

THE DUEL BETWEEN NATIVE ADS AND DISPLAY ADS: NO ONE TAKES ALL

Ai-Yun Hsieh
Department of Marketing
Chinese Culture University
Hwa-Kang Rd, 11114, Taipei, Taiwan,
xay@ulive.pccu.edu.tw

Shao-Kang Lo¹
Department of Marketing
Chinese Culture University
Hwa-Kang Rd, 11114, Taipei, Taiwan,
shaokang@ulive.pccu.edu.tw

ABSTRACT

This research aims to discuss the advantages and disadvantages of native and display ads and argues that the winner-takes-all rule does not apply here. We conducted an experimental study and manipulated the two forms of advertising (native ad & display ad) on the news website page. Voluntary participants were recruited to the laboratory and were given the reading task. Participants' gaze behavior, brand attitude and brand memory were measured in this study. Across two experiments, this research demonstrated that native ad generates more consumer gaze and greater brand memory than do display ad, but display ads more effectively increase brand attitudes. Findings from this study provide insights into the difference advertising effectiveness between display ads and native ad. The winner-takes-all rule does not apply because different formats affect different aspects of consumer behavior. The finding suggests that advertisers should define their goal when choosing the types of ads to purchase.

Keywords: Native Ad; Display Ad; Schema congruity; Persuasion knowledge model; Limited capacity Model of mediated message processing

1. Introduction

Oatly, a Swedish oat milk company, spent US\$5.5 million on a commercial that aired during the 2021 Super Bowl. The 30-second commercial—featuring the company's CEO singing “Wow! No cow!”—was viewed by over 100 million people, thereby garnering significant global attention for their vegan milk. Super Bowl commercials, though expensive, are highly effective. Advertisers are typically more concerned about the selected media and tools' effectiveness than their cost. Remarkably, the Internet is the most widely and frequently used advertising medium. Advertisers have shifted their budgets from traditional media (e.g., TV, newspapers, magazines, and radio) to a search-engine-centered interface for more precise audience targeting (Köster et al. 2015; Peng et al. 2014; Rzemieniak 2015).

Nevertheless, industry and academia have questioned the effectiveness of display ads on webpages. Cho and Cheon (2004) reported that banner ads' click-through rate is gradually decreasing. Moreover, consumers avoid viewing (Drèze & Hussherr, 2003; Pasandaran & Mutmainnah, 2020) or focusing on (Chatterjee, 2008) banner ads when surfing the Internet. Benway (1999; 1998) defined this phenomenon as “banner blindness,” attributable to consumers experienced in Internet use establishing a “conviction” on where and in what form banner ads predominantly likely appear. That is, they have established a schema of banner ads (Liu et al., 2018), which causes them to intentionally avoid viewing display ads. This subconscious avoidance action is termed cognitive ad avoidance (Chatterjee, 2008).

Advertising practitioners have been attempting to bypass such ad schema—that is, discover a means to gain consumers' visual browsing behavior without them recognizing the presence of advertising—to attract advertisers to place ads. The most noticeable example is native ads, which refer to marketers placing paid content conforming to or

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¹ corresponding author

imitating the format or location of nonpaid editorial content by content publishers (Wojdyski & Evans, 2016; Wojdyski & Golan, 2016). As native ads resemble content publishers' content, viewers intuitively browse through the ad content when reading the editorial content (LaBrecque et al., 2024). Arguably, native ads facilitate more browsing behavior than display ads (Pasandaran & Mutmainnah, 2020). Does this imply that display ads should concede and allow native ads to dominate web advertising?

This study examines the advantages and disadvantages of native and display ads and postulates that the winner-takes-all rule does not apply here; that is, native ads are superior in gaining exposure and building brand memory, whereas display ads are more effective in enhancing brand attitudes. This study's findings enable advertisers to ascertain their marketing goals according to the brand life cycle and, thus, select the most efficient and effective advertising format.

2. Theoretical background

2.1 Display versus native ads

Advertising is the non-face-to-face presentation or promotion of ideas, goods, or services through various media paid for by sponsors (Kotler & Keller, 2011). Varied methods of Internet advertising are collectively termed web advertising, which originated with the launch of the online magazine *Hotwired* (HotWires.com) in 1994. The online magazine sold space on its webpage to AT&T, defining such advertising as banner ads (Cho & Cheon, 2004; Kaye & Medoff, 1998; Evans, 2009; Briggs & Hollis, 1997). Despite continuous innovations in advertising formats, banner ads remain the primary and most widely used display ads because of their high visibility (Cho & Cheon, 2004; Briggs & Hollis, 1997).

Banners are animated or static images stretching across the top, bottom, or sides of a webpage (Faber et al., 2004). Advertisers expect consumers to click on the display ads, which act as hyperlinks redirecting them to a webpage designated by the advertiser, aiming to affect consumer attitudes and behaviors toward products or brands by providing them with more in-depth information (Kes, 2011). However, banner ads' click-through rate is declining because of their voluntary exposure format, which necessitates them to be embedded on webpages and passively await viewing. Thus, voluntary exposure ads compete with editorial content for consumer attention. If consumers are focused solely on the content that they intend to view, they overlook or ignore voluntary exposure ads (Chatterjee, 2008). As mentioned earlier, Benway (1999; 1998) defined this phenomenon of banner-based voluntary exposure ads being overlooked as "banner blindness."

Advertisers have consistently tried capturing consumer attention and increasing the click-through rate (Drèze & Hussherr, 2003). To this end, they use flashing or enlarged banners and even display misleading or deceptive information, only to have the approach backfire. Dreze and Hussherr (2003) reported that prominent ads are negatively correlated with click-through rates. Further, scholars and advertisers have discussed the appropriateness of using click-through rate as a measure of banner ads' advertising effectiveness (Faber et al. 2004), arguing that in function and advertising effectiveness, banner ads resemble billboards: Both are more suitable when focusing on brand awareness, brand attitude, and other emotional variables rather than on click-through rate (Faber et al. 2004).

Native ads refer to the placement of paid content conforming to or imitating the format or location of nonpaid editorial content by content publishers (Wojdyski & Evans, 2016; Wojdyski & Golan, 2016; Wojdyski, 2016). Since approximately 2011, advertisers and platform operators have been drawn to the notion of native ads (Lee et al., 2016); the placement of native ads deviates from the conventional ad schema and disallows consumers from easily recognizing, avoiding, and skipping them (Cho & Cheon, 2004; Chatterjee, 2008; Benway, 1998; LaBrecque et al., 2024).

In recent years, online content publishers, social media operators, advertisers, and platform operators have developed varied native ad formats, which often confuse consumers and prevent them from differentiating between nonpaid editorial content and paid content (Wojdyski & Golan, 2016). Native ads exist in various forms and continue to diversify; examples include sponsored posts on social media, sponsored articles and videos on online content sites, sponsored links on search engines, recommendation blocks on content providers, and sponsored news on news sites (Wojdyski & Evans, 2016; Wojdyski & Golan, 2016). Irrespective of format, native ads are carefully designed to overcome the predicament of conventional ads no longer attracting consumer attention (Drèze & Hussherr, 2003). Online platform operators and advertisers consider native ads a crucial advertising approach (Boland, 2016).

2.2 Schema Congruity and Advertising Effectiveness: Native Ads Create Greater Brand Awareness

Display ads differ from traditional TV or radio ads, which require acquiring and utilizing all the bandwidth in a specific period to deliver messages (Drèze & Zufryden, 2000); hence, message reception remains uninterrupted unless the viewer takes the initiative to switch channels (Gustafson & Siddarth, 2007). By contrast, online banner ads must share bandwidth with other webpage elements. One display ad usually accounts for under 10% of the total webpage area. Therefore, display ads are easily ignored when consumer attention is focused on the main targeted content (Drèze

& Hussherr, 2003). Additionally, an individual's familiarization with a certain medium or a medium's inertial presentation of ads contributes to accumulating experience; thereby, the individual learns to distinguish ads from nonpaid editorial content. As mentioned earlier, banner ads always stretch across the top, bottom, or sides of a website, and this placement has become consumers' schema of banner ads (Liu et al., 2018). Upon entering a webpage, consumers immediately identify the presence of ads through pre-attentive processing and ignore or reduce exposure to them (Drèze & Hussherr, 2003; Chatterjee, 2008; Faber et al., 2004). Therefore, most banner ads are ignored (De Keyser et al., 2023; Duff & Faber 2011). Consumers with more web browsing experience demonstrate marked ad avoidance behavior (Janiszewski 1998) because experience is a crucial factor in schema establishment (Liu et al., 2018).

Schema, first introduced in Piaget's cognitive development theory (Piaget & Inhelder, 1969), is a hypothetical cognitive structure that guides perceptions, thoughts, and actions based on the prior knowledge of stimuli gained through experience, such as media exposure (McDaniel, 1999; Hsieh et al., 2016; Rumelhart & Ortony, 1977; Pelsmacker et al., 2019). People frequently use their accumulated knowledge of a schema to comprehend and judge the objects that they encounter (Kean & Albada, 2003). They understand a schema's cognitive structure based on the congruence between new knowledge and their self-schema (Verhellen et al., 2013). If new information fulfills expectations, perceptions are smooth and logical; congruent information's accumulation consolidates self-schema (Mandler, 1981; Warlaumont, 1997). The self-schema may adjust according to the new knowledge if new information is inconsistent with existing beliefs. New information that is extremely inconsistent with existing beliefs may be rejected or subcategorized to prevent a direct impact on the original schema (Mandler, 1981; Lynch & Schuler, 1994; Sujan & Bettman, 1989).

On a webpage, display ads typically surround the main editorial content. Thus, when consumers enter the webpage, they avoid viewing the four sides of the screen. Owing to their schema of display ads, consumers recognize the content on the four sides as ads. To avoid disturbance by ads and proceed with regular online surfing, consumers avoid looking at these display ad areas. Native ads operate on a simple principle: the utilization of consumers' schema of editorial content and presentation of information in the format of non-advertising content that consumers are familiar with. Based on their existing schema of webpages and ads, consumers mistake ads for editorial content and view them as such (Wojdyski, 2016). For example, native ads embedded in a news website may resemble the format, location, and appearance of the site's editorial content. Having activated the schema of the news-reading experience, consumers intuitively mistake the ad for a news article (editorial content; Carlson, 2015). Consequently, they do not engage in ad avoidance and, instead, exhibit increased gaze behavior in the section; only after reading the ad do they realize that they have mistaken it for editorial content. Accordingly, hypothesis 1 (H1) was proposed:

H1: Native ad generates more consumer gaze than do display ad.

2.3 Persuasion Knowledge Model and Advertising Effectiveness: Display Ad Generates Higher Brand Attitudes

According to the persuasion knowledge model (Friestad & Wright, 1994), consumers develop knowledge about persuasion and utilize this knowledge to cope with persuasion episodes. Specifically, persuasion knowledge refers to consumers' theories about persuasion, including their belief in the persuader's motives and strategies, the persuasion tactics' effectiveness and appropriateness, mediators that the persuader seeks to influence, and their own coping mechanisms in response to persuasion attempts (Campbell & Kirmani, 2000; Boerman et al., 2015). That is, the most basic persuasion knowledge model involves the target audience employing their persuasion knowledge to recognize an agent attempting to influence them and trying to cope with the persuasive event or strategy to avoid being affected (De Keyser et al., 2023).

Information receivers with persuasion knowledge understand how to respond to persuasive messages. Upon recognizing a persuasive attempt in messages from a party, consumers use their persuasion knowledge and select and execute the coping mechanism that they believe is effective and appropriate for countering the persuasive attempt (Friestad & Wright, 1994). Examples of so-called persuasive messages include ads; salespeople's words; and any picture, text, body language, or clue intended to influence consumers. Persuasion knowledge is dynamic and naturally formed. People can comprehend how the actions of persuaders (e.g., advertisers and salespeople) impact information receiver attitudes and behaviors by observing marketers and persuaders. To establish coping mechanisms, people observe how they and others cope with persuasive messages and such coping strategies' effectiveness. Persuasion knowledge continues developing throughout one's life and may vary across periods by culture and generation (Friestad & Wright, 1994).

As consumers engage in coping behavior only when they recognize the persuasive attempt in a message, the first step of persuasion knowledge involves developing the ability to distinguish persuasive messages (e.g., ads) from a

large amount of content (Boerman et al, 2015; John, 1999). That is, consumers' use of persuasion knowledge to cope with persuasive messages depends on the accessibility of ulterior persuasion motives and their cognitive capacity (Campbell & Kirmani, 2000). In sum, persuasion knowledge can be used only when a persuasive attempt is identified (Kirmani & Zhu, 2007). However, the persuasive attempt identified by consumers, being a product of subjective inference, is not necessarily the real persuasive message. Persuasion knowledge can be activated even in the absence of product placement by the brand. For example, consumers identify a car driven by an actor in a movie scene as a sponsored product. When individuals infer that a message's originator has hidden ulterior motives to influence them, the originator is perceived as slimy, insincere, and manipulative (Vonk, 1998). When consumers doubt the message originator's motives, their persuasion knowledge is activated, and thus, they tend to perceive the originator negatively (Campbell & Kirmani, 2000).

Native ads are designed to match, resemble, and imitate editorial content (Wojdyski & Evans, 2016; Wojdyski & Golan, 2016; Wojdyski, 2016), thereby preventing consumers from recognizing them through pre-attentive processing (Cho & Cheon, 2004; Chatterjee, 2008; Benway, 1998). When reading the main editorial content, consumers neither anticipate an ad's appearance in the area (judging per their ad schema) nor expect the content that they consume to be an ad. Upon realizing that the content they read is a persuasive message or an ad imitating editorial content (e.g., by reading native ads hidden in the editorial content or seeing an ad disclosure), consumers are convinced that the message sender deliberately disguised the persuasive message and, hence, perceive the brand as slimy, insincere, and manipulative. Consequently, consumers activate their persuasion knowledge (Stürmer & Einwiller 2023) and develop negative attitudes toward the brand. Although display ads are persuasive messages, they are placed in positions acknowledged by consumers' ad schema; consumers neither identify them as hidden, insincere, and manipulative messages nor immediately lower their brand attitudes. That is, for the same brand, display ads precipitate higher brand attitudes than native ads. Accordingly, hypothesis 2 (H2) was proposed.

H2: Display ads generate higher brand attitudes than do native ads.

2.4 LC4MP and Advertising Effectiveness: Native Ads Generate Higher Brand Memory

According to the limited capacity model of mediated message processing (LC4MP), mental resources are required to process messages, but people have a limited or fixed capacity of mental resources (Lang, 1995; Lang & Basil, 1998; Lang, 2000). Information processing involves a set of subprocesses occurring simultaneously, namely, encoding, storage, and retrieval (Baddeley et al., 2009; Lang, 2000; Sternberg & Sternberg, 2017). Any of these subprocesses can be executed cursorily or thoroughly depending on the amount of cognitive resources allocated to it, which determines the outcomes of the present and subsequent subprocesses. Therefore, combining the three subprocesses results in forming the memory of a message (Lang, 2000), which is a never-ending cycle (Baddeley et al., 2009).

Encoding involves obtaining environmental information and inputting it into the brain. Such information must reach relevant sensory receptors for it to enter the sensory store (Zechmeister & Nyberg, 1982), which is a virtual system for temporary storage with unlimited capacity. The information stored in the sensory store either disappears or is overwritten by new information unless selected and consolidated into short-term memory (also termed working memory; Lang, 2000). Failure to enter the sensory store or to be selected to enter short-term memory results in a future inability to retrieve such information from long-term memory.

Storage—that is, previously stored information—is necessary for and, thus, closely related to retrieval. Retrieval performance is inferior if the new information cannot be deeply integrated and stored into the existing associative memory network. This perspective aligns with Craik and Lockhart's (1972) levels of processing model, which contends that elaboration processing facilitates better information storage in memory. The more the links between new and old information, the more comprehensively new information can be stored. Therefore, the storage subprocess constitutes a spectrum, with poor storage (fewer associations and links) at one end and thorough storage (more associations and links) at the other (Lang, 2000).

People consciously and unconsciously select environmental information and perform the aforementioned subprocesses. Information selection studies have proposed various arguments. In this study, the orienting response proposed by Pavlov (1927) was adopted to explain the reaction to a sudden environmental stimulus and how we orient our sensory receptors toward the stimulus. The orienting response may occur in the face of sudden environmental stimuli, such as novel or signal stimuli (Ohman, 1979). Signal stimuli are meaningful cues that people learn and establish through their interpersonal relationships, culture, and everyday environments. A stimulus, after being defined as a signal, elicits an orienting response. For example, one's name is a meaningful signal, and thus, people focus on and respond to a stimulus in their surroundings that displays their name. Likewise, terms such as "big sale" and "available for a limited time only" are meaningful signals depending on our experience. Novel stimuli refer to environmental changes or unexpected events that trigger orienting responses. Examples include a person dressed in

purple among a group of people wearing green uniforms and the mention of Kung Pao chicken, which is Chinese cuisine, on a French restaurant's menu. When an orienting response is triggered, viewers allocate cognitive resources for cue processing (Campbell et al., 1997; Graham, 1997; Hoffman, 1997; Kimmel et al., 1979); that is, they orient their sensory receptors (e.g., eyes and ears) toward the stimulus (Boerman et al., 2015).

An orienting response is a mechanism that determines which types of sensory store information are selected into short-term memory (Ohman, 1979), thus enabling cognitive resources to automatically orient toward the stimulus. In the context of a webpage, consumers have limited experience with hidden ads imitating and embedded in editorial content (e.g., native ads), which does not (yet) exist in their schema of ads. Therefore, native ads or disclosure hints that result in consumers perceiving the information resembling editorial content as an ad are novel stimuli. Furthermore, ad disclosure hints include mentions of "ad," "promoted link," and "sponsored result." As these indicators are meaningful signals for consumers, who have learned to recognize them from daily life experiences, the orienting response makes consumers allocate cognitive resources to native ads, which, therefore, precipitate relatively superior encoding, storage, and information retrieval performance.

Per the persuasion knowledge model, consumers must devote resources to identify, analyze, interpret, and evaluate persuasive attempts when faced with messages, particularly hidden ones. Additionally, they should select and implement the coping mechanism that they deem effective and appropriate (Friestad & Wright, 1994). Compared with display ads, which conform to their schema of ads, consumers may choose to further engage with native ads to identify, analyze, interpret, and evaluate the information for selecting coping methods. That is, higher integration with the existing associative memory network and deeper processing occur, which naturally contribute to superior information retrieval performance (Craik & Lockhart, 1972). Accordingly, hypothesis 3 (H3) was proposed.

H3: Native ads generate greater brand memory than do display ads.

3. Method

This study adopted a quasi-experimental design. Since native ads and display ads compete for attention on webpage, a within-subjects design is more suitable for the experiment, allowing participants to be exposed to both types of ads simultaneously on the page. However, If the experiment controls the same content of two different forms of advertising (Logo, brand name, copywriting) on the same page, it is worried that reactive effects of experimental arrangements will affect the external validity, so different advertising content will be designed. In the experiment 2, to ensure that difference in the dependent variable are attributable solely to the advertising form, the between subjects design is adopted. The experiment will manipulate a single advertising format (native ad & display ad) on the news website page. The advertising content in the two treatments was controlled to be consistent, and the participants were randomly assigned to one of the two treatments.

3.1. Experiment 1

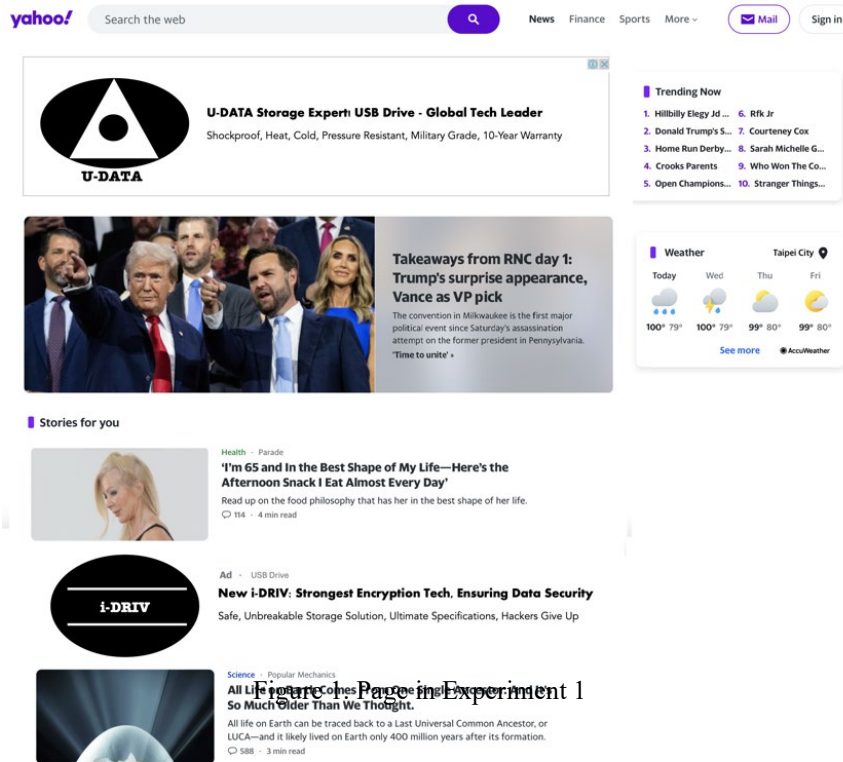
3.1.1 Procedure and Participants

Participants were invited to the laboratory and were asked to read the news headlines and editorial content on the news page, without being assigned specific browsing tasks. During the reading process, we used an eye tracker to record and analyze participants' browsing behavior. Afterward, the participants' attitude and memory toward the brand in the advertisement were measured. We recruited 109 volunteers with experience in browsing news websites, of which 58 were male and 51 were female. The average age is 25.38 (SD=3.94), and the average internet use experience is 12.26 years (SD=2.74).

3.1.2 Materials

In order to ensure that the website layout aligned with participants' advertising schema for display ads, this study imitated the most highly trafficked news website in the region where the experiment was conducted. We also designed a non-scrollable page to control both browsing time and the browsing scope. The display ad was placed at the top of the webpage in the form of banner ad, while native ad mimicked the news headline format and was inserted in the latest news list (see Figure 1). A flash drive was chosen as the advertising product because it is commonly used by participants. Additionally, a virtual brand was used to prevent participants' previous brand experience affecting the response to the research variables. Regarding brand selection, to eliminate the potential influence of participants' preferences for brand names and logo designs on the study results, a pilot test was conducted. A total of 31 participants were recruited to evaluate their attitudes toward 10 brand names designed by the researchers. Brand attitude was measured with single-item ten-point Likert scales adapted from Bergkvist and Rossiter (2007). The two brand names ranked 5th and 6th in average score were selected: U-DATA and i-DRIV. The attitude scores for U-DATA ($M = 5.53$, $SD = 0.629$) and i-DRIV ($M = 5.60$, $SD = 0.621$) showed no significant difference ($p = 0.681$). Two logo designs were also selected. One consisted of a circle in the middle of the triangle and with the brand name outside the logo (the attitude score: $M = 5.47$, $SD = 0.681$). The other is an oval with two horizontal lines with brand name in the middle (the

attitude score: $M=5.40$, $SD=0.621$). Both logos were designed in black and white, and no significant difference in attitude toward the two colors was found ($p = 0.694$). The two brands were randomly assigned as either a display or native ad. Half of the participants saw U-DATA as a display ad and i-DRIV as a native ad, while the other half saw i-DRIV as a display ad and U-DATA as a native ad.



Since the amount of information received is influenced by the time spent on the page, this study conducted a pilot test to determine the average reading time required by participants. A total of 28 participants read the experimental page. The results showed that the average reading time was 65.74 seconds ($SD = 2.86$). Therefore, we set the browsing time to 66 seconds. After this period, the system automatically redirected participants away from the page. Subsequently, their attitudes and brand memory toward the two advertised brands were measured.

3.2.3 Measurement

An eye tracker was used to record observation count and observation length while consumers viewed the two ads areas during the experiment. To ensure that the apparatus minimally obstructed and influenced the participants' behavior, the Mangold Vision Eye Tracker, a nonintrusive apparatus featuring a minimal eyeball scanning frequency of 60 Hz and the capacity to measure time in milliseconds, was used in this study.

Attitudes toward the brand was measured with single-item ten-point Likert scales adapted from Bergkvist and Rossiter (2007). Brand memory was assessed through a recognition-based method. We disassembled the brand elements into three components: the outer frame, the internal graphics, and the text. Each component contained both correct and incorrect elements, which can be recombined into eight brands variations. For example, in the U-DATA logo, the triangle was replaced with a square, the inner circle was changed to a heart shape, and the brand name was altered to T-EDEN. Similarly, in the i-DRIV logo, the oval frame was changed to a rectangular shape, the inner horizontal line was modified into an arc-shaped dashed line, and the brand name was changed to Y-DELE. Participants were asked to identify the two ad brands they had seen on the page from two sets of eight brand variations. The researcher coded 1 to 4 points based on the brands form completely incorrect to completely correct.

3.2 Experiment 2

3.2.1 Procedure and Participants

In this experiment, participants were randomly assigned to news sites that featured either a native ad or a display ad. Participants were asked to read the news headlines and editorial content on the page at their own pace. An eye-tracking device was used to record and analyze the participants' browsing behavior throughout the entire process. After browsing, participants' attitudes toward and memories of the brand in the advertisement were measured.

Experiment 2 recruited 127 volunteer participants with experience in browsing news websites, including 62 male and 65 female. The average age was 25.09 ($SD=3.74$), and the average internet use experience was 12.19 years ($SD=2.68$).

3.2.2 Materials

The materials used in Experiment 2, including the layout of the news website and the formats of the two types of ads, were the same as those of Experiment 1. However, only one type of ad—either a native ad or a display ad—was presented on the experiment page. The brand logo, brand name, and advertisement copy on both pages were kept consistent (see Figure 2). Additionally, to examine whether the experimental results were influenced by product type, Experiment 2 introduced a hedonic product—a gaming console—as the test product, while continuing to use the flash drive (a utilitarian product) from Experiment 1.

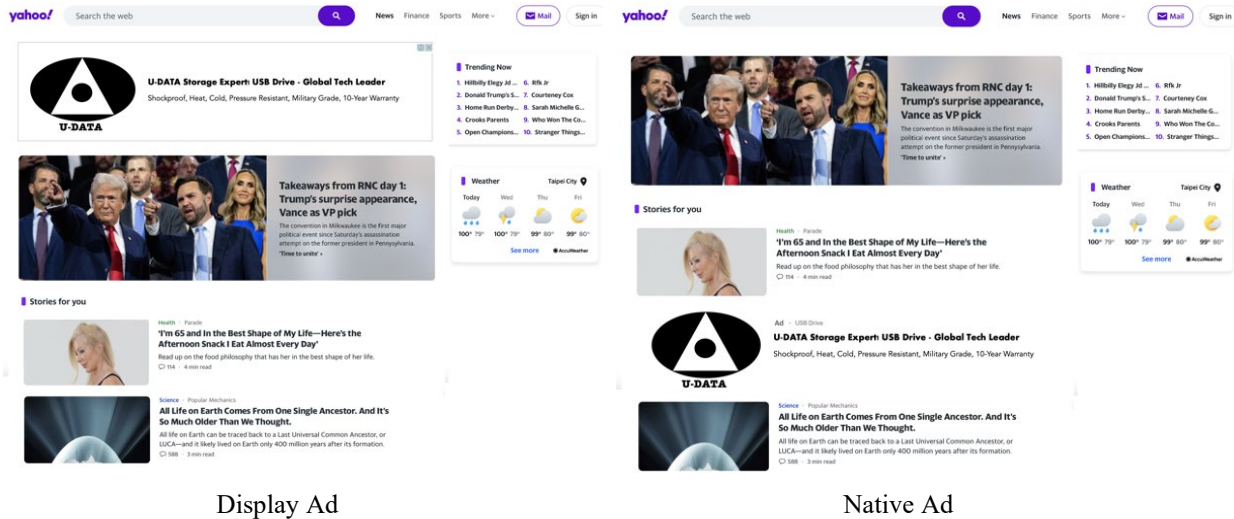


Figure 2. Pages in Experiment 2

Since the length of stay on the page affects the amount of information received, this study performed a pilot test by recruiting 25 participants to read the experiment page. The results show that the average reading time is 63.88 seconds ($SD = 3.44$).

Therefore, a time limit was set for browsing the experimental page. When participants entered the news website, the system started timing and automatically redirected them after 64 seconds. Afterward, participants' brand attitudes and memory of the advertisement were measured.

3.2.3 Measurement

The gaze behavior was measured in the same manner as in Experiment 1. An eye tracker was used to record the numbers and times of the participant's eyeballs in the advertising area. Attitudes toward the brand was measured with single-item ten-point Likert scales adapted from Bergkvist and Rossiter (2007). Recognition was used to measure memory. The brand elements were disassembled into three components: the outer frame, the internal graphics, and the text. The correct and incorrect elements of these three components were recombined to create eight brand variations. Participants were asked to identify the brand they had seen in the advertisement from among these eight options. The researcher coded 1 to 4 points based on the brands from completely incorrect to completely correct.

4. Result

4.1 Experiment 1

In order to examine whether there is a difference in browsing behavior between native ad and display ad on the same webpage, we conducted a t-test analysis. The results indicated a significant difference in observation counts ($M_{Display\ ad} = 11.40$; $M_{Native\ ad} = 21.70$; $p = 0.01$) and observation length ($M_{Display\ ad} = 1002.38$; $M_{Native\ ad} = 5727.51$; $p = 0.01$). The results support H1. Additionally, a t-test was conducted to determine whether consumers' attitudes toward the brands differed between the two ad formats. The result revealed that consumers' attitude towards native ad was significantly lower than display ad ($M_{Display\ ad} = 5.44$; $M_{Native\ ad} = 3.52$; $p = 0.01$), supporting H2. In brand memory, the result of t-test showed that the recognition performance for native ad was significantly better than for display ad ($M_{Display\ ad} = 1.97$; $M_{Native\ ad} = 2.89$; $p = 0.01$). Thus, H3 was also supported (see Table 1).

Table 1 The results of Experiment 1

<i>Dependent variable</i>	<i>Ads</i>	<i>n</i>	<i>M</i>	<i>sd</i>	<i>p</i>
<i>observation count</i>	<i>Display ad</i>	109	11.40	2.67	0.01*
	<i>Native ad</i>		21.70	4.77	
<i>observation length</i>	<i>Display ad</i>		1002.38	330.15	0.01*
	<i>Native ad</i>		5727.51	1081.04	
<i>attitudes toward the brand</i>	<i>Display ad</i>		5.44	0.73	0.01*
	<i>Native ad</i>		3.52	0.81	
<i>brand memory (recognition)</i>	<i>Display ad</i>		1.97	0.94	0.01*
	<i>Native ad</i>		2.89	0.96	

Note: n = participants in set; M = average; sd = standard deviation; t = t-value; p = p-value

4.2 Experiment 2

A total of 127 participants were randomly assigned to one of the two experimental treatments, in which a utilitarian product was used as the advertising product. Among them, 63 participants viewed news sites featuring only display ad, while the remaining 64 viewed pages with only native ad. An independent sample t-test was conducted to examine whether there was a difference between the two advertisings in acquiring consumer browsing behavior.

The result showed that the native ad had a significantly higher observation count than the display ad ($M_{Display\ ad} = 12.43$; $M_{Native\ ad} = 22.03$; $p = 0.01$), as well as a longer observation length ($M_{Display\ ad} = 1226.35$; $M_{Native\ ad} = 5525.61$; $p = 0.01$). Thus, H1 in the Experiment 2 was also supported. Additionally, brand attitude toward the display ad was significantly higher than that toward the native ad ($M_{Display\ ad} = 5.43$; $M_{Native\ ad} = 3.38$; $p = 0.01$), while brand memory for native ad was significantly higher than that of the display ad ($M_{Display\ ad} = 1.90$; $M_{Native\ ad} = 2.98$; $p = 0.01$). Therefore, both H2 and H3 were supported in Experiment 2 (see Table 2).

Regarding the experimental treatment in which hedonic product was used as advertising products, this study reached the same conclusion. 57 participants viewed display ad, while 61 viewed native ad. A t-test showed that native ad had significantly higher observation counts ($M_{Display\ ad} = 14.22$; $M_{Native\ ad} = 23.83$; $p = 0.01$) and longer viewing durations ($M_{Display\ ad} = 1554.61$; $M_{Native\ ad} = 6046.38$; $p = 0.01$), supporting H1. Additionally, display ad led to a more favorable brand attitude ($M_{Display\ ad} = 5.02$; $M_{Native\ ad} = 3.44$; $p = 0.02$), whereas native ad had better brand memory ($M_{Display\ ad} = 1.95$; $M_{Native\ ad} = 3.27$; $p = 0.01$), confirming H2 and H3.

Table 2. The results of Experiment 2

	<i>Dependent variable</i>	<i>Ads</i>	<i>n</i>	<i>M</i>	<i>sd</i>	<i>p</i>
<i>utility product</i>	<i>observation count</i>	<i>Display ad</i>	63	12.43	2.62	0.01*
		<i>Native ad</i>	64	22.03	5.36	
	<i>observation length</i>	<i>Display ad</i>	63	1226.35	348.94	0.01*
		<i>Native ad</i>	64	5525.61	708.62	
	<i>attitudes toward the brand</i>	<i>Display ad</i>	63	5.43	0.76	0.01*
		<i>Native ad</i>	64	3.58	0.94	
	<i>brand memory (recognition)</i>	<i>Display ad</i>	63	1.90	1.03	0.01*
		<i>Native ad</i>	64	2.98	0.85	
<i>hedonic products</i>	<i>observation count</i>	<i>Display ad</i>	57	14.22	3.01	0.01*
		<i>Native ad</i>	61	23.83	5.82	
	<i>observation length</i>	<i>Display ad</i>	57	1554.61	446.21	0.01*
		<i>Native ad</i>	61	6046.38	653.46	
	<i>attitudes toward the brand</i>	<i>Display ad</i>	57	5.02	0.94	0.02*
		<i>Native ad</i>	61	3.44	1.07	
	<i>brand memory (recognition)</i>	<i>Display ad</i>	57	1.95	0.92	0.01*
		<i>Native ad</i>	61	3.27	0.90	

Note: n = participants in set; M = average; sd = standard deviation; t = t-value; p = p-value

5. Discussion and Conclusion

Native ads are developed to overcome the problem of consumers avoiding traditional web advertising. Native ads attract greater consumer attention than display ads. Therefore, this study aimed to answer the following question: “Should display ads concede and allow native ads to dominate web advertising?” We argue that the winner-takes-all rule does not apply to advertising and that the new advertising format does not necessarily guarantee superior effectiveness. Moreover, advertising effectiveness is determined using various approaches, and advertising formats vary in characteristics and yield diverse consumer responses. In this study, we compared display and native ads. We postulated and demonstrated that display ads attract significantly less consumer attention than native ads. However, as native ads represent hidden persuasive content, consumers who recognize such content as ads exhibit a negative attitude toward the advertised brand. Therefore, using native ads—compared with display ads—significantly lowers brand attitude. Concerning brand memory, native ads are forms of hidden persuasive information requiring consumers to devote more cognitive resources to identify, analyze, interpret, and evaluate them. Moreover, consumers must select an appropriate response to cope with the information. Display ads, which do not present hidden persuasive information, are placed on webpages in compliance with consumers’ advertising schema. By contrast, native ads require consumers to make elaborations; that is, more links are established with the existing memory network. As native ads are superior to display ads vis-à-vis information storage and retrieval, the former elicit higher brand memory than the latter. Considering that native and display ads coexist on webpages in competition for cognitive resources, Experiment 1 adopted a within-subjects design, wherein participants browsed news websites presenting both native and display ads. An eye tracker was utilized to record their gaze behavior, and a scale was used to measure their attitudes toward and memories of the advertised brand. Experiment 2 employed a between-subjects design, wherein participants browsed news websites presenting only one type of ad. The content of the two ad types was controlled for and rendered identical to understand the ad format’s effects on attention, brand attitude, and brand memory. The experimental results supported this study’s hypotheses, with the two product types not influencing the results.

This study has several academic implications. First, most research on conventional web advertising has examined factors influencing a single ad format’s effectiveness. However, this study explored the competitive relationship between native and display ads on the same webpage. Building on De Keyser et al. (2023), this study shifted the focus from mediating variables to a direct performance-based comparison. Grounded in schema congruity theory, persuasion knowledge, and LC4MP, this study employed a relatively controlled experimental design to enhance internal validity and offer deeper insights into ad effectiveness. Second, we posited that newly developed advertising formats do not necessarily guarantee better outcomes and that proving which advertising format is more effective is unimportant. The winner-takes-all rule does not apply because different formats impact different aspects of consumer behavior. Third, two experiments—one with a within-subjects design and another with a between-subjects design—were performed to test the hypotheses and strengthen the conclusions’ reliability. Fourth, most studies have employed self-report measures to assess consumer attention to ads and browsing behavior by asking participants to recall their degree of attention toward ads following the stimuli, even though attention typically occurs unconsciously and participants cannot recall unconscious eye movements. To address this research gap, an eye tracker was used to objectively record the participants’ browsing behaviors, thereby eliminating the bias and distortion produced by conscious processing and yielding more precise and complete results.

This study’s findings suggest that advertisers should not focus solely on novelty or the overall effectiveness. Instead, they should clearly define their objectives when selecting which types of ads to purchase. Specifically, native ads should be used when the goal is to build brand awareness and enhance brand memory, whereas display ads are preferable when the aim is to improve brand attitudes. An integrated strategy is therefore advisable. In practice, a multi-stage marketing funnel strategy should be adopted. During the initial brand awareness and memory-building stage, native advertising should be widely employed. Its advantages in attracting attention and enhancing memory (H1, H3) help overcome banner blindness and quickly embed the brand in consumers’ minds—ensuring the brand is both “seen and remembered.” In the subsequent attitude and consideration stage, advertisers should switch to or supplement with display ads, capitalizing on their strength to enhance brand attitude (H2), communicate brand value, and appear in schema-consistent positions to reduce negative consumer inferences. This transition helps move consumers from basic awareness and memory to liking and consideration. Moreover, native ads attract attention because they break traditional ad schemas by mimicking editorial content. However, once consumers recognize the content as advertising, they may activate the persuasion knowledge model, leading to skepticism and brand distrust. Therefore, it is advisable to clearly disclose the nature of native ads. Although such disclosure may slightly weaken their “camouflaged” appearance, it significantly reduces consumer resistance and helps maintain long-term brand trust—a crucial trade-off between short-term engagement and long-term brand equity. Finally, for news websites, aligning with this multi-stage strategy, it is advisable to develop and offer integrated advertising packages that combine native and display ads.

Given their effectiveness in achieving targeted marketing outcomes such as brand recall and favorable attitudes, these packages can be priced at a premium rate.

To control for exogenous variables, only one each of the native and display ads was placed on the two experimental webpages; however, a webpage may contain multiple display and native ads stretching across various parts of the webpage and simultaneously competing for attention. In this study, the display ad was arranged in the webpage's top section, while the native ad was placed below the main news as the second item of the "latest news list." In the future, researchers should not only explore the competition and mutual influence among multiple ads of the same type on the same webpage but also verify the outcomes of competition between display and native ads placed in different positions on a webpage to supplement this study's conclusions.

This study compared the effects of native and display ads on visual attention, brand attitude, and brand memory; nevertheless, as a relatively novel trend in online advertising, native ads continue to evolve. This study's findings open avenues to further investigate native ads. First, as consumers become increasingly familiar with native ads over time, they may form a schema for them. This could precipitate negative attitudes toward native ads, especially toward ads that conceal their nature, potentially impacting brand loyalty and trust. Future research could explore native advertising's long-term effects. Second, while "trust" has been studied in native advertising, findings regarding this aspect are inconsistent. Besides ad disclosure (Han et al., 2018; Lee et al., 2016) and media trust (Han et al., 2018; Wojdyski, 2016), which have been demonstrated as moderating factors influencing trust in native ads, future studies could assess other variables influencing consumer trust. Third, this study's participants were predominantly digitally savvy consumers aged 18–35. Findings may vary between younger and older age groups owing to differences in their familiarity with online advertisements. Future research could explore how diverse demographics (e.g., age and digital literacy) influence the recognition and processing of native versus display ads. Fourth, future research could explore ad placement's contextual relevance, including content type, platform, and device, to better understand their impact on the effectiveness of native and display ads. Additionally, this study's findings are presented in broad generalities. Future research could examine the possibility that native ads perform better in certain industries, whereas display ads may be more effective in others (e.g., content-driven industries or high-involvement products and services). Thus, future studies could investigate the influence of contextual factors and industry-specific characteristics on the effectiveness of—and consumer browsing behavior related to—native and display ads. Fifth, this study examined whether native and display ads influence consumers differently based on product type in Experiment 2, finding no significant differences in visual attention, brand attitude, or brand memory. This suggests that consumer responses to ad formats are primarily driven by the structural and cognitive characteristics of the ads rather than the nature of the advertised product. One possible explanation is that ad recognition and persuasion knowledge activation occur at a fundamental cognitive level, remaining consistent across product types. Prior research has shown that hedonic and utility products may elicit different levels of engagement depending on choice context and goals (e.g., Dhar & Wertenbroch, 2000). However, since this study focused on web browsing rather than actual purchase decisions, the psychological trade-offs between hedonic and utility products may be less pronounced. Future research could examine whether specific product characteristics or individual differences moderate this relationship in different contexts.

REFERENCES

- Baddeley, A, Eysenck, M.W., & Anderson, M.C. (2009) *Memory*. Psychology Press, New York.
- Benway, J. P. (1999) Banner blindness: What searching users notice and do not notice on the World Wide Web. Unpublished doctoral dissertation, Rice University.
- Benway, J. P. (1998) Banner Blindness: The irony of attention grabbing on the world wide web. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*. 42(5), 463-467.
- Bergkvist, L, & Rossiter, J.R. (2007) The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research*, 44(2), 175-184.
- Boerman, S. C., van Reijmersdal, E.A., & Neijens, P.C. (2015) Using eye tracking to understand the effects of brand placement disclosure types in television. *Programs*, 44(3), 196-207.
- Boland, M. (2016) Native ads will drive 74% of all ad revenue by 2021. *Business Insider*, Retrieved from [https://www.businessinsider.com/author/margaret-boland]
- Briggs, R, & Hollis, N. (1997) Advertising on the Web: Is there response before click-through? *Journal of Advertising Research*, 37(2), 33-45.
- Campbell, B. A. Wood, G., & McBride, T. (1997) *Origins of orienting and defensive responses: An evolutionary perspective in Attention and orienting: Sensory and motivational processes* eds (PJ Lang RF Simons M Balaban & R Simons Hillsdale NJ: Erlbaum) (pp. 41–68).
- Campbell, M. C., & Kirmani, A. (2000) Consumers' use of persuasion knowledge: The effects of accessibility and cognitive capacity on perceptions of an influence agent. *Journal of Consumer Research*, 27(1), 69-83.

- Carlson, M. (2015) When news sites go native: Redefining the advertising–editorial divide in response to native advertising. *Journalism*, 16(7), 849-865.
- Chatterjee, P. (2008) Are unclicked ads wasted? Enduring effects of banner and pop-up ad exposures on brand memory and attitudes. *Journal of electronic commerce Research*, 9(1), 56-61.
- Cho, C., & Cheon, H.J. (2004) Why do people avoid advertising on the internet? *Journal of Advertising*, 33(4), 89-97.
- Craik, F. I., & Lockhart, R. S. (1972) Levels of processing: A framework for memory research *Journal of Verbal Learning and Verbal Behavior*, 11(6), 671-684.
- De Keyser, F., Dens, N., & De Pelsmacker, P. (2023). The processing of native advertising compared to banner advertising: an eye-tracking experiment. *Electronic Commerce Research*, 23(3), 1921-1940.
- Dhar, R., & Wertenbroch, K. (2000). Consumer choice between hedonic and utilitarian goods. *Journal of Marketing Research*, 37(1), 60–71.
- Drèze, X., & Hussherr, F. (2003) Internet advertising: Is anybody watching? *Journal of Interactive Marketing*, 17(4), 8-23.
- Drèze, X., & Zufryden, F. (2000) Internet advertising: the medium is the difference. *Consumption Markets and Culture*, 4(1), 23-37.
- Duff, B. R., & Faber, R.J. (2011) Missing the mark. *Journal of Advertising*, 40(2), 51-62.
- Evans, D. S. (2009) The online advertising industry: Economics evolution and privacy *Journal of Economic Perspectives*, 23(3), 37-60.
- Faber, R. J., Lee, M., & Nan, X. (2004) Advertising and the consumer information environment online. *American Behavioral Scientist*, 48(4), 447-466.
- Flores, W., Chen J. V., & Ross, W. H. (2014) The effect of variations in banner ad type of product website context and language of advertising on Internet users' attitudes. *Computers in Human Behavior*, 31, 37-47.
- Friestad, M, Wright, P (1994) The persuasion knowledge model: How people cope with persuasion attempts. *Journal of Consumer Research*, 21(1), 1-31.
- Graham, F. K. (1997) Afterword: Pre-attentive processing and passive and active attention. In P. J. Lang, R. F. Simons, & M. T. Balaban (Eds.), *Attention and orienting: Sensory and motivational processes* (pp. 417–452). Mahwah NJ: Erlbaum.
- Gustafson, P., & Siddarth, S. (2007) Describing the dynamics of attention to TV commercials: A hierarchical Bayes analysis of the time to zap an ad. *Journal of Applied Statistics*, 34(5), 585-609.
- Han, J., Drumwright, M., & Goo, W. (2018). Native Advertising: Is Deception an Asset or a Liability? *Journal of Media Ethics*, 33(3), 102–119.
- Hoffman, H. S. (1997) Attentional factors in the elicitation and modification of the startle reaction. In P. J. Lang, R. F. Simons, & M. T. Balaban (Eds.), *Attention and orienting: Sensory and motivational processes* (pp. 185–204). Mahwah NJ: Erlbaum.
- Hsieh, A. Y., Lo, S. K., & Chiu, Y. P. (2016) Where to place online advertisements? The commercialization congruence between online advertising and web site context. *Journal of Electronic Commerce Research*, 17(1), 36-46.
- Janiszewski, C. (1998) The influence of display characteristics on visual exploratory search behavior. *Journal of Consumer Research*, 25(3), 290-301.
- John, D. R. (1999) Consumer socialization of children: A retrospective look at twenty-five years of research. *Journal of Consumer Research*. 26(3), 183-213.
- Kaye, B. K., & Medoff, N. J. (1998) The world wide web: A mass communication perspective. *Mountain View CA: Mayfield*
- Kean, L. G., & Albada, K. F. (2003) The relationship between college students' schema regarding alcohol use their television viewing patterns and their previous experience with alcohol. *Health communication*, 15(3), 277-298.
- Kes, Y. (2011) Current approaches in e-advertisement. *International Journal of Business and Social Science*, 2(21), 124-137.
- Kimmel, L., van Olst, E. H., & Orlebeke, J. F. (1979) The Orienting Reflex in Humans. *Lawrence Erlbaum Associates Hillsdale NJ*.
- Kirman, A., & Zhu, R. (2007) Vigilant against manipulation: The effect of regulatory focus on the use of persuasion knowledge. *Journal of Marketing Research*. 44(4), 688-701.
- Köster, M., Rueth, M., Hamborg, K., & Kaspar, K. (2015) Effects of personalized banner ads on visual attention and recognition memory. *Applied Cognitive Psychology*, 29(2), 181-192.
- Kotler, P., & Keller, K. (2011) Marketing management (14th ed.). Prentice Hall.

- LaBrecque, A. C., Voorhees, C.M., Khodakarami, F., & Fombelle, P.W. (2024) Native advertising effectiveness: The role of congruence and consumer annoyance on clicks, bounces, and visits. *Journal of the Academy of Marketing Science*, 52(1), 1692–1712.
- Lang, A. (2000) The limited capacity model of mediated message processing. *Journal of Communication*, 50(1), 46-70.
- Lang, A. (1995) Defining audio/video redundancy from a limited-capacity information processing perspective. *Communication Research*, 22(1), 86-115.
- Lang, A., & Basil, M. D. (1998) Attention resource allocation and communication research: What do secondary task reaction times measure anyway? *Annals of the International Communication Association*, 21(1), 443-458.
- Lee, J., Kim, S., & Ham, C. (2016) A double-edged sword? Predicting consumers' attitudes toward and sharing intention of native advertising on social media. *American Behavioral Scientist*, 60(12), 1425-1441.
- Liu, C. W., Lo, S. K., Hsieh, A. Y., & Hwang, Y. (2018) Effects of banner Ad shape and the schema creating process on consumer internet browsing behavior. *Computers in Human Behavior*. 86, 9-17.
- Lynch, J., & Schuler, D. (1994) The matchup effect of spokesperson and product congruency: A schema theory interpretation. *Psychology & Marketing*, 11(5), 417-445.
- Mandler, G. (1981) The structure of value: Accounting for taste. In M. S. Friedman, J. P. Das, & N. O'Connor (Eds.), *Affect and cognition* (pp. 3-36). Hillsdale NJ: Erlbaum.
- McDaniel, S. R. (1999) An investigation of match-up effects in sport sponsorship advertising: The implications of consumer advertising schemas. *Psychology & Marketing*, 16(2), 163-184.
- Ohman, A. (1979) The Orienting response attention and learning: An information-processing response. In the *Orienting Reflex in Humans* Routledge London 29.
- Pasandaran, C. C., & Mutmainnah, N. (2020) Young adults' recognition of native advertising disguised as news. *Young Consumers*, 21(1), 91-108.
- Pavlov, P. (1927) Conditioned reflexes: an investigation of the physiological activity of the cerebral cortex. *Oxford Univ Press*.
- Pelsmacker, P. D., Dens, N., & Verberckmoes, S. (2019) How ad congruity and interactivity affect fantasy game players' attitude toward in-game advertising. *Journal of Electronic Commerce Research*, 20(1), 55-74.
- Peng, J., Zhang, G., Zhang, S., Dai X., & Li J. (2014) Effects of online advertising on automobile sales. *Management Decision*, 52(5), 834-851.
- Piaget, J., & Inhelder, B. (1969). The psychology of the child. *Basic Books New York*.
- Rumelhart, D. E., & Ortony, A. (1977) The representation of knowledge in memory. In RC Anderson, RJ Spiro, WE Montague (Eds) *Schooling and the acquisition of knowledge* (pp. 99–135). Hillsdale NJ: Erlbaum.
- Rzemieniak, M. (2015). Measuring the effectiveness of online advertising campaigns in the aspect of e-entrepreneurship. *Procedia Computer Science*, 65, 980-987.
- Sternberg, R. J., & Sternberg, K. (2017) *Cognitive psychology* (7th ed.). Boston, MA: Cengage Learning.
- Stürmer, L., & Einwiller, S. (2023). Is this advertising or not, and do I care? Perceptions of and opinions regarding hybrid forms of content. *Journal of Marketing Communications*, 29(2), 161-178.
- Sujan, M., & Bettman, J. R. (1989) The effects of brand positioning strategies on consumers' brand and category perceptions: Some insights from schema research. *Journal of Marketing Research*, 26(4), 454-467.
- Verhellen, Y., Dens, N., & De Pelsmacker, P. (2013) Consumer responses to brands placed in YouTube movies: the effect of prominence and celebrity endorser expertise. *Journal of Electronic Commerce Research*, 14(4), 287-303.
- Vonk, R. (1998). The slime effect: Suspicion and dislike of likeable behavior toward superiors. *Journal of Personality and Social Psychology*, 74(4), 849-864.
- Warlaumont, H. G. (1997) Appropriating reality: Consumers' perceptions of schema-inconsistent advertising. *Journalism & Mass Communication Quarterly*, 74(1), 39-54.
- Wojdyski, B. W. (2016) The deceptiveness of sponsored news articles: How readers recognize and perceive native advertising. *American Behavioral Scientist*, 60(12), 1475-1491.
- Wojdyski, B. W., & Evans, N. J. (2016) Going native: Effects of disclosure position and language on the recognition and evaluation of online native advertising. *Journal of Advertising*. 45(2), 157-168.
- Wojdyski, B. W., & Golan, G. J. (2016) Native advertising and the future of mass communication. *American Behavioral Scientist*, 60(12), 1403-1407.
- Zechmeister, E. B., & Nyberg, S. E. (1982) *Human memory an introduction to research and theory*. Pacific Grove: Brook/Cole Publishing.