

**Effects of Image Temperature and Types of Messages on  
Advertisement and Product Evaluations**

Junhui Feng

Submitted in partial fulfilment  
of the requirements for the degree of  
Master of Science in Management  
(Marketing)

Goodman School of Business, Brock University  
St. Catharines, Ontario

© Junhui Feng 2022

## **Abstract**

This study examined the effects of images and messages in advertisement and product evaluations. The study categorized advertisements into two parts: images (warm and cold imagery) and messages (abstract and concrete messaging). It is expected that an advertisement with warm images and concrete messages, cold images and abstract messages is more effective in stimulating positive advertisement and product evaluations. The study also explored the mediating role of processing fluency toward advertisement and product evaluations. Results suggest that a warm image fits better with abstract messages, a cold image fits better with concrete messages, which could generate more positive advertisement and product evaluations. In addition, the effect of the “fit condition” of image and message on advertisement and product evaluations is mediated by viewers’ advertisement processing fluency.

*Keywords:* advertisement message, advertisement image, processing fluency, advertisement evaluation, product evaluation

## Table of Contents

|  | <b>Page</b> |
|--|-------------|
| Introduction.....  | 1           |
| Literature Review.....   | 5           |
| Advertisement Messages and Images.....                                   | 5           |
| Temperature.....   | 16          |
| Processing Fluency.....  | 19          |
| Construal Level Theory.....  | 21          |
| Hypotheses Development.....  | 23          |
| Research Methodology and Findings.....                                   | 28          |
| Study 1.....   | 28          |
| Participants.....  | 28          |
| Stimulus Development.....  | 28          |
| Procedure.....   | 29          |
| Results.....   | 30          |
| Manipulation Checks.....   | 30          |
| Hypothesis Testing.....  | 30          |
| Mediation Effect.....  | 31          |
| Discussion.....  | 32          |
| Study 2.....   | 33          |
| Participants.....  | 33          |
| Stimulus Development.....  | 33          |
| Procedure.....   | 34          |
| Results.....   | 34          |
| Manipulation Checks.....   | 34          |
| Hypothesis Testing.....  | 35          |
| Mediation Effect.....  | 36          |
| Discussion.....  | 37          |
| General Discussion.....  | 38          |
| Theoretical Implications.....  | 38          |
| Managerial Implications.....   | 40          |
| Limitations and Future Research.....                                     | 41          |
| Conclusion.....  | 43          |
| References.....  | 44          |
| Appendix A: Advertisement Image and Advertisement Message for Shoes..... | 58          |
| Appendix B: Four Advertisement Versions for Shoes.....                   | 60          |

|  |    |
|--|----|
| Appendix C: Definitions of Abstract and Concrete Messages .....          | 64 |
| Appendix D: Advertisement Image and Advertisement Message for Cars ..... | 65 |
| Appendix E: Four Advertisement Versions for Cars .....                   | 67 |
| Appendix F: Measurement Scales .....                                     | 71 |

## List of Tables

| <b>Table</b> |  | <b>Page</b> |
|--------------|--|-------------|
| 1            | Literature Review for Ad Messages and Ad Images.....                                       | 7           |
| 2            | Literature Review for Interaction of Advertisement Message and<br>Advertisement Image..... | 14          |
| 3            | Literature Review for Temperature .....  | 17          |

## List of Figures

| <b>Figure</b> |                        | <b>Page</b> |
|---------------|------------------------|-------------|
| 1             | Conceptual Model ..... | 27          |

## Introduction

Many firms allocate a large portion of their budget to design appealing advertisements that attract more customers. Advertisement, as a communication tool that brings marketing messages to the customers, has been implicated for decades for understanding its effects on consumption behavior. Marketers spend time and resources to design advertisements that could stimulate more positive attitude and evaluation from consumers. Thus, it is important to answer the question: What kind of advertisements can better stimulate people's positive evaluation towards the advertisements? Two parts of the advertisement are equally important when looking at a designed advertisement: images and messages. According to the elaboration likelihood model (ELM) proposed by Petty and Cacioppo (1986), message elements of an advertisement are central cues that are more enduring in memory than other peripheral cues and pictorial images that have been proved to elicit strong emotional responses (Bradley et al., 1992). Therefore, it is likely that subtle changes of these two elements ultimately will make a big difference on advertisement. Thus, in this study aims to investigate which type of images (warm and cold images) and messages (concrete and abstract messages) will work better together to enhance product and advertisement evaluations as well as to explore its underlying mechanism.

Images in the advertisements that are studied in this research are differentiated into warm images and cold images. Cold images refer to images depicting nature scenes with ice, frost, and snow and warm images refer to images depicting fire, embers, and candles (Choi et al., 2016). Different from previous literatures focusing on the real ambient temperature, this research explores perceived temperatures triggered by images. Furthermore, it is proved that temperature priming effect can be triggered not only by physical experience but also by a conceptual process encompassing other forms of stimulation (e.g., different colours, different images, different words, etc.) that may give people a feeling of cold or warm (Halali et al., 2017). Most of the

studies till now have focused more on how physical temperature affects people's impulsive purchase intention (Zia et al., 2016), willingness to pay (Cheema & Patrick, 2012; Sinha & Bagchi, 2019), and performance on cognitive-related tasks (Pilcher et al., 2002) but few of them pay attention to perceived temperature (Kolb et al., 2012). Both physical and conceptual temperature primes are worthy to investigate since even though the feelings of warmth or cold are caused by different situational factors, they might have similar impact on consumer behaviour (Halali et al., 2017). This research aims to investigate whether and how temperature generated by images influences consumer information processing and evaluation.

In addition to images, the message is another key element that catches consumers' attention in advertisements. Message framing is a way to manipulate how information is presented to optimize people's reactions (Rothman & Salovey, 1997). Previous studies have explored persuasive messages in advertisements. For example, prior studies focused on the benefits of taking recommended behaviour (i.e., gain framing) or the losses of neglecting the recommended behaviour (i.e., loss framing; Cervellon, 2012). Levin and Gaeth (1988) also demonstrated that consumers' evaluation of the same product is more positive when it is described in a gain framing versus a loss framing. Based on construal level theory (CLT; Trope & Liberman, 2010), messages framed in a concrete or abstract way influence how people process the information in the messages (West & Holcomb, 2000). This research investigates how messages (concrete vs. abstract) interact with images (cold vs. warm) to influence advertisement and product evaluation.

Processing fluency could be influenced by different stimuli; for example, it could be affected by different regulatory focus (Lee & Aaker, 2004), aesthetic pleasure (Reber et al., 2004), and visual complexity (Orth & Crouch, 2014). Previous studies in marketing also have found that processing fluency affects consumer judgments, such as advertisement evaluations

(Alter & Oppenheimer, 2009; Reber et al., 2004). However, researchers did not pay much attention to how image and temperature in the advertisement influence processing fluency. Based on the CLT, this research proposes that a fit between images and messages could lead to a higher level of processing fluency. Winkielman and Cacioppo (2001) showed that an increase in processing fluency will lead to a more positive evaluation. Therefore, the results further advance the understanding and influence of processing fluency.

This research contributes to the literature on image temperature, processing fluency, and advertising. First, previous studies explored temperature trigger by a haptic stimulus (Williams & Bargh, 2008), different colour (Pilelienė & Grigaliūnaitė, 2017), and different lightning (Mills et al., 2007). In this research, I focus on feelings of warmth and coldness stimulated by visual stimulus—images in the advertisement. Prior study showed that perceived temperature through watching or thinking about something cool could influence individuals' performance by improving cognitive control (Halali et al., 2017). This research demonstrates that image triggered temperature interacts with different messages (abstract and concrete messages) to influence advertisement and product evaluations. Second, the findings of this research advance the understanding of processing fluency, especially when viewing an advertisement. Prior research has shown various factors (e.g., aesthetic pleasure, visual complexity) that can lead to processing fluency. Few explored whether and how different images and different messages could influence processing fluency. Based on CLT, this research proposed and showed that the amounts of resources used when processing the advertisement influences processing fluency, which subsequently affects product and advertisement evaluations. More specifically, higher temperature generates greater psychological proximity (Ijzerman & Semin, 2009) that promotes the ability to understand concrete messages. On the other hand, cold images leave individuals with a feeling of distance (Ijzerman & Semin, 2009), which will enhance the performance on

processing abstract messages framed abstractly.

Third, the advertising literature has studied the impact of message framing in an advertisement on advertisement persuasiveness. For example, studies have examined the effect of two types of scarcity messages (e.g., limited quantity and limited time; Aggarwal et al., 2011), the effects of message concreteness and gain (vs. loss) framing (Xiao et al., 2021), the effect of promotion-focused and prevention-focused messages (Kareklas et al., 2012), and the effect of attribute-framed and goal-framed messages (Putrevu, 2010) on advertisement effectiveness. On the other hand, with a focus on images, scholars also studied how multiple images (Chowdhury et al., 2008), cold (vs. neutral or warm) images (Choi et al., 2016), and product image facing direction (left versus right) in an advertisement (Zhang et al., 2019) influence advertisement persuasiveness. Building on these two streams of research, this study examines the interaction effect of image temperature (warm vs. cold) and message concreteness (abstract vs. concrete) on advertisement persuasion. In conclusion, these findings provide managerial implications for marketers by advancing the understanding of what type of image and message work better together in an advertisement to enhance advertisement effectiveness.

## Literature Review

### Advertisement Messages and Images

Message framing is defined as manipulating the way that information in a message is presented to optimize its impact on receivers' behaviour and reactions (Rothman & Salovey, 1997). Previous studies have already examined effects of different message types on advertisement recall. For example, Mukherjee (2002) studied how imagery-provoking ad messages influence advertisement recall and showed that when the verbal attribute information in the advertisement is not image-provoking, the added pictures that provide examples of the information enhance recall of the advertisement. The effectiveness of more associative versus less associative communications are explored in the marketing context. It is shown that stronger association communications (e.g., "get matching shirt free") are more imagery evocative compared to those weaker association (e.g., "get second item free"), thus resulting more favorable consumer evaluations (Aydınoglu & Krishna, 2019). Besides, the effectiveness of narrative versus non-narrative messages in the advertisement was studied. Researchers showed that a narrative compared to a non-narrative message style produces more favorable ad attitude and more positive green evaluations (Anna Kim et al., 2022) Most of previous studies focus on how gain-framed and loss-framed messages influence people's evaluation of and attitude toward the message (e.g., Baek & Yoon, 2017; Kulkarni & Yuan, 2015), as well as the persuasiveness of promotion- and prevention-focused messages (e.g., Kareklas et al., 2012; Lee & Aaker, 2004; Allard & Griffin, 2017). However, there is an aspect that needs more attention from scholars, which is the abstract and concrete message in the advertisement. Research from the judgment and decision context suggests that vividly described information (i.e., concrete information) has more impact on judgments than merely giving raw facts (i.e., abstract information) (Borgida & Nisbett, 1977). Thus, it is necessary to explore how people make different evaluations and

judgements on advertisements containing abstract or concrete information. Therefore, this study explored the difference between abstract and concrete advertisement messages, as presented in Table 1. For example, the same information is judged as more probably true when it is framed in a concrete rather than an abstract way (Hansen & Wänke, 2010). Abstract product descriptions also are perceived as more luxurious than concrete product descriptions (Hansen & Wänke, 2011). In addition, a speed and accuracy advantage for lexical decision about concrete words could be found when people are viewing concrete words before abstract words (Kroll & Merves, 1986). In this research, I focus on how abstract- and concrete-framed messages influence people's evaluation of products and advertisements. Even though my study also distinguishes messages into abstract and concrete ones, I combine the effect of different messages with the effect of different images in an advertisement together, which is the main unique aspect of this study.

**Table 1***Literature Review for Ad Messages and Ad Images*

| Study                | Theoretical context  | Independent variable(s)   | Moderator(s)       | Outcome variable(s)   | Main findings   |
|----------------------|--|---|--------------------|---|---|
| Ad messages          |  |   |                    |   |   |
| Mukherjee (2002)     | Explore the impact of pictures on the accompanying verbal information in print advertisements for high-imagery and low-imagery copy, and for high-involvement and low-involvement products | Ad message (imagery-provoking vs. Not imagery provoking)                  |                    | Advertisement recall, affect or feelings generated by the advertisement | When the verbal attribute information in the advertisement copy is not imagery-provoking, the addition of pictures exemplifying that information enhances both recall and affect, while, when the verbal attribute information itself is imagery-provoking, the addition of pictures increases affect but not recall.   |
| Lee and Aaker (2004) | The study examines the Influence of regulatory fit on processing fluency and persuasion  | Regulatory focus (promotion vs. prevention) message frame (gain vs. Loss) | Processing fluency | Brand attitude  | Appeals presented in gain frames are more persuasive when the message is promotion focused, whereas loss-framed appeals are more persuasive when the message is prevention focused. Enhanced processing fluency leading to more favorable evaluations in conditions of compatibility appears to underlie these effects. |

|                           |  |   |                                    |  |   |
|---------------------------|--|---|------------------------------------|--|---|
| Kareklas et al. (2012)    | This research draws on theoretical perspectives related to regulatory focus and self-view in the context of "green" advertising appeals. | Regulation focus (promotion vs. prevention), self-view (independent vs. interdependent) |                                    | Brand attitude                                   | Prevention (vs. promotion) focused environmental appeals generated more favorable attitudes for individuals who are situationally primed to have an independent self-view. In the interdependent self-view condition, the promotion-focused appeals performed as well as or better than the prevention-focused appeals.   |
| Roy and Sharma (2015)     | The impact of message framing and scarcity appeal types in advertisements on consumers with varying levels of need for uniqueness (NFU)  | Message framing and levels of NFU   | Messages framed as gains or losses | Scarcity appeal types                            | Participants with lower levels of NFU show a greater impact of demand (vs. supply) scarcity appeal on their attitudes and purchase intentions, whereas participants with higher levels of NFU show a greater impact of supply (vs. demand) appeal. Under both gain and loss frames, participants with lower levels of NFU prefer demand over supply appeal, whereas under the loss frame, participants with higher levels of NFU prefer supply over demand. |
| Kulkarni and Yuan (2015)  | Effect of ad-irrelevant distance cues on persuasiveness  | Irrelevant cues in the ad environment   |                                    | Persuasiveness of message framing                | Participants evaluated positively (negatively) framed messages more favourably when induced with social remoteness (proximity), spatial remoteness (proximity), and an abstract (concrete) construal.   |
| Allard and Griffin (2017) | How perceived expensiveness shapes consumers' response to the  | Product categories (low- vs. high-cost) message framing (high-construal vs.             |                                    | Choice, evaluation, fit, and purchase intentions | Comparatively expensive versions of objectively low-priced products (e.g., an expensive chocolate truffle) are best promoted through more abstract slogans,   |

|                              |  |   |                                   |  |
|------------------------------|--|---|-----------------------------------|--|
|                              | wording of marketing communications.   | low-construal messages)   |                                   | whereas comparatively affordable versions of objectively high-priced products (e.g., an inexpensive diamond pendant) are best promoted using more concrete slogans.  |
| Baek and Yoon (2017)         | How two negative emotions (guilt and shame) influence responses to environmental ad messages   | Guilt and shame   | Persuasiveness of message framing | Participants primed with guilt express higher intention to conserve water after they view a gain-framed water conservation ad; participants primed with shame express higher conservation intention after they view a loss-framed ad.                        |
| Aydinoğlu and Krishna (2019) | Subtle differences in textual marketing communications can impact the evocation of consumption-imagery, implicitly subsuming all the senses, which consequently affects consumer attitudes toward the communication and the product. | Verbal deal communication (more associative vs. less associative) | Communication effectiveness       | Retail-store deals which communicate stronger association between products (“get matching shirt free”) are more imagery evocative compared to those with weaker association (“get second item free”), thereby impacting consumer evaluations.                |
| Anna Kim et al. (2022)       | The research evaluates the effectiveness of a narrative approach to social-media messages that communicate green initiatives   | Message style (narrative vs. non-narrative)                       | Ad attitude and ad evaluation     | Results show that a narrative (vs. non-narrative) message style produces more favorable Ad attitude and more positive green evaluations and the advantage of narrative messages over non-narrative messages is narrowed in the case of specific information. |

---

**Table 1 (cont'd)***Literature Review for Ad Messages and Ad Images*

| Study                        | Theoretical context                               | Independent variable(s)  | Moderator(s) | Outcome variable(s)                    | Main findings  |
|------------------------------|---|--|--------------|--|--|
| Ad images                    |   |  |              |  |  |
| McQuarri and Phillips (2011) | The effect of personification in advertising      | Different images in the advertisement (personification vs. nonpersonification images)              |              | Brand attitude, brand liking           | Visual personification--pictures in an ad that metaphorically represent a product as engaged in some kind of human behavior--can trigger anthropomorphism. Such personification, when embedded in an ad, appears to lead to more positive emotions, more positive attributions of brand personality, and greater brand liking.   |
| (Chang, 2013)                | Imagery fluency and narrative advertising effects | Picture type (narrative versus product picture)<br>picture type (narrative versus product picture) |              | Advertisement attitude, brand attitude | Narrative pictures, as opposed to product pictures, increased comprehension fluency and imagery fluency, which further affected ad judgments (ad attitudes and brand attitudes); accessible, as opposed to less accessible, narratives, which were expected to facilitate conceptual fluency, actually increased comprehension fluency and further enhanced imagery fluency. |

|                      |  |   |   |  |
|----------------------|--|---|---|--|
| Choi et al. (2016)   | The Impact of Visual Stimuli on the effectiveness of Negative Emotional Charity Appeals  | Cold image (present vs. absent)   | The effectiveness of a negative (versus neutral) charity appeal | Cold image induced feelings of loneliness will mitigate an individual's ability to sympathize with the victims in a charity appeal, thereby eliminating the effectiveness of the appeal.   |
| Guido et al., (2018) | Whether print advertisements featuring faces (i.e., face advertisements) or face-like images (i.e., pareidolian advertisements) better capture consumer attention than advertisements that do not include such elements. | Ad image (face vs. pareidolian)   | Brand recognition and advertisement preference                  | Both face advertisements and pareidolian advertisements increased brand recognition and advertisement preference. Both two types of advertisements captured viewers' attention and more frequently were recognized than advertisements that did not feature faces or face-like objects.  |
| Sung et al. (2019)   | The effect of unrealistic product images in advertising  | Image (unrealistic vs. realistic)   | Product evaluation  | Using unrealistic product images in advertisements attenuates consumers' judgments of the product's benefits and drawbacks and has consequences for consumption behaviour.   |
| (Zhang et al., 2020) | This research examined the interaction effects between product presentation dynamism and other advertising stimuli on imagery fluency and purchase intentions.   | Product presentation (dynamism: stationary versus dynamic), background image (plain versus transformational versus informational) | Perceived transformativeness and perceived informativeness      | Dynamic presentation diverts attentional resources to the advertised product, diminishing the positive effects of contextual backgrounds on imagery fluency for both hedonic and utilitarian products. The indirect effect of contextual backgrounds on purchase intentions via imagery fluency appears to be conditional on dynamic product presentation. |

Words that represent concrete concepts are processed more quickly and efficiently than the words that represent more abstract concepts (West & Holcomb, 2000). Also, the time people use to understand a sentence is generally shorter when the sentence is concrete instead of abstract (Haberlandt & Graesser, 1985; Schwanenflugel & Shoben, 1983). Individuals usually identify with and remember messages when they are in a concrete rather than an abstract form—referred to as the concreteness effect (Breedin et al., 1994). It takes less time for those who get concrete messages to understand the messages.

In addition to message, image is another element of an advertisement. Previous studies have shed light on how various images in the advertisement influence customers differently, as presented in Table 1. For example, the same characteristic of the product is judged less intensely when a product is presented by an unrealistic image instead of a realistic image (Sung et al., 2019). Cold images compared to warm images could better mitigate an individual's ability to sympathize with the victims in a charity appeal (Choi et al., 2016). Both face advertisements and pareidolian advertisements capture more attention from customers than advertisements that did not feature faces or face-like objects (Guido et al., 2018). Visual personification in the advertisement leads to more positive emotions, more positive attributions of brand personality, and greater brand liking (McQuarri & Phillips, 2011). Dynamic presentation diverts attentional resources to the advertised product, diminishing the positive effects of contextual backgrounds on imagery fluency (Zhang et al. 2020). Narrative pictures, compared to product pictures, increase comprehension fluency and imagery fluency, which further affect advertisement judgments (Chang, 2013). The extant studies also focus on the interaction effect of image and message in the advertisement, as presented in Table 2. For example, the congruency of advertisements in the social media like Instagram has been studied and it is concluded that customers are more interested in the brand-related posts that are congruent in image and text in

Instagram (e.g., brand-related images and brand-related hashtags; Ha et al., 2021). Besides, the congruity of background banner color and banner text color on the website was studied and it indicated that incongruity has a more favorable effect on advertisement recall and recognition, whereas congruity has more favorable effects on website attitudes (Moore et al., 2005). Previous study also explored the interaction effect of visual metaphors (low vs. high complexity) and verbal messages (explicit vs. implicit) in the advertisement and the results showed that consumers experience a higher sense of pleasure and appreciation when explicit (vs. implicit) verbal messages are presented with extremely complex visual metaphors (Ryoo et al., 2020). Moreover, how people process different types of indirect claims was also studied. It was concluded that when the indirect metaphorical claim in an advertisement is presented in a picture, customers are more likely to generate positive inferences spontaneously (McQuarrie & Phillips, 2005). Therefore, as another factor in the advertisement, images are also worth studying. This research aims to investigate effects of image temperature (cold vs. warm) and its interaction effect with messages. Since almost all the advertisements come out with these two factors, it is important to understand the interaction effect between them, which could guide the design of a more attractive advertisement.

**Table 2***Literature Review for Interaction of Advertisement Message and Advertisement Image*

| Study                         | Theoretical context   | Independent variable(s)   | Outcome variable(s)  | Main findings  |
|-------------------------------|---|---|--|--|
| McQuarrie and Phillips (2005) | How consumers process different types of indirect claims in pictures and words  | Indirect metaphorical claim (words vs. pictures)  | If consumers are receptive to multiple, distinct, positive inferences about the advertised brand | When consumers are presented with an indirect metaphorical claim, they become more receptive to multiple positive inferences about the advertised brand. In addition, when the indirect metaphorical claim takes the form of a picture, consumers are more likely to spontaneously generate such positive inferences at the time of ad exposure. |
| (Moore et al., 2005)          | This research examines the effects of advertiser-Web site congruity, background banner color and banner color-text color contrast on Web browsers' attention, as well as attitude toward the ad and the Web site. | Advertiser-Web site context congruency (congruent vs. incongruent)                        | Attention, attitude toward the ad, and attitude toward the Web site.                             | The results indicate that incongruity has a more favorable effect on recall and recognition, whereas congruity has more favorable effects on attitudes. When ads generate sufficient attention to gain recall or recognition, moderate congruity offers the most favorable attitudes toward the ad   |
| Ryoo et al. (2020)            | How different visual metaphors and verbal messages interactively impact on consumers' pleasure and advertisement appreciation.  | Visual metaphors (low complexity vs. High complexity) Ad messages (explicit vs. implicit) | Consumers' pleasure and ad appreciation  | Consumers experience a higher sense of pleasure and appreciation when explicit (vs. implicit) verbal messages are presented with extremely complex visual metaphors (i.e., replacement ads), whereas implicit (vs. explicit) verbal messages are more effective with moderately complex visual metaphors (i.e., fusion ads).                     |

|                     |   |  |                                  |  |
|---------------------|---|--|----------------------------------|--|
| Ha et al.<br>(2021) | Automatically<br>detecting image–text<br>mismatch on<br>Instagram with deep<br>learning | Visual<br>information<br>is congruent<br>or<br>incongruent | Attitude<br>towards the<br>brand | Visual information mismatch in<br>brand-related posts creates<br>contextual incongruence, which<br>violates the consumer-driven<br>culture of searching for brand<br>information and connecting with<br>other consumers. |
|---------------------|---|--|----------------------------------|--|

---

The hypotheses proposed in this thesis are informed by the research on advertisements framing, and with a particular focus on abstract and concrete messages, as well as the various types of images in an advertisement.

### **Temperature**

Situational factors that may be irrelevant to the products can often shape people's response to the products (Krishna, 2012), including a store's background music, theme colour, or even ceiling height. One of the essential factors that affects people's attitude to the products is temperature, which has been studied for decades. Previous studies have already identified different effects on consumers' reaction caused by warm and cool temperatures, as shown in Table 3. For instance, warm conditions easily develop and maintain people's relationships with brands (Albert & Valette-Florence, 2010) and are also more likely to increase product valuation (Zwebner et al., 2014; Barbera et al., 2018). Compared to neutral temperature product surface, physical cold product surface can increase consumers' perceptions of a product's status signaling and luxuriousness (Park & Hadi, 2019). Besides, people literally felt cold or preferred warm food when they experienced being socially excluded (Zhong & Leonardelli, 2008). Compared with cool temperatures, people under warm conditions use less cognitive resources to deal with presented information quickly, effortlessly, and unconsciously (Cheema & Patrick, 2012). People rely more on intuitive thinking when the resources have been depleted by prior actions, since the ability to engage in an effortful situation has been decreased (Pocheptsova et al., 2009).

**Table 3***Literature Review for Temperature*

| Study                          | Theoretical context  | Independent variable(s)   | Outcome variable(s)  | Main findings   |
|--------------------------------|--|---|--|---|
| Pilcher et al. (2002)          | Effects of hot and cold temperature exposure on customers' performance   |   | Customers' performance   | Hot and cold temperature exposure has a negative impact on performance; other variables (e.g., length of exposure to temperature or task duration) may modify this relationship.  |
| Mills et al. (2007)            | Quantify the effects of newly developed high correlated colour temperature fluorescent lights  | Fluorescent lights to achieve non-visual, biological effects within a workplace setting | Biological effects within a workplace setting  | High correlated colour temperature fluorescent lights could provide a useful intervention to improve well-being and productivity in the corporate setting.  |
| Zhong and Leonardelli (2008)   | The research tested whether social exclusion induces an actual feeling of coldness by asking participants to estimate the current room temperature and to indicate their preference for warm versus cold foods and drinks. | Recall experience (social exclusion vs. Social inclusion)                               | Feeling of coldness  | People literally felt cold or preferred warm food when they experienced being socially excluded, regardless of whether such experience was induced through recalling past experience or participating in a virtual interaction. |
| Cheema and Patrick (2012)      | Influence of warm vs. cool temperatures on consumer choice   | Warm vs. cool temperature   | Customers' performance on complex choice task  | Warm (vs. cool) temperatures deplete resources, increase System 1 processing, and influence performance on complex choice tasks.  |
| Inagaki and Eisenberger (2013) | Whether experiencing social warmth increases feelings of warmth and whether experiencing physical warmth increases feelings of social connection   | Physical-warmth manipulation and social – warm manipulation                             | Extent to which participants felt connected after reading the positive and neutral messages and how warm | Findings showed an overlap between physical and social warmth: Participants felt warmer after reading the positive (compared with neutral) messages and more connected  |

|                        |  |  |  |  |
|------------------------|--|--|--|--|
|                        |  |  | showed items felt  | after holding the warm pack (compared with the ball).  |
| Zwebner et al. (2014)  | Relationship between warm temperature and customers' evaluation  | Warm vs. cold temperature                      | Willingness to pay   | Exposure to physical warmth activates the concept of emotional warmth, eliciting positive reactions and increasing product valuation; warm temperatures also reduce individuals' perceived distance from the target products.  |
| Halali et al. (2017)   | How experienced and perceived temperatures affect cognitive control  | Cool vs. warm temperature                      | Cognitive control  | Cool (vs. warm) temperatures lead to improved performance on an anti-saccade task, an established cognitive control measure.   |
| (Barbera et al., 2018) | The current research examined the effect of weather and temperature-related visual cues on consumer valuations of a service product. | Temperature cues (warm vs. cool)               | Price valuation  | Participants who view high (vs. low) temperature cues will provide higher (vs lower) evaluations of value. Low level of impulsivity will attenuate the effects of the temperature cues, such that participants who view high (vs. low) temperature cues will report higher expected values only in high levels of impulsivity condition. |
| Park and Hadi (2019)   | The research examines the association between high-status products and cold temperature  | Product surface temperature (cold vs. neutral) | Perceived status signaling and luxuriousness, and positively influence product evaluations | Physical cold can indeed increase consumers' perceptions of a product's status signaling and luxuriousness.  |

---

Besides experiencing summer and winter, which could directly impart a feeling of warm and cold, temperature feeling could also be found when individuals are exposed to different colour (Pilelienė & Grigaliūnaitė, 2017) or different lighting (Mills et al., 2007). Temperature priming effect does not necessarily require physical experience; it could also be triggered through conceptual processes (Halali et al., 2017; Inagaki & Eisenberger, 2013). For instance, watching or thinking of something cool (e.g., pictures of landscapes related to cool temperatures) could lead to improved cognitive control (Halali et al., 2017), watching objects in red colour could lead to a feeling of higher temperature than with other colours (Fenko et al., 2010), and watching smooth-surfaced materials (e.g., glass) could lead to a greater feeling of cold than by watching rough materials, such as wood (Wastiels et al., 2012). Researchers found that even though there are two different ways of giving people the feeling of cold or warm, but the temperature effect on consumer behavior is almost the same (Inagaki & Eisenberger, 2013). While researchers have used different colours, lighting, and materials to create visually warm or cold environments in a retail context, a research gap exists on how different images stimulate different feelings of warm or cold in the advertising industry. The temperature in this research focuses on temperature generated by images.

The hypothesis proposed in this thesis focused on how various images presented in the advertisements leave people with different feelings of warmth and coldness.

### **Processing Fluency**

Processing a message or an advertisement always mobilizes various internal mental events. For example, people may spend some time considering the truth of the advertisement or may be attracted by the image or message in the advertisement. Fluency is the factor that dominates the whole process (Oppenheimer, 2008). People can easily recognize if it is difficult or easy to process information. The results of processing similar content may differ in effort

(Schwarz, 1998) and speed (Jacoby, 1983) due to different kinds of presentations to people. High fluency elicits more positive outcomes (e.g., product evaluation) compared with low fluency (Winkielman & Cacioppo, 2001). Previous studies have examined the relationship between processing fluency and judgments of truth (Reber & Schwarz, 1999), evaluative judgment (Winkielman et al., 2003), and aesthetic pleasure (Reber et al., 2004). It has been shown that processing fluency could be influenced by various variables, such as the font of words (Cabooter et al., 2016), complexity (Labroo et al., 2011), or repeated exposure (Bornstein & D'Agostino, 1994). Therefore, it is obvious that fluency can play an essential role in making a judgment.

Kacen and Lee (2002) proposed that processing fluency could be triggered perceptually or conceptually. Perceptual fluency could be identified more easily by individuals, which render stimulus more readily recognized on subsequent encounters (Jacoby & Dallas, 1981). It relates to the finding that some attributes of perceptual objects may be processed more quickly than other attributes (e.g., symmetry). Conceptual fluency is triggered by other associations that render the stimulus more accessible in memory. It results from coherence with existing conceptual knowledge. Perceptual fluency is sensitive to any changes of the product or advertisement across different exposures. Therefore, it is important for marketers to make sure the proper content is chosen in the advertisement when the advertisement evaluation is driven by perceptual fluency. However, conceptual fluency relies more on elaborative processing so it cannot be affected by features changed across different exposures. Later, a third type of processing fluency is demonstrated; encoding fluency is identified as the ease or difficulty with which information can be encoded in memory (Hertzog et al., 2003). In the current research, I extend the understanding of processing fluency effects: the higher or lower level of processing fluency while viewing an advertisement is influenced by the ease or difficulty while trying to understand the images and messages in the advertisement. Based on the CLT, greater psychological proximity generated by

warm images promotes the ability to understand concrete messages, and greater psychological distance generated by cold images promotes the ability to understand abstract message.

Therefore, I propose that when viewing an advertisement consisting of warm (cold) images and concrete (abstract) messages, the level of processing fluency is enhanced since it is easier to process the information in the advertisement.

### **Construal Level Theory**

According to the theory of categorization proposed by Rosch (1975) and the concept of formation proposed by Medin and Smith (1984), high-level construal focuses more on abstract, general, coherent, superordinate features, while low-level construal represents more concrete, specific, contextualized, and subordinate features (Liberman & Trope, 1998). Concrete presentations often include several abstractions (Trope & Liberman, 2010), which means the content in an advertisement could be formed in either an abstract way or a concrete way due to the various presentations. For example, when we describe an object such as a “cellular phone,” we exclude the feature of its size; when we say “hanging out” instead of “going to a Chinese restaurant,” we exclude the exact behaviours.

Since the CLT was proposed, it has been studied for years from different angles. As CLT proposed, one of the most common aspects being studied based on this theory is psychological distance (Trope & Liberman, 2010). Scholars also applied CLT to examine consumers’ decision-making (Fiedler, 2007; Trope et al., 2007), spatial distance (Henderson et al., 2006) as well as temporal distance (Liberman & Trope, 1998; Trope & Liberman, 2010). Based on the CLT, the lower-level construal is more concrete and more contextual, while the higher level of construal is more abstract and more summary. Following this vein, I aim to understand how CLT works while processing the advertisement consisting of abstract or concrete message and warm image and cold image. Such aim helps to fill the gap of interaction effect of messages and images in an

advertisement, which gives researchers a bright idea of how and why different presentations of advertisement lead to various effects.

## Hypotheses Development

Warm images, even though they are different from the physical temperature people experience every day, can trigger a warm feeling perceptually (Halali et al., 2017). It is proved to be the same with the cold image; for example, watching or thinking of something cool could lead to a perceptual cold feeling (Halali et al., 2017). Therefore, the image in the advertisement could indirectly affect people's perception of temperature. More specifically, when people are presenting an advertisement with an image of cold glaciers, whatever the ambient temperature, people will have a cold feeling perceptually. The same is true for the warm image. Thus, I propose that a warm image (e.g., an image containing the sun, a desert, or similar warm scenery) and a cold image (e.g., an image containing snow, ice, or similar cold scenery) can deliver a feeling of warmth and a feeling of coldness, respectively, which would be equivalent to the feeling people experience under a physical warm (e.g., the rising indoor temperature) and cold condition (e.g., the reduced indoor temperature).

In terms of the messages, some theories demonstrated the difference between processing concrete and abstract words. For example, according to Paivio's (1990) dual coding theory, the messages that individuals hear or view are encoded and stored in memory by two separate systems: the verbal system and the nonverbal (imagery or visual) system. The theory suggests that compared with abstract words that only access the verbal system, concrete words are ready to access both systems, which makes it easier to process and remember them (Paivio et al., 1994), which supports my perspective on people processing information framed in abstract and concrete ways differently. Context availability theory argues that compared to abstract words, concrete words are processed faster because of a broader contextual verbal support, which means concrete words activate more associative information (Schwanenflugel & Shoben, 1983; Schwanenflugel & Stowe, 1989). Based on the reviewed literature, it is obvious that different

types of messages with the same content are processed differently.

Different ambient temperatures also are proved to have a close connection with differences of psychological proximity (Ijzerman & Semin, 2009). More specifically, higher temperature generates greater psychological proximity (Ijzerman & Semin, 2009). According to CLT, people implicitly associate psychological distance with high-level construal and psychological proximity with low-level construal (Trope & Liberman, 2010). At low-level construal, individuals focus on the details of the information and the particulars. In contrast, at high-level construal, individuals focus on the overall description of the information and big picture of a scenario. Furthermore, psychological proximity facilitates processing an idea concretely, while psychological distance facilitates processing an idea abstractly (Wakslak et al., 2006). When people are experiencing psychological proximity, it is easier for them to process the information framed concretely, and on the other hand, when they are experiencing psychological distance, it is easier for them to process the information framed abstractly. In sum, after watching warm images, people would have a feeling of warmth, which generates psychological proximity that promotes the ability to process the concrete message.

In addition, cold images leave individuals a feeling of distance (Ijzerman & Semin, 2009; Liberman & Trope, 2005). When people are experiencing psychological distance, construal would become more abstract. CLT contends that as people are getting more psychological distance from the object, they tend to use higher levels of construal to describe the object. As discussed, high-level construal individuals focus on overall features of the object. Messages framed in an abstract way emphasize the big picture of the scenario and show the information in a more general way. Therefore, it is expected that when people are viewing advertisements consisting of cold images and abstract messages, it is easier for people to process.

Thus, it is expected that warm images and concrete words could work better together than

warm images and abstract words, and cold images and abstract words could work better together than cold images and concrete words. These two combinations are easier for people to process and understand the information in the advertisement. The ease of processing information would promote more positive judgments (Storme et al., 2015). Thus, I propose,

**H1:** Advertisements with concrete messages and warm images will lead to more favourable (a) advertisement evaluation and (b) product evaluation than advertisements with abstract messages and warm images.

**H2:** Advertisements with abstract messages and cold images will lead to more favourable (a) advertisement evaluation and (b) product evaluation than advertisements with concrete messages and cold images.

Alter and Oppenheimer (2009) defined processing fluency as “the subjective experience of ease with which people process information” (p. 1414). Further studies support and extend the understanding of processing fluency, which can be defined as the smoothness of ongoing cognitive processes (Reber et al., 2004). Specifically, in this research, people may find it easy or difficult to process different versions of the advertisement with the same content. Due to various designs of the advertisements, even though they are telling the same story, people will have different understandings of them. That is why I am trying to find a fit condition of image and message in the advertisement to maximize the stimulation of positive evaluations of advertisement.

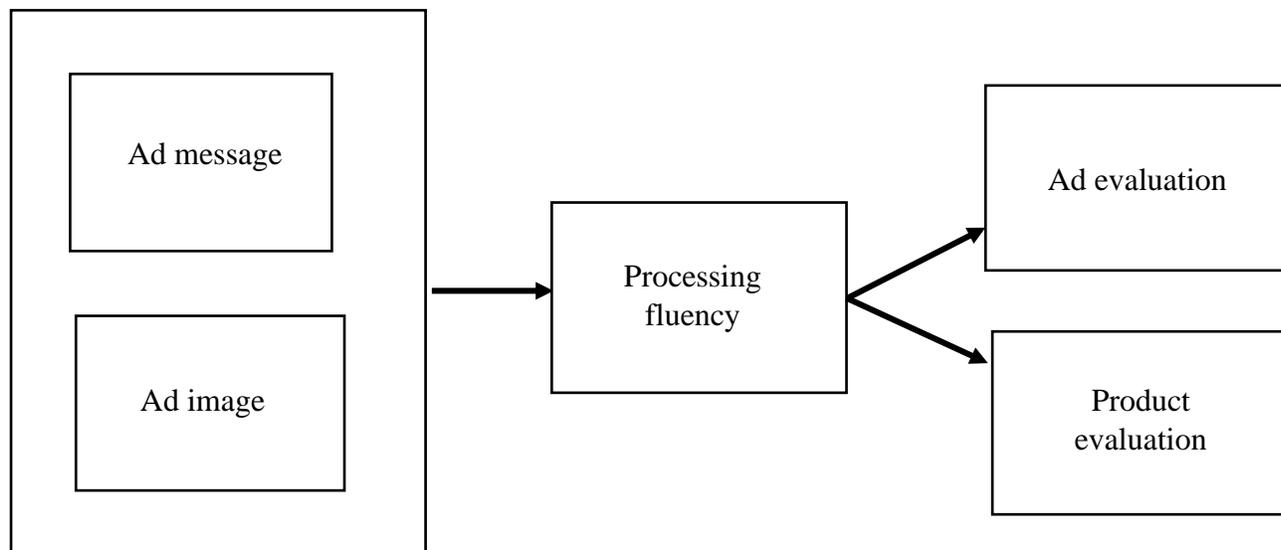
Consumers will evaluate the advertisement more favourably when the expectation of the advertisement is consistent with how it appears (Chae & Hoegg, 2013). In an advertising context, researchers demonstrate the congruency between people’s conceptualization and the design of the advertisement as “fit” (Chae & Hoegg, 2013; Oakes, 2007). In my research, when people are viewing the advertisement with warm (cold) images and concrete (abstract) messages, it is matched with how people expect the presentation of the advertisement. More specifically, the

psychological proximity (distance) generated by viewing warm images promote the ability to process concrete (abstract) messages, which is matched with the designed advertisement with warm and concrete message. The specific combination of image and message demonstrated by scholars that could make people feel easier to process is the same as how actually the advertisement is shown to them. Thus, under such fit condition, there are no obstacles or difficulties for people to process the advertisement, which finally lead to process the information fluently.

Processing information that requires less effort and without any obstacles could be regarded as processing at a high level of fluency (Winkielman et al., 2003). Researchers have already attributed fluency to message comprehensibility (Masson, 1995) or stimulus clarity (Seamon et al., 1998). Therefore, a better design of images and messages in the advertisement would influence the ease or difficulty of processing the content and then the level of processing fluency. Thus, I propose concrete (abstract) words and warm (cold) images create a fit condition that could enhance processing fluency.

By manipulating process fluency using different methods by scholars, the results show that a high level of process fluency promotes more positive judgments (Reber & Schwarz, 1999; Reber et al., 1998; Storme et al., 2015). Therefore, it is expected that fit advertising content generates a higher level of process fluency and would influence advertisement evaluation and product evaluations positively. I formulate a hypothesis below. Figure 1 presents the conceptual model.

**H3:** Processing fluency mediates the effect of the advertisement on (a) advertisement evaluation and (b) product evaluation when there is an advertisement message and image fit.

**Figure 1***Conceptual Model*

## **Research Methodology and Findings**

### **Study 1**

Study 1 investigated the effect between image temperature and message concreteness on product evaluation and advertisement evaluation. A 2 (image temperature: warm vs. cold) x 2 (message concreteness: abstract vs. concrete) between-subjects design was used in this study. In this study, I chose shoes as the researched products. A previous study that analyzed how different designs of the advertisement influence the brand trust, ease of the process, and feeling right (fit condition) of the advertisement chose yacht rental, cars, and running shoes as the researched products (Monahan & Romero, 2020). Since my research also investigates how different versions of the advertisement influence advertisement and product evaluations, I follow their path to research shoes in Study 1 and cars in the Study 2.

### ***Participants***

Study participants were recruited from Prolific, an online panel similar to Amazon Mechanical Turk. A total of 203 people (aged 18–70 years,  $M=33.49$  years; 27% male) participated in the study.

### ***Stimulus Development***

First, two images were developed to manipulate image temperature. One represents a cold image and the other represents a warm image. A warm image was designed to contain a desert and sun scene and a cold image was designed to contain a snow scene. Two messages were developed to manipulate message concreteness. One represents an abstract message and the other represents a concrete message. Abstract messages were designed to introduce features (e.g., eco-friendly and durable) of a pair of shoes in a general way whereas concrete messages were designed to introduce the same features of the shoes in a detailed way. The images and messages

are presented in Appendix A.

A pretest was conducted to make sure that the image and message manipulations are effective. In this pretest, 60 participants were recruited and presented with one image and one message randomly. After viewing the image, participants were asked, “Do you think the image passes you a feeling of warmth?” and “Do you think the image passes you a feeling of coldness?” The responses to image temperature were rated on 7-point Likert scale (1=strongly disagree to 7=strongly agree). The responses to the first item were recoded. Higher scores indicate a colder temperature. The results indicated that the warm image I chose could pass people a feeling of warmth and the cold image we chose could give people a feeling of coldness ( $M_{\text{warm}} = 1.92$ ,  $M_{\text{cold}} = 5.83$ ,  $t = 29.806$ ,  $p < 0.001$ ). The responses to message concreteness were rated on 7-point semantic differential scale with four items (abstract vs. concrete, not precise vs. precise, not specific vs. specific, not detailed vs. detailed). Higher ratings indicate messages are more concrete. The results indicated that participants consider the concrete messages to be more concrete than the abstract one ( $M_{\text{abstract}} = 3.10$ ,  $M_{\text{concrete}} = 5.39$ ,  $t = 18.871$ ,  $p < 0.001$ ).

### ***Procedure***

Participants were told to imagine they are browsing in a shopping mall without any clear plan to purchase any product. They were randomly assigned to one of the four conditions. The four versions of the advertisements could be found in Appendix B. They were told that the purpose of the study was to understand consumers’ advertisement and product evaluations. After viewing the advertisement closely, they were asked to express opinions toward product evaluation on a 9-point semantic differential scale with four items (bad vs. good, dislike vs. like, undesirable vs. desirable, and low-quality vs. high-quality,  $\alpha = 0.815$ ); advertisement evaluation on 7-point semantic differential scale with three items (uninteresting vs. interesting, negative vs. positive, poor quality vs. excellent quality,  $\alpha = 0.785$ ); processing fluency on a 7-point Likert

scale (1=strongly disagree to 7=strongly agree) with three items (clear, easy to process, and well structured,  $\alpha = 0.825$ ); advertisement involvement on a 6-point Likert scale with three items (“I was involved with the advertisement content”, “I concentrated on the advertisement content”, and “I paid attention to the advertisement content when viewing the advertisement”,  $\alpha = 0.779$ ). Covariates were measured to control for extraneous variation in the data using analysis of covariance. Advertisement involvement is chosen to the covariate tested in the study is because the large literature suggesting its usefulness in assessing the extent to which people process ad information in an in-depth manner (Martin et al., 2008). Demographic information regarding the participants’ gender, age, education, employment, and income was collected at the end.

### **Results**

**Manipulation Checks.** In terms of the message and image manipulations, all participants in this study were asked opinions towards the image and message shown in the advertisement. To make sure participants understand the question clearly, I gave them the definitions for abstract and concrete message (definitions are presented in Appendix C). The results showed that the participants considered the cold image passed more coldness to them ( $M_{\text{warm}} = 2.28$ ,  $M_{\text{cold}} = 5.89$ ,  $t = 24.24$ ,  $p < 0.001$ ). The results also showed that the participants considered the concrete messages more concrete than the abstract messages ( $M_{\text{abstract}} = 3.23$ ,  $M_{\text{concrete}} = 5.15$ ,  $t = -9.35$ ,  $p < 0.001$ ). Therefore, the manipulations were successful.

**Hypothesis Testing.** A two-way analysis of covariance (ANCOVA) on advertisement evaluation was performed. Advertisement involvement was included as a covariate. The results revealed that the covariate advertisement involvement had a significant effect on advertisement evaluation ( $F(1, 198) = 7.18$ ,  $p < 0.001$ ). The respondents with higher advertisement involvement exhibited a more positive attitude toward the advertisement ( $\beta = 0.44$ ,  $t = 7.18$ ,  $p < 0.001$ ) than those with lower advertisement involvement. No other main effects were found. The

results revealed a significant interaction effect of message concreteness and image temperature on advertisement evaluation ( $F(1,198) = 12.02, p = 0.001$ ). Planned contrast effects were performed to explore the interaction effect. When a cold image was presented, abstract messages generated a higher level of advertisement evaluation than concrete messages ( $M_{\text{abstract}} = 4.17, M_{\text{concrete}} = 3.54; F(1,198) = 6.79, p = 0.01$ ). When a warm image was presented, concrete messages generated a higher level of advertisement evaluation than abstract messages ( $M_{\text{abstract}} = 3.74, M_{\text{concrete}} = 4.24; F(1,198) = 4.50, p < 0.05$ ). Thus, hypothesis 1 and hypothesis 2 are supported.

A two-way analysis of covariance (ANCOVA) on product evaluation was performed. Advertisement involvement was included as a covariate. The results revealed that the covariate advertisement involvement had a significant effect on product evaluation ( $F(1, 198) = 5.98, p < 0.001$ ). The results revealed a significant interaction effect of message concreteness and image temperature on product evaluation ( $F(1,198) = 24.17, p < 0.001$ ). The respondents with higher advertisement involvement exhibited a more positive attitude toward the product ( $\beta = 0.49, t = 5.98, p < 0.001$ ) than those with lower advertisement involvement. No other main effects were found. Planned contrast effects were performed to explore the interaction effect. When a cold image was presented, abstract messages generated more favourable product evaluations than concrete messages ( $M_{\text{abstract}} = 5.65, M_{\text{concrete}} = 4.78; F(1,198) = 7.92, p < 0.01$ ). When a warm image was presented, concrete messages generated more favourable product evaluations than abstract messages ( $M_{\text{abstract}} = 4.64, M_{\text{concrete}} = 5.92; F(1,198) = 17.27, p < 0.001$ ).

**Mediation Effect.** I conducted a mediation analysis by using PROCESS Model 4 to test the mediating effect of processing fluency on advertisement and product evaluations, respectively. Before analyzing the data, I coded a new variable as our independent variable. In the new variable, I labeled either a warm image with concrete messages or a cold image with

abstract messages as a “fit” condition, and the other conditions were labeled as a “nonfit” condition.

A bootstrapping mediation analysis at a 95% confidence interval (CI) with 5,000 bootstrapped samples revealed that the “fit” condition affected product evaluation and advertisement evaluation through processing fluency. The “fit” condition influenced processing fluency ( $a = 0.45$ ,  $t = 2.71$ ,  $p < 0.01$ ), advertisement evaluation ( $c = 0.35$ ,  $t = 2.36$ ,  $p < 0.1$ ), and product evaluation ( $c = 0.89$ ,  $t = 4.18$ ,  $p < 0.001$ ). The mediator (processing fluency) influenced advertisement evaluation ( $b = 0.46$ ,  $t = 7.34$ ,  $p < 0.001$ ) and product evaluation ( $b = 0.34$ ,  $t = 3.85$ ,  $p < 0.001$ ). The bootstrapping tests indicated that processing fluency mediated the indirect effect of “fit” condition on advertisement evaluation ( $a*b=0.21$ , 95%CI= 0.0519 to 0.3890) and product evaluation ( $a*b=0.15$ , 95%CI= 0.0261 to 0.3570). Thus, hypothesis 3 is supported.

### *Discussion*

The results of Study 1 suggest that a warm image which fits better with concrete messages than abstract messages generated more positive advertisement and product evaluations. A cold image which fits better with abstract messages than with concrete messages generated more positive advertisement and product evaluations. In addition, the effect of the fit condition of image temperature and message concreteness on advertisement evaluation and product evaluation was mediated by respondents’ advertisement processing fluency.

I have another study that chooses cars as the research product to test the generalizability of the findings of the Study 1. Since the researched product, shoes, in Study 1 is the common products in a shopping mall, there is a large part of the consumers have the purpose of buying a pair of shoes while browsing in the store. However, compared to the shoes, cars are not common products that usually sold in a shopping mall. Thus, I try to make sure that both common and uncommon products are included to test the reliability of the hypothesis.

## Study 2

Study 2 investigated the effect between image temperature and message concreteness on product evaluation and advertisement evaluation. A 2 (image temperature: warm vs. cold) x 2 (message concreteness: abstract vs. concrete) between-subjects design was used in this study. In this study, I chose the car as my research product.

### *Participants*

Study participants were recruited from Prolific, an online panel similar to Amazon Mechanical Turk. A total of 319 people (aged 18-70 years,  $M=33.49$  years; 27% male) participated in the study.

### *Stimulus Development*

First, the same two images (cold and warm) in Study1 were used to manipulate image temperature. Two messages were developed to manipulate message concreteness. One represents an abstract message and the other represents a concrete message. Abstract messages were designed to introduce features (e.g., fuel efficient and comfortable) of a car in a general way whereas concrete messages were designed to introduce the same features of the car in a detailed way. The images and messages are presented in the Appendix D.

A pretest was conducted to make sure that the image and message manipulations are effective. I also checked the message persuasiveness for both abstract and concrete messages. In this pretest, 50 participants were recruited and presented with one image and one message randomly. The measurements of image temperature, message concreteness, and persuasiveness were the same as those used in Study 1. The results indicated that the warm image I chose could pass people a feeling of warmth and the cold image I chose could give people a feeling of coldness ( $M_{\text{warm}} = 1.92$ ,  $M_{\text{cold}} = 5.83$ ,  $t = 29.806$ ,  $p < 0.001$ ). Participants consider the concrete messages to be more concrete than the abstract one ( $M_{\text{abstract}} = 3.58$ ,  $M_{\text{concrete}} = 5.12$ ,  $t = -4.72$ ,  $p <$

0.001). The responses to message persuasiveness were rated on 7-point semantic differential scale with five items (bad vs. good, dislike vs. like, uninteresting vs. interesting, unpleasant vs. pleasant, unfavourable vs. favourable). Both concrete and abstract messages generate similar level of message persuasiveness ( $M_{\text{abstract}} = 5.22$ ,  $M_{\text{concrete}} = 4.94$ ,  $t = 0.862$ ,  $p < 0.5$ ).

### ***Procedure***

The procedure was the same as we used in Study1. Participants were told to imagine they are browsing in a shopping mall without any clear plan to purchase any product. They were randomly assigned to one of the four conditions. The four versions of the advertisements could be found in Appendix E. They were told that the purpose of the study was to understand consumers' advertisement evaluation and product evaluation. After viewing the advertisement closely, they were asked to express opinions toward product evaluation on 9-point semantic differential scale with four items (bad vs. good, dislike vs. like, undesirable vs. desirable, and low-quality vs. high-quality,  $\alpha = 0.883$ ); advertisement evaluation on 7-point semantic differential scale with three items (uninteresting vs. interesting, negative vs. positive, poor quality vs. excellent quality,  $\alpha = 0.755$ ); processing fluency on a 7-point Likert scale (1=strongly disagree to 7=strongly agree) with three items (clear, easy to process, and well structured,  $\alpha = 0.929$ ); and advertisement involvement on 6-point Likert scale with three items ("I was involved with the advertisement content", "I concentrated on the advertisement content", and "I paid attention to the advertisement content when viewing the advertisement",  $\alpha = 0.759$ ).

Demographic information regarding the participants' gender, age, education, employment, and income was collected at the end.

### ***Results***

**Manipulation Checks.** In terms of the message and image manipulations, all participants in this study were asked opinions towards the image and message shown in the advertisement.

To make sure participants understood the question clearly, I gave them the definitions for abstract and concrete message (definitions are presented in Appendix C). The results showed that the participants considered the cold image passed more coldness to them ( $M_{\text{warm}} = 2.93$ ,  $M_{\text{cold}} = 5.90$ ,  $t = 24.16$ ,  $p < 0.001$ ). The results also showed that the participants considered the concrete messages more concrete than the abstract messages ( $M_{\text{abstract}} = 2.95$ ,  $M_{\text{concrete}} = 4.90$ ,  $t = -13.38$ ,  $p < 0.001$ ). Therefore, the manipulations were successful.

**Hypothesis Testing.** A two-way analysis of covariance (ANCOVA) on advertisement evaluation was performed. Advertisement involvement was included as a covariate. The results revealed that the covariate advertisement involvement had a significant effect on advertisement evaluation ( $F(1, 314) = 5.04$ ,  $p < 0.001$ ). The respondents with higher advertisement involvement exhibited a more positive attitude toward the advertisement ( $\beta = 0.27$ ,  $t = 5.04$ ,  $p < 0.001$ ) than those with lower advertisement involvement. No other main effects were found. The results revealed a significant interaction effect of message concreteness and image temperature on advertisement evaluation ( $F(1, 314) = 25.43$ ,  $p < 0.001$ ). Planned contrast effects were performed to explore the interaction effect. When a cold image was presented, abstract messages generated a higher level of advertisement evaluation than concrete messages ( $M_{\text{abstract}} = 4.59$ ,  $M_{\text{concrete}} = 4.19$ ;  $F(1, 314) = 6.20$ ,  $p < 0.05$ ). When a warm image was presented, concrete messages generated a higher level of advertisement evaluation than abstract messages ( $M_{\text{abstract}} = 3.94$ ,  $M_{\text{concrete}} = 4.79$ ;  $F(1, 198) = 15.78$ ,  $p < 0.001$ ). Thus, hypothesis 1 and hypothesis 2 are supported.

A two-way analysis of covariance (ANCOVA) on product evaluation was performed. Advertisement involvement was included as a covariate. The results revealed that the covariate advertisement involvement had a significant effect on product evaluation ( $F(1, 314) = 3.44$ ,  $p = 0.001$ ). The results revealed a significant interaction effect of message concreteness and image

temperature on product evaluation ( $F(1,314) = 11.80, p = 0.001$ ). The respondents with higher advertisement involvement exhibited a more positive attitude toward the product ( $\beta = 0.19, t = 3.44, p = 0.001$ ) than those with lower advertisement involvement. No other main effects were found. Planned contrast effects were performed to explore the interaction effect. When a cold image was presented, abstract messages generated more favourable product evaluations than concrete messages ( $M_{\text{abstract}} = 6.39, M_{\text{concrete}} = 5.93; F(1,198) = 7.92, p < 0.01$ ). When a warm image was presented, concrete messages generated more favourable product evaluations than abstract messages ( $M_{\text{abstract}} = 4.64, M_{\text{concrete}} = 5.92; F(1,198) = 17.27, p < 0.001$ ). Thus, hypotheses 1(a) and 1(b) are supported.

**Mediation Effect.** I conducted a mediation analysis by using PROCESS Model 4 to test the mediating effect of processing fluency on advertisement evaluation and product evaluation, respectively. Similar to Study 1, before analyzing the data, I coded a new variable as my independent variable. In the new variable, I labeled either a warm image with concrete messages or a cold image with abstract messages as a “fit” condition, and the other conditions were labeled as a “nonfit” condition.

A bootstrapping mediation analysis at a 95% confidence interval (CI) with 5,000 bootstrapped samples revealed that the “fit” condition affected advertisement evaluation and product evaluation through processing fluency. The “fit” condition influenced processing fluency ( $a = 0.50, t = 3.81, p < 0.001$ ), advertisement evaluation ( $c = 0.42, t = 3.46, p < 0.01$ ) and product evaluation ( $c = 0.46, t = 42.86, p < 0.01$ ). The mediator (processing fluency) influenced advertisement evaluation ( $b = 0.28, t = 5.44, p < 0.001$ ) and product evaluation ( $b = 0.33, t = 4.88, p < 0.001$ ). The bootstrapping tests indicated that processing fluency mediated the indirect effect of “fit” condition on advertisement evaluation ( $a*b = 0.14, 95\%CI = 0.0621$  to  $0.2315$ ) and product evaluation ( $a*b = 0.16, 95\%CI = 0.0658$  to  $0.2901$ ). Thus, hypothesis 3 is supported.

### *Discussion*

The results of Study 2 suggest that a warm image presented with concrete messages as opposed to abstract messages generated more positive advertisement evaluation and product evaluation. A cold image presented with abstract messages as opposed to concrete messages generated more positive advertisement evaluation and product evaluation. In addition, the effect of the fit condition of message concreteness and image temperature on advertisement evaluation and product evaluation was mediated by respondents' advertisement processing fluency.

## **General Discussion**

This research examines the effects of image temperature (warm image and cold image) and message type (abstract messages and concrete messages) on advertisement and product evaluation. It also explores the mediating role of processing fluency in the observed effects. Results from this research show that warm images when being paired with concrete messages in an advertisement generate more favourable advertisement and product evaluation. On the other hand, cold images when paired with abstract messages in an advertisement generate more favourable advertisement and product evaluation. It is proposed that warm images when paired with concrete messages, cold images when paired with abstract are considered fit, generating processing fluency and resulting in favourable evaluations. The results confirm the theorizing that processing fluency mediates the effect of the fit condition on advertisement and product evaluations. Based on the findings, I can draw several important theoretical and managerial implications for researchers and practitioners in the field of advertising.

### **Theoretical Implications**

First, this research extends the understanding of temperature triggered by viewing images. Scholars have examined the effect of temperature on people's perceptions, feelings, and behaviours. For example, a haptic stimulus (holding a cup of warm coffee) makes people feel physically warm, which could trigger feelings of trust and comfort (Williams & Bargh, 2008). People feel lonelier after holding a cold object in their hands for a short duration (Bargh & Shalev, 2012). Tactile or visually induced cold temperature could increase people's perception of product luxuriousness (Park & Hadi, 2019). Exposure to the ambient coldness increases people's vice inclinations (Yu & Wang, 2021). This research focuses on the feeling of warmth and coldness triggered by visual stimuli, in this case images in advertisement. Specifically, the results show that an image of the sun or other warm scenery could give viewers a feeling of warmth and

a cold image of snow or other cold scenery could give viewers a feeling of cold. In addition, the image temperature (warmth/cold) can interact with advertisement messages to influence consumers' advertising information processing and affect advertisement and product evaluations.

Second, this research contributes to advertising literature by exploring the two critical factors (image and message) in an advertisement. Previous studies have already investigated the interaction effect between image and message in the advertisement. For example, headlines that provide a clue to the meaning of a pictorial metaphor in the advertisement can better increase advertisement liking compared to headlines that completely explain the metaphor (Phillips, 2000); a complete headline, which spells out the advertisement message clearly, leads to more positive brand communication effects than headlines that only provide a clue (Bergkvist et al., 2012). Thus, it is important to understand the interaction between image and message because the fit between image and message could generate better advertising effects. Extending this stream of research, this study investigates how image temperature (warm and cold) and messages (concrete and abstract) in an advertisement interact to influence advertisement and product evaluations. The findings advance our understanding of the interaction effect between image and message.

Third, by exploring processing fluency as a mediator, I provide insights on how different images and messages in an advertisement influence advertisement and product evaluation. Lee (2002) proposed that processing fluency could be triggered perceptually or conceptually. Later, a third type of processing fluency is demonstrated; encoding fluency is identified as the ease or difficulty with which information can be encoded in memory (Hertzog et al., 2003). My study further extends the understanding of processing fluency from a different aspect: CLT. More specifically, warm images could help generate greater psychological proximity, which promotes the ability to handle concrete (abstract) messages, cold images could help generate greater

psychological distance which promotes the ability to handle abstract messages based on the CLT. Thus, when warm images are paired with concrete messages, cold images are paired with abstract messages, it is easier to process, which enhances the level of processing fluency and further leads to more positive evaluations. Thus, the results show different combinations of images and messages could influence processing fluency, which had not been discovered by previous study.

### **Managerial Implications**

Firms always allocate a huge budget to design advertisements in order to attract more customers. Based on the results from the two studies, in order to have a more positive evaluation, advertisers should be careful when designing images and messages in advertisements. When images and messages are used together, their combination and its effect should be considered. The results suggest that image theme can act as a temperature cue that influences consumers' information processing of advertisement messages. Thus, when advertisers feature a sunshine scene (i.e., warm image) in the advertisement, concrete messages should be presented so that they can generate favourable product evaluation and advertisement evaluations. If the marketers are designing an advertisement with a cold image (i.e., snow scenery), it would be better to describe the information in an abstract way.

Besides, since some products have their own cold or warm properties. For example, when thinking about a winter jacket, the first thing that comes to mind spontaneously is its close association with cold weather. People will have a feeling of cold when they realize the advertisement is introducing a winter jacket. Thus, based on the results of the research, advertisers should then think about using abstract words to explain the details in the advertisement. On the other hand, some products like sunglasses and sunscreen cream give people a feeling of hot summer when thinking of these products. Under such conditions, the

advertisement should be designed to tell the information in a concrete way, which is easier for people to process and more likely to have a positive evaluation of the products.

Moreover, since one of the features we choose to describe the studied products is eco-friendly, we also provide an implication on the green advertising industry. From the practical standpoint, when trying to persuade customers to choose green products, marketers could consider more about how to combine the images and messages in the advertisement to best trigger customers' purchase intentions. Based on the results, advertisers could design the advertisements with warm(cold) images and concrete(abstract) messages, which better stimulate people's positive evaluation towards the product. Furthermore, it will leave a positive impact on the global environment.

### **Limitations and Future Research**

This research has some limitations. The study only focuses on the content of the advertisement. Future studies could investigate the other features of the advertisement. While the other features are not related to the main or most important part of the advertisement, they could be like other components of a dominant colour of an advertisement—hue, saturation, and lightness (Lichtlé, 2007). Future studies could consider the impact of colours of the background in the advertisement on advertisement persuasiveness. For example, orange (a warm colour) evokes positive feelings towards the advertisement, while blue (a cold colour) triggers negative feelings (Palmer, 2013). Therefore, researchers can investigate whether and how different colours interact with message type (concrete vs. abstract) to influence advertisement persuasiveness. Messages can also be studied further from different perspectives. For instance, marketing studies have found that homophones can prime judgments related to an unread homophone only under conditions of cognitive capacity constraints (Ilicic et al., 2018). It is just one of the possible aspects that could be studied, and the interaction effect of image and

homophone could be explored further.

## Conclusion

Overall, I proposed that warm and cold images interact with abstract and concrete messages to influence advertisement and product evaluation. The results support my theorizing. Specifically, my research shows that a combination of warm image and concrete message or cold image and abstract message in an advertisement could generate processing fluency that leads to positive advertisement and product evaluations. The reasons behind this are supported by previous literature that it is easier for people to process the advertisement while viewing warm images with concrete message or cold image with abstract message, which is considered a fit condition. In addition, compared with the cold condition, higher temperature generates greater psychological proximity (Ijzerman & Semin, 2009). Thus, based on CLT, psychological distance promotes the ability to handle abstract messages, while psychological proximity promotes the ability to deal with concrete messages (Trope & Liberman, 2010). In conclusion, under two fit conditions, warm image and concrete message, cold image and abstract message, people could process the advertisement easier, which generates a higher level of processing fluency and then leads to positive advertisement and product evaluations. This study offers impactful contributions to advertising and marketing literature, which still lacks adequate attention and research from scholars.

## References

- Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages: A consumer competition perspective. *Journal of Advertising*, 40(3), 19–30. <https://doi.org/10.2753/JOA0091-3367400302>
- Albert, N., & Valette-Florence, P. (2010). Measuring the love feeling for a brand using interpersonal love items. *Journal of Marketing Development and Competitiveness*, 5(1), 57–63.
- Allard, T., & Griffin, D. (2017). Comparative price and the design of Effective Product Communications. *Journal of Marketing*, 81(5), 16–29. <https://doi.org/10.1509/jm.16.0018>
- Alter, A. L., & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. *Personality and Social Psychology Review*, 13(3), 219–235. <https://doi.org/10.1177%2F1088868309341564>
- (Anna) Kim, E., Shoenberger, H., (Penny) Kwon, E., & Ratneshwar, S. (2022). A narrative approach for overcoming the message credibility problem in green advertising. *Journal of Business Research*, 147, 449–461. <https://doi.org/10.1016/j.jbusres.2022.04.024>
- Aydinoğlu, N. Z., & Krishna, A. (2019). The power of consumption-imagery in communicating retail-store deals. *Journal of Retailing*, 95(4), 116–127. <https://doi.org/10.1016/j.jretai.2019.10.010>
- Baek, T. H., & Yoon, S. (2017). Guilt and shame: Environmental message framing effects. *Journal of Advertising*, 46(3), 440–453. <https://doi.org/10.1080/00913367.2017.1321069>
- Barbera, M., Northey, G., Septianto, F., & Spanjaard, D. (2018). Those prices are hot! how

- temperature-related visual cues anchor expectations of price and value. *Journal of Retailing and Consumer Services*, 44, 178–181.  
<https://doi.org/10.1016/j.jretconser.2018.06.012>
- Bargh, J. A., & Shalev, I. (2012). The substitutability of physical and social warmth in daily life. *Emotion*, 12(1), 154–162. <https://doi.org/10.1037/a0023527>
- Bergkvist, L., Eiderbäck, D., & Palombo, M. (2012). The brand communication effects of using a headline to prompt the key benefit in ads with pictorial metaphors. *Journal of Advertising*, 41(2), 67–76. <https://doi.org/10.2753/JOA0091-3367410205>
- Bochaver, A., & Fenko, A. (2010). Metaphors in happy and unhappy life stories of Russian adults. *Metaphor and Symbol*, 25(4), 243–262.  
<https://doi.org/10.1080/10926488.2010.510928>
- Borgida, E., & Nisbett, R. E. (1977). The differential impact of abstract vs. concrete information on decisions1. *Journal of Applied Social Psychology*, 7(3), 258–271.  
<https://doi.org/10.1111/j.1559-1816.1977.tb00750.x>
- Bornstein, R. F., & D’Agostino, P. R. (1994). The attribution and discounting of perceptual fluency: Preliminary tests of a perceptual fluency/attributional model of the mere exposure effect. *Social Cognition*, 12(2), 103–128.  
<https://doi.org/10.1521/soco.1994.12.2.103>
- Bradley, M. M., Greenwald, M. K., Petry, M. C., & Lang, P. J. (1992). Remembering pictures: Pleasure and arousal in memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 18(2), 379–390. <https://doi.org/10.1037//0278-7393.18.2.379>

- Breedin, S. D., Saffran, E. M., & Coslett, H. B. (1994). Reversal of the concreteness effect in a patient with semantic dementia. *Cognitive Neuropsychology*, *11*(6), 617–660.  
<https://doi.org/10.1080%2F02643290903512305>
- Cabooter, E., Millet, K., Weijters, B., & Pandelaere, M. (2016). The “I” in extreme responding. *Journal of Consumer Psychology*, *26*(4), 510–523.  
<https://doi.org/10.1016/j.jcps.2016.03.002>
- Cervellon, M. C. (2012). Victoria’s dirty secrets: Effectiveness of green not-for-profit messages targeting brands. *Journal of Advertising*, *41*(4), 133–145.  
<https://doi.org/10.1080/00913367.2012.10672462>
- Chae, B., & Hoegg, J. (2013). The future looks “right”: Effects of the horizontal location of advertising images on product attitude. *Journal of Consumer Research*, *40*(2), 223–238.  
<https://doi.org/10.1086/669476>
- Chang, C. (2013). Imagery fluency and narrative advertising effects. *Journal of Advertising*, *42*(1), 54–68. <https://doi.org/10.1080/00913367.2012.749087>
- Cheema, A., & Patrick, V. M. (2012). Influence of warm versus cool temperatures on consumer choice: A resource depletion account. *Journal of Marketing Research*, *49*(6), 984–995.  
<https://doi.org/10.1509%2Fjmr.08.0205>
- Choi, J., Rangan, P., & Singh, S. N. (2016). Do cold images cause cold-heartedness? The impact of visual stimuli on the effectiveness of negative emotional charity appeals. *Journal of Advertising*, *45*(4), 417–426. <https://doi.org/10.1080/00913367.2016.1185982>

- Chowdhury, R. M. M., Olsen, G. D., & Pracejus, J. W. (2008). Affective responses to images in print advertising: Affect integration in a simultaneous presentation context. *Journal of Advertising*, *37*(3), 7–18. <https://doi.org/10.2753/JOA0091-3367370301>
- Denstsu International. (2022, January 26). *Dentsu ad spend report predicts second year of growth boosted by digital* [Press release]. <https://tinyurl.com/55zpe4vn>
- Fenko, A., Schifferstein, H. N. J., & Hekkert, P. (2010). Looking hot or feeling hot: What determines the product experience of warmth? *Materials & Design*, *31*(3), 1325–1331. <https://doi.org/10.1016/j.matdes.2009.09.008>
- Fiedler, K. (2007). Construal level theory as an integrative framework for behavioral decision-making research and consumer psychology. *Journal of Consumer Psychology*, *17*(2), 101–106. [https://doi.org/10.1016/S1057-7408\(07\)70015-3](https://doi.org/10.1016/S1057-7408(07)70015-3)
- Guido, G., Pichierri, M., Pino, G., & Natarajan, R. (2018). Effects of face images and face pareidolia on consumers' responses to print advertising. *Journal of Advertising Research*, *59*(2), 219–231. <https://doi.org/10.2501/jar-2018-030>
- Haberlandt, K. F., & Graesser, A. C. (1985). Component processes in text comprehension and some of their interactions. *Journal of Experimental Psychology: General*, *114*(3), 357–374. <https://doi.org/10.1037/0096-3445.114.3.357>
- Ha, Y., Park, K., Kim, S. J., Joo, J., & Cha, M. (2021). Automatically detecting image–text mismatch on Instagram with deep learning. *Journal of Advertising*, *50*(1), 52–62. <https://doi.org/10.1080/00913367.2020.1843091>

- Halali, E., Meiran, N., & Shalev, I. (2017). Keep it cool: Temperature priming effect on cognitive control. *Psychological Research, 81*(2), 343–354.  
<https://doi.org/10.1007/s00426-016-0753-6>
- Hansen, J., & Wänke, M. (2010). Truth from language and truth from fit: The impact of linguistic concreteness and level of construal on subjective truth. *Personality and Social Psychology Bulletin, 36*(11), 1576–1588. <https://doi.org/10.1177/0146167210386238>
- Henderson, M. D., Fujita, K., Trope, Y., & Liberman, N. (2006). Transcending the "here": The effect of spatial distance on social judgment. *Journal of Personality and Social Psychology, 91*(5), 845–856. <https://doi.org/10.1037/0022-3514.91.5.845>
- Hertzog, C., Dunlosky, J., Robinson, A. E., & Kidder, D. P. (2003). Encoding fluency is a cue used for judgments about learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 29*(1), 22–34. <https://doi.org/10.1037/0278-7393.29.1.22>
- Ijzerman, H., & Semin, G. R. (2009). The thermometer of social relations: Mapping social proximity on temperature. *Psychological Science, 20*(10), 1214–1220.  
<https://doi.org/10.1111/j.1467-9280.2009.02434.x>
- Ilicic, J., Baxter, S. M., & Kulczynski, A. (2018). To meet or meat? homophones in advertising encourage judgments and behaviors in children. *Journal of Advertising, 47*(4), 378–394.  
<https://doi.org/10.1080/00913367.2018.1539361>
- Inagaki, T. K., & Eisenberger, N. I. (2013). Shared neural mechanisms underlying social warmth and physical warmth. *Psychological Science, 24*(11), 2272–2280.  
<https://doi.org/10.1177/0956797613492773>

- Jacoby, L. L. (1983). Remembering the data: Analyzing interactive processes in reading. *Journal of Verbal Learning and Verbal Behavior*, 22(5), 485–508. [https://doi.org/10.1016/S0022-5371\(83\)90301-8](https://doi.org/10.1016/S0022-5371(83)90301-8)
- Jacoby, L. L., & Dallas, M. (1981). On the relationship between autobiographical memory and perceptual learning. *Journal of Experimental Psychology: General*, 110(3), 306–340. <https://doi.org/10.1037//0096-3445.110.3.306>
- Kacen, J. J., & Lee, J. A. (2002). The influence of culture on consumer impulsive buying behavior. *Journal of Consumer Psychology*, 12(2), 163–176. [https://doi.org/10.1207/S15327663JCP1202\\_08](https://doi.org/10.1207/S15327663JCP1202_08)
- Kareklas, I., Carlson, J. R., & Muehling, D. D. (2012). The role of regulatory focus and self-view in “green” advertising message framing. *Journal of Advertising*, 41(4), 25–39. <https://doi.org/10.1080/00913367.2012.10672455>
- Kolb, P., Gockel, C., & Werth, L. (2012). The effects of temperature on service employees’ customer orientation: An experimental approach. *Ergonomics*, 55(6), 621–635. <https://doi.org/10.1080/00140139.2012.659763>
- Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology*, 22(3), 332–351. <https://doi.org/10.1016/j.jcps.2011.08.003>
- Kroll, J. F., & Merves, J. S. (1986). Lexical access for concrete and abstract words. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 12(1), 92–107. <https://doi.org/10.1037/0278-7393.12.1.92>

- Kulkarni, A. A., & Yuan, H. (2015). Effect of ad-irrelevant distance cues on persuasiveness of message framing. *Journal of Advertising*, *44*(3), 254–263.  
<https://doi.org/10.1080/00913367.2014.975877>
- Labroo, A. A., Landwehr, J. R., & Herrmann, A. (2011). Gut liking for the ordinary: Incorporating design fluency improves automobile sales forecasts. *Marketing Science*, *30*(3), 416–429. <https://doi.org/10.1287/mksc.1110.0633>
- Lee, A. Y. (2002). Effects of implicit memory on memory-based versus stimulus-based brand choice. *Journal of Marketing Research*, *39*(4), 440–454.  
<https://doi.org/10.1509/jmkr.39.4.440.19119>
- Lee, A. Y., & Aaker, J. L. (2004). Bringing the frame into focus: The influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology*, *86*(2), 205–218. <https://doi.org/10.1037/0022-3514.86.2.205>
- Levin, I. P., & Gaeth, G. J. (1988). How consumers are affected by the framing of attribute information before and after consuming the product. *Journal of Consumer Research*, *15*(3), 374–378. <https://doi.org/10.1086/209174>
- Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology*, *75*(1), 5–18. <https://doi.org/10.1037/0022-3514.75.1.5>
- Liberman, N., & Trope, Y. (2005). Psychological distance. *PsycEXTRA Dataset*.  
<https://doi.org/10.1037/e633942013-052>

- Lichtlé, M. C. (2007). The effect of an advertisement's colour on emotions evoked by attitude towards the ad: The moderating role of the optimal stimulation level. *International Journal of Advertising*, 26(1), 37–62. <https://doi.org/10.1080/02650487.2007.11072995>
- Martin, B. A. S., Wentzel, D., & Tomczak, T. (2008). Effects of susceptibility to normative influence and type of testimonial on attitudes toward print advertising. *Journal of Advertising*, 37(1), 29–43. <https://doi.org/10.2753/joa0091-3367370103>
- Masson, M. E. (1995). A distributed memory model of semantic priming. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21(1), 3–23. <https://doi.org/10.1037/0278-7393.21.1.3>
- McQuarrie, E. F., & Phillips, B. J. (2005). Indirect persuasion in advertising: How consumers process metaphors presented in pictures and words. *Journal of Advertising*, 34(2), 7–20. <https://doi.org/10.1080/00913367.2005.10639188>
- Medin, D. L., & Smith, E. E. (1984). Concepts and concept formation. *Annual Review of Psychology*, 35(1), 113–138. <https://doi.org/10.1146/annurev.ps.35.020184.000553>
- Mills, P. R., Tomkins, S. C., & Schlangen, L. J. (2007). The effect of high correlated colour temperature office lighting on employee wellbeing and work performance. *Journal of Circadian Rhythms*, 5(1), 1–9. <https://doi.org/10.1186%2F1740-3391-5-2>
- Monahan, L., & Romero, M. (2020). Heading the right way? The influence of motion direction in advertising on brand trust. *Journal of Advertising*, 49(3), 250–269. <https://doi.org/10.1080/00913367.2020.1751010>

- Moore, R. S., Stammerjohan, C. A., & Coulter, R. A. (2005). Banner Advertiser-web site context congruity and color effects on attention and attitudes. *Journal of Advertising*, 34(2), 71–84. <https://doi.org/10.1080/00913367.2005.10639189>
- Mukherjee, A. (2002). Pictures in words or words in pictures? new insights from Indian Print Advertising Research. *International Journal of Advertising*, 21(1), 67–86. <https://doi.org/10.1080/02650487.2002.11104917>
- Oakes, S. (2007). Evaluating empirical research into music in advertising: A congruity perspective. *Journal of Advertising Research*, 47(1), 38–50. <https://doi.org/10.2501/S0021849907070055>
- Oppenheimer, D. M. (2008). The secret life of fluency. *Trends in Cognitive Sciences*, 12(6), 237–241. <https://doi.org/10.1016/j.tics.2008.02.014>
- Orth, U. R., & Crouch, R. C. (2014). Is beauty in the aisles of the retailer? Package Processing in visually complex contexts. *Journal of Retailing*, 90(4), 524–537. <https://doi.org/10.1016/j.jretai.2014.05.004>
- Paivio, A. (1990). *Mental representations: A dual coding approach*. Oxford University Press.
- Paivio, A., Walsh, M., & Bons, T. (1994). Concreteness effects on memory: When and why? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20(5), 1196–1204. <https://doi.org/10.1037/0278-7393.20.5.1196>
- Palmer, K. T. (2013). *Threads of incidence* [Unpublished master's thesis]. Truman State University.

- Park, J., & Hadi, R. (2020). Shivering for status: When cold temperatures increase product evaluation. *Journal of Consumer Psychology, 30*(2), 314–328.  
<https://doi.org/10.1002/jcpy.1133>
- Petty, R. E., & Cacioppo, J. T. (1986). Communication and persuasion.  
<https://doi.org/10.1007/978-1-4612-4964-1>
- Phillips, B. J. (2000). The impact of verbal anchoring on consumer response to image ads. *Journal of Advertising, 29*(1), 15–24. <https://doi.org/10.1080/00913367.2000.10673600>
- Pilcher, J. J., Nadler, E., & Busch, C. (2002). Effects of hot and cold temperature exposure on performance: A meta-analytic review. *Ergonomics, 45*(10), 682–698.  
<https://doi.org/10.1080/00140130210158419>
- Pilelienė, L., & Grigaliūnaitė, V. (2017). Relationship between spokesperson's gender and advertising color temperature in a framework of advertising effectiveness. *Scientific Annals of Economics and Business, 64*, 1–13. <https://doi.org/10.1515/saeb-2017-0036>
- Pocheptsova, A., Amir, O., Dhar, R., & Baumeister, R. F. (2009). Deciding without resources: Resource depletion and choice in context. *Journal of Marketing Research, 46*(3), 344–355. <https://doi.org/10.1509%2Fjmk.46.3.344>
- Putrevu, S. (2010). An examination of consumer responses toward attribute- and goal-framed messages. *Journal of Advertising, 39*(3), 5–24. <https://doi.org/10.2753/joa0091-3367390301>
- Reber, R., & Schwarz, N. (1999). Effects of perceptual fluency on judgments of truth. *Consciousness and Cognition, 8*(3), 338–342. <https://doi.org/10.1006/ccog.1999.0386>

Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8(4), 364–382. [https://doi.org/10.1207/s15327957pspr0804\\_3](https://doi.org/10.1207/s15327957pspr0804_3)

Rosch, E. (1975). Cognitive representations of semantic categories. *Journal of Experimental Psychology: General*, 104(3), 192–233. <https://doi.org/10.1037/0096-3445.104.3.192>

Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin*, 121(1), 3–19. <https://doi.org/10.1037/0033-2909.121.1.3>

Roy, R., & Sharma, P. (2015). Scarcity appeal in advertising: Exploring the moderating roles of need for uniqueness and message framing. *Journal of Advertising*, 44(4), 349–359. <https://doi.org/10.1080/00913367.2015.1018459>

Ryoo, Y., Jeon, Y. A., & Sung, Y. (2020). Interpret me! the interplay between visual metaphors and verbal messages in advertising. *International Journal of Advertising*, 40(5), 760–782. <https://doi.org/10.1080/02650487.2020.1781477>

Schwanenflugel, P. J., & Shoben, E. J. (1983). Differential context effects in the comprehension of abstract and concrete verbal materials. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9(1), 82–102. <https://doi.org/10.1037/0278-7393.9.1.82>

Schwanenflugel, P. J., & Stowe, R. W. (1989). Context availability and the processing of abstract and concrete words in sentences. *Reading Research Quarterly*, 24(1), 114–126. <https://doi.org/10.2307/748013>

- Schwarz, N. (1998). Accessible content and accessibility experiences: The interplay of declarative and experiential information in judgment. *Personality and Social Psychology Review*, 2(2), 87–99. [https://doi.org/10.1207/s15327957pspr0202\\_2](https://doi.org/10.1207/s15327957pspr0202_2)
- Seamon, J. G., McKenna, P. A., & Binder, N. (1998). The mere exposure effect is differentially sensitive to different judgment tasks. *Consciousness and Cognition*, 7(1), 85–102. <https://doi.org/10.1006/ccog.1998.0334>
- Sinha, J., & Bagchi, R. (2019). Role of ambient temperature in influencing willingness to pay in auctions and negotiations. *Journal of Marketing*, 83(4), 121–138. <https://doi.org/10.1177%2F0022242919841595>
- Storme, M., Myszkowski, N., Davila, A., & Bournois, F. (2015). How subjective processing fluency predicts attitudes toward visual advertisements and purchase intention. *Journal of Consumer Marketing*, 32(6), 432–440. <https://doi.org/10.1108/JCM-10-2014-1187>
- Sung, M., Kim, J., Kim, J., & Yu, S. C. (2019). Realistic sonar image simulation using generative adversarial network. *IFAC-PapersOnLine*, 52(21), 291–296. <https://doi.org/10.1016/j.ifacol.2019.12.322>
- Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, 117(2), 440–463. <https://dx.doi.org/10.1037%2Fa0018963>
- Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal levels and psychological distance: Effects on representation, prediction, evaluation, and behavior. *Journal of Consumer Psychology*, 17(2), 83–95. [https://doi.org/10.1016/s1057-7408\(07\)70013-x](https://doi.org/10.1016/s1057-7408(07)70013-x)

- Wakslak, C. J., Trope, Y., Liberman, N., & Alony, R. (2006). Seeing the forest when entry is unlikely: Probability and the mental representation of events. *Journal of Experimental Psychology: General*, *135*(4), 641–653. <https://doi.org/10.1037/0096-3445.135.4.641>
- Wastiels, L., Schifferstein, H. N., Heylighen, A., & Wouters, I. (2012). Red or rough, what makes materials warmer? *Materials in Engineering*, *42*, 441–449. <https://doi.org/10.1016/j.matdes.2012.06.028>
- West, W. C., & Holcomb, P. J. (2000). Imaginal, semantic, and surface-level processing of concrete and abstract words: An electrophysiological investigation. *Journal of Cognitive Neuroscience*, *12*(6), 1024–1037. <https://doi.org/10.1162/08989290051137558>
- Williams, L. E., & Bargh, J. A. (2008). Experiencing physical warmth promotes interpersonal warmth. *Science*, *322*(5901), 606–607. <https://doi.org/10.1126%2Fscience.1162548>
- Winkielman, P., & Cacioppo, J. T. (2001). Mind at ease puts a smile on the face: Psychophysiological evidence that processing facilitation elicits positive affect. *Journal of Personality and Social Psychology*, *81*(6), 989–1000. <https://doi.org/10.1037/0022-3514.81.6.989>
- Winkielman, P., Schwarz, N., Fazendeiro, T. A., & Reber, R. (2003). The hedonic marking of processing fluency: Implications for evaluative judgment. In J. Musch & K. C. Klauer (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (pp. 189–217). Lawrence Erlbaum Associates.
- Xiao, A., Huang, Y., Bortree, D. S., & Waters, R. D. (2021). Designing social media fundraising messages: An experimental approach to understanding how message concreteness and

- framing influence donation intentions. *Nonprofit and Voluntary Sector Quarterly*.  
<https://doi.org/10.1177%2F08997640211022838>
- Yu, Y., & Wang, L. (2021). Need to warm up! Ambient coldness increases vice inclinations. *Journal of Sensory Studies*, 36(5), Article e12686. <https://doi.org/10.1111/joss.12686>
- Zhang, Y., Kwak, H., Jeong, H., & Puzakova, M. (2019). Facing the “right” side? The effect of product facing direction. *Journal of Advertising*, 48(2), 153–166.  
<https://doi.org/10.1080/00913367.2018.1503576>
- Zhang, Y., Xiao, S. H., & Nicholson, M. (2020). The effects of dynamic product presentation and contextual backgrounds on consumer purchase intentions: Perspectives from the load theory of attention and cognitive control. *Journal of Advertising*, 49(5), 592–612.  
<https://doi.org/10.1080/00913367.2020.1789014>
- Zhong, C.-B., & Leonardelli, G. J. (2008). Cold and lonely. *Psychological Science*, 19(9), 838–842. <https://doi.org/10.1111/j.1467-9280.2008.02165.x>
- Zia, N. U., Luqman, M., & Akram, M. W. (2016). Impact of salesman behavior on customer satisfaction: An empirical study of dairy retail handlers. *Kuwait Chapter of Arabian Journal of Business & Management Review*, 5(8), 20–27.  
<http://doi.org/10.12816/0019409>
- Zwebner, Y., Lee, L., & Goldenberg, J. (2014). The temperature premium: Warm temperatures increase product valuation. *Journal of Consumer Psychology*, 24(2), 251–259.  
<https://doi.org/10.1016/j.jcps.2013.11.003>

## Appendix A

### Advertisement Image and Advertisement Message for Shoes

**Warm image**



**Cold image**



| Abstract message  | Concrete message   |
|---|--|
| <p><b>Eco-friendly</b></p> <p>This pair of eco-friendly shoes is designed to leave a positive environmental footprint. The advanced manufacturing processes help minimize damage to the environment.</p> <p><b>Durable</b></p> <p>This footwear has many versatile features to offer. By retaining the industry's best features, we offer shoes that are durable and comfortable to wear.</p> | <p><b>Eco-friendly</b></p> <p>This pair of eco-friendly shoes has an outer lining made of 100% recycled materials, and the inside of the shoes is made of 30% natural latex. The advanced manufacturing processes result in the reduction of CO2 emissions by 20%.</p> <p><b>Durable</b></p> <p>This footwear has many versatile features. Durability is achieved through the use of synthetic and mesh fabric, and the use of EVA foam and soft cushioning reduces friction between the materials to minimize pressure points and makes them comfortable to wear.</p> |

## Appendix B

### Four Advertisement Versions for Shoes

#### Warm image and concrete message



#### Eco-friendly

This pair of eco-friendly shoes has an outer lining made of 100% recycled materials, and the inside of the shoes is made of 30% natural latex. The advanced manufacturing processes result in the reduction of CO2 emissions by 20%.

#### Durable

This footwear has many versatile features. Durability is achieved through the use of synthetic and mesh fabric, and the use of EVA foam and soft cushioning reduces friction between the materials to minimize pressure points and makes them comfortable to wear.

**Warm image and abstract message****Eco-friendly**

This pair of eco-friendly shoes is designed to leave a positive environmental footprint. The advanced manufacturing processes help minimize damage to the environment.

**Durable**

This footwear has many versatile features to offer. By retaining the industry's best features, we offer shoes that are durable and comfortable to wear.

**Cold image & concrete message****Eco-friendly**

This pair of eco-friendly shoes has an outer lining made of 100% recycled materials, and the inside of the shoes is made of 30% natural latex. The advanced manufacturing processes result in the reduction of CO2 emissions by 20%.

**Durable**

This footwear has many versatile features. Durability is achieved through the use of synthetic and mesh fabric, and the use of EVA foam and soft cushioning reduces friction between the materials to minimize pressure points and makes them comfortable to wear.

**Cold image & abstract message****Eco-friendly**

This pair of eco-friendly shoes is designed to leave a positive environmental footprint. The advanced manufacturing processes help minimize damage to the environment.

**Durable**

This footwear has many versatile features to offer. By retaining the industry's best features, we offer shoes that are durable and comfortable to wear.

## **Appendix C**

### **Definitions of Abstract and Concrete Messages**

- Abstract messages provide general information without any details. For example, “This pair of shoes is designed to leave a positive environmental footprint.” The message does not provide additional details.
- Concrete messages provide information in a detailed way with the addition of figures or explaining with more details. For example, “This pair of shoes is made of 100% recycled materials and 30% natural latex which helps to reduce CO2 emissions by 20%.” The message explains how this pair of shoes helps to prevent damage to the environment.

## Appendix D

### Advertisement Image and Advertisement Message for Cars

**Cold image**



**Warm image**



| <b>Abstract message</b>   | <b>Concrete message</b>   |
|---|---|
| <p>This is a fuel-efficient and eco-friendly automobile that is designed for a positive environmental footprint. The interior of the car is sustainably produced from renewable resources that reduce greenhouse gas emissions.</p> <p>This car offers versatile features. The use of high-quality materials and parts results in a car that is durable and comfortable to drive.</p> | <p>This fuel-efficient car has an I-VTEC engine that saves energy by 10%. Using biodegradable materials (natural bioparticles) for the interior of the car results in 5% reduction of greenhouse gas emissions.</p> <p>This car offers versatile features. Durability is achieved with carbon fiber (stronger than steel), and the use of synthetic-leather seats makes the car comfortable to drive.</p> |

## Appendix E

### Four Advertisement Versions for Cars

#### Cold image and abstract message



This is a fuel-efficient and eco-friendly automobile that is designed for a positive environmental footprint. The interior of the car is sustainably produced from renewable resources that reduce greenhouse gas emissions.

This car offers versatile features. The use of high-quality materials and parts results in a car that is durable and comfortable to drive.

### Cold image and concrete message



This fuel-efficient car has an I-VTEC engine that saves energy by 10%. Using biodegradable materials (natural bioparticles) for the interior of the car results in 5% reduction of greenhouse gas emissions.

This car offers versatile features. Durability is achieved with carbon fiber (stronger than steel), and the use of synthetic-leather seats makes the car comfortable to drive.

### Warm image and abstract message



This is a fuel-efficient and eco-friendly automobile that is designed for a positive environmental footprint. The interior of the car is sustainably produced from renewable resources that reduce greenhouse gas emissions.

This car offers versatile features. The use of high-quality materials and parts results in a car that is durable and comfortable to drive.

### Warm image and concrete message



This fuel-efficient car has an I-VTEC engine that saves energy by 10%. Using biodegradable materials (natural bioparticles) for the interior of the car results in 5% reduction of greenhouse gas emissions.

This car offers versatile features. Durability is achieved with carbon fiber (stronger than steel), and the use of synthetic-leather seats makes the car comfortable to drive.

## Appendix F

### Measurement Scales

#### Image

Do you think the image pass you a feeling of warmth?

|  |  |   |   |  |   |   |
|--|--|---|---|--|---|---|
| <input type="checkbox"/><br>1=very<br>strongly<br>disagree | <input type="checkbox"/><br>2=very<br>disagree | <input type="checkbox"/><br>3=somewh<br>at disagree | <input type="checkbox"/><br>4=Neither<br>or not | <input type="checkbox"/><br>5=somewh<br>at agree | <input type="checkbox"/><br>6=very<br>agree | <input type="checkbox"/><br>7=very<br>strongly<br>agree |
|--|--|---|---|--|---|---|

Do you think the image pass you a feeling of coldness?

|  |  |   |   |  |   |   |
|--|--|---|---|--|---|---|
| <input type="checkbox"/><br>1=very<br>strongly<br>disagree | <input type="checkbox"/><br>2=very<br>disagree | <input type="checkbox"/><br>3=somewh<br>at disagree | <input type="checkbox"/><br>4=Neither<br>or not | <input type="checkbox"/><br>5=somewh<br>at agree | <input type="checkbox"/><br>6=very<br>agree | <input type="checkbox"/><br>7=very<br>strongly<br>agree |
|--|--|---|---|--|---|---|

#### Message

Please indicate your feelings regarding the message.

|          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |                 |
|----------|---|---|---|---|---|---|---|-----------------|
| Abstract |   |   |   |   |   |   |   | concrete        |
| Precise  |   |   |   |   |   |   |   | Not<br>precise  |
| Detailed |   |   |   |   |   |   |   | Not<br>detailed |
| Specific |   |   |   |   |   |   |   | Not<br>specific |

#### Processing fluency

Please indicate your agreement regarding perceived ease of processing the information in the message.

|                    |                          |                          |                            |                          |                          |                          |                          |
|--------------------|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| clear              | 1=strongl<br>y disagree  | 2=disag<br>ree           | 3=somew<br>hat<br>disagree | 4=Neithe<br>r or not     | 5=somew<br>hat agree     | 6=<br>agree              | 7= strongly<br>agree     |
| Easy to<br>process | 1=strongl<br>y disagree  | 2=disag<br>ree           | 3=somew<br>hat<br>disagree | 4=Neithe<br>r or not     | 5=somew<br>hat agree     | 6=<br>agree              | 7 strongly<br>agree      |
| Well<br>structured | 1=strongl<br>y disagree  | 2=disag<br>ree           | 3=somew<br>hat<br>disagree | 4=Neithe<br>r or not     | 5=somew<br>hat agree     | 6=<br>agree              | 7 strongly<br>agree      |

**Advertisement evaluation**

| What do you think of the advertisement? |   |   |   |   |   |   |   |                   |
|---|---|---|---|---|---|---|---|-------------------|
|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |                   |
| Uninteresting                           |   |   |   |   |   |   |   | Interesting       |
| Negative                                |   |   |   |   |   |   |   | Positive          |
| Poor quality                            |   |   |   |   |   |   |   | Excellent quality |

**Product evaluation**

| What do you think of the product? |   |   |   |   |   |   |   |   |   |              |
|-----------------------------------|---|---|---|---|---|---|---|---|---|--------------|
|                                   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |              |
| Bad                               |   |   |   |   |   |   |   |   |   | Good         |
| Dislike                           |   |   |   |   |   |   |   |   |   | Like         |
| Undesirable                       |   |   |   |   |   |   |   |   |   | Desirable    |
| Low-quality                       |   |   |   |   |   |   |   |   |   | High-quality |

**Advertisement involvement**

|  | 1                        | 2                        | 3                        | 4                        | 5                        | 6                        |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I was involved with the advertisement content                                | <input type="checkbox"/> |
| I concentrated on the advertisement content                                  | <input type="checkbox"/> |
| I paid attention to the advertisement content when viewing the advertisement | <input type="checkbox"/> |

**Demographic questions**

What gender do you identify as?

- Male
- Female
- Other

What is your age?

- Under 18 years old
- 18-30 years old
- 31-45 years old

- 46-70 years old
- Over 70 years old

What is the highest degree or level of education you have completed?

- High school
- Bachelor's degree
- Master's degree
- PH.D or higher
- Trade school
- Other

Are you currently...?

- Employed for wages
- Self-employed
- A homemaker
- A student
- Retired
- Out of work
- Other

What is your annual household income?

- Less than \$25,000
- \$25,000 - \$50,000
- \$50,000 - \$100,000
- \$10,000 - \$200,000
- More than \$200,000