dynamics, marketers can craft more credible, consistent, and impactful communication strategies that resonate deeply and drive stronger engagement and trust.

Online reviews and advertising are important sources of information, and consumers often integrate the information emanating from these sources to form product judgments (Jones et al., 2009; Luan et al., 2019). Technology now makes it possible for marketers to target consumers who have visited a particular website, searched for a specific product, or consumed product-related information (e.g., online reviews, blog posts) almost in real-time (Lambrecht & Tucker, 2013). These advancements allow marketers to present and sequence targeted communications to accompany consumer-driven content, such as online reviews and blogs.

Often, the integration of information is not straightforward because consumers may combine a variety of messages, such as information that reflects different viewpoints that are in favor of or against a particular brand. Using experimental studies, we examine the extent to which online reviews and advertising persuade consumers compared to the impact of either individually. In Study 1, we tested the role of two psychological mechanisms (skepticism toward advertising and priming) that may explain the causal relationship between the type of communication (multi-source vs. single-source communication) and communication effectiveness. The study exposed subjects to eight media conditions, manipulating sources, message content, and source sequence. In Study 2, we used eye-tracking to examine the influence of message content and source sequence on subjects' attention toward various elements in the stimuli. It is important to note that we considered only positive online reviews in our studies, although, in reality, all positive, neutral, negative, and double-sided reviews coexist. Examining reviews with different valence was out of our scope, as it required additional treatment levels, further complicating the study design, or required additional studies.

This research makes multiple contributions to the literature. First, this study examines the synergistic effects of online reviews and advertising, a widely prevalent yet unexplored phenomenon. Second, we consider how the interplay of message sequence and content influences communication effectiveness. Third, this investigation delves into the psychological mechanisms that likely lead to the synergistic effects of multi-source communications. Lastly, in the second study, we used eye-tracking to measure participants' responses as an alternative to the commonly used yet less robust self-reported measures. While previous studies focus on marketer-controlled messaging, this research examines how consumer-generated content (e.g., reviews) interacts with advertising to influence attitudes and purchase intentions. The study also fills the gap in message variation effects, analyzing whether similar or varied messages across sources enhance cognitive engagement. This research advances IMC theory by integrating objective attention measures with psychological constructs and offers actionable insights for digital advertising strategies. The findings of this study should help marketers better strategize their marketing communication endeavors.

The remainder of this article is structured as follows. First, we provide a brief literature background, explain the constructs, and then present the specific hypotheses. Next, the methodology section explains how the experiment was conducted. Finally, we describe and discuss the results. The paper concludes with research implications and the scope of future studies.

## **BACKGROUND**

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### ***INTEGRATED MARKETING COMMUNICATION***

Integrated marketing communication (IMC) asserts that marketing communication is more effective when messages (communications) are delivered through multiple sources in a well-coordinated manner with a converged voice. This phenomenon is often referred to as synergy, “the linkages that are created in a receiver’s mind as a result of messages that connect to create impact beyond the power of any one message on its own” (Moriarty, 1996, p. 333). Porcu et al. (2017, p. 694) define IMC as “The stakeholder-centred interactive process of cross-functional planning and alignment of organisational, analytical and communication processes that allows for the possibility of continuous dialogue by conveying consistent and transparent messages via all media to foster long-term profitable relationships that create value.” IMC literature has largely focused on how consumers integrate information from multiple sources and the extent to which the manifested persuasive effects differ from the persuasive effects of single-source communications. Persuasiveness is largely measured in terms of change in consumers’ attitude toward advertisements (AA<sub>d</sub>) or other communication sources, attitude toward brands (AB), and purchase intention (PI) (Fishbein & Ajzen, 1997; Smith & Vogt, 1995).

Researchers have examined communication synergies across various contexts, including integration across a particular medium and within and across communication tactics (also referred to as communication mix elements or communication programs) (Lane Keller, 2001). Integration across a medium consists of communication that is consistent throughout the medium, for example, television advertising (C. Yoo et al., 2009) and print advertising (Burnkrant & Unnava, 1987), while integration within a communication tactic focuses on the integration of communication using various mediums within a tactic (e.g., a combination of television and radio advertising) (Edell & Keller, 1989). At the broadest level, integration has been examined across communication tactics, for example, the integration of advertising and publicity (Kim et al., 2010; Loda & Coleman, 2005) and of advertising and WOM (Smith & Vogt, 1995).

Recent research has focused on consumer response to information integrated from multiple sources, such as social media and traditional marketing (Kumar et al., 2017), business-to-business (B2B) and social media marketing (Gruner & Power, 2018), online broadcast media and interactive media (Dong & Li, 2018), and integrated campaigns across television, the Internet, and mobile TV (Lim et al., 2015). Overall, these studies revealed that the persuasive influence of exposure to well-integrated sources is stronger than that of repeated exposure to a single source. These synergistic effects are usually attributed to differences in the various psychological mechanisms involved when individuals integrate information (Kim et al., 2010; Voorveld et al., 2011). More recently, IMC research has examined consumer integration of new-age communication channels such as chatbots (Khoa, 2021), social media (Rehman et al., 2022), content management systems (Das, 2021), etc.

Consumer response to integrated digital and traditional media is especially relevant today due to the fragmented media landscape and evolving consumer behaviors. Research shows that 72% of consumers prefer an omnichannel experience that blends online and offline interactions (McKinsey & Company, 2022). Brands that integrate digital (social media, search ads) with traditional media (TV, print) experience a 35% higher engagement rate and 60% greater brand recall (Nielsen, 2023). The convergence of media ensures consistency, enhances reach, and strengthens persuasion, making integrated strategies essential in modern marketing. In the next section, we explore key theoretical frameworks that form the basis for our hypothesis development.

## ***PSYCHOLOGICAL MECHANISMS UNDERLYING THE INTEGRATION OF INFORMATION***

There has been a long-standing interest in understanding the psychological processes that shape consumer responses in communication research (Preacher & Hayes, 2008). While studies on multi-source communication synergies acknowledge the role of psychological mechanisms in influencing outcomes, few have explicitly examined these mechanisms in detail. Notably, we found only one study (Voorveld et al., 2011) that explored these mechanisms in the context of consumer integration of TV advertisements and website information. Their findings identified forward encoding and multiple source perception as key drivers of stronger persuasive effects, while image transfer showed no significant impact. Forward encoding refers to the process where initial exposure to information enhances the cognitive processing of subsequent messages, leading to stronger memory retention and persuasion. When consumers first encounter credible content (e.g., online reviews), they encode it as a reference point, influencing how they later process related advertisements. On the other hand, multiple source perception is the consumers' tendency to evaluate information differently based on the diversity of sources. When messages originate from both marketer-controlled (e.g., advertisements) and independent sources (e.g., online reviews), consumers perceive the information as more credible and persuasive (Voorveld et al., 2011).

Given the critical role of psychological mechanisms in multi-source communication, this study examines skepticism toward advertising and priming as key factors in shaping consumer responses to integrated messaging from online reviews and display advertising. These mechanisms and other essential variables influencing information assimilation are analyzed within the Integrated Marketing Communication (IMC) framework to provide a deeper understanding of their impact in the following section.

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Forward encoding refers to the process where initial exposure to information enhances the cognitive processing of subsequent messages, leading to stronger memory retention and persuasion. When consumers first encounter credible content (e.g., online reviews), they encode it as a reference point, influencing how they later process related advertisements. This aligns with Petty and Cacioppo's (1986) Elaboration Likelihood Model (ELM), which suggests that individuals process information through either the central route (deep, effortful cognitive processing) or the peripheral route (heuristic-based, less effortful processing). In the case of forward encoding, early exposure to a credible source enhances central route processing, leading to stronger attitudes and more enduring persuasion.

Similarly, multiple source perception reflects consumers' tendency to evaluate information differently based on the diversity of its sources. When messages originate from both marketer-controlled (e.g., advertisements) and independent sources (e.g., online reviews), consumers perceive the information as more credible and persuasive (Voorveld et al., 2011). From an ELM perspective, multiple sources act as peripheral cues, signaling credibility and reducing skepticism, particularly for consumers not engaging in deep cognitive elaboration. By integrating diverse sources, marketers can increase message acceptance across both high-involvement and low-involvement audiences, making multi-source communication more effective.

### ***SKEPTICISM TOWARD ADVERTISING***

Skepticism toward advertising is defined as the “tendency toward disbelief of advertising claims” (Obermiller et al., 2005, p. 309). This disbelief may not be limited to claims made in the advertisement – it may also pertain to the perceived motive of the advertiser, the value of the information contained in the advertisement, and other related issues. The literature suggests that consumers are skeptical toward advertising, so they cope with such persuasive episodes by engaging in tactics like discounting the advertising message (Calfee & Ringold, 1994; Obermiller et al., 2005). Studies show that skepticism toward advertising significantly influences attitudes toward advertisements, the believability of advertising claims, and the perceived influence of and perceived untruths in advertisements (Obermiller et al., 2005; C. Yoo & MacInnis, 2005). Further, higher levels of skepticism lead to less attention, advertisement avoidance, zapping, and reduced reliance on information contained in advertising (Baek & Morimoto, 2012; Obermiller et al., 2005).

Studies examining communication synergies show that exposure to advertising across multiple mediums (Chang & Thorson, 2004; Lim et al., 2015) or with other tactics (e.g., publicity) leads to stronger levels of persuasion (Dong & Li, 2018; Kim et al., 2016; Loda & Coleman, 2005; Voorveld et al., 2011; Wang, 2006) and increased sales (Kumar et al., 2017). The literature attributes such synergistic effects to the enhanced credibility that results when multiple sources communicate the same or similar information, especially when any of those sources is not marketer-supported (Kim et al., 2010). Conversely, consumers are skeptical of advertising and often consider the stated claims inauthentic, so they discount such messages (Calfee & Ringold, 1994; Obermiller et al., 2005). However, online consumer reviews should not elicit such detrimental reactions, as marketing does not support this type of information (Bickart & Schindler, 2001), so it is perceived as more credible than advertising (Chen & Xie, 2008; Dong & Li, 2018). Thus, when consumers integrate the same or similar messages received through both a positive consumer review and an advertisement, their trust in the advertisement should increase. In other words, under such conditions, consumers should process advertising with less skepticism, making the multi-source communication more persuasive. Thus, we hypothesized the following:

- H1a:** Subjects under multi-source conditions will be less skeptical of advertisements than subjects exposed to repeated advertising, which will lead to stronger (b<sub>i</sub>) AAd, (b<sub>ii</sub>) AB, and higher (b<sub>iii</sub>) PI.

### ***ROLE OF EXPOSURE SEQUENCE***

Sequence plays an important role when consumers are presented with information about a particular topic through multiple sources (Loda & Coleman, 2005; Voorveld et al., 2011). The integrated information response model (IIRM) explains how the strength of consumers’ beliefs is influenced by the sequence in which the messages are presented (Smith & Swinyard, 1982). When consumers are exposed to a credible initial message source (e.g., WOM, product trials, and so on), a powerful information base for attitudinal development is created (Loda & Coleman, 2005). However, initial exposure to advertising is likely to create a relatively weaker attitudinal base (Bickart & Schindler, 2001; Fishbein & Ajzen, 1997).

Research on source sequence reveals that initial exposure to online interactive media leads to higher message acceptance and message response than exposure to broadcast media (Dong & Li, 2018), and initial exposure to publicity significantly increases message acceptance of and response to the subsequent advertisement (Loda & Coleman, 2005). On the other hand, initial exposure to negative WOM reduces the perceived credibility of the advertisement as well as subjects’ attitudes toward the brand and purchase intentions (Smith & Vogt, 1995).

Thus, initial exposure to a more credible source should elevate consumers’ trust toward a subsequent advertisement when both sources contain similar information, making the review advertisement sequence more persuasive (Flanagin & Metzger, 2013). This effect should result from the decreased

level of skepticism that subjects elicit while processing the advertisement due to their initial exposure to the review. Therefore, we further hypothesized the following:

- H2a:** Subjects who are first exposed to a review under multi-source conditions will be less skeptical toward an advertisement than subjects who were first exposed to the advertisement, which will lead to stronger (b<sub>i</sub>) AAd, (b<sub>ii</sub>) AB, and higher (b<sub>iii</sub>) PI.

### ***ROLE OF SIMILAR VS. VARIED INFORMATION***

Consumers often endorse product information that is unlike the product information endorsed in the advertisement for the same product. Previous research in the information processing literature suggests that varied messages stimulate consumers' thinking more than messages of a similar type (Kim et al., 2016; Wang, 2006). This is because consumers attempt to reconcile the differences in such messages and, thus, engage in more cognitive processing (Chang & Thorson, 2004). Additionally, varied messages from multiple sources are perceived as independent pieces and are often processed more diligently (Harkins & Petty, 1987; Wang, 2006). Therefore, we proposed the following:

- H3a:** Subjects **exposed** to varied messages under multi-source conditions will be less skeptical toward the advertisement than subjects exposed to similar messages, which will lead to (b<sub>i</sub>) stronger (b<sub>i</sub>) AAd, (b<sub>ii</sub>) AB, and higher (b<sub>iii</sub>) PI.

### ***PRIMING***

Priming refers to the effect that a preceding stimulus has on a consumer's reaction to a subsequent stimulus. Consumers are more likely to actively process a message if they have attended (were primed by) similar information earlier (Edell & Keller, 1989); that is, the information in the first stimulus may act as a "teaser," leading to more attention, arousal, or curiosity when the related stimulus is subsequently encountered (Edell & Keller, 1989; Voorveld et al., 2011). This interest may stimulate deeper processing and easier encoding of the message, which can facilitate more effective communication (Voorveld et al., 2011). This may not hold true if the second communication consists of an exact copy of the first, which may lead to reduced attention (Unnava & Burnkrant, 1991). Voorveld et al. (2011) found that exposure to cross-media sources resulted in more priming than repeated exposure to the same TV commercial. Moreover, credible and expert sources tend to be more engaging and processed more fervently than untrustworthy sources, leading to stronger attitudes (Banerjee et al., 2017; Chaiken & Maheswaran, 1994).

Therefore, if the information is sufficiently processed during the first exposure, repeated exposure to the same information through the same source would disinterest the customer. On the other hand, when information about the same topic comes from an alternate source and/or in a different form, the recipient is likely to be motivated to process it. The recipient may expect this source to provide an alternative viewpoint about the topic. Thus, subjects exposed to multiple sources are likely to engage in more priming compared to subjects exposed to the same source multiple times. Moreover, the enhanced priming should result in more cognitive processing, which is likely to generate stronger attitudes and behavior (Voorveld et al., 2011). As such, we put forth the following hypothesis:

- H4a:** Subjects exposed to multiple sources will engage in more priming than subjects exposed to a single source, which will lead to (b<sub>i</sub>) AAd, (b<sub>ii</sub>) AB, and higher (b<sub>iii</sub>) PI.

Priming plays an important role when sources convey varied messages. Usually, varied messages convey differing viewpoints. Varied messages can highlight the benefits of a product that were not discussed in a previous message, use separate creative elements or communication themes, be presented by a different spokesperson, or be distinct in other ways. Previous research considering varied message strategies revealed that consumers are motivated to allocate more cognitive capacity to make sense of varied messages (Srull & Wyer, 1989) because they process initial and subsequent messages in relation to each other and form an integrated perception based on both (Maheswaran & Chaiken, 1991). Further, increasing the number of message sources intensifies information-processing

activities (Harkins & Petty, 1987) and elicits more thought (Edell & Keller, 1989). Also, exposure to a novel stimulus containing a slightly different message can attract more attention than exposure to the same source (Putrevu & Lord, 2003). Thus, it is expected that varied messages would lead to more priming compared to the same message. Further, this is expected to enhance subjects' attitudes and responses. This led to our next hypothesis:

**H5a:** Subjects exposed to varied messages under multi-source conditions will engage in more priming than subjects exposed to similar messages, which will lead to stronger (b<sub>i</sub>) AAd, (b<sub>ii</sub>) AB, and higher (b<sub>iii</sub>) PI.

H1–H5 were evaluated using self-reported measures in Study 1. However, to enhance the robustness of the findings, Study 2 incorporated a behavioral approach – eye-tracking – to provide objective validation. The following section presents the theoretical foundation and corresponding hypotheses for the eye-tracking study, which was conducted separately to strengthen the research further.

### ***EXAMINING MULTI-CHANNEL COMMUNICATION USING EYE-TRACKING***

In advertising research, eye-tracking methodologies offer significant advantages over self-reported measures. They provide precise, real-time data on visual attention, capturing the dynamics of gaze behavior that self-reports often miss (Bell et al., 2018). This approach minimizes biases such as social desirability and recall inaccuracies inherent in self-reporting. Moreover, eye-tracking uncovers subconscious responses, offering insights into automatic visual attention processes that participants might be unaware of. By capturing objective behavioral data, eye-tracking enhances the validity of findings and offers a deeper understanding of consumer interactions with advertisements. The eye-mind hypothesis (Just & Carpenter, 1976) asserts that the focal point at which an individual's eyes are directed can indicate the topic on which that individual's thinking is centered. In the context of information processing, attention can be seen as a cognitive resource allocated by an individual by exerting mental energy to the incoming stimuli or media messages (Bae, 2019).

Visual attention is paramount in decision-making, as most information acquisition and processing is driven by the visual system. As eye-tracking can effectively and unobtrusively gauge a subject's attention level, researchers continuously emphasize the use of eye-tracking methods to validate and complement self-reported measures influenced by both bottom-up and top-down processing factors (Buschman & Miller, 2007; Massaro et al., 2012). Bottom-up factors relate to the characteristics of the design elements (e.g., font, color, layout) of the stimulus being processed, whereas top-down factors are invoked by the pre-existing traits and states of the consumer (e.g., prior exposure to similar messages, brand familiarity, level of product involvement). In other words, eye-tracking data helps us to understand actual rather than self-reported differences in visual attention caused by differences in stimuli (bottom-up) and various psychological (top-down) factors.

Although eye-tracking methods have been widely used in the context of marketing and advertising (see Wedel and Pieters (2008) for a review), studies have rarely used eye-tracking to examine responses to multi-source communications. The only such study we came across (Pieters et al., 1999) demonstrated that attention duration decreased as much as 50% when subjects saw the same print advertisement a second time. Recently, Bae (2019) found that individuals with high levels of skepticism tend to spend more time (total fixation duration) processing ads with a negative emotional appeal than ads with a positive emotional appeal. Moreover, highly skeptical individuals gazed more on heuristic cues than those with lower skepticism levels.

In the integration of information encountered through online reviews and advertising, it is expected that subjects would pay more attention when information in the review and advertisement is varied. As discussed previously, this should occur due to both priming and skepticism toward advertising. In other words, subjects are likely to mentally recapture the message seen earlier (priming) and reconcile it with the existing (varied) message, thus increasing the attention span towards the information contained in the stimuli when they see varied messages. Nevertheless, when an advertisement and review contain similar information, the subjects are likely to be more skeptical and, thus, should scrutinize



elements endorsing review credibility (e.g., name of the reviewer, reviews website domain name) more attentively. Thus, the following hypotheses were formulated:

- H6:** Compared to **similar** messages, varied messages in advertisement and review induce longer total fixation duration towards (a) heading and (b) product attribute information.
- H7:** In the ad-review **sequence**, compared to varied messages, similar messages induce greater total fixation duration towards the review credibility attributes.

The next section discusses the methods used to conduct the experimental research.

## STUDY 1

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### *RESEARCH METHODOLOGY*

The data were collected in an experimental setting. A 2 (message source: single versus multiple) x 2 (message sequence: advertisement then review versus review then advertisement) x 2 (message content: similar message versus varied message) between-subjects design was employed. As noted earlier, the study aimed to measure differences arising from multiple exposures (either to the same or different information sources). A post-test-only design was used rather than differences arising due to single versus multiple exposure conditions. This design ensured that subjects were not biased due to any leaning arising from previous exposures (Loda & Coleman, 2005).

Young adults (18 to 24 years old) were considered ideal candidates, as they spend ample time learning about products and services on the internet (Johnson Jorgensen & Ha, 2019). Participants were MBA students and were recruited from a large university based out of Hyderabad, India. To ensure pre-tests do not influence main study results, students were recruited from different batches with ages ranging between 19 and 23 years ( $M=21.7$ ).

#### **Pre-tests**

Three pre-tests were conducted prior to developing the experimental stimulus. Simple Random Sampling without Replacement (SRSWR) method was used to pick samples from the sampling frame for both the pre-tests and the main study. The first pre-test was conducted to identify suitable product categories. Subjects ( $N=27$ ) were asked to list at least three product categories that they were likely to buy in the near future and for which they would refer to both advertising and online reviews before making the purchase decision. Subjects were also asked to report the level of involvement for each product category on a seven-point, four-item Purchase Decision Involvement (PDI) scale. Out of 87 responses, four products received mentions from more than seven subjects and had an above-average PDI score. These products were tablet computers, laser printers, hard disk drives, and mobile phones.

The second pre-test was conducted to finalize products for the stimuli development. A product with high utility benefits over hedonic benefits was preferred, and the decision-making behavior for such products was often straightforward (Hirschman & Holbrook, 1982). A pre-test was conducted to identify the perceived utility versus hedonic benefits of the four products. A total of 35 subjects were asked to rate the product categories on a seven-point, ten-item hedonic/utilitarian (HED/UT) scale (Voss et al., 2003). The printer ( $M=5.01$ ,  $SD=0.664$ ) and hard disk drive ( $M=5.09$ ,  $SD=0.724$ ) were both perceived to be equally utilitarian and were more utilitarian than mobile phone ( $M=4.26$ ,  $SD=0.702$ ) and computer tablet ( $M=4.56$ ,  $SD=0.683$ ). Thus, printers and hard disk devices were shortlisted as suitable produces for Study 1 and Study 2, respectively.

The third pre-test was conducted to identify equally important attributes across the two product categories required to create varied messages (one for Study 1 and Study 2). A different set of subjects ( $N=25$  for printer,  $N=24$  for hard disk drive) who had recently purchased these products were recruited. Subjects were asked to list and rank four product attributes that they considered important on a seven-point scale. For the printer, printing speed and printing resolution (clarity) were

mentioned the most (20 and 19 times, respectively, with 16 subjects mentioning both of these). To examine if both the product attributes (printing speed and printing resolution) were equally important, a paired sample *t*-test was performed ( $N=16$ ). The results revealed that both the attributes (Printing resolution:  $M=5.43$ ; Printing speed:  $M=5.56$ ) were equally important ( $t[15]=-0.415$ ,  $p=0.684$ ) and thus were suitable to create advertisements and reviews with equally convincing messages with varied product attributes). For the hard disk drive, higher storage capacity appeared as the most desired attribute, which was mentioned by 22 subjects ( $M=6.4$ ). The next two attributes mentioned were data transfer speed and drive portability (19 and 16 times, respectively, with 14 subjects mentioning both). These two attributes appeared to be equally compelling (Speed:  $M=5.42$ ; Portability:  $M=5.28$ ,  $t[14]=-0.46$ ,  $p=0.32$ ) and were used to design varied messages for study 2.

### Stimuli development

Two versions of display advertisement and online consumer reviews were created by a professional advertising agency. To nullify any pre-conceived notions that may affect the responses, the ad stimuli were made for a fictitious brand of laser printer named LaserPro. The display ad used an image of the product, a headline focusing on the specific attribute of the product (either speed or resolution), and ad copy. The ad copy further explained the particular product attribute. The ad copy was kept to a minimum so that subjects were motivated to read the same.

Online consumer reviews were carefully embedded in a web page that resembled an online reviews website. The fictitious review website was named TrueReviews.com. Though the tone conveying the message in the consumer review was less formal, the number of arguments and argument strength was similar to that of the advertisement. A manipulation check was performed to confirm information present in online reviews and advertisements containing messages with two different product attributes was equally convincing. Subjects ( $N=77$ ) rated the display advertisement and reviews with two different messages. The seven-point bi-polar scale had the following items: strong/weak, persuasive/unpersuasive, convincing/not convincing, and good arguments/bad arguments (Cronbach's alpha ranged between 0.75 and 0.86). ANOVA revealed that all four stimuli (two advertisements and two reviews) were equally convincing ( $F(3, 130)= 0.710$ ,  $p=0.746$ ). Display ads and reviews used as stimuli are shown in Appendix 1. A similar process was followed to create a review webpage for Study 2.

### Variables and measurement scales

There were three independent variables: Message Source (single *versus* multiple), Message Sequence (advertisement, review versus review, then advertisement), and Message Content (similar message versus varied message). Skepticism toward advertising and priming served as mediators. Dependent variables included attitude towards advertisement (AA<sub>d</sub>), attitude towards reviews (AA<sub>r</sub>), attitude towards brand (AB), and purchase intention (PI). Established measurement scales were borrowed and used. Table 1 presents the scales used and scale-wise Cronbach's alpha values.

**Table 1. Variables, measurement scales used, and Cronbach's  $\alpha$  values**

Variables	Measurement items	Original scales	Cronbach's $\alpha$
<b>Attitude towards online review/ advertisement</b>	Not likeable-likable Not interesting-interesting, Bad-good Not appealing-appealing	De Pelsmacker and Van Den Bergh (1996)	.86/.91
<b>Attitude towards brand</b>	Unpleasant-pleasant Of low quality - Of high quality Unfavorable-favorable Bad-good	Grier and Deshpandé (2001)	.89
<b>Purchase intention</b>	Likelihood to buy Likelihood to recommend	Baker and Churchill (1977)	.88

Variables	Measurement items	Original scales	Cronbach's $\alpha$
<b>Skepticism toward advertising</b>	I can depend on getting the truth from this advertisement. This advertisement's aim is to inform me. I believe this advertisement is informative. This advertisement is truthful. This advertisement is a reliable source of information about the quality and performance of LaserPro. This advertisement provides me with essential information about LaserPro. This advertisement tells the truth well. This advertisement presents a true picture of the LaserPro printer. I feel I've been accurately informed after viewing this advertisement.	Tutaj and van Reijmersdal (2012)	.93
<b>Priming</b>	I became more interested in the second ad after seeing the first ad. I wanted to know more about the brand after seeing the first ad. I wanted more information about the brand after seeing the first ad	Voorveld et al. (2011)	.90

### Sample, data collection, and procedure

Study 1 recruited 340 MBA and BBA students from a large business school in Hyderabad, India. Different subjects were recruited for the pre-tests and main study, though with similar sample characteristics. For the main study, the mean sample age was 21.7 years, with 178 (56.15%) male and 139 (43.85%) female respondents. Approximately 25% of the students were above 25 years of age, 30% between 22 and 25 years, and the remaining 45% were below 22 years. Nevertheless, the sample had diverse social-cultural backgrounds, representing more than 80% of Indian states. The sample reported an average of 20.5 hours of internet usage per week, of which 5.2 hours were for general web browsing. The student sample was appropriate for this study as they actively engage with multiple sources to shape opinions, demonstrate high involvement in purchase decisions, and exhibit relative homogeneity, reducing potential confounding effects on dependent variables. To enhance representation across age groups and mitigate biases related to education level and age, quota sampling was employed to ensure balanced participation from both MBA and BBA students.

The experiment consisted of four different exposure combinations: advertisement-advertisement, review-review, advertisement-review, and review-advertisement. These exposures were segregated into two levels of message content (similar message versus varied message), resulting in eight exposure treatments. Stimulus with printing resolution as a product attribute was shown for treatments with similar messages, while both printing resolution and printer speed were used, in that order, when treatments had varied messages. Data were collected only after subjects viewed both the stimulus materials. The experiment followed a between-subjects design, where participants were randomly assigned to one of the treatment conditions. This approach ensures that each participant is exposed to only one condition, reducing the risk of learning effects, demand characteristics, or fatigue that might arise in a within-subjects design. Random assignment further strengthens internal validity by evenly distributing individual differences across conditions, minimizing selection bias and potential confounding variables. This design is particularly useful when measuring responses that could be influenced by prior exposure, ensuring that observed effects are attributable solely to the treatment rather than external factors.

The experiment was conducted in a computer lab. Subjects were provided with a booklet containing instructions, a form to fill in basic details, and scales to capture dependent measures. Subjects were instructed to read the instructions carefully before the start of the experiment. Additionally, respondents were motivated to ask any questions before the experiment started. Subjects were instructed that they would spend the necessary time (self-pacing) evaluating the stimuli before filling in the questionnaire. The 7-minute documentary was shown to ensure cognitive separation between exposures, minimizing carryover effects or priming biases that could influence responses. This neutral stimulus helped reset participants' cognitive state, ensuring their evaluation remained unaffected by prior exposure. It maintained engagement without causing fatigue, enhancing the internal validity of the study to ensure cognitive spatiality between the two exposures. Subjects filled in the responses after they had been exposed to both stimuli. The experiment lasted for about 35 minutes. In total, 317 usable questionnaires were received, where respondents had answered all the questions.

The results were analyzed using ANOVA to examine group differences and Preacher and Hayes' (2008) Model 4 mediation analysis to assess the indirect effect of the independent variable on the dependent variable through skepticism towards advertising and priming. The analysis was conducted using SPSS Version 24, with the PROCESS macro developed by Preacher and Hayes installed to perform mediation analysis. This macro facilitated bootstrapped confidence intervals to assess the significance of indirect effects, enhancing the robustness of the mediation analysis. To ensure the robustness of the analysis, key assumptions for ANOVA and mediation analysis were tested. For ANOVA, the normality of residuals was assessed using the Shapiro-Wilk test, Q-Q plots, and histograms, confirming that the data followed an approximately normal distribution. Levene's Test indicated homogeneity of variances across groups ( $p > 0.05$ ), satisfying this assumption. The independence of observations was ensured through random assignment, preventing dependencies within the dataset. For mediation analysis (Preacher and Hayes' (2008) Model 4), assumptions of linearity, multicollinearity, homoscedasticity, and absence of influential outliers were tested. Scatter plots and correlation analysis confirmed linearity, while Variance Inflation Factor (VIF) values were below the acceptable threshold, indicating no multicollinearity concerns.

## **RESULTS**

### **Manipulation checks**

The results of the manipulation check revealed an insignificant difference in the argument strength ( $F(3,313) = .854, p=0.465$ ) for the four texts present in the stimulus. Scale reliability using Cronbach's  $\alpha$  was calculated to measure the psychometric properties of the variables. All the scales were highly reliable ( $\alpha > 0.70$ ) and listed in Table 1.

### **Main results**

To test H1a, data were subjected to dummy variable regression analysis, with treatment conditions (multi-source condition vs. repeated advertising) regressing on skepticism toward advertising. Results revealed a significant difference in level of skepticism ( $\beta=-0.80, p< .001$ ). Subjects exposed to advertisement and review had lower skepticism toward advertising ( $M=2.40, SD= 0.73$ ) than subjects exposed to repeated advertising conditions ( $M=3.20, SD= 0.93$ ). Therefore, H1a was supported. H1b stated that a lower level of skepticism toward advertising in multi-source conditions would positively influence AAd, AB, and PI in multi-source conditions than repeated advertisement conditions. Results revealed subjects in the multi-source condition had significantly stronger AAd ( $\beta= 0.75, p<0.001, M=4.68, SD= 0.70$ ), AB ( $\beta=1.07, p< .001, M=5.22, SD= 0.47$ ) and PI ( $\beta=1.12, p<0.001, M=4.69, SD= 0.62$ ) than people who saw advertisement twice (AAd:  $M=3.93, SD= 0.93$ ; AB:  $M=4.15, SD= 0.91$ ; PI:  $M=3.58, SD=0.93$ ). To examine if skepticism toward advertising mediated the relationship between exposure conditions and source effectiveness measures, direct and indirect effects were tested using bootstrapping procedures using PROCESS macro 2.15 for SPSS 24.0 (Hayes, 2013). The bootstrapping procedure provides upper and lower-level confidence intervals (ULCI and LLCI), where the analysis shows significance if the ULCI and LLCI do not include zero.

This method yields more accurate results for studies with fewer sample sizes and overcomes the limitations of the approach given by Baron and Kenny (1986). Bootstrapped confidence intervals (CIs) provide a robust way to assess the significance of indirect effects in mediation analysis, particularly when traditional parametric assumptions may not hold. In this study, the bootstrapping procedure involved resampling the data 5,000 times to generate upper-level (ULCI) and lower-level (LLCI) confidence intervals for the estimated indirect effects. The key criterion for significance is that the confidence interval does not include zero, indicating that the indirect effect is consistently positive (or negative) across resampled datasets. In the context of this study, the bootstrapped 95% CIs for skepticism toward advertising confirm its mediating role in the relationship between exposure conditions and source effectiveness measures (AAd, AB, and PI). Since all reported confidence intervals exclude zero, it provides strong statistical evidence that skepticism significantly influences source effectiveness, thereby supporting hypotheses H1b(i, ii, iii). This interpretation strengthens the findings by demonstrating that the observed mediation effect is unlikely due to random variation and provides a more reliable test of indirect effects than traditional methods (e.g., Baron & Kenny, 1986), particularly in studies with smaller sample sizes. Effects were computed for each of 5,000 bootstrapped samples with 95% confidence intervals. Skepticism toward advertising exerted a significant indirect effect on all three source effectiveness measures, i.e., AAd (95% CI: 0.41 – 0.80,  $p < 0.001$ ), AB (95% CI: 0.25 – 0.54,  $p < 0.001$ ) and PI (95% CI: 0.30 – 0.61,  $p < 0.001$ ). Therefore, H1b(i, ii, iii) were supported (refer to Table 2 and Table 3).

**Table 2. Summary of regression analyses for influence of exposure conditions on process variables**

	Independent variable	Dependent variable	N	B	t value
H1a	Repeated Advertising (D) vs. Multi-Source	Skepticism	238	-0.80***	-7.22
H2a	Advertisement First (D) vs. Review First	Skepticism	159	-0.25*	-2.19
H3a	Similar Message (D) vs. Varied Message	Skepticism	159	-0.22	-1.94
H4a	Repeated Source (D) vs. Multi-Source	Priming	317	0.93***	9.35
H4a	Repeated Advertising (D) vs. Multi-Source	Priming	238	1.17***	9.78
H5a	Similar Message (D) vs. Varied Message	Priming	159	0.28*	2.49

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table 3. Influence of exposure conditions on media effectiveness variables using scepticism as mediator**

		Independent variable	Dependent variable	N	B	SE	t value/(95% confidence interval)	Results
H1b	(1)	Repeated Advertising (D) vs. Multi-Source	AAd	238	0.75***	0.11	6.98	Indirect Effect
	(2)	Repeated Advertising (D) vs. Multi-Source			0.15*	0.08	2.03	
	(3)	Skepticism			-0.75***	0.04	-18.38	
	(4)	Indirect Effect			0.60***	0.10	(0.41 - 0.80)	
	(1)	Repeated Advertising (D) vs. Multi-Source	AB	238	1.07***	0.09	12.01	Indirect Effect
	(2)	Repeated Advertising (D) vs. Multi-Source			0.69***	0.08	8.66	
	(3)	Skepticism			-0.48***	0.04	-11.41	
	(4)	Indirect Effect			0.38***	0.07	(0.25 - 0.54)	
(1)	Repeated Advertising (D) vs. Multi-Source	PI	238	1.12***	0.10	10.00		

		Independent variable	Dependent variable	N	B	SE	t value/(95% confidence interval)	Results
	(2)	Repeated Advertising (D) vs. Multi-Source			0.68***	0.09	7.52	Indirect Effect
	(3)	Skepticism			-0.55***	0.05	-11.52	
	(4)	Indirect Effect			0.44***	0.08	(0.30 - 0.61)	
H2b	(1)	Advertisement First (D) vs. Review First	AAd	159	0.31**	0.11	2.92	Direct Effect
	(2)	Advertisement First (D) vs. Review First			0.15	0.08	1.90	
	(3)	Skepticism			-0.67*	0.05	-12.65	
	(4)	Indirect Effect			0.17*	0.08	(0.02 - 0.32)	
	(1)	Advertisement First (D) vs. Review First	AB	159	0.13	0.07	1.79	Direct Effect
	(2)	Advertisement First (D) vs. Review First			0.07	0.07	1.05	
	(3)	Skepticism			-0.23*	0.05	-4.78	
	(4)	Indirect Effect			0.11*	0.06	(0.01 - 0.26)	
	(1)	Advertisement First (D) vs. Review First	PI	159	0.24*	0.10	2.48	Direct Effect
	(2)	Advertisement First (D) vs. Review First			0.15	0.09	1.65	
	(3)	Skepticism			-0.38***	0.061	-6.16	
	(4)	Indirect Effect			0.09*	0.044	(0.01 - 0.18)	

Note: \* $p < 0.05$ , \*\* $p < .01$ , \*\*\* $p < .001$

D = Dummy variable, where dummy variable is the reference category. The first row (1) displays the direct effect of the dummy variable on the dependent variable (first regression analysis). The second (2) and third row (3) display the combined effect of the dummy variable and the process variables on the campaign results (second regression analysis). The fourth row (4) displays the bias-controlled bootstrapping results using 5000 bootstrap samples with a 95% confidence interval computed by determining the indirect effects at the 2.5th and 97.5th percentiles.

H2a examined the influence of source sequence (advertisement first vs. review first) on the level of skepticism toward advertising. Subjects who saw the review first had significantly less skepticism toward advertising ( $\beta = -0.25, p < 0.05, M = 2.28, SD = 0.73$ ) than subjects seeing the advertisement first ( $M = 2.53, SD = 0.72$ ), thus supporting H2a. The review-first condition resulted in less skepticism due to source credibility theory and the Integrated Information Response Model (IIRM) (Smith & Swinyard, 1982). Online reviews, perceived as credible and consumer-driven, establish trust before exposure to an advertisement, reducing skepticism. According to ELM (Petty & Cacioppo, 1986), prior exposure to trustworthy content primes consumers to process subsequent marketer-controlled messages with lower resistance. This aligns with research showing that initial exposure to credible sources enhances ad effectiveness and reduces skepticism (Loda & Coleman, 2005; Voorveld et al., 2011). Thus, the sequence effect supports H2a, as trust built through consumer-generated content makes subsequent advertising more persuasive.

Further, H2b tested if a lower level of skepticism toward advertising mediated the relationship between source sequence and source effectiveness. Regression results reveal that subjects who saw the review first had stronger AAd ( $\beta = 0.31, p < 0.01, M = 4.85, SD = 0.70$ ) and higher PI ( $\beta = 0.24, p < 0.05, M = 4.82, SD = 0.61$ ) than subjects who saw advertisement first (AAd:  $M = 4.52, SD = 0.65$ , and PI:  $M = 4.58, SD = 0.62$ ). Although AB was stronger for subjects exposed to the review first ( $M = 5.28, SD = 0.46$ ) than for advertisement ( $M = 5.15, SD = 0.47$ ), the difference was not significant ( $\beta = 0.317, p > 0.05$ ). Moreover, skepticism toward advertising mediated relationship between exposure sequence for all the three media effectiveness measures, i.e., AAd (95% CI: 0.02 – 0.32,  $p < 0.05$ ), AB (95% CI: 0.01 – 0.26,  $p < 0.05$ ) and PI (95% CI: 0.01 – 0.18,  $p < 0.05$ ). Therefore, H2b<sub>(i, ii, iii)</sub> were supported.

Regression results did not reveal a significant difference in skepticism toward advertising ( $\beta = -0.224$ ,  $p > .05$ ) for subjects exposed to varied messages ( $M = 2.291$ ,  $SD = 0.63$ ) and similar messages ( $M = 2.522$ ,  $SD = 0.812$ ). Therefore, H3a was not supported. Consequently, the possibility of skepticism toward advertising intervening in the effects of message variability on media effectiveness was nullified, and analysis for H3b was not conducted. The non-significant results for H3a suggest that message variation alone may not reduce skepticism, highlighting the need to explore factors like source credibility and prior brand perceptions. Practically, this implies that varying ad content may boost engagement but not necessarily trust, reinforcing the importance of integrating consumer-trusted sources like reviews. Future research should examine how these effects vary across product types and audience segments to refine marketing strategies.

H4 and H5 examined if multi-source communication would lead to an increased level of priming and this would influence media effectiveness. Priming was higher in multi-source condition ( $\beta = 0.93$ ,  $p < 0.001$ ;  $M = 5.55$ ,  $SD = 0.73$ ) as compared to repeated source ( $M = 4.61$ ,  $SD = 1.02$ ), supporting H4a.

In the case of H4b, mediation analysis using 5000 bootstrap samples with 95% CI revealed priming partially mediated effect of exposure conditions on AAd (95% CI: 0.31 – 0.67,  $p < 0.001$ ), AB (95% CI: .24 – 0.47,  $p < 0.001$ ) and PI (95% CI: 0.27 – 0.52,  $p < 0.001$ ). Therefore, H4b (i, ii, iii) were all supported (refer to Table 2 and Table 4). The partial mediation suggests that while priming enhances ad attitudes and purchase intentions, exposure conditions also have a direct impact. This implies that multi-source communication strengthens persuasion through priming and mechanisms like credibility or message reinforcement. Future research could explore additional mediators like cognitive elaboration or trust to deepen understanding.

Results show subjects involved in significantly more priming when exposed to varied messages ( $M = 5.70$ ,  $SD = 0.57$ ;  $\beta = 0.28$ ,  $p < 0.05$ ) as compared to similar messages ( $M = 5.41$ ,  $SD = 0.84$ ). Moreover, when a message was varied, subjects had significantly higher AAd ( $M = 4.81$ ,  $SD = 0.67$ ;  $\beta = 0.26$ ,  $p < .05$ ) and PI ( $M = 4.81$ ,  $SD = 0.56$ ;  $\beta = 0.23$ ,  $p < 0.05$ ) as compared to the similar message (AAd:  $M = 4.55$ ,  $SD = 0.70$ ; PI:  $M = 4.58$ ,  $SD = 0.67$ ). Though AB was higher in the case of varied message conditions ( $M = 5.29$ ,  $SD = 0.45$ ) than similar message conditions ( $M = 5.15$ ,  $SD = 0.47$ ), this difference was not significant ( $\beta = 0.14$ ,  $p < 0.05$ ).

Mediation analysis revealed that skepticism was positively related to AAd ( $\beta = 0.104$ ; 95% CI: 0.02 – 0.21,  $p < 0.05$ ), AB ( $\beta = 0.07$ ; 95% CI: 0.02 – 0.14,  $p < 0.05$ ) and PI ( $\beta = 0.11$ ; 95% CI: 0.02 – 0.23,  $p < 0.05$ ). In addition, results show that the direct effect of the difference in exposure condition on AAd and PI became non-significant (AAd:  $\beta = 0.15$ ,  $p > 0.05$ ; PI:  $\beta = 0.11$ ,  $p > 0.05$ ) when controlling for differences in priming, thus suggesting full mediation. Thus, though hypothesis H5a, H5b(i), and H5b(iii) were supported, H5b(ii) was not supported.

The observed differences across AAd, AB, and PI suggest that varied messages primarily influence immediate ad evaluations (AAd) and purchase intent (PI) but have a weaker effect on long-term brand attitudes (AB). This could be because ad attitudes and purchase intent are more responsive to message novelty and engagement, whereas brand attitudes develop over time through repeated exposure and reinforcement. Future research could explore whether longer-term brand perceptions are influenced by sustained exposure to varied messaging. The finding of full mediation indicates that the effect of message exposure on ad attitudes (AAd) and purchase intention (PI) operates entirely through priming, meaning that varied messages enhance engagement, which in turn drives persuasion. This is significant for media effectiveness, as it suggests that simply varying messages is not enough – its impact depends on how well it activates cognitive processing (priming). This insight highlights the importance of designing ad sequences that maximize cognitive engagement to improve persuasion outcomes.

**Table 4. Influence of exposure conditions on media effectiveness variables using priming as mediator**

		Independent variable	Dependent variable	N	B	SE	t value (95% confidence interval)	Results
<b>H4b<sub>i</sub>, b<sub>ii</sub>, b<sub>iii</sub></b>	(1)	Repeated Source (D) Vs. Multi-Source	AAAd	238	0.75***	0.11	6.98	Indirect Effect
	(2)	Repeated Source (D) Vs. Multi-Source			0.28*	0.11	2.43	
	(3)	Priming			0.40***	0.05	7.73	
	(4)	Indirect Effects			0.47***	0.09	(0.31 - 0.67)	
	(1)	Repeated Source (D) Vs. Multi-Source	AB	238	0.71***	0.08	9.04	Indirect Effect
	(2)	Repeated Source (D) Vs. Multi-Source			0.36***	0.08	4.60	
	(3)	Priming			0.38***	0.04	9.61	
	(4)	Indirect Effects			0.35***	0.06	(0.24 - 0.47)	
	(1)	Repeated Source (D) Vs. Multi-Source	PI	317	0.70***	0.09	7.62	Indirect Effect
	(2)	Repeated Source (D) Vs. Multi-Source			0.31**	0.09	3.33	
	(3)	Priming			0.42***	0.05	9.07	
	(4)	Indirect Effects			0.39***	0.06	(0.27 - 0.52)	
<b>H5b<sub>i</sub>, b<sub>ii</sub>, b<sub>iii</sub></b>	(1)	Similar Message (D) Vs. Varied Message	AAAd	159	0.26*	0.11	2.37	Direct Effect
	(2)	Similar Message (D) Vs. Varied Message			0.15	0.10	1.50	
	(3)	Priming			0.37***	0.07	5.24	
	(3)	Indirect Effects			0.10*	0.05	(0.021 - 0.21)	
	(1)	Similar Message (D) Vs. Varied Message	AB	159	0.14	0.07	1.87	Direct Effect
	(2)	Similar Message (D) Vs. Varied Message			0.06	0.07	0.92	
	(3)	Priming			0.26***	0.05	5.54	
	(4)	Indirect Effects			0.074*	0.03	0.017 - 0.14)	
	(1)	Similar Message (D) Vs. Varied Message	PI	159	0.23*	0.10	2.35	Direct Effect
	(2)	Similar Message (D) Vs. Varied Message			0.11	0.09	1.30	
	(3)	Priming			0.40***	0.06	6.65	
	(4)	Indirect Effects			0.11*	0.05	0.02 - 0.23	

Note: \* $p < 0.05$ , \*\* $p < .01$ , \*\*\* $p < .001$

D = Dummy variable, where dummy variable is the reference category. The first row (1) displays the direct effect of the dummy variable on the dependent variable (first regression analysis). The second (2) and third row (3) displays the combined effect of the dummy variable and the process variables on the campaign results (second regression analysis). The fourth row (4) displays the bias-controlled bootstrapping results using 5000 bootstrap samples with 95% confidence interval computed by determining the indirect effects at the 2.5th and 97.5th percentiles.



## ***STUDY 2***

### **Methodology**

The second study used eye-tracking measures and examined hypotheses 6 and 7. A total of 125 undergraduate students from two different universities in Hyderabad, India, participated in the study. The students were recruited based on an invite sent to their respective email addresses. All participants received a gift voucher from a prominent online retailer equivalent to a value of Rs. 200 (~USD3). Of the 125 participants, data could not be collected from two participants due to poor eye movement, resulting in 123 final responses. Sixty-three respondents were female, while the remaining 60 were male. Participant ages ranged from 20 to 26 years, with the mean age being 22.9 years (SD 1.43).

Data was collected in a classroom and converted into a laboratory for the purpose of the study. Individual participants were invited to the classroom at a pre-scheduled time. Every participant was asked to sign a consent form and was briefed about the study. They were informed that the purpose of the study was to understand their perceptions about the design execution of the stimuli. Participants provided their basic information, such as name, gender, age, etc., before they were exposed to the stimuli. The gaze data was collected using a GazePoint GP3 HD eye-tracking device, which was connected to a 22-inch LG monitor set at a resolution of 1920x1080 pixels. The eye-tracker was configured to collect data at a sampling frequency of 150 Hz and was calibrated using 5-point calibration. Participants were allowed to see the stimulus as long as they desired and were allocated randomly to one of the four treatment conditions. The study had 2 (Sequence: Advertising First versus Review First) X 2 (Message Content: Similar versus Varied) between-subject design. After recording the eye movement data, participants were thanked, debriefed, and handed the gift voucher. On average, the experiment lasted for about 15 minutes.

### **Stimuli development**

The procedure to develop stimuli was similar to Study 1. Based on the pre-tests done in Study 1, two versions of print advertisements and online reviews web pages were created for a fictional brand of hard disk drive. The hard disk drive was named SX D5i. The design elements included an image of the product, a headline focusing on the specific attributes of the hard disk drive (data transfer speed or portability), and a body copy. It was ensured that the design was not cluttered and that eye fixations on each of the areas of interest (AOI) could be captured accurately.

### **Measures**

Eye-tracking enabled the objective measurement of attention, which was assessed by the time spent on the area of interest, measured as total fixation duration (TFD). Fixation refers to the eye position when the eyes rest for a brief moment in a specific region and visual information is gathered. The length of fixation is an indication of attention, which results in information processing. A longer TFD for a particular AOI means greater information elaboration, which was measured in seconds. Three separate areas of interest (AOIs) were drawn. Two of these were drawn on the advertisements and reviews, i.e., ad/review headings (AOI 1) and ad body copy/review text (AOI 2), while the third was drawn around the review credibility attributes (AOI 3). The area of the particular AOI was kept proportionately consistent with the overall layout across the ads and online reviews and was set up at 120% of the actual area, as suggested in previous studies (Orquin et al., 2016). This ensured that possible noise in the eye-tracking data, chances of peripheral attention, and variations in calibration did not influence the eye-tracking data collection across AOIs. The specific AOIs are depicted in Appendix B.

Though not part of any specific hypothesis, two additional eye-fixation measures were collected apart from TFD. These were the time to first fixation on an AOI and fixation count. Time to first fixation represented the time elapsed between showcasing the stimuli and the subjects' first fixation on the AOI. The fixation count on an AOI represented the number of times an AIO was seen (see Table 5).

**Table 5. Means of the eye-tracking measures per condition for the three AOIs**

Condition	N	Average total fixation duration (in seconds)			Average time to first fixation (after seconds)			Average fixation count (frequency)		
		AOI 1	AOI 2	AOI 3	AOI 1	AOI 2	AOI 3	AOI 1	AOI 2	AOI 3
Ad-Review (Similar Message)	30	6.75	10.85	3.12	2.57	8.72	6.20	2.30	7.10	3.20
Review-Ad (Similar Message)	32	6.26	8.14	–	2.20	6.25	–	1.80	4.50	–
<b>Overall Average (Similar Message)</b>	<b>62</b>	<b>6.50</b>	<b>9.45</b>	<b>3.12</b>	<b>2.38</b>	<b>7.48</b>	<b>6.20</b>	<b>2.05</b>	<b>5.80</b>	<b>3.20</b>
Ad-Review (Varied Message)	31	8.70	11.41	2.26	2.85	7.30	5.80	2.60	7.50	2.90
Review-Ad (Varied Message)	30	6.84	8.64	–	2.00	6.75	–	2.35	5.65	–
<b>Overall Average (Varied Message)</b>	<b>61</b>	<b>7.79</b>	<b>10.05</b>	<b>2.26</b>	<b>2.42</b>	<b>7.02</b>	<b>5.80</b>	<b>2.47</b>	<b>6.57</b>	<b>2.90</b>

*Note:* AOI 1: Heading, AOI 2: Product attribute information, AOI v3: Review credibility

## RESULTS

As the purpose of the study was to explore the influence of initial exposure on subsequent exposure, the comparisons were made only for the second stimulus in the sequence. Subjects exposed to the varied message ( $M=7.80$ ,  $SD=2.55$ ) reported significantly longer TFD ( $t(121) = 4.35$ ,  $p<0.001$ ) for heading as compared to subjects exposed to the similar message ( $M=6.50$ ,  $SD=2.88$ ). However, TFD for product attribute information was not significantly longer ( $t(121) = 1.10$ ,  $p=0.13$ ) for the varied message condition ( $M=10.05$ ,  $SD=9.72$ ) as compared to the similar message ( $M=9.45$ ,  $SD=8.59$ ). Thus, only H6a was supported.

Furthermore, as hypothesized in H7, a similar message did induce longer fixation on the review credibility attributes. The TFD was significantly longer ( $t(56) = 2.70$ ,  $p<0.01$ ) when subjects saw a similar message ( $M=3.12$ ,  $SD=1.67$ ), as compared to a varied message ( $M=2.26$ ,  $SD=1.37$ ) in the advertisement-review sequence. Thus, subjects paid more attention to the review source when both advertisement and review had a similar message. Overall, the eye-tracking-based results largely supported the results of Study 1.

## DISCUSSION

These studies conceptualize and examine the role of psychological mechanisms in explaining the synergistic effects of multi-source communications. Moreover, the role of exposure sequence and message variation were also examined. Mediation analyses were performed to establish if skepticism toward advertising and priming were responsible for persuasive effects in cases of multi-source communications. Eye-tracking revealed changes in subjects' attention due to variations in communication source and sequence.

Overall, the results uncovered that subjects exposed to multi-source communications exhibited less skepticism toward advertising, leading to stronger persuasive effects. This suggests that when consumers obtain brand-oriented information from non-market-supported sources, their evaluation of similar information from the marketer becomes favorable. These results are similar to the findings of Voorveld et al. (2011). Moreover, the sequence in which subjects processed information affected their level of skepticism toward advertising and communication effectiveness. These findings support the previous conflicting results (Kim et al., 2010) and support the conclusion that initial exposure to more credible information sources is more impactful. Our results were similar to those produced by Loda and Coleman (2005), who found that initial exposure to publicity increased message acceptance and response. Notably, our study goes a step further by validating the underlying psychological mechanisms that are assumed to exist in the previous literature.

Contrary to our expectations, skepticism toward advertising did not differ in cases of different versus similar messages in reviews and advertisements. However, subjects did have stronger attitudes and purchase intentions when the message varied across sources. Two competing theories can explain this. First, given that online consumer reviews are a non-biased source of information, subjects did not discount the advertisement containing similar information after seeing the review. However, this may not have been the case if the subjects integrated the expert reviews and advertising, as consumers often suspect marketers pay expert reviewers. Second, it could be that other mechanisms, such as priming, could induce synergistic effects due to varied messages. Previous studies have also theoretically attributed such effects to message variation based on the contrast effect theory (Eagly & Chaiken, 1993). For example, Wang (2006) examined the superiority of varied messages and affirmed that the "varied message condition might alleviate the degree of suspicions that the audiences might have regarding the purpose and the interdependence of the (publicity) article under the similar messages condition" (p.167). On the other hand, eye-tracking revealed that subjects were more attentive to credibility attributes when the message was similar, thus suggesting a greater degree of skepticism. These conflicting results warrant a future inquiry and testify to the importance of a multi-method investigation. Eye-tracking data and heat maps further manifest the differences in attention due to

message variation across sources. Notwithstanding, unlike TFD for advertisement and review heading, TFD for product attribute information was not significantly longer for product attribution. However, heat maps reflect slightly intense gazes for both the AOIs in the varied message conditions.

## IMPLICATIONS

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To the best of the authors' knowledge, this is the first study to examine the role of skepticism toward advertising and priming as psychological mechanisms responsible for synergies in the context of multi-source communications. Based on consumer-IMC, these studies incorporate the integration of two popular sources of information: online reviews and display advertising. The findings add to the body of knowledge in the domain of advertising psychology, depicting how consumers pre-disposed to a particular information source (online review) exhibit different levels of skepticism toward advertising and differ in the level of priming. Our research fills a gap in the literature by specifically testing mechanisms that are often assumed to be responsible for the synergetic effects of multi-source communications and are often stated as research limitations or recommended for future study (Kim et al., 2010; Wang, 2006). Moreover, these studies further extend the IMC literature by integrating information sources that differ in the extent to which the marketer can control them. Previous studies have primarily focused on information sources that were totally marketer-initiated. Nevertheless, research has shown that marketers can indirectly harness the power of positive online reviews and make marketing decisions based on them. Our findings are relevant in the prevailing multi-source tactics-driven marketplace and provide a valuable theoretical contribution to the existing IMC literature.

This research provides marketing managers with a better understanding of how online reviews can enhance the effectiveness of display advertising. Results revealed that consumers' pre-disposition to a credible source of information enhances the effect of the second information source that communicates a similar or the same message. Thus, when consumer reviews portray favorable brand perceptions, they can be leveraged by strategically integrating advertising efforts. Marketers should create and support avenues through which consumer-generated information can be communicated. Moreover, the findings reveal that consumers are likely to engage in more priming, be more attentive, and tend to exhibit less skepticism toward advertising when online consumer reviews reinforce the perceptions created by those advertisements. It seems online reviews strengthen the weakly held attitudes created by advertising, facilitating the development of more persistent attitudes and behavioral intentions. This suggests that managers may benefit from advertising message strategy by considering the information that consumers are expressing or are likely to express in reviews of the product whenever possible. For example, marketers may reap more benefits by focusing on specific product attributes in advertisements that are not being discussed in consumer reviews. This strategy can be easily applied by marketers by leveraging behavioral targeting and displaying advertising alongside online reviews or post-consumer exposure to them.

Further, for all exposure conditions, consumers were more persuaded when they were exposed to online reviews and advertisements than when they were exposed to advertisements alone. This finding should further strengthen managers' confidence in using multiple communication sources and leveraging credible sources of information, such as online reviews. In addition to advertising, these sources may include publicity, third-party product/brand endorsements, consumer reports, expert reviews, and consumer reviews, among others. Our research holds significant societal implications. The findings suggest that by strategically combining marketer-driven communication channels, such as advertising, with consumer-driven channels like online reviews, marketers can achieve greater synergy than using a single channel alone. This approach benefits both consumers and marketers, as it provides consumers with a well-rounded view, incorporating perspectives from both fellow consumers and marketers. Such a balanced strategy empowers consumers to make more

informed and thoughtful purchasing decisions, reducing the reliance on purely persuasive marketing tactics. This contributes to a more conscious and discerning consumer culture.

From a practical standpoint, these insights emphasize the need for marketers to strategically integrate consumer-generated content (e.g., online reviews) with advertisements to enhance credibility and reduce skepticism. Furthermore, the results suggest that message sequencing and variation should be carefully designed to maximize priming effects and improve persuasion outcomes. Future research should explore additional psychological mechanisms, such as cognitive elaboration and trust, across diverse product categories and real-world settings to further refine communication strategies.

## LIMITATIONS AND FUTURE RESEARCH

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This study has its share of limitations, some of which can be addressed in future research. First, these studies were performed in a controlled laboratory environment, which, at best, can come close to creating the environment that consumers experience in real life but cannot replicate. Therefore, more studies examining similar phenomena should be considered, specifically using field-based data. This would elicit more insights and validate the results of this study. Second, these studies were based on utilitarian products. Consumers' use of heuristics for information searches and processing in the case of hedonic products is likely to be different than when utilitarian products are involved. Therefore, future research focusing on hedonic products can bring new insights. Moreover, this study incorporated online reviews that were positive in nature. Previous research has shown that negative valance information is often evaluated critically and impacts consumers' persuasion differently (Kim et al., 2010). Future research should focus on identifying and examining more psychological mechanisms than those tested in this study. Another limitation of this study is with respect to its sample. As the study used only the undergraduate student population as its sample, that is, from a particular city in India, the results of this study may not be generalizable. It is recommended that similar studies be conducted across varied sample populations to conclude that the examined psychosocial mechanisms and communication synergies are a more generalized phenomenon. Lastly, it will be worthwhile if the presence and role of these mechanisms can be validated through other robust techniques, such as thought listing.

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## APPENDICES

### APPENDIX A: DISPLAY ADVERTISEMENT AND ONLINE REVIEW WEBPAGE (STUDY 1)

#### Display Advertisement

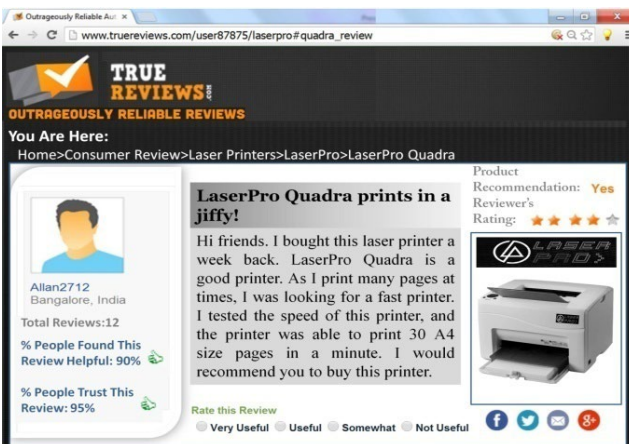


Printing Resolution as  
Product Attribute

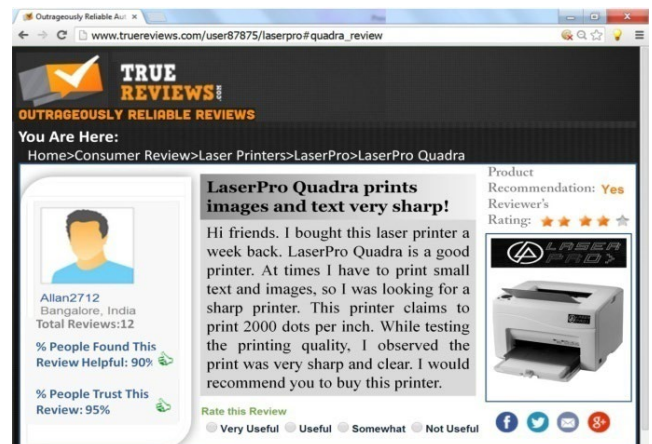


Printing Speed as  
Product Attribute

#### Online Review

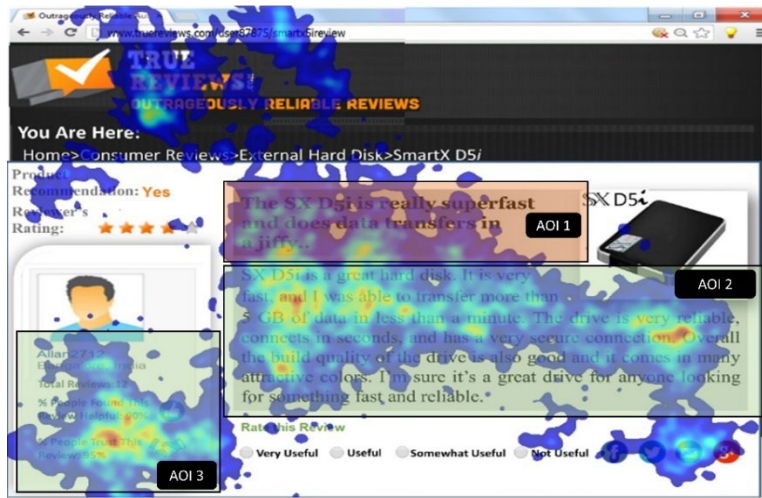


Printing Speed as  
Product Attribute

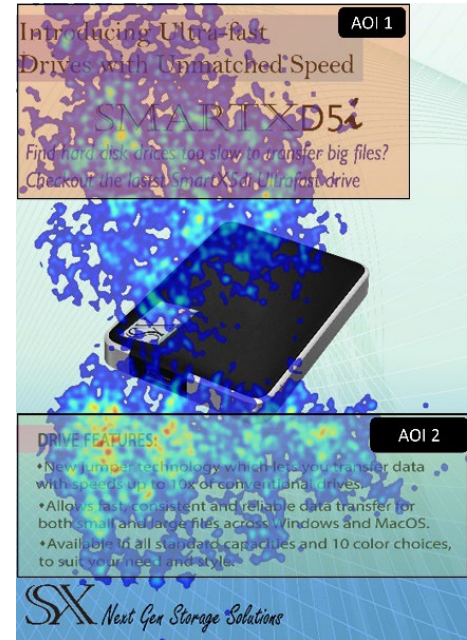


Printing Resolution as  
Product Attribute

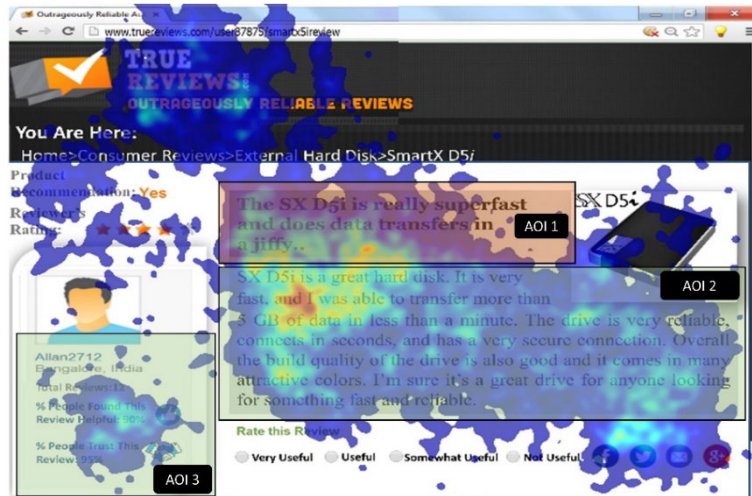
## APPENDIX B. AOIs AND HEAT-MAPS DEPICTING GAZE FOR DISPLAY ADVERTISEMENTS AND ONLINE REVIEW ACROSS TREATMENTS



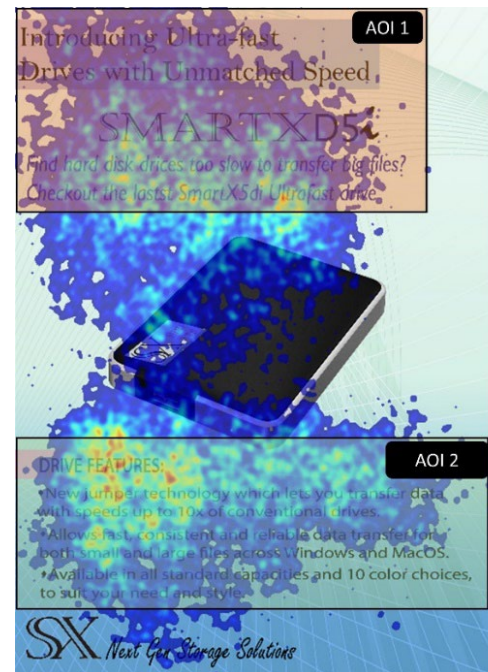
Treatment: Review-Ad (Similar)



Treatment: Ad-Review (Similar)



Treatment: Review-Ad (Varied)



Treatment: Ad-Review (Varied)

Note: The above heat maps are for the second stimuli in the particular treatment. Images for only one of the two stimuli versions created (data transfer speed or portability) are shown for easier comparison.

## AUTHORS

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**Rishi Dwesar (PhD)** is an Associate Professor in the Marketing and Strategy Department at ICFAI Business School, IFHE University, Hyderabad, India. His research areas include native advertising, examining online reviews, consumer information processing, and innovative teaching pedagogies. He has published several papers and case studies in reputed journals, such as *Management Decision*, *Sustainable Futures*, *Environment, Development, and Sustainability*, to name a few. His case study on Go-Pro is a Harvard Business School Publishing best seller. He has won several best paper awards and is an active consultant for SMEs.



**Ankita Sharma (PhD)** is an Assistant Professor in the Marketing and Analytics Department at IILM University, Greater Noida, India. Her research area includes technology adoption, green energy, climate change, and sustainability. She has published several research papers and book chapters in reputed peer-reviewed journals, like *Marketing Intelligence and Planning*. She has a blend of industry and academic experience and is passionate about teaching brand management, marketing analytics, strategic management, and Entrepreneurship Development. She has received Best Paper awards from IIM Kozhikode and Sheth Consortium.



**Megha Tyagi** is a Doctoral Fellow at ICFAI University, Dehradun, where she is pursuing her PhD in Management. She teaches marketing and economics courses, bringing academic expertise and practical insights to her students. A distinguished scholar, she earned her MBA from ICFAI Business School, Bangalore, as a rank holder and gold medalist. She holds a Bachelor's in Journalism and Mass Communication from Amity University. Her research interests lie in digital marketing, consumer behavior, and branding, with a strong passion for consumer psychology and neuromarketing. Through her work, she aims to explore the evolving dynamics of consumer decision-making in the digital age.