



A Design-related Information Processing Model for Brand Communication in Retail Spaces*

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Abstract

Purpose: This research presents a practical tool aimed at increasing collaboration between designers and marketers for effective retail space branding. We present a design-related information processing model (DIP Model), which is a schematic map that includes cognitive theories which have design applications to retail space branding. **Research design, data and methodology:** Through literature review and practitioner opinion survey, 43 theories pertaining to the brand communication in retail spaces were selected, and design applications of the theories were analysed through field trips to stores of global brands. **Results:** The DIP Model consists of two axes: the information processing axis (i.e., encoding vs retrieval) and the regulatory focus axis (i.e., promotion vs prevention). Theories related to information processing axis are theories that facilitate the encoding and retrieval of information as intended by the company. Theories related to regulatory focus axis are theories that reinforce positive cognition and prevent negative cognition regarding the brand. **Conclusions:** The DIP Model is developed as a tool to categorise cognitive theories that are applicable to the design of brand communication in retail spaces. As such, the model can provide a better understanding of the role of behavioural design, with the aim of building stronger brands in retail spaces.

Keywords : Retail Space Branding, Information Processing, Design Cognition, Design Psychology, Design Model, Store Design

JEL Classification Code: D91, M30, M31

1. Introduction

“Invisible and Incorporeal.” It describes one of main directions design is headed today: making the role of design evolve from material realisation into the embodiment of incorporeal and psychological values. This direction is happening because many consumers today are seeking self-actualisation needs in their consumption.

Therefore, from the standpoint of business, it is becoming more and more important to provide

psychological value-added through brand-related experiences. A famous example is Sephora’s transformation. According to Harvard Business School Case (9-511-137), Sephora was once an offline-only cosmetics retailer, but with the advent of online shopping, it had to change its marketing strategy to advocate consumer experiences, encouraging customers to try out the products in their stores even if no purchase is made at the store. Sephora’s strategy is to encourage customers to experience the products in their stores and then purchase online. By altering main offering

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of its stores from material cosmetics into cosmetic experience, Sephora has managed to escape the retail apocalypse.

Social change like this is moving design toward an experience-oriented direction and pushes designers into a situation where they need to be an expert not only in material aspects but also in psychological aspects of their design solutions. Therefore, this paper studies psychological theories for designing consumer experiences, especially in connection with brand communication in retail spaces.

Brand communication in retail spaces is particularly relevant because, among many brand-related experiences, those encountered at the store are absorbed directly through all the senses and thus more powerfully imprinted on consumers' memory (Hultén, 2017). In the past, brand communication was mainly carried out indirectly through mass media. However, companies are now diversifying their strategies, and retail space branding is one of the important alternatives. While mass media may reach more people, retail space branding creates a stronger and more authentic impression (Grundey, 2008).

This paper focuses on the information processing aspect of retail space branding, namely, cognitive theories related to effective communication of brand information in retail spaces. Often, a company's brand communication efforts fail because consumers do not understand and remember the brand message as intended by the company, which is the failure of the company to carefully consider the receiver's cognitive process. Thus, the main objective of this paper will be to provide a structural model made up of cognitive theories, interpreted in light of designing effective brand communication in retail spaces. Because behavioural design of brand communication is an area that requires interdisciplinary cooperation between design and consumer behaviour, this paper can also provide effective bridges between the fields of design, consumer behaviour, and branding.

In this paper, "cognition" is defined in a narrow sense of the term that excludes sensory perception, which is a biological and automatic information process. Instead, this paper defines cognition as high-level information processing behaviour.

Research methodologies used in this study are literature review, field trips to brand stores, design case studies, and practitioner opinion survey. A detailed explanation will be given in Section 4.

2. Retail Space Branding and Brand Communication

Branding is a company's activity aimed at increasing brand equity, and two factors that determine brand equity

are "brand image" and "brand awareness" (Keller, 2008). Brand image refers to the set of associations linked to the brand that consumers hold in memory and is related to attributes and benefits of the brand. Since a strong brand image is achieved by effectively communicating brand-related information to consumers, a branding strategy must be constructed so that information processing by consumers occurs in a way that companies had intended. Brand awareness refers to whether consumers can recall or recognise a brand. Marketing activities that increase brand awareness facilitate retrieval of brand knowledge from consumer's long-term memory (Huang & Sarigöllü, 2014).

Retail space branding aims to improve on these two factors of brand equity. In this study, we define retail space branding as a communication strategy that uses spaces, such as retail stores, flagship stores, pop-up stores, and in-store PR events, for brand building. As businesses found it more difficult to differentiate on the product's functional elements, they are striving to increase brand equity through image, emotion, and experience. Leading this change is experiential marketing (Lemon & Verhoef, 2016), which refers to the activities of a company that aims to increase brand equity by providing customers with high-level brand experiences. Retail space branding is embraced today by many companies because the intensity of the consumer attitude formed by direct experience at the store will be higher than that formed by indirect experiences such as hearing about the product from advertising or another person (de Farias, Aguiar, & Melo, 2014).

One well-known company that actively uses retail space branding strategy is IKEA. IKEA tries to make customers aware that it is a lifestyle brand rather than a product brand through its showrooms, in which their products are beautifully arranged under creative lifestyle themes. In addition, IKEA stores have been operated as spaces for both sales and branding. To this end, IKEA operates mega-size stores so that they can provide many enjoyable brand experiences (e.g. Showrooms with creative themes, Child-care service, Restaurant, Café, Bistro, Customising stations, Consulting service station, Children's play stations etc.). Customers go to IKEA stores not only to shop but also to enjoy themselves. According to Harvard Business School Case (#716458), this retail space branding strategy of IKEA has been a great success. Even in an era of online shopping, IKEA stores are places where loyal customers visit for fun.

3. Structure of the Model

In this section, we will develop the structure of the model, namely, "the design-related information processing model for retail space branding" (hereafter, the DIP Model). This model has two axes.

3.1. Information Processing Axis: Encoding vs. Retrieval

The first axis is related to human information processing model. (Fig. 1) (Huiitt, 2003)

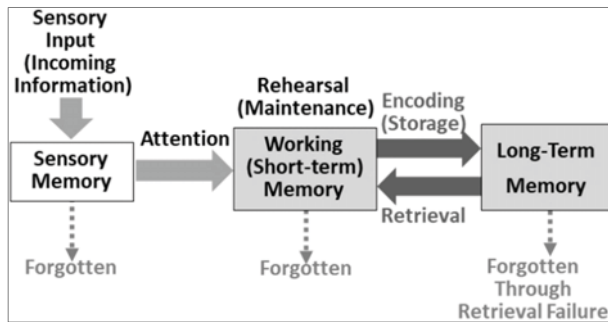


Figure 1: Multi-Store Model by Atkinson & Shiffrin

As mentioned earlier, this study excluded sensory perception, which is related to sensory input and sensory memory (Fig. 1, left). Instead, we studied higher-level of information processing, which is related to working memory and long-term memory.

Brand equity is determined by brand image and brand awareness. Successful branding is achieved when information is encoded-as-intended to consumers (i.e., increase in positive brand image) and retrieved easily from their memory (i.e., increase in brand awareness). Therefore, these two aspects of human information processing constitute the horizontal axis of our model: encoding-related vs. retrieval-related (Fig. 7, upper matrix).

3.2. Regulatory Focus Axis: Promotion vs. Prevention

Another axis of our model derives from regulatory focus theory (Senbeto & Hon, 2019). According to this theory, goals that humans have when regulating their behaviour can be divided into promotion and prevention: promotion aims at obtaining positive results, and prevention aims at avoiding negative results. We propose that regulatory focus can be applied not only to human activities but also to corporate branding activities.

In our model, the regulatory focus element constitutes the vertical axis: promotion-related vs. prevention-related (Fig. 7, upper matrix). Promotion-related strategies reinforce positive image of the brand, and even cognitive biases can sometimes serve a positive purpose. Theories analysed in relation to this are presented in the promotion-related axis.

Marketers usually put more effort into promotion-related strategies. However, without prevention strategies, even well-intended messages will not be effective because

cognitive overload and error may occur. Prevention-related strategies address this problem of human cognitive limitations. Countermeasures for these limitations should be prepared so that information which flows into the consumer is meaningfully classified; the amount of information is appropriate; and there are no competing factors to hinder processing of information. Theories analysed in relation to these are presented in the prevention-related axis.

3.3. Four Quadrants of the Model

The structural model consists of four quadrants formed by the two axes (Fig. 7, upper matrix). Theories to be analysed are classified into these quadrants according to their emphasis.

Promotion-Encoding Quadrant: It is related to mechanisms that facilitate input of positive brand information “into” the consumer’s memory. For example, the source effect states that perception of reliability of the information depends on who delivers it.

Promotion-Retrieval Quadrant: It is related to facilitating retrieval of information “from” consumer’s memory. While the promotion-encoding quadrant emphasises “positive” encoding of brand information, this quadrant emphasises “assured” retrieval from memory, regardless of whether the information is positive or not. For example, the Zeigarnik Effect is “the superior remembrance of things or tasks that were incomplete or where mistakes were made.” Information that emphasises seeming mistakes or incompleteness can be made on purpose to increase memorability.

Prevention-Encoding Quadrant: It is related to prevention of factors that hinder the input of information. Potential inhibitors such as cognitive error, cognitive overload, and cognitive interference should be prevented.

Prevention-Retrieval Quadrant: It is related to prevention of retrieval failure or retrieval of mis-information. For example, consumers have more difficulty with recall memory compared to recognition memory.

4. Contents of the Model

In this section, we analyse the contents of our model, namely cognitive theories related to effective brand communication in retail spaces.

4.1. Research Methodology

Relevant theories were selected through literature review, field trips to brand stores, design case studies, and collection of practitioner opinion. The selection procedure for the theories is as follows.

① Literature Screening

First, books related to consumer behaviour were selected. From Amazon.com, we selected books that were published or revised after 2010, and which had a customer rating score of 4.0 or higher (out of 5.0). Then, books that had more than 100 customer reviews from the latest edition plus the previous edition were selected (we adopted this criterion in place of the number of sales because the latter was not provided in Amazon.com). Four books met these criteria (Hoyer, MacInnis, & Pieters, 2018; Mothersbaugh, Hawkins, & Kleiser, 2020; Schiffman & Wisenblit, 2019; Solomon, 2020). These four books were comprehensive enough to cover most of the important theories in consumer behaviour, as the theories covered by most books on consumer behaviour were quite similar.

Next, books on design psychology were selected. In this case, a larger number of books were reviewed because the theories covered by each book differed considerably. From Amazon.com, books published or revised after 2010 and with a customer rating score of 4.0 or higher were selected. From this set, we examined the contents of each book to evaluate the suitability to the topic. Six books were selected (Lidwell, Holden, & Butler, 2010; Norman, 2013; Weinschenk, 2011; Wendel, 2020; Whalen, 2019; Yablonski, 2020). Books with overlapping contents with the abovementioned books and books with low relevance to the topic of this paper were excluded. In addition, to supplement the contents of the aforesaid books, we also examined books with a customer rating score of less than 4.0. Two more books were selected (Batra, Seifert, & Brei, 2016; Stone, Alex, Keebler, Chaparro, & McConnell, 2017). So, the final list contained eight books.

② Initial theory selection: Literature Review

From the above literature, author A (marketing major) and author B (design major) selected 63 theories related to effective communication of brand information in retail spaces.

③ Secondary theory selection: Research on Design Applications

Author B (design major) reviewed each of 63 theories as to its applicability to design for retail space branding. Design applications for each theory were collected through direct observation during field study of brand stores. The criteria for the store selection were stores of global brands, occupying an entire building, in the Seoul metropolitan area. Effort was made to select the brands from different product categories. Author B visited and analysed the stores of selected brands.

Three stores of IKEA (Gwangmyeong, Goyang, and Giheung stores) were the primary subjects for design case study because IKEA is a brand that has successfully

operated retail space branding through its mega-stores. In their stores, IKEA also delivers a lot of brand information. Therefore, IKEA stores were favourable places to discover design applications of many theories studied in this paper. In effect, they provided the majority of design application examples.

Next, flagship stores of other brands were analysed. Since flagship stores focus on branding rather than sales, they are appropriate subjects for research on retail space branding. “House of Dior,” “Apple Store,” and “Hyundai Motor Studio Goyang” were studied. For matters requiring additional confirmation, informal employee interviews and media articles were used.

At this stage, theories for which appropriate design applications could not be found were excluded. As a result, 54 theories were confirmed with design applications.

④ Tertiary theory selection: Academic Article Review and Additional Inquiry

Next, author C (marketing major) reviewed academic articles on 54 theories and each theory was re-examined on its applicability to effective brand communication in retail spaces. With author C's suggestions and through discussions of the authors, theories with similar or closely tied contents were combined and theories with low relevance to the topic were dropped. As a result, a total of 44 theories were selected.

⑤ Final theory selection: Collecting Opinions from Practitioners

In this final stage, we collected the opinions from practitioners. To propose our model as a tool to support the collaboration between designers and marketers, 44 theories chosen by academics needed to be checked by practitioners. Ten practitioners (five each from design & marketing) were commissioned for a final review. A questionnaire explained the 44 theories and their design applications (example: see Appendix). Two questions were asked for each theory: whether the theory was relevant for effective brand communication in retail spaces, and whether the design application was appropriate for the theory. In addition, respondents were asked to write comments if they had further opinions (e.g. reasons for agree/disagree, better design examples etc.).

Table 1 shows the results. For theories, 43 theories got less than two disagree out of ten. We also checked the comments for disagreements and didn't find any serious reason. However, one theory (Face-ism) got three disagreements, and its design case got four disagreements. More disagreement came from marketers (2 for theory & 3 for design case) than designers. So, it was deemed insufficient for marketing application and excluded from the final list.

For design cases, 42 cases got less than two disagree. Among them, 40 theories with no further comments to consider were confirmed. However, when we checked the comments of remaining three cases (Confirmation Bias and Physical Presence of a Good - two disagreements / Zeigarnik Effect - three disagreements), we found some good comments which prompted us to revise our design cases (e.g. better design case, adding more images or explanations)

Table 1: Results - Collection of practitioners' opinion

Number of "Agree/Disagree"	Number of Theories	Number of Design Cases
10 agree / 0 disagree	29	22
9 agree / 1 disagree	13	16
8 agree / 2 disagree	1	4
7 agree / 3 disagree	1	1
6 agree / 4 disagree	0	1

4.2. Contents of the Model

Figure 7 (in section 5) shows the final 43 theories. Based on the results of the literature review and design application study, and through discussions among authors, the placement of each theory on the four quadrants of the model was determined. Some theories were found to be boundary theories, related to both encoding and retrieval, or both promotion and prevention. In section 5, these boundary theories will be explained further.

The following is the explanation of each theory and its design application. Even though there were more design features analysed, only one or two representative ones were presented for each theory.

4.2.1. Promotion & Encoding-related Theories

Endowment Effect (= Mere Ownership Effect) : A human tendency to place a higher value on things that she owns. This can happen either by ownership or by just thinking about ownership. Providing a touch experience is actively used, as it increases the customer's feeling of owning the product (Dommer & Swaminathan, 2013).

<Design Case> In all the stores analysed, products are displayed in a way that encourages customers to touch and use them.

Source Effect : Consumer's acceptance of the message varies depending on who delivers it. Credibility and attractiveness of the source are important. Attractiveness is determined by the degree to which the spokesperson is viewed favourably or the degree to which consumers feel similarity with the spokesperson (Yoon & Kim, 2016).

<Design Case> IKEA: Themed showrooms, "Let me introduce my house," are actual residential spaces of young customers (IKEA's main target), designed with the help of

IKEA's consulting service. This approach increases the similarity felt between customers and the spokesperson.

Involvement : It is consumer's perceived personal importance of a product. It is influenced by personal, product, and situational factors and by the degree of financial risk involved.

<Design Case> IKEA: Furniture (high financial risk products) sales area provides detailed information, diverse showrooms, consulting stations, and customising tools that help customers make informed decisions. On the other hand, home furnishing accessories (low financial risk products) sales area displays mainly price information with some instructions about how to use them.

Prospect Theory & Mental Accounting : Humans are more sensitive to the value of loss than of gain. Also, humans treat gains and losses in different accounts in their heads. Thinking of gains separately adds more positive utility, while lumping together losses results in less negative utility (Chen, Kök, & Tong, 2013).

<Design Case> IKEA: Graphic materials explaining psychological gains such as member benefits, 365-day return service, and lower prices are separated and placed in various spots in the store (gains dispersed separately). On the other hand, those that can be felt as psychological loss, such as explanation of why self-assembly is necessary, why there are not many guide staff in the store, and why consumers need to take their own delivery, are grouped together in the last self-serve area (losses lumped together).

Optimum Stimulation Theory : Humans want to maintain an appropriate level of cognitive activation. When it is too low or too high, they try to raise or lower it (Avornyo, Fang, Antwi, Aboagye, & Boadi, 2019).

<Design Case> IKEA: There is a "launch area" at the entrance, the showrooms of which change every 5~6 months, while other showrooms change once a year. Returning customers can experience the new showroom designs of the launch area first, thus preventing a decrease in interest caused by revisiting the same showrooms.

Truth Effect : When humans are exposed repeatedly to the same message, there is a tendency to accept it as truth.

<Design Case> IKEA: IKEA's key marketing message (Democratic design, Sustainability, Low Price) are repeatedly presented throughout the store. For example, graphic materials for "DESIGN FOR EVERYONE" was spotted 24 times at the Giheung store (Fig. 2-①).

Licensing Effect : Humans rationalise immoral or self-indulgent behaviour as being acceptable, if the person has performed moral actions preceding them (Kouchaki & Jami,

2018). For example, charitable activities of luxury brands make customers feel that they are engaged in something worthwhile.

<Design Case> IKEA: Graphic materials explaining IKEA's sustainability and charitable activities are placed throughout the store (Fig. 2-②).

Confirmation Bias : Humans have the tendency to pay attention only to information that supports their existing beliefs. Companies try to reinforce customers' existing beliefs that are favourable to them. Meanwhile they also strive to overcome existing-unfavourable beliefs.

<Design Case 1> Dior: In and out of its building, House of Dior is designed to be reminiscent of elegance and luxury which is the existing brand image and the core philosophy of Dior. (Fig. 2-③, upper images)

<Design Case 2> Hyundai: The brand image of Hyundai in Korea is associated with heavy industries. To promote a more customer-friendly image, the company operates Hyundai Motor Studio Goyang as a family theme park focusing on emotional and cultural experiences (Fig. 2-③, lower images).

Physical Presence of a Good : In product evaluation, consumers value the product more when they physically experience it in front of their eyes than when they check it out with images.

<Design Case> All the stores visited occupied the entire building so that they can display as many products as possible.

Influence of Ceiling Height (= Cathedral Effect) : A high ceiling promotes abstract thinking and creativity, while a low ceiling promotes concrete and detailed thinking (Meyers-Levy & Zhu, 2007).

<Design Case> IKEA: Sales areas (Fig 2-④, upper image) have high ceilings to promote creative thinking for customers' residential design. The ceiling is low only in the checkout area (Fig. 2-④, lower image) to promote exact calculation of purchases.

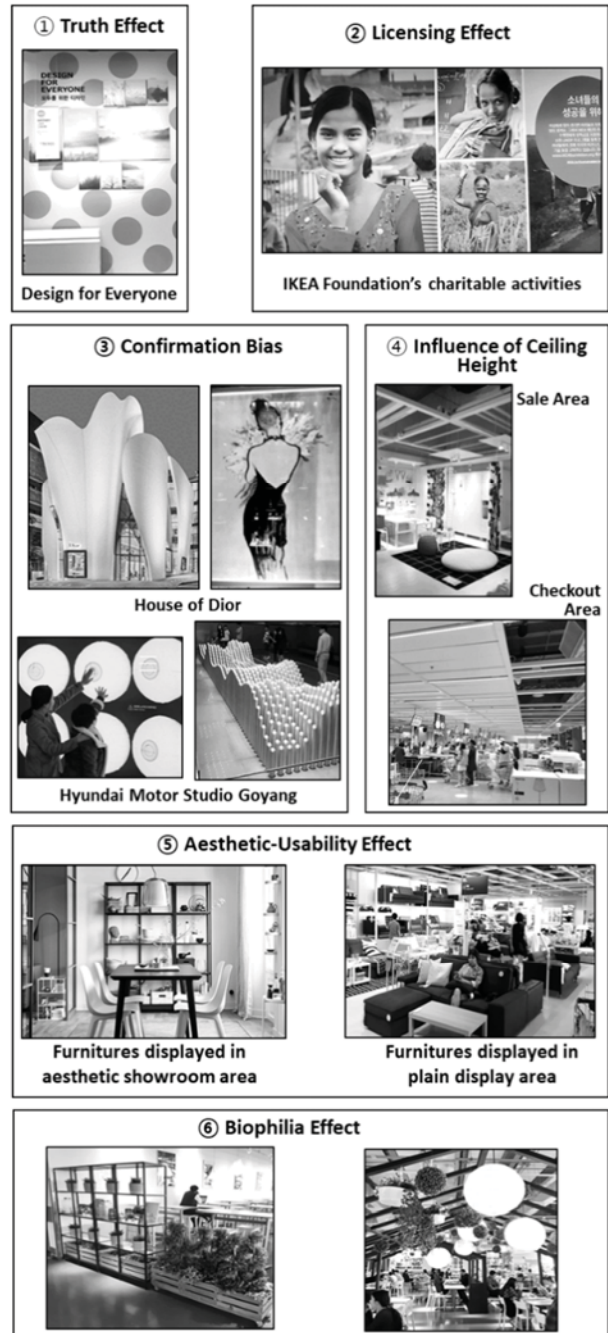
Positive Affect & Creative Thinking : When human brain feels happy, divergent thinking and creativity are promoted. When anxious or worried, convergent thinking regarding the problem at hand is induced (Runco, 2014).

<Design Case> IKEA: IKEA stores provide fun experiences by providing a variety of aesthetic showrooms, inexpensive food served in a nice ambience, and children's play facilities etc. This makes customers feel positive affect.

Aesthetic-Usability Effect : Aesthetic design is perceived as having higher usability than a design which is not. (Tractinsky, Katz, & Ikar, 2000).

<Design Case> IKEA: Products displayed in the context of

aesthetic showrooms (Fig. 2-⑤, left) are perceived to have higher usability than the products on a plain display area (Fig. 2-⑤, right).



Source: Own - ①, ②, ③upper right & lower right, ④, ⑤right, ⑥
https://www.dior.com/ko_kr - ③upper left
<https://motorstudio.hyundai.com> - ③lower left
<https://www.ikea.com/kr/ko/> - ⑤left

Figure 2: Design Cases-1

Biophilia Effect : An environment with plants increases attention and work efficiency, and reduces mental fatigue (Sanchez, Ikaga, & Sanchez, 2018).

<Design Case> IKEA: Located in the middle of the store, restaurant is a place to take a break and organise the shopping information. Many plants are placed at this place (Fig. 2-⑥).

Short-term Memory (STM) (= Working Memory) & Long-term Memory (LTM) : STM is a place where information from outside is temporarily stored. Information is lost if it is not sent to LTM. Repetition is a good way to pass information to LTM.

<Design Case> IKEA: Key branding messages (Democratic Design, Sustainability, Low Price) are repeatedly presented to induce their passage into LTM. A lengthy one-way traffic flow of the store layout helps to repeatedly present them.

Miller's Law & Chunking : Working memory has a limited capacity of 7 ± 2 pieces of information. However, it increases when information is delivered in chunks (Cowan, 2015).

<Design Case> IKEA: Store contents are divided into 4 areas (Showroom, Restaurant, Home Furnishing Accessories, Self-serve Furniture). The showroom area and the Home Furnishing Accessories area are then divided into 9 sections each.

Picture Superiority Effect : In memory, pictures are easier to store and retrieve than text. However, “picture + text” is most advantageous (Crutcher & Beer, 2011).

<Design Case> IKEA: Most of explanation materials have both picture and text (Fig. 3-①).

Order Effect (= Serial Position Effect) : For information provided in serial order, the first and the last information are remembered more (Azizian & Polich, 2007).

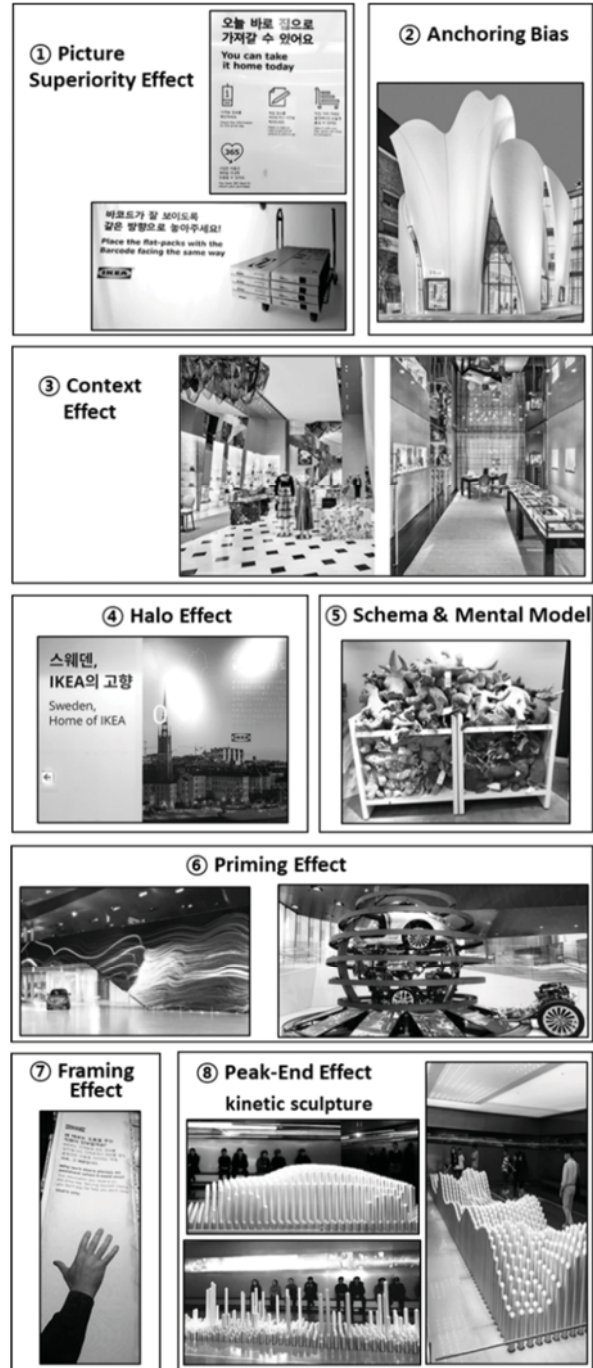
<Design Case> IKEA: Some showrooms located at the entrance are designed to have much lower prices than expected (under \$1,000), imprinting “IKEA=Best cost performance.” In addition, by locating Bistro at the end of the store, where soft ice cream (\$0.4) and hot dog (\$0.8) are sold at very cheap prices, the best cost performance of IKEA is stressed one last time.

Anchoring Bias : The first information encountered becomes a reference point and has the greatest weight (Shan, Diao, & Wu, 2020).

<Design Case> Dior: The building façade is designed like an elegant sculpture and anchors Dior’s brand philosophy, “the pursuit of timeless elegance.” (Fig. 3-②).

Context Effect : The interpretation of a specific stimulus is affected by the context in which it is presented. (Gruner, Specker, & Leder, 2019).

<Design Case> Dior: The entire store is composed like an art gallery with many artworks so that Dior products are presented in the context of “Dior = Art” (Fig. 3-③).



Source: Own - ①, ④, ⑤, ⑦, ⑧
https://www.dior.com/ko_kr - ②, ③
<https://motorstudio.hyundai.com> - ⑥

Figure 3: Design Cases-2

Halo Effect : A phenomenon in which a positive (or negative) perception of an object is carried over to another related object (Nufer, 2019).

<Design Case> IKEA: Many design features highlight IKEA's Swedish heritage because Sweden's national brand is very favourable. (e.g. Graphic materials explaining Swedish culture, Swedish product names, Swedish greetings, Children's carts with Swedish flags etc.) (Fig. 3-④).

Schema & Mental Model : Formed by past experiences, schema refers to a cognitive framework in which humans organise information, while mental model refers to a cognitive model that one has about the operation of a certain object. New designs that tap into an existing schema or mental model will be easier to understand.

<Design Case> IKEA: There is IKEA's display technique (called Bulla Bulla) of placing a large number of low-priced items inside a big see-through bin so that the products in it are all visible (Fig. 3-⑤). It matches the consumer's schema that price is cheap when there is a great number of things.

Priming Effect : Response to information is affected by exposure to prior information (Weingarten, Chen, McAdams, Yi, Hepler, & Albarracin, 2016).

<Design Case> Hyundai: The waiting area for the permanent exhibition is designed as automobile-related art exhibition hall, priming the emotional automobile culture about to be experienced (Fig. 3-⑥).

Framing Effect : The same content, presented in a different frame, is interpreted differently.

<Design Case> IKEA: The lack of sales assistance in the store is framed as being beneficial to the consumer since cost savings are transferred to the customer. Graphic materials explaining it say "The information you need is on the price tag. Serving yourself means you don't pay for help you don't need." (Fig. 3-⑦).

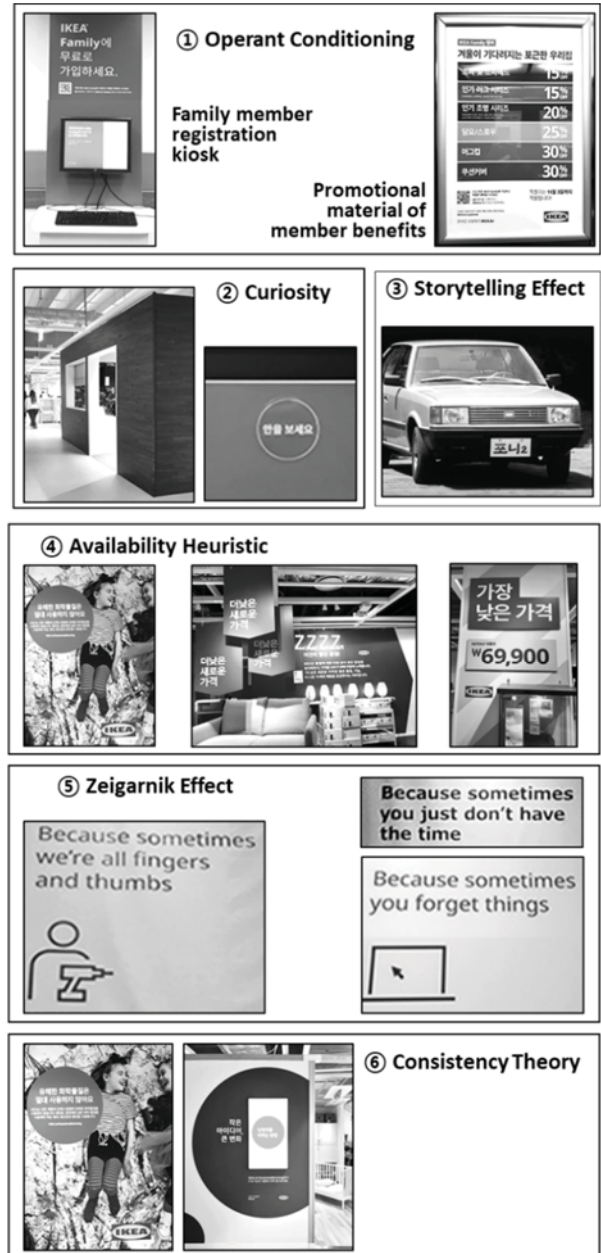
Peak-End Effect : Humans judge and remember a certain experience based on the average of what they felt at the emotional peak and the end, not the whole experience (Hoogerheide, Vink, Finn, Raes, & Paas, 2018).

<Design Case> Hyundai: Among the contents of permanent exhibitions, the "kinetic sculpture" (2018 iF Design Award, Gold Medal) harmonising video art, music, and lighting provides a peak experience (Fig. 3-⑧). 4D movie theatre stimulating viewers' five senses is placed at the end and provides an intense end experience.

Operant Conditioning : It states that responses to stimuli can be strengthened or reduced by reinforcement, which can be given by a fixed-interval plan, or by a variable-interval plan. Under fixed-interval reinforcement, learning takes

place quickly, but when reinforcement disappears, learning is erased quickly too. Under variable-interval reinforcement, the opposite happens.

<Design Case> IKEA: IKEA Family Member (reinforcement program) - Registration kiosks and graphic materials explaining member benefits are placed throughout the store (Fig. 4-①).



Source: Own - ①, ②, ④, ⑤, ⑥
<https://motorstudio.hyundai.com> - ③

Figure 4: Design Cases-3

Curiosity: Curiosity exerts a powerful effect that attracts human attention and encourages further information search (Silvia, 2012). For example, a teaser advertisement of a new car that only shows the silhouette of the car induces customers to search for more information.

<Design Case> IKEA: Some showrooms are covered by walls so that the interior is not fully visible from the outside. They arouse curiosity and make customers enter them. A sign on the furniture saying "Look inside" also arouses curiosity (Fig. 4-②).

Storytelling Effect: Information with a story is beneficial for inducing interest, understanding, learning, and persistence & retrieval of memory.

<Design Case> Hyundai: Cultural storytelling is provided along with six test drive experiences. For example, "Heritage Drive" is an experience of going back into modern Korean history in a classic Hyundai automobile from that era (Fig. 4-③).

4.2.2. Promotion & Retrieval-related Theories

Availability Heuristic: The propensity for humans to place more importance on information that is easily accessible in their memory. Since humans remember information that excites sensory organs or arouses emotions more easily than objective facts or statistics, such information is more readily available (Geurten, Willems, Germain, & Meulemans, 2015).

<Design Case> IKEA: Three core messages (Democratic Design, Sustainability, Low Price) are intensively repeated, and the explanation materials of them are designed to contain a unique pattern so that customers can easily recognise them (Fig. 4-④). Especially, the messages for low price use high-saturated red or yellow to stimulate customers' sensory organs and emotions.

Isolation Effect (= von Restorff Effect): In a situation with many similar stimuli, a stimulus that is differentiated and stands out will remain in memory longer (Schmidt & Schmidt, 2017).

<Design Case> IKEA: For promotional materials related to price, high-saturated red and yellow, which are not often used in IKEA stores, are used.

Zeigarnik Effect: It is superior remembrance of things or tasks that were incomplete or where mistakes were made, rather than of things or tasks done well (Rajagopal, Raju, & Unnava, 2006).

<Design Case> IKEA: Promotional materials for some services are presented under the phrase emphasising the possible mistakes or shortcomings (Fig. 4-⑤).

Consistency Theory: Humans have an unconscious

desire to maintain consistency among their cognitions, which increases the likelihood that the information will be retrieved (Schmitt, 2012).

<Design Case> IKEA: Information designs with similar content adopt the same pattern. For example, all the graphic materials explaining sustainability have green circular pattern (Fig. 4-⑥).

4.2.3. Prevention & Encoding-related Theories

Post-Decision Dissonance: A form of cognitive dissonance. It occurs when the apparent disadvantages of the selected alternative compared to the foregone ones are detected. It is more likely when the decision is important, cannot be undone, or is made entirely by the decider (Suzuki, 2019).

<Design Case> IKEA: Graphic materials explaining returns and exchanges are repeatedly placed and the return period is long (365 days). Therefore, the decision can be undone. Information stations for the support of staffs are placed throughout the store so that important decisions are not made entirely by the customer (Fig. 5-①).

Fitts Law: According to this rule, in order to reduce cognitive load and cognitive error, the selection object should be (1) large enough in size, (2) placed in an easily reachable area, and (3) if placed together with other objects, sufficient distance must be secured (Grosjean, Shiffrar, & Knoblich, 2007).

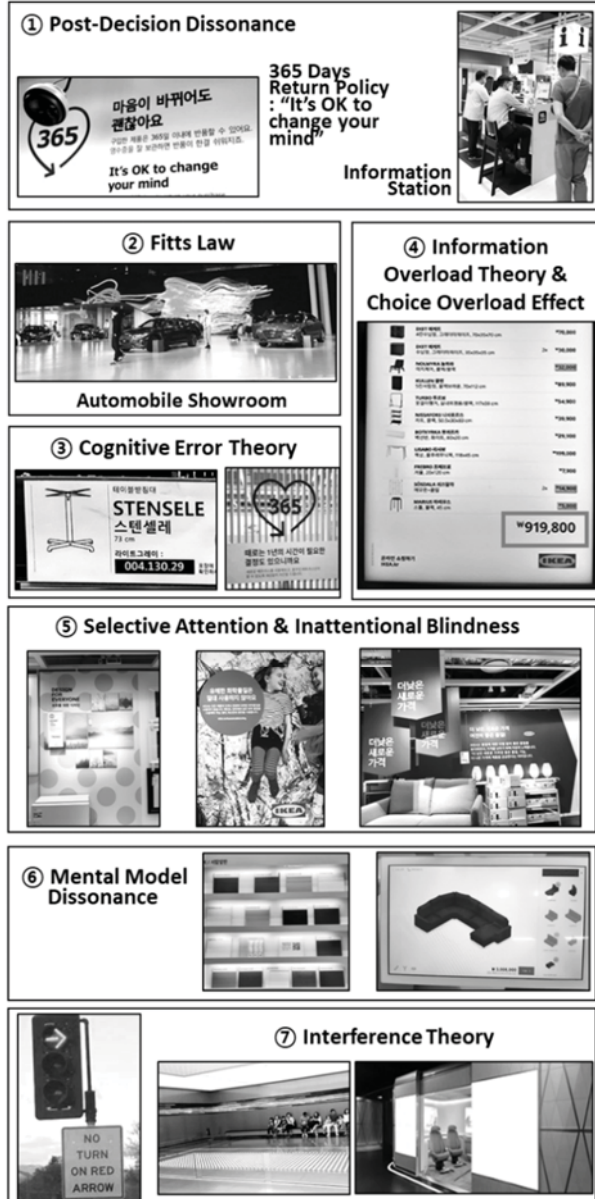
<Design Case> Hyundai: The automobile showroom is located in the lobby floor, so it is easily accessible. A large space is allocated to ensure sufficient distance between products (Fig. 5-②).

Cognitive Error Theory: Humans make mistakes. It is the company's responsibility to check possible cognitive errors in advance and prepare countermeasures (e.g. prevention strategy, post-return strategy, damage minimisation strategy etc.).

<Design Case> IKEA: In the Flat Pack boxes of the products that customers need to pick up by themselves, the product's image is drawn along with the product name and number to prevent mistakes of picking up the wrong box (prevention strategy; Fig. 5-③, left). Explanation materials for the 365 days return system (post-return strategy) and long warranty period (5~25 years) (damage minimisation strategy) are repeatedly placed throughout the store (Fig. 5-③, right).

Cognitive Load Theory: Cognitive load refers to the capacity of working memory required to perform a given task. Methods to increase the efficiency of it include chunking (categorisation), avoiding multi-task, and using recognition memory (not recall memory).

<Design Case> IKEA: One-way traffic of the store allows many contents to be presented in a serial manner (no need for multi-tasking). Furthermore, it makes customers use recognition memory, not recall memory, because customers recognise and pick up products that they want as they pass them by. Customers do not have to recall them and find out where they are located.



Source: Own - ①, ②, ③, ④, ⑤, ⑥, ⑦middle
<https://motorstudio.hyundai.com> - ⑦right
<https://www.capecops.com/newsroom/2019/12/2/traffic-tuesday-right-on-a-red-arrow> - ⑦left

Figure 5: Design Cases-4

Information Overload Theory & Choice Overload Effect :

If the amount of information exceeds the decision maker's ability to process it, the possibility of making the best choice is lowered. Therefore, not only too few choice-options but also too many choice-options result in low satisfaction (Scheibehenne, Greifeneder, & Todd, 2010).

<Design Case> IKEA: There are a huge number of products at IKEA stores. IKEA's showroom strategy is designed to relieve the customer's cognitive load in selecting each product. Rather than making buy or no-buy decisions for individual items, customers can select the entire design configuration of the showroom that they like. To encourage such behavior, the price of the entire showroom is presented, together with the prices of the individual items (Fig. 5-④).

Selective Attention & Inattention Blindness : Since the amount of information that humans can process at one moment is limited, if a lot of information is given, only some of them are selectively processed, according to their importance (Selective Attention). When humans are focused on a certain cognitive task, they can be unaware of the other information, even if it is obvious (Inattention blindness) (Drew, Vo, & Wolfe, 2013).

<Design Case> IKEA: Graphic materials carrying important brand messages (democratic design, sustainability, low price) adopt large size, high-saturated colour, and a unified design pattern to avoid inattention blindness (Fig. 5-⑤).

Mental Model Dissonance : A phenomenon that adversely affects the user's cognitive speed due to the introduction of an unexpected psychological mechanism, different from the familiar mental model. This can be prevented by allowing time to adapt to the new method, by combining the new method and the existing one for a certain period (Wilke, McInnes, Jack, & Littlewood, 2007).

<Design Case> IKEA: IKEA stores still provide many analogue methods of information display along with new digital methods. For example, to support customising of furniture, IKEA provides both analogue materials and digital displays (Fig. 5-⑥).

Interference Theory : Reaction time to specific information can be delayed due to cognitive interference by other information. Typically, they are caused by similarity and discordance. Interference caused by similarity decreases when the information is presented in a visually distinctive way. It can also be caused by the discordance. For example, a traffic light with a red arrow (Fig. 5-⑦, left) causes confusion because while red usually indicates "stop," the arrow indicates "go." An additional sign, "NO TURN ON RED ARROW," had to be added.

<Design Case> Hyundai: The permanent exhibition is

planned as a one-way traffic flow, and each sub-section is composed of a completely separate space. So, the information of one section is provided without interference from another section (Fig. 5-⑦, right two images).

Yerkes-Dodson Law : Performance increases with mental arousal, but only up to a point. When the arousal level becomes too high, performance decreases (Jeong & Biocca, 2012).

<Design Case> IKEA: The restaurant is located at the end of the showroom area which generates a high level of mental arousal. It is a place to lower this level before customers restart their shopping in home furnishing accessories area.

4.2.4. Prevention & Retrieval-related Theories

Retrieval Failure & Retrieval Cues : There are cases in which the information stored in long-term memory cannot be retrieved. However, with help of related cues, information is more easily retrieved.

<Design Case> IKEA: IKEA employs design strategy that uses the same pattern for graphic materials of the same content (e.g. green circle for sustainability, red arrow pattern for “new lower price” etc.) The pattern can act as a retrieval cue about the related message (Fig. 6-①).

Recall Memory & Recognition Memory : There are two methods of retrieving information from memory: recall & recognition. With recall, people have to retrieve the contents in the memory by themselves. Recognition, selecting the right option among the presented ones, is an easier method.

<Design Case> IKEA: Digital provision of information follows the recognition method (Fig. 6-②).

<Design Case> IKEA: In order to obtain an accurate evaluation of the IKEA experience (i.e., to prevent rosy retrospection), customer evaluation devices are placed throughout the store, rather than at the end (Fig. 6-③).

5. DIP Model

This section proposes “a design-related information processing model for retail space branding” by integrating the structure and contents studied in Sections 3 and 4. Figure 7 shows the final DIP Model. The placement of each theory on the four quadrants of the model was based on the literature review and design application study. In the process, some theories fit nicely into one of the four quadrants, and others were placed on the boundaries of two or all four quadrants.

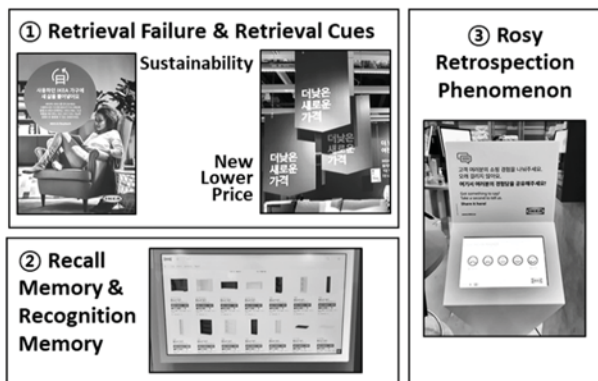
Boundary theories of the horizontal axis can be both encoding-related and retrieval-related. For example, information with a picture (picture superiority effect) or a story (storytelling effect) is advantageous not only for superior understanding (encoding-related) but also for superior remembrance (retrieval-related).

Boundary theories of the vertical axis can be both promotion-related and prevention-related. An example is the anchoring bias. For designing the entry point, which exert the anchoring effect, designers should not only create attractive elements, but also check the negative elements (e.g. safety issues, the worn-out element) which hinder users’ further interactions with the design.

Theories placed at the centre of the plane are boundary theories of all four quadrants. An example is the availability heuristic. It can be prevented, but it can also be promoted to strengthen the favourable bias for the company. Also, it is about the biased judgment of customers (encoding-related), but it happens in relation with their memory (retrieval-related).

6. Managerial Implications & Conclusions

This paper researched a design-related information processing model for retail space branding. The structure of the model has two axes: the information processing axis (encoding-retrieval) and the regulatory focus axis (promotion-prevention) (Fig. 7, upper matrix). Next, literature research was conducted to analyse cognitive theories as contents of this model. To examine the actual applicability of these theories to retail space branding design, we analysed store designs of global brands. We also collected the opinions of the practitioners (of design and marketing) and confirmed the final 43 theories. Lastly, theories were combined with the structure to form the final DIP model (Fig. 7).



Source: Own - ①, ②, ③

Figure 6: Design Cases-5

Rosy Retrospection Phenomenon : A phenomenon in which humans remember or evaluate the past more positively than the present (Trope & Liberman, 2003).

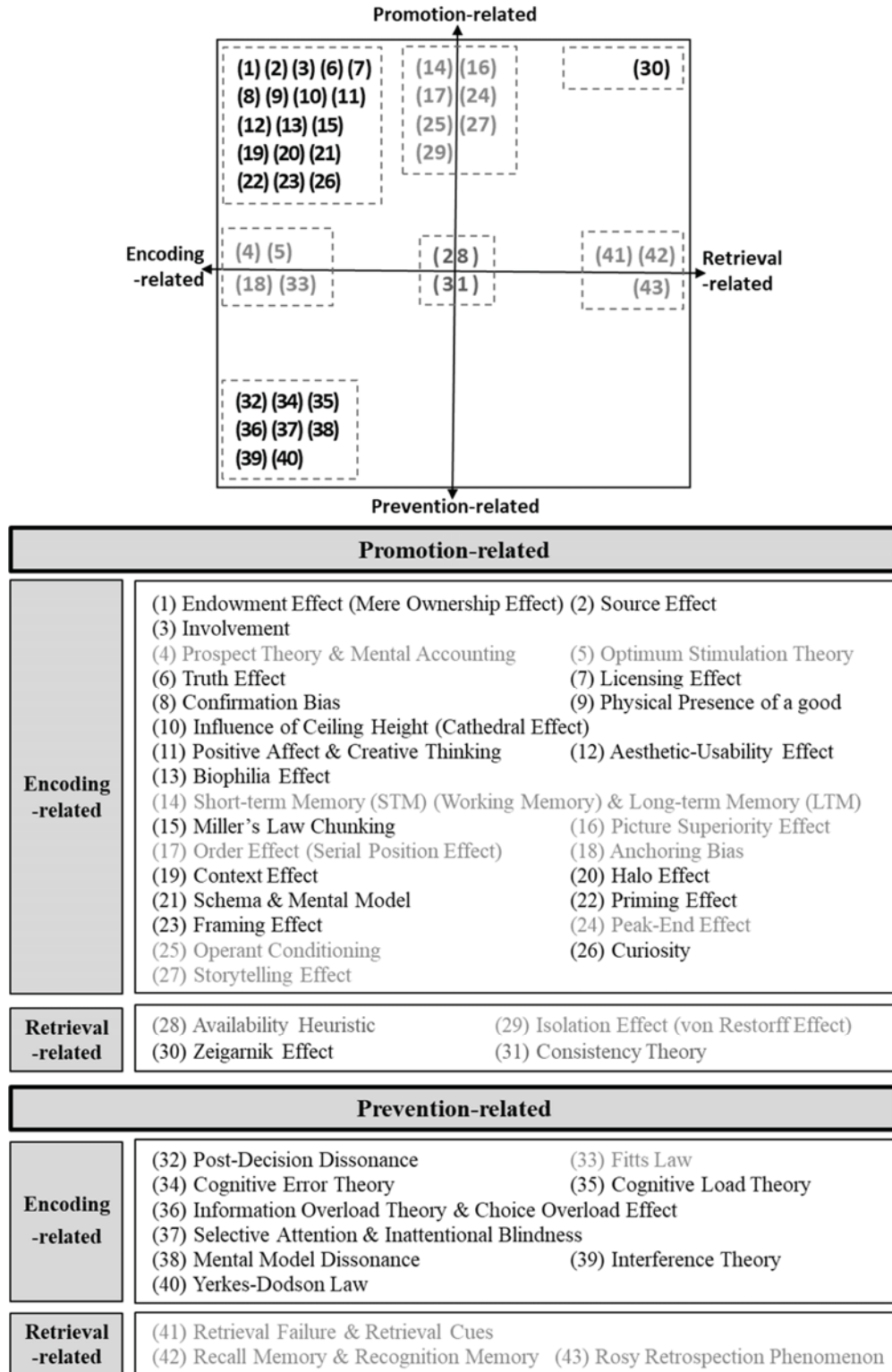


Figure 7: DIP Model for Retail Space Branding

For the results of our study, we suggest some managerial implications as follows. First, our model can act as a bridge between designers and marketers. For roughly 40% of the cognitive theories analysed, we presented new insight for design applicability, or new implications for marketing practice. There were theories of consumer behaviour that have yet to be introduced into the design psychology literature, and for which we presented new insight for their design applicability. Also, some theories of design psychology have not been mentioned in consumer behaviour literature, and for which we presented new implications for marketing practice. Therefore, we think that this model will provide useful information for the interdisciplinary projects of design and marketing.

Second, even though all the brand stores that we analysed presented relevant application of the DIP model, the stores also had some limitations in the layout that could be improved upon. For example, by applying “Peak-End Effect” in its service design, IKEA may be able to do something about its reputation for mediocre staff service. While it would be difficult to increase the service level of all staff, IKEA could increase the overall perception of service by including two or three very impressive service experiences in the middle and at the end of the customer journey map. IKEA can also utilise “Rosy Retrospection Phenomenon” not only for an accurate evaluation but also for brand building. Namely, while immediate feedback at the point-of-experience makes for an accurate evaluation, from the perspective of brand building, later collection of feedback can be added as well. Customers answering questionnaire few days after the visit (e.g. survey through a smartphone) can reminisce on their experiences and conclude that they were great. Also, the in-store reward schemes are provided with fixed-interval plans. However, according to “Operant Conditioning Theory,” to increase the retention of information, more variable-interval rewards may be used as well. These observations are applicable not only to IKEA but also to all the other brand stores.

Third, we suggest that this model can be applied to designing communications not only in retail spaces, but also in any spaces of service design where customers have to deal with a lot of information. For example, there are so many information at the airport or at a theme park. Designers should consider the results of our research when they make customer journey map for these spaces so that customers can process complex information properly and easily.

Finally, we leave the following for future research. First, as mentioned in the introduction, this study did not cover sensory perception in the information processing model. Research on sensory perception is left as a separate topic of future research. Second, this paper focused on information processing aspect of brand building activity. But a customer’s brand experiences can include more aspects. In particular,

there are numerous psychological principles related to preference formation, which are closely related to motivation, emotion and self-concept. Due to its scope, preference needs to be treated in a separate study too. Third, a detailed case study of IKEA and other flagship stores mentioned, in and of itself, could be an interesting research topic with many practical implications for designing retail space branding. In this paper, only one or two design features suitable for each theory were presented, but in fact, there were much more features. A comprehensive case study of these stores would be a good topic for future research.

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Appendix

Example questionnaire for practitioners

Context Effect

The interpretation of a specific stimulus is affected by the context in which it is presented. For example, people rate the works exhibited in art museums as more interesting than those exhibited in the laboratory.

<Design Example> House of Dior, Seoul

It has the entire building composed like an art gallery so that its products are presented in the context of "Dior = Art." (e.g. sculpture-like façade, Dior products displayed in a gallery, many artworks of famous artists etc.)



<Survey Questions>

(1) Is the theory applicable to effective brand communication in retail spaces?

Agree (), Disagree ()

(2) Is the design case an appropriate application of the theory?

Agree (), Disagree ()

(3) Please feel free to state any other opinion regarding the above questions.