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Exploring Mask Appeal: Vertical vs. Horizontal Fold Flat Masks Using Eye-Tracking*

Junsik Lee
Graduate School of Business IT, Kookmin University
(jscx9303@gmail.com)

Nan-Hee Jeong
School of Business, Yonsei University
(nhjeong52@gmail.com)

Ji-Chan Yun
Graduate School of Business IT, Kookmin University
(chanyosh@kookmin.ac.kr)

Do-Hyung Park
Graduate School of Business IT/School of Management Information Systems, Kookmin University
(dohyungpark@kookmin.ac.kr)

Se-Bum Park
School of Business, Yonsei University
(seapark@yonsei.ac.kr)

The global COVID-19 pandemic has transformed face masks from situational accessories to indispensable items in daily life, prompting a shift in public perception and behavior. While the relaxation of mandatory mask-wearing regulations is underway, a significant number of individuals continue to embrace face masks, turning them into a form of personal expression and identity. This phenomenon has given rise to the Fashion Mask industry, characterized by unique designs and colors, experiencing rapid growth in the market. However, existing research on masks is predominantly focused on their efficacy in preventing infection or exploring attitudes during the pandemic, leaving a gap in understanding consumer preferences for mask design. We address this gap by investigating consumer perceptions and preferences for two prevalent mask designs—horizontal fold flat masks and vertical fold flat masks. Through a comprehensive approach involving surveys and eye-tracking experiments, we aim to unravel the subtle differences in how consumers perceive these designs. Our research questions focus on determining which design is more appealing and exploring the reasons behind any observed differences. The study's findings reveal a clear preference for vertical fold flat masks, which are not only preferred but also perceived as unique, sophisticated, three-dimensional, and lively. The eye-tracking analysis provides insights into the visual attention patterns associated with mask designs, highlighting the pivotal role of the fold line in influencing these patterns. This research contributes to the evolving understanding of masks as a fashion statement and provides valuable insights for manufacturers and marketers in the Fashion Mask industry. The results have implications beyond the pandemic, emphasizing the importance of design elements in sustaining consumer interest in face masks.

Keywords : Eye-Tracking, Product Design Evaluation, Face Mask, Vertical Fold Flat Masks, Horizontal Fold Flat Masks

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1. Introduction

The emergence of COVID-19 as a global pandemic has triggered a profound shift in public perception regarding the wearing of face masks, marking a societal phenomenon worthy of significant attention. In the past, the use of face masks was confined to specific scenarios involving patients, healthcare professionals, criminals, or even festive occasions like Halloween (Wollslager, 2021). However, with the intensification of the pandemic in 2020 and the subsequent efforts to curb virus transmission, numerous jurisdictions globally mandated the compulsory use of face masks (Lyu & Wehby, 2020; Rab et al., 2020). Consequently, face masks transitioned from a limited, situational accessory to an indispensable item in people's daily lives, persisting for an extended period.

As the trajectory of COVID-19 transmission shows signs of stabilization and nations progressively ease public health guidelines and regulations, there is a discernible trend toward the relaxation of mandatory face mask requirements (Cowger et al., 2022). Despite this shift, a noteworthy number of individuals continue to embrace face mask usage (Jeong et al., 2023). Beyond the utilitarian purpose of protecting oneself in dangerous environments or covering one's face for a specific reason, masks now serve as a means of personal expression, symbolizing an individual's identity and uniqueness (Palcu et al., 2022; Silchenko & Visconti, 2022; Bluteau, 2023).

The burgeoning popularity of face masks as a fashion statement has given rise to a distinctive market segment – the Fashion Mask industry. This market, characterized by masks featuring unique designs and colors, has witnessed rapid growth. Contrary to conventional disposable medical masks or N95 respirators, Fashion Masks with unconventional aesthetics have carved a niche for themselves. The global Fashion Face Mask market was valued at $4.65 billion in 2019, and it is projected to experience a compound annual growth rate (CAGR) of 22.7% from 2020 to 2027 (Wollslager, 2021).

Despite the evolution of masks as a means of expressing individuality and the wide variety of designs available on the market, research on masks is very limited in scope. Much of the research conducted on masks since the pandemic has been limited to validating their effectiveness in preventing COVID-19 infection (Eikenberry et al., 2020; Wang et al., 2021; Brüssow & Zuber, 2022) or examining people's attitudes and intentions toward wearing masks during the pandemic (Chen & Lei, 2022; Pan & Liu, 2022; Jia & Luo, 2023). This trajectory of mask research, driven by the urgency of the pandemic, reveals the limitations of scalability. While numerous post-pandemic mask studies have extensively validated masks' effectiveness in preventing infection, the importance of these existing studies is diminishing as the intensity of COVID-19 infection declines.

It is now pertinent to redirect our focus to the current phenomenon. Despite the declining spread of COVID-19 and the relaxation of mandatory mask-wearing regulations, a significant number of individuals persist in wearing masks (Jeong et al., 2023; Cha et al., 2023). This persistence of mask-wearing deserves careful attention and investigation as it signifies a notable societal behavior extending

beyond the initial imperative of infection prevention. Surprisingly, there remains a significant gap in our understanding of consumer preferences regarding mask design. The current literature largely neglects to investigate which designs are more appealing to consumers and why.

Given that fashion masks vary in materials, colors, and components depending on the manufacturer and individual product (Bluteau, 2023), scrutinizing the design of each product individually is challenging. However, a shared attribute among the majority of face masks is the folding direction. Therefore, this study will categorize mask designs into two types based on the folding direction: horizontal fold flat masks and vertical fold flat masks. These two forms represent the most common designs in South Korea, with a majority of currently available face masks adhering to one of these two configurations. When considering the commonly known vertical fold flat masks, often referred to as beak-type, and horizontal fold flat masks known as dental masks, adopting these two forms in our study is deemed appropriate. By focusing on these two designs, our research aims to cover a significant portion of the mask-wearing population and address crucial aspects, considering they represent the most prevalent designs in the current market of South Korea. Additionally, this differentiation is essential not only for a superficial review of mask design but also to delve into the fundamental aspects of how folding direction influences consumer perception.

〈Figure 1〉 Mask Design Spheres Based on Folding Direction
(Left: Vertical Fold Flat Masks vs. Right: Horizontal Fold Flat Masks)

Our study aims to investigate how consumers perceive and evaluate these two types of masks, focusing particularly on the visual attention they allocate to each. We will employ a survey to gather insights into consumers' subjective mask preferences and an eye-tracking experiment to substantiate our findings with quantitative data. The use of eye-tracking methodology is increasingly common, particularly in digital commerce. Its significance in e-commerce cannot be overstated, as it provides empirical validation of how consumers visually engage with products and how these interactions contribute to purchase decisions (Ha et al., 2022; Modi & Singh, 2023).

Taking a closer look at our research, we will measure the sophistication and liveliness of mask design through a survey. Especially, the sophistication of a design is often characterized by elegance, complexity, or refined aesthetic sense, and this sophistication is crucial as it can influence consumer perceptions. Specifically, when a mask is perceived as sophisticated, it may arouse curiosity or interest in the observer. This can manifest in the form of increased gaze

duration on uncovered facial areas in eye-tracking data. These inferences support the hypothesis that the sophistication of a mask leads observers to infer specific characteristics about the wearer, prompting them to focus their gaze on visible facial features to gather more information. Additionally, through eye-tracking methods, we can explore the relationship between mask design and liveliness. Lively masks can be conveyed through vibrant colors, dynamic patterns, or a sense of energy in the design. When observers perceive a mask as lively, it can attribute qualities of vitality or liveliness to the wearer. This perception may manifest in increased gaze concentration on uncovered facial areas in eye-tracking data. The hypothesis here is that the liveliness of a mask heightens overall interest in the wearer, leading observers to focus more attentively on the wearer's exposed facial features. Through a comprehensive approach encompassing qualitative insights from surveys and quantitative insights from eye-tracking, we anticipate uncovering subtle differences in consumer preferences for the folding direction of fashion masks. To achieve our research objectives, we propose two research questions.

RQ1. Which is more appealing: horizontal fold flat masks or vertical fold flat masks?

RQ2. If there is a difference in attractiveness between the two types of masks, what might be the reasons for it?

2. Experiment 1: Survey on Mask Designs Attractiveness

2.1. Objective & Design

To explore the appeal of horizontal fold flat masks versus vertical fold flat masks, as discussed in research question 1, we conducted Experiment 1 using a paper-and-pencil self-administered survey. Building on previous findings, including Jeong et al. (2023), which suggest that wearing a mask leads to more favorable evaluations of the target person compared to not wearing one, we conducted an attractiveness assessment specifically focusing on the mask designs.

The current study employed a one-factor within-subject experimental design, where participants sequentially assessed the attractiveness of two mask designs: a horizontal fold flat mask versus a vertical fold flat mask. The mask design (horizontal or vertical) was presented randomly. Additionally, the gender of the target person was alternated between male and female to control for gender effects (Jeong et al., 2023). We recruited undergraduate students located in Seoul, Korea, and used the responses from a total of 26 participants for analysis (M_{age} = 22.7, 58% female).

2.2. Stimuli Material & Procedures

We used modified images of a male and a female from an online database, adjusted for academic purposes. To control for the influence of race and age, we selected photos of Korean individuals in

their twenties. To manipulate the mask design into horizontal or vertical fold flat masks, we applied masks to the faces of males and females. Participants were shown a total of two stimuli and responded to the following five items on a 7-point Likert scale (1 = not at all; 7 = very much): "The mask in the picture is appealing," "The mask in the picture is unique," "The mask in the picture appears sophisticated," "The mask in the picture feels three-dimensional," "The mask in the picture appears lively." Last, participants reported their age and gender.

2.3. Results & Discussion

First, we conducted a paired t-test to determine the relative appeal of the two mask designs: horizontal fold flat mask and vertical fold flat mask. The analysis revealed that participants perceived the vertical fold flat mask (M = 4.58, SD = 1.70) as more attractive compared to the horizontal fold flat mask (M = 3.58, SD = 1.77; $t(25)$ = -2.08, $p < 0.05$), suggesting that participants considered individuals wearing a vertical fold flat mask more attractive in relation to the mask designs than those wearing a horizontal fold flat mask.

Next, the results for the measured items, in addition to attractiveness toward the two mask designs, are as follows. Participants evaluated the vertical fold flat mask as more unique ($M_{vertical}$ = 2.88, SD = 1.68 vs. $M_{horizontal}$ = 1.54, SD = 0.86; $t(25)$ = -4.23, $p < 0.001$), and sophisticated ($M_{vertical}$ = 2.77, SD = 1.68) compared to the horizontal fold flat mask ($M_{horizontal}$ = 1.62, SD = 1.50; $t(25)$ = -2.84, $p < 0.01$). Furthermore, regarding three-dimensionality, the vertical fold flat mask (M = 5.46, SD = 1.66) was rated higher than the horizontal fold flat mask (M = 2.00, SD = 1.60; $t(25)$ = -6.23, $p < 0.001$). Finally, the vertical fold flat mask was perceived as more lively ($M_{vertical}$ = 3.73, SD = 1.54) compared to the horizontal fold flat mask ($M_{horizontal}$ = 2.85, SD = 1.49; $t(25)$ = -2.54, $p < 0.05$).

Concerning the relationship between the attractiveness of the two mask designs, the results of Experiment 1 revealed that the vertical fold flat mask is more attractive than the horizontal fold flat mask. Regarding the characteristics of mask design, participants tended to perceive vertical fold flat masks as more unique, sophisticated, three-dimensional, and lively than horizontal fold flat masks. Building on the findings of Experiment 1, our objective is to elucidate why the vertical fold flat mask was perceived as more attractive than the horizontal fold flat mask. Therefore, in the upcoming experiment, we will focus on addressing the reasons for RQ 1.

3. Experiment 2: Analyzing Eye Movements: Horizontal vs. Vertical Fold Flat Masks

3.1. Objective & Design

Experiment 2 aims to further explore the reasons behind the enhanced perception of attractiveness for vertical fold flat masks compared to horizontal fold flat masks, as indicated by the results of

〈Table 1〉 Results of Experiment 1

Measurement Items (1 = not at all; 7 = very much)	Horizontal Fold Flat Mask		Vertical Fold Flat Mask		t-test
	Mean	SD	Mean	SD	
The mask in the picture is appealing.	3.58	(1.77)	4.58	(1.70)	$t(25) = -2.08$ $p < 0.05$
The mask in the picture is unique.	1.54	(.86)	2.88	(1.68)	$t(25) = -4.23$ $p < 0.001$
The mask in the picture appears sophisticated.	1.62	(1.50)	2.77	(1.68)	$t(25) = -2.84$ $p < 0.01$
The mask in the picture feels three-dimensional.	2.00	(1.60)	5.46	(1.66)	$t(25) = -6.23$ $p < 0.001$
The mask in the picture appears lively.	2.85	(1.49)	3.73	(1.54)	$t(25) = -2.54$ $p < 0.05$

Experiment 1. In this experiment, we aim to employ eye-tracking methodology to investigate participants' visual attention patterns when exposed to individuals wearing flat masks folded both horizontally and vertically. Therefore, we adopted a within-subject design in which participants are exposed to both 'Frontal and side profile photographs of the wearer of horizontal fold flat masks' and 'Frontal and side profile photographs of the wearer of vertical fold flat masks.' This dual exposure aims to comprehensively explore participants' responses to the two distinct types of mask designs.

To control for potential gender-related effects in the stimulus, we evenly distributed participants exposed to male and female mask wearers. This ensures equitable gender representation, minimizing bias associated with gender-specific reactions. Furthermore, to mitigate the impact of exposure order on participants' responses, the presentation order of 'Frontal and side profile photographs of the wearer of horizontal fold flat masks' and 'Frontal and side profile photographs of the wearer of vertical fold flat masks' is randomized. This randomization minimizes the influence of presentation order, enhancing internal validity and facilitating a more reliable comparison of participant responses. This carefully structured experimental design enhances the robustness of the study, allowing for a nuanced exploration of participants' reactions to the frontal and side profiles of individuals wearing both horizontal and vertical fold flat masks while controlling for potential confounding variables.

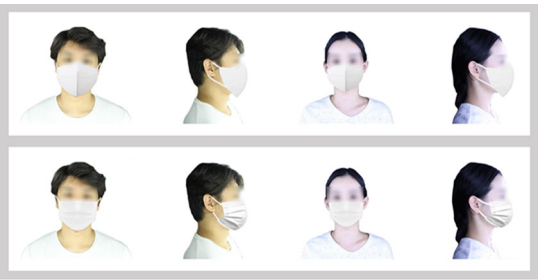
In Experiment 2, similar to Experiment 1, we recruited participants from a participant pool at a private university in Seoul, South Korea. The participants included 44 undergraduate and graduate students. However, due to eye-tracking measurement errors or non-compliance with participant instructions, data from 5 participants were excluded. Therefore, the final analysis utilized eye-tracking data from 39 participants.

〈Table 2〉 Participant Demographics and Stimulus Assignment

		Assigned Stimulus		Total
		Male Wearer	Female Wearer	
Participants	Male	7	10	17 (43.6%)
	Female	11	11	22 (56.4%)
Total		18 (46.2%)	21 (53.8%)	N = 39

Note: M_{age} = 22.7 (SD = 2.16)

3.2. Stimuli Material & Procedures



〈Figure 2〉 Experimental Stimuli
(Top: Vertical Fold Flat Masks vs. Bottom: Horizontal Fold Flat Masks)

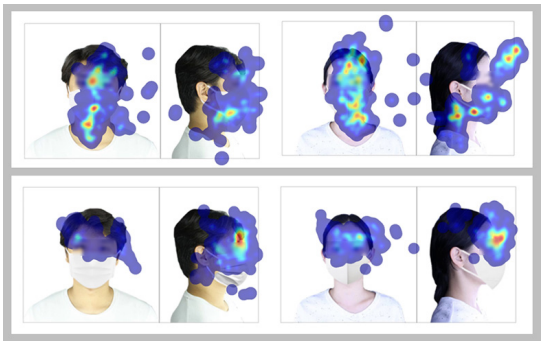
For the creation of stimuli used in the experiment, we processed images obtained from the AI-Hub database (https://www.aihub.or.kr), operated by National Information Society Agency (NIA) in Korea. Specifically, we tailored photographs of both male and female subjects, provided by AI-Hub, to craft 'Frontal and side profile photographs of the wearer of horizontal fold flat masks' and 'Frontal and side profile photographs of the wearer of vertical fold flat masks.' It is crucial to note that the original images of male and female subjects used to create stimuli were manipulated solely for academic purposes. To control for potential influences of race and age on human perception, we selected photographs of individuals in their twenties from the Korean population.

To explore whether participants' gaze patterns differ based on the mask orientation (horizontal fold flat masks or vertical fold flat masks), we defined the frontal and side profile images of mask wearers as Areas of Interest (AOI). By defining these AOIs, we measured 'Time Viewed', 'Fixation Score', and 'Revisit Score'. 'Time Viewed' represents the total duration participants focused on the AOI. 'Fixation Score' is calculated when a participant's pupil remains motionless in the AOI for more than 0.05 seconds, indicating gaze focus intensity. 'Revisit Score' provides insights into the dynamic nature of visual attention by quantifying instances when a participant's gaze moved away from and returned to the AOI.

The experiment proceeded according to the following procedure: Firstly, participants received an introduction to the eye-tracking experiment and a pre-explanation of the research procedures. After obtaining consent for participation, participants were escorted to a dedicated experimental room. In this room, participants sat approximately 50cm away from the monitor and underwent a calibration process to ensure the accuracy of the eye-tracking equipment. After successful calibration, participants were assigned to either a male or female wearer condition. Participants were then exposed to stimuli, including 'Frontal and side profile photographs of the wearer of horizontal fold flat masks' and 'Frontal and side

profile photographs of the wearer of vertical fold flat masks,' each presented for 12 seconds. Upon completing the eye-tracking experiment, participants provided basic information, such as age and gender. As a token of appreciation, participants were offered small mementos before concluding the experiment.

3.3. Results & Discussion



〈Figure 3〉 Heatmap Analysis Results (Top: Vertical Fold Flat Masks vs. Bottom: Horizontal Fold Flat Masks)

To investigate the differences in gaze patterns between horizontal fold flat masks and vertical fold flat masks, we conducted a heatmap analysis as a first step. Heatmap analysis is a visualization technique that transforms eye-tracking data into visual heatmaps, allowing an intuitive understanding of participants' gaze patterns. This method visually represents the concentration of gaze at specific points, aiding in identifying areas that attract attention or are perceived as significant.

The results of the heatmap analysis indicated that participants' gaze distribution tended to form around the folding lines of the masks. When exposed to stimuli featuring horizontal fold flat masks, participants exhibited a gaze distribution spreading widely along the horizontal folding lines, especially focusing on the revealed facial areas such as eyes and forehead. In contrast, stimuli featuring vertical fold flat masks revealed a gaze distribution concentrating narrowly along the vertical folding lines. When viewing images of individuals wearing vertical fold flat masks, participants allocated their gaze not only to facial regions, including eyes and forehead, but also to the mask area, following the vertical folding lines.

Combining these findings with Experiment 1 results, we can infer that the vertical folding lines in vertical fold flat masks accentuated depth and dynamism in the wearer's facial features, contributing to a pronounced effect that enhances the perception of the mask as more three-dimensional and sophisticated.

To further scrutinize the observed differences in gaze patterns between horizontal and vertical fold flat masks revealed through heatmap analysis, we conducted detailed examinations using paired *t*-tests to compare measurement metrics of the frontal profile and side profile AOI for each mask design.

For vertical fold flat masks, when both frontal and side profiles were simultaneously presented, the 'Time Viewed,' 'Fixation Score,' and 'Revisit Score' metrics assigned to the frontal profile were all significantly higher compared to the side profile. The heightened attention to the frontal profile implies a perceived significance in facial features, possibly influenced by the uniqueness and sophistication associated with vertical folds. This aligns with the findings of Experiment 1, where

〈Table 3〉 Paired *t*-test Results for Vertical Fold Flat Mask

Measurement Items	Frontal		Side		*t*-test
	Mean	SD	Mean	SD	
Time Viewed	3.81	2.22	2.04	1.33	$t(38) = 5.64$ $p < 0.001$
Fixation Score	10.77	5.65	6.46	2.90	$t(38) = 5.11$ $p < 0.001$
Revisit Score	2.85	1.60	1.90	1.29	$t(38) = 3.39$ $p < 0.01$

〈Table 4〉 Paired *t*-test Results for Horizontal Fold Flat Mask

Measurement Items	Frontal		Side		*t*-test
	Mean	SD	Mean	SD	
Time Viewed	3.35	2.20	2.92	1.64	$t(38) = 1.29$ ns $(p = 0.21)$
Fixation Score	9.67	5.08	8.77	4.63	$t(38) = 0.96$ ns $(p = 0.35)$
Revisit Score	2.31	1.36	2.54	1.89	$t(38) = -1.01$ ns $(p = 0.32)$

vertical fold flat masks were perceived as more attractive, unique, and three-dimensional.

In contrast, for horizontal fold flat masks, there was no significant difference in 'Time Viewed,' 'Fixation Score,' and 'Revisit Score' between the frontal and side profiles. The absence of a significant difference in gaze patterns for horizontal fold flat masks between the frontal and side profiles underscores a potential limitation in capturing unique attention-grabbing features in this mask design.

4. Conclusion

We examined how mask design impacts consumer perceptions and preferences, focusing on masks' evolving role in the post-pandemic environment. Specifically, we delved into the uncharted territory of

consumer preferences regarding the folding direction of masks, distinguishing between horizontal fold flat masks and vertical fold flat masks. Experiment 1 aimed to uncover consumer perceptions and preferences for mask designs through survey data. The results of Experiment 1 unequivocally affirmed that vertical fold flat masks are not only preferred over horizontal fold flat masks but are also perceived as unique, sophisticated, three-dimensional, and lively. Building upon insights from Experiment 1, Experiment 2 employed eye-tracking analysis to comprehensively explore the reasons behind the heightened attractiveness perception of vertical fold flat masks. The findings from Experiment 2 provided deep insights into the visual attention patterns associated with mask designs. Through heatmap analysis and eye-tracking metrics, we found important clues indicating that the mask's fold line played a pivotal role in influencing changes in visual attention patterns.

In summary, our study has made significant theoretical contributions in three key areas. Firstly, it expanded the scope of mask-related research beyond the limited focus on disease prevention, addressing a broader landscape – the perception and evaluation of mask designs by consumers. Unlike previous studies that were confined to specific aspects of masks, such as their disease prevention effectiveness, our research explores the broader realm of mask design by focusing on how consumers perceive and evaluate it. This significant contribution broadens the scope of mask research and provides a more comprehensive understanding of masks' role. Secondly, the study unveiled the latent potential of specific design elements, especially the Folding Lines, in shaping consumers' perceptions, attitudes, and physiological responses to mask designs. This insight emphasizes the pivotal role of design nuances and underscores the need for a nuanced understanding of how these elements interact with individuals' cognitive and physiological processes. Recognizing the intricate interplay between design features and consumer responses, our research contributes to a more holistic comprehension of the complex dynamics influencing mask preferences and wearer perceptions. Lastly, our research explained the variations in consumer responses based on the folding direction of masks, a dimension often overlooked in prior studies. By delving into the distinct preferences and perceptions associated with horizontal fold flat masks and vertical fold flat masks, we uncovered valuable insights into the significance of this design aspect. This understanding enriches the current discourse on mask preferences and offers practical implications for manufacturers and marketers seeking to tailor mask designs to align better with consumer preferences. Our findings highlight the importance of considering folding direction as a crucial factor in the ongoing evolution of mask design and its impact on consumer behavior. In conclusion, these theoretical insights fill gaps in existing literature and pave the way for a more nuanced understanding of the complex dynamics between mask design and consumer perceptions, providing valuable foundations for future studies in this evolving field.

In addition to the preceding theoretical contributions, our work offers three significant practical contributions

that extend beyond the realm of academia. Firstly, our study provides valuable design guidelines for companies engaged in mask manufacturing. Understanding consumers' nuanced preferences and perceptions of different mask designs allows companies to enhance the visual appeal of their products. Our research provides insights into folding direction preferences, empowering mask designers to strategically incorporate these elements for masks that resonate more closely with consumer preferences. Secondly, our study empowers consumers to make more informed fashion decisions when selecting masks. Highlighting the significance of design elements like Folding Lines and their impact on perceived attractiveness, uniqueness, and sophistication allows consumers to navigate the diverse fashion mask market with increased confidence. This practical insight allows individuals to align their mask choices not only with functional considerations but also with their personal style preferences, enhancing the overall satisfaction and personalization of the mask-wearing experience. Finally, a notable practical implication of our research introduces eye-tracking analysis as a method to enhance the visual appeal of products, particularly masks. By incorporating this methodology, companies can gain valuable insights into how consumers visually engage with their products and optimize design elements for maximum impact. The proposed eye-tracking analysis offers a systematic approach to evaluate and improve the visual attractiveness of masks, providing a valuable tool for companies aiming to refine their product designs in response to consumer preferences.

In conclusion, our study offers significant contributions to the understanding of mask design and consumer preferences; however, several limitations warrant consideration for future research. Firstly, the sample, predominantly composed of university students, raises concerns about the generalizability of our findings across diverse age and occupational groups. Therefore, in future research, we need to diversify the sample by including various age groups, not limited to university students, and secure an ample sample to replicate and validate the results of this study. Secondly, our exploration of how folding direction influences personal perceptions and preferences for masks did not delve into the potential impact on the wearer's image or attractiveness. Moreover, the multifaceted nature of consumer decision-making in mask purchases necessitates comprehensive consideration beyond design factors. Future research should explore the various influences on consumers' choices in this context. While our study identified a preference for vertical fold flat masks, eye-tracking analysis revealed that different mask types may elicit distinct gaze patterns on frontal or side profiles. This suggests that preferences for masks may be influenced by situational factors, such as frontal or side profile emphasis. This context-dependent nature emphasizes the need for nuanced interpretations and further investigation into varying preferences across different scenarios. Thirdly, a limitation of our study is the exclusive focus on the folding style among the various design elements of masks. Notably, alongside the folding style, the color of the mask can be a significant design element. For instance, the emotional response of an individual may vary

depending on whether the mask color is white, black, or a skin-tone matching beige. Future research should investigate the impact of color on the perception of mask design. Lastly, while eye-tracking analysis provided valuable insights, its potential could be enhanced through big data analytics. Integrating these methodologies offers a more scientific and intelligent approach to mask design optimization. A study that developed a predictive model based on gaze patterns in the online shopping domain (Mikalef et al., 2023) provides a promising direction for future research to improve mask design and consumer satisfaction.

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국문요약

마스크 매력 탐구: 아이트래킹을 활용한 수직 접이형 대 수평 접이형 마스크 비교 분석

이준식* · 정난희** · 윤지찬*** · 박도형**** · 박세범*****

COVID-19 팬데믹의 확산은 마스크를 일상생활에서의 필수품으로 변화시켰으며, 마스크에 대한 대중의 인식과 행동에 큰 변화를 일으켰다. 마스크 착용 의무의 완화가 진행되고 있는 가운데, 여전히 많은 사람들이 마스크 착용을 유지하며, 마스크를 개인의 개성과 정체성을 표현하는 패션 수단으로 활용하는 추세가 나타나고 있다. 그러나 마스크와 관련된 기존 연구는 주로 마스크의 감염 예방 효과나 팬데믹 상황에서의 채택 태도를 탐구하는 등 제한된 분야에 국한되어 있어, 마스크 디자인에 대한 소비자 선호도를 이해하기 위한 연구의 필요성이 대두되고 있다. 본 연구는 마스크의 접이 방식에 따라 마스크 디자인을 수평 접이형 마스크와 수직 접이형 마스크 두 가지 유형으로 구분하고, 각각의 디자인에 대한 소비자 지각과 선호도를 설문 및 시선 추적 방법론을 활용하여 조사하였다. 소비자 설문에 대한 T 검정을 수행한 결과, 수직 접이형 마스크가 수평 접이형 마스크 대비 소비자에게 선호되며, 독특성, 세련미, 입체감, 생동감이 높게 평가되는 경향이 나타났다. 이후, 수직 접이형 마스크가 매력적으로 인식되는 원인을 실증적으로 이해하기 위해 각 마스크 디자인에 대한 아이트래킹 분석을 수행하고, 마스크 디자인 별 시선 패턴의 차이를 도출하였다. 본 연구는 마스크 관련 연구의 범위를 감염 예방 효과 검증 등의 제한적인 영역에서 나아가, 소비자의 디자인 지각 및 평가 영역까지 확장한 점, 마스크의 접이 방식이라는 디자인 요소가 소비자의 지각, 태도 및 생리적 반응에 미치는 잠재적 영향력을 설명하고자 한 점에서 이론적인 공헌이 있으며, 소비자에게 선호되는 마스크 디자인을 위한 의사결정을 지원할 수 있다는 측면에서 실무적인 함의가 있다.

주제어 : 시선 추적, 제품 디자인 평가, 마스크, 수직 접이형 마스크, 수평 접이형 마스크

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* 국민대학교 비즈니스 IT 전문대학원
** 연세대학교 경영대학
*** 국민대학교 비즈니스 IT 전문대학원
**** 교신저자: 박도형
국민대학교 비즈니스 IT 전문대학원/경영정보학부
서울특별시 성북구 정릉로 77
Tel: +82-2-910-5613, E-mail: dohyungpark@kookmin.ac.kr
***** 연세대학교 경영대학

저 자 소 개

이준식

국민대학교 경영대학 경영정보 심화전공, EmTeD (Emerging Technology Beyond Design; 미래기술융합디자인) 부전공으로 학사 학위, 동 대학 비즈니스IT전문대학원에서 공학석사 학위를 취득하였으며, 현재 동 대학원 고객경험연구실 (CXLab.)에서 박사과정을 이수하고 있다. 주요 연구분야는 사회심리학 기반 사용자/소비자 행동 이론 (User/Customer Behavior), 통계 및 인공지능 기법 기반의 사용자/소비자 애널리틱스 (User/Customer Analytics), 디자인사고 기반의 사용자/소비자 경험 디자인 (Experience Design)이며, Data-Driven UX 및 전략 수립, 소비자 감성 기반 디자인평가, 과학기술정책 및 신산업 규제혁신, 스마트 물류, 소셜 로봇 등 다양한 분야의 연구를 수행하고 있다.

정난희

연세대학교 경영대학 일반대학원 마케팅 박사과정을 수료하였으며, 소비자행동을 세부 전공으로, 심도 있는 연구를 위해 심리학을 부전공으로 하여 전공분야에 대한 전문성을 확보하고자 했다. 주요 관심분야는 목표 진전/달성(Goal Progress/Attainment)과 관련된 목표 이론(Goal Theory), 소비자 정보 처리(Information Processing), 친사회적 행동(Prosocial Behaviors), 크기/시각적 지각(Size/Visual Perception)이며, 관심 분야를 비롯해 소비자 행동과 관련된 다양한 주제로 연구 프로젝트를 수행하고 있다.

윤지찬

국민대학교 경영정보학부에서 경영학사 및 공학사를 취득하였으며, 국민대학교 비즈니스IT전문대학원에서 석사과정에 재학 중이다. 주요 연구분야는 디지털 에이전트, 데이터 기반 사용자/소비자 고객 행동 분석, 고객 경험 디자인 등과 관련된 연구를 수행하고 있다.

박도형

KAIST 경영대학원에서 MIS 전공으로 석사 및 박사학위를 취득하였다. 현재 국민대학교 경영대학 경영정보학부/비즈니스IT전문대학원 교수로 재직 중이며, 고객경험연구실 (CXLab.)을 책임지고 있다(www.cxlab.co.kr). 한국 과학 기술 정보 연구원(KISTI)에서 유망아이템 발굴, 기술가치 평가 및 로드맵 수립, 빅데이터 분석 등을 수행하였고, LG전자에서 통계, 시선/뇌파 분석, 데이터 마이닝을 활용한 소비자 평가 모형 개발을 담당했었고, 스마트폰, 스마트TV, 스마트Car 등에 대한 Technology, Business, Market Insight 기반 컨셉 도출 프로젝트를 다수 수행하였다. 현재 주요 관심분야는 사회심리학 기반의 사용자/소비자의 행동 이론(User/Customer Behavior), 통계 및 인공지능 기법 기반의 사용자/소비자 애널리틱스(User/Customer Analytics), 디자인사고(Design Thinking) 기반의 사용자/소비자 경험 디자인(Experience Design)이다.

박세범

현재 연세대학교 경영대학 마케팅 교수로 재직 중이다. 연세대학교 경영학과에서 학사 및 석사, 미국 일리노이 대학교 어바나-샴페인 캠퍼스에서 경영학 석사 학위를 취득한 후, 미국 노스웨스턴 대학교 켈로그 경영대학에서 마케팅으로 박사 학위를 취득하였다. 주요 연구 분야는 소비자 정보 처리, 메타인지, 소비자 식품심리학 및 소비자 신제품 수용의 심리학이며, 연구 성과는 Journal of Consumer Research, Journal of Consumer Psychology, Journal of Product Innovation Management, Psychology & Marketing, Frontiers in Psychology, Journal of Advertising Research, Food Quality and Preference, Journal of Sensory Studies 등의 주요 국제학술지 및 마케팅연구와 소비자학 연구 등의 국내 학술지에 다수 게재되었다. 교재로는 소비자행동(2판)과 통합 브랜드 커뮤니케이션(1판)을 저술하였다.