

ORIGINAL CONTRIBUTIONS

Recognition and the development potential of mobile shopping of customized cosmetic on untact coronavirus disease 2019 period: Focused on 40's to 60's women in Seoul, Republic of Korea

Jinkyung Lee BA^{1,2}  | Ki Han Kwon PhD¹

¹Division of Beauty Arts Care,
Department of Practical Arts, Graduate
School of Culture and Arts, Dongguk
University, Seoul, South Korea

²Daily Beauty Unit, Amorepacific Co,
Seoul, South Korea

Correspondence

Ki Han Kwon, Division of Beauty Arts
Care, Department of Practical Arts,
Graduate School of Culture and Arts,
Dongguk University, Seoul 04620, South
Korea.
Email: kihan.kwon@dongguk.edu

Abstract

Background: Our research results will be helpful in the development of the K-beauty customized cosmetics industry as well as consumers who are having difficulty in purchasing cosmetics due to the rapid transition to a non-face-to-face society due to COVID-19.

Objectives: This paper attempted to investigate the recognition and development potential of customized cosmetics, focusing on mobile shopping in the era of COVID-19 untact period.

Methods: The women included in the study consumer Seoul residence in the mobile shopping experience 40–60 targets for women 380 were the people. Statistical processing of data collected by the data analysis method is analyzed using the SPSS (Statistical Package for Social Science) WIN25.0 statistical package program through the process of data coding and data cleaning.

Results: As the untact era enters, the frequency of using non-face-to-face mobile shopping for customized cosmetics is increasing, and it is believed to be deeply related to the level of interest in skin and recognition of customized cosmetics, such as the use of hands-on apps that incorporate new technologies of the 4th industrial revolution. Looking at the Kaiser–Meyer–Olkin to confirm the normality and validity of the population proved its validity. January 2020 (after COVID-19 spread), the use of mobile shopping was increased. In the future, it was significantly higher to continue shopping for cosmetics using mobile devices $p < 0.001$.

Conclusion: The present study focused on the recognition and development potential of customized cosmetics on mobile shopping in the era of COVID-19 untact period. Our results suggested that the possibility of developing customized cosmetics through mobile shopping in the untact era after COVID-19 will be endless, and it is believed that various marketing strategies will be supported in the future.

KEYWORDS

COVID-19, customized cosmetics, mobile shopping 4th industrial revolution, untact

1 | INTRODUCTION

Gupta et al¹ coronavirus disease 2019 (COVID-19) is a deadly disease that can lead to serious respiratory illness. It was supposed to be caused by the SARS-CoV-2 virus. Myers² also confirmed the first human case in China in December 2019, and the infection spreads rapidly around the world. It is highly contagious, with Corona-19 spreading worldwide in 2020, and the World Health Organization (WHO) reportedly proclaims a Pandemic for Corona-19. Khan MA, Moverley Smith (2020) said South Korea saw a record COVID-19 death on December 17, 2020 and panicked due to fears of closure. All countries have adopted measures such as blockade and separation. Affected by the company's production and operational plans, most companies say they have stopped production. The overall production rate slowed down, the growth rate of global GDP decreased, and it had a great impact on the world economy.³ Zhang et al (2020) also said that COVID-19 not only affects the production activities of companies, but also seriously affects the needs of consumers, which has led to the recent post-corona. With the growing doubts and anxieties of the 19th era, the social risks caused by the infectious disease Corona-19 (COVID-19), as well as the economic and social crises, are now growing all over the world. It was bumped.⁴ Mohammed Ahmed Garout (2021) said the world was in the early stages of ensuring the effectiveness of the vaccine and the exact positive effects of the infection.⁵

Kim ND et al. in (2018), "Untact" has emerged as a major trend in the service industry in recent years, driven by this situation. It is not a loanword that means "no contact" with an unattached to a contact that means contact with an tact, but it is Korean English. This is a service method that provides information in a non-face-to-face manner, such as minimizing contact with people.⁶ Kotranews (2020) Poland is recommended to keep a social distance to prevent the spread of infectious diseases from the government after the first corona-19 confirmed self-occurrence on March 4, 2020. Demand for face-to-face services is increasing, interest and demand for anti-face services are gradually increasing, and there are ways to diversify business channels for non-face-to-face services, as well as online medical care, contact card payments, and unattended home delivery. It was expected to become a business suitable for the post-corona era.⁷ In addition, Zhao et al (2017) reported that market research firm (Nielsen) has made consumers in the Asia-Pacific region the most active group of online shopping. In network marketing practices, the use of virtual reality (VR) and augmented reality (AR) technologies is increasing. Online shopping represented the fourth retail revolution. AR technology is confirmed to change the future of shopping. AR online shopping, based on whether implemented or not, can be the focus of potential market research applications.⁸ Due to the popularity of mobile shopping, shopping behavior is no longer constrained by time and space, which has led to more recent purchases and effective consumption promotion.⁴ Utilization rates for this tend to increase.

Patravale and Mandawgade (2008) state that today's global consumers are looking for personal care products that offer many

benefits with minimal effort, and they are also innovative with the latest technological advances. Faced with these trends, the formula strives to develop highly differentiated multifunctional products with a focus on treatment and beauty.⁹ Most Esther (2019) "As mentioned in the awareness survey on custom cosmetics and custom product preparation manager system", in line with this, the Republic of Korea implemented the custom cosmetics system of the Republic of Korea Food and Drug Safety Agency from March 2020.¹⁰ Qualification as "Custom Cosmetics Preparation Manager," this newly established, customized cosmetics business has started in the Republic of Korea, and although there are concerns about raw materials, quality control, and reliability, customized cosmetics are used by consumers. It is expected that consumer demand will increase more and more by combining and selling in small lots according to individual needs.¹⁰

Mike O'Brien (2020) also unveiled home appliances for making on-demand custom cosmetics by L'Oréal and Procter & Gamble at a consumer electronics exhibition in Las Vegas earlier this year. Similarly, Shiseido, a Japanese beauty retail chain, has created a system that allows you to check someone's skin texture, pores, and water content with a simple photograph, taking into account variables such as temperature, humidity, and menstrual cycle. After developing it, an IoT support machine will distribute the correct combination of serum and moisturizer.¹¹ This is also a very important factor in the study of the impact of cosmetic consumption desires on the purchase of customized cosmetics, and the motivation for purchasing cosmetics is the cosmetic consumption desire. By verifying that purchasing custom cosmetics can also explain the relationship, he said to open up the possibility of revitalizing the cosmetics market for customized marketing.¹² However, Kim et al (2020) state that custom cosmetics made in the field by consumers and sellers have some safety issues and require a proactive approach to safety management.¹³ Kwon and Jeon (2020), the modern consumer culture has gone through the era of mass desires, and the custom-made marketing that maximizes the individual needs such as their own products is actively developed, and only for myself. Customizable cosmetics that can fully express the taste of Seongsim are developing in various ways in another form of niche market and are required to be important as an industry that creates high added value.¹⁴ In the cosmetics evaluation study based on the recognition of custom cosmetics, which is the existing previous research of Mi-sung and Songtam (2020), the improvement points based on the recognition of customized cosmetics are the most convenient to purchase and the recognition of custom cosmetics. We recognized the difference between custom cosmetics and general cosmetics, whether it was customized cosmetics or not, and found that there was a significant difference depending on the risk of customized cosmetics. This is due to the vague idea of consumers that the price of cosmetics seems to be expensive due to the image of custom cosmetics and the inadequate place to buy cosmetics, although the awareness of custom cosmetics is still low. It was thought that,¹⁵ in addition, the possibility of selling cosmetics is largely determined by the texture of the skin and the skin sensation performance. In order to satisfy targeted customers, it is important to collect information for consumer awareness of the

sensory characteristics of the product.¹⁶ Horning et al¹⁷ state that mobile market shopping can have a positive impact on customer behavior and health outcomes.

Therefore, in this study, as the range of use of mobile shopping customized cosmetics in the COVID-19 untact era expanded, the sales staff through advanced equipment recently looked at the trends of customized cosmetics and minimized contact with consumers. Leveraging a customized cosmetics industry environment for women in their 40s and 60s who are unfamiliar with how to do it and hands-on apps with new technologies from the 4th Industrial Revolution such as AR and VR. In order to revitalize mobile cosmetics sales, we prepare basic materials to respond swiftly and flexibly to changes in consumer needs and accurately grasp customer needs (needs) for customized cosmetics. Then, we will prepare mobile shopping customized cosmetics activation plans for the untact era all over the world, provide materials for formulating marketing strategies for the domestic and overseas cosmetics industry, and contribute to the future development of the customized cosmetics industry.

2 | MATERIALS AND METHODS

In this study, a 2-week online survey was conducted from November 2nd to November 15th, 2020 for women in their 40s and 60s who purchase cosmetics through mobile shopping in Seoul, South Korea. Participants who did not purchase cosmetics from shopping were excluded. A total of 400 materials were collected, targeting 380 people, excluding 20 dishonest respondents. Statistical processing of data collected by the data analysis method is analyzed using the SPSS (Statistical Package for Social Science) WIN25.0 statistical package program through the process of data coding and data cleaning.¹⁸ First, a frequency analysis was performed to learn about the characteristics of the subjects and the types of people who prefer custom cosmetics. Second, factor analysis and reliability analysis were carried out to investigate each dimension of inflow degree, usage environment, purchase satisfaction, necessity of skin diagnosis, perception, and development direction. The factor extraction method used was principal component analysis (PCA), which aims to extract a small number of factors that explain as much of the variance of the original variable as possible. Third, we conducted Descriptive Statistics to see the degree of inflow, usage environment, purchase satisfaction, necessity of mobile skin diagnosis, perception, average, and standard deviation of development direction. Fourth, independent sample *t*-test and member placement ANOVA investigate differences in inflow, usage environment, purchase satisfaction, need for mobile skin diagnosis, perception, and direction of development according to the characteristics of the survey subjects. An analysis (one-way ANOVA) was performed. Fifth, in order to investigate the influence of the degree of inflow, usage environment, and purchase satisfaction on the recognition of the need for skin diagnosis, and to investigate the effect of the recognition of the need for mobile phone skin diagnosis on the development direction, regression analysis (Multiple Regression Analysis) was performed.¹⁹

In this study, we verified under the significance levels $p < 0.05$, $p < 0.01$, and $p < 0.001$.²⁰

3 | RESULTS

3.1 | Degree of inflow

The results of verifying the validity and reliability of the inflow degree scale are shown. Looking at the results of exploratory factor analysis (EFA), and looking at Kaiser-Meyer-Olkin (KMO) to confirm that it is a valid measure of population normality, the validity is 0.734. It was proved that Bartlett's old formation test result approximates chi-square value is 544.569 ($p < 0.001$), and it was found that the above factors may be analyzed as this research tool. PCA was used as the factor extraction model, and the Varymax method was used as the factor rotation method. The total amount of explanation explained by the four questions was about 63.46%. From the fact that the Eigenvalue of the inflow level is 2.538 and has an explanatory amount of about 63.46%, it was found that this research tool is composed of appropriate subfactors. The Cronbach's alpha value calculated for reliability verification showed an inflow degree of 0.805 and a reference value of 6 or more, and the degree of internal agreement between each question item was very high.

3.2 | Use environment

The results of verifying the validity and reliability of the usage environment scale are shown. Looking at the results of EFA, and looking at KMO to confirm that it is a valid measure of population normality, the validity is 0.723. It was proved that Bartlett's old formation test result approximates chi-square value is 284.240 ($p < 0.001$), and it was found that the above factors may be analyzed as this research tool. PCA was used as the factor extraction model, and the Varimax method was used as the factor rotation method. The total amount of explanation explained by a total of four questions was about 53.68%. From the fact that the Eigenvalue of the usage environment is 2.147, which has an explanation amount of about 53.68%, it was found that this research tool is composed of appropriate subfactors. The Cronbach's alpha value calculated for reliability verification showed that the usage environment was 700 and the standard value was 6 or more, and the degree of internal agreement between each question item was very high.

3.3 | Purchase satisfaction

The results of verifying the validity and reliability of the purchase satisfaction scale, excluding the two questions that hinder validity and reliability, are shown in Table 1. Looking at the results of EFA, and looking at KMO to confirm that it is a valid measure of population normality, the validity is 0.750. It was proved that Bartlett's

TABLE 1 Validity and reliability of purchase satisfaction scale

Diagnosis	Purchase satisfaction	Cronbach's α
Mobile shopping compared to offline is good because cosmetics are cheap and easy to compare	0.706	0.727
I feel comfortable buying cosmetics through mobile shopping compared to offline	0.677	
It is good to check the usage reviews of cosmetics purchases through mobile shopping compared to offline	0.653	
Mobile shopping compared to offline is good because there are more diverse products due to cosmetics purchase	0.648	
I don't want to buy cosmetics with mobile shopping compared to offline because I can't get counseling with beauty consultants	0.568	
I don't like to buy cosmetics through mobile shopping compared to offline because exchange (AS) is inconvenient	0.543	
I don't want to buy cosmetics with mobile shopping compared to offline because I can't get the product right away	0.537	
Eigenvalues	2.709	
% of Variance	38.695	
Cumulative %	38.695	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.750		
Bartlett's test of sphericity test [Approx. Chi-Square: 754.188, df: 21, $p < 0.001$]		

old formation test result approximates chi-square value is 754.188 ($p < 0.001$), and it was found that the above factors may be analyzed as this research tool. PCA was used as the factor extraction model, and the Verymax method was used as the factor rotation method. The total amount of explanation explained by the seven questions was about 38.70%. The Eigenvalue of purchase satisfaction was 2.709, which was about 38.70% of the explanation, indicating that this research tool was composed of reasonable subfactors. The Cronbach's alpha value calculated for reliability verification showed a purchase satisfaction of 0.727 with a reference value of 6 or more, and the degree of internal agreement between each question item was very high.

3.4 | Recognition

Except for one question that impedes validity and reliability, the results of verifying the validity and reliability of the cognitive scale appear. Looking at the results of EFA and looking at KMO to confirm that it is a valid measure of population normality, the validity is 0.757. It was proved that Bartlett's old formation test result approximates chi-square value is 747.251 ($p < 0.001$), and it was found that the above factors may be analyzed as this research tool. PCA was used as the factor extraction model, and the Verymax method was used as the factor rotation method. The total amount of explanation explained in 5 questions was about 57.25%. The Eigenvalue

of recognition was 2.862, which was about 57.25% of the explanation, indicating that this research tool was composed of reasonable subfactors. The clone Bach alpha value calculated for reliability verification showed a recognition of 0.804 and a reference value of 6 or more, and the degree of internal agreement between each question item was very high.

3.5 | Development direction

The results of verifying the validity and reliability of the development direction scale are shown, except for the two questions that hinder validity and reliability. Looking at the results of EFA and looking at KMO to confirm that it is a valid measure of population normality, the validity is 0.796. It was proved that Bartlett's old formation test result approximates chi-square value is 513.118 ($p < 0.001$), and it was found that the above factors may be analyzed as this research tool. PCA was used as the factor extraction model, and the Verymax method was used as the factor rotation method. The total amount of explanation explained by the four questions was about 65.00%. Eigenvalue in the direction of development is 2.600, which is about 65.00% of the explanation, indicating that this research tool is composed of reasonable subfactors. The Cronbach's alpha value calculated for reliability verification showed a recognition of 0.819 and a reference value of 6 or more, and the degree of internal agreement between each question item was very high.

3.6 | Characteristics of survey subjects

The following Table 2 shows the characteristics of the survey subjects. Looking at the monthly purchase amount of mobile cosmetics, 151 people (39.7%) have <50,000 yen, 135 people (35.5%) have 50,000 won or more and <100,000 won, and 100,000 won or more and <150,000 won. 61 people (16.1%), 150,000 yen or more and less than 200,000 won 22 people (5.8%), 200,000 yen or more and 11 people (2.9%), and the average monthly income is 2 million won or more-350 120 people (31.6%) have <10,000 won, 3.5 million won or more-83 people (21.8%) have <5 million won, 82 people (21.6%) have 5 million won or more, 1 million won or more-200 51 people (13.4%) were <10,000 won, and 44 people (11.6%) were <1 million yen. Looking at the jobs, 139 (36.6%) are clerical/managers, 135 (35.5%) are housewives, 41 (10.8%) are professional/technical, and 40 (10.5%) are sales/service workers, and 25 self-employed (6.6%), with 175 fourth-year university graduates (46.1%) having the highest educational background, 100 high school graduates (26.3%), and 73 junior college graduates (19.2%), 32 masters and above (8.4%). Looking at the ages, 118 (31.1%) were 40–43 years old or younger, 82 (21.6%) were 44–47 years old, 70 (18.4%) were 48–50 years old, and 66 were 51–55 years old. In the order of people (17.4%) and 44 people aged 56–60 (11.6%), 299 married people (78.7%) were relatively higher than 81 unmarried people (21.3%). The ratio is shown.

3.7 | Type of preference for customized cosmetics

Looking at the types that prefer custom cosmetics, it is as shown in Table 3 below. Looking at the preferred types of cosmetics, basic cosmetics accounted for the largest number at 319 (83.9%), color cosmetics 28 (7.4%), human body cosmetics 14 (3.7%), and directional cosmetics 11 (2.9%), hair cosmetics eight people (2.1%), 171 people (45.0%) at the appropriate price of 50,000 won or more and <100,000 won at the time of purchase, 140 people (36.8%) <50,000 won, 100,000 won or more-less than 150,000 won 50 people (13.2%), 150,000 won or more and 19 people (5.0%). Looking at the preferred types of basic custom cosmetics, essence was the most common in 134 (35.3%), convergent, supple and affected, lotion was 111 (29.2%), cream was 64 (16.8%), lotion 46. In the order of people (12.1%) and eye cream 25 people (6.6%), the most preferred type of color custom cosmetics was makeup base 125 people (32.9%) and liquid cream foundation 120 people (31.6%), face powder, face cake 69 (18.2%), lipstick 52 (13.7%), and eye shadow 14 (3.7%). Looking at the types of custom cosmetics for personal cleansing, 245 (64.5%) had the most width cleansers, 69 (18.2%) were liquid soaps, cosmetic soaps, and solid-form facial cleansers, and 57 body cleansers. In order of people (15.0%) and genital cleanser nine people (2.4%), shampoo and conditioner were the most preferred types of custom cosmetics for hair at 253 people (66.6%), and hair conditioner 78 people (66.6%). 20.5%, 28 hair tonics (7.4%), and 21 hair oils (5.5%).

TABLE 2 Characteristic of subject to investigation (N = 380)

Diagnosis		N	%
Monthly purchase amount of mobile cosmetics	Less than 50,000 won	151	39.7
	More than 50,000 won and less than 100,000 won	135	35.5
	More than 100,000 won and less than 150,000 won	61	16.1
	More than 150,000 won and less than 200,000 won	22	5.8
	Over 200,000 won	11	2.9
Average monthly income	Less than 1 million won	44	11.6
	More than 1 million won - less than 2 million won	51	13.4
	More than 2 million won and less than 3.5 million won	120	31.6
	More than 3.5 million won less than 5 million won	83	21.8
	Over 5 million won	82	21.6
Occupation	Professional/technical jobs	41	10.8
	Office/management positions	139	36.6
	Self-ownership	25	6.6
	Sales/service jobs	40	10.5
	The housewife	135	35.5
Academic background	High school graduation	100	26.3
	A junior college degree	73	19.2
	A fourth-year college graduate	175	46.1
	Master's degree or higher	32	8.4
Age	Under the age of 40–43	118	31.1
	44–47 years old	82	21.6
	48–50 years old	70	18.4
	51–55 years old	66	17.4
	56–60 years old	44	11.6
Marital status	Single	81	21.3
	Married marriage	299	78.7

3.8 | Descriptive statistics for each variable

As a basic analysis, looking at the mean, standard deviation, and kurtosis of each scale, it looks like the following Table 4. The average inflow is 3.99 (SD = 0.72), the usage environment is 4.19 (SD = 0.59), purchase satisfaction is 3.75 (SD = 0.56), and the need for skin diagnosis is 3.47 (SD = 0.78), recognition 3.35 (SD = 0.78) points, and development direction 3.84 (SD = 0.64) points. Finch and West (1997) also suggested that the measurement variables satisfy the normal distribution assumption when the absolute values of the help kurtosis do not exceed 2 and 7, respectively, but SPSS approaches zero kurtosis. In this study, we assume a normal distribution, so if all the kurtosis does not exceed the absolute value of 2, it is considered that the normal distribution assumption is satisfied. As a result of

calculating why to help kurtosis, it is found that the kurtosis is -0.79 to 0.06 and the kurtosis is -0.18 to 0.60 , which does not exceed the absolute value of 2 for all variables, satisfying the work variable normality assumption. You can see that, therefore, we determined that all variables are suitable for verifying the significance of the study

TABLE 3 Customized cosmetics preference type ($N = 380$)

Diagnosis		N	%
Preferred cosmetics	Basic cosmetics	319	83.9
	Color cosmetics	28	7.4
	Directional cosmetics	11	2.9
	Human cleansing cosmetics	14	3.7
	Hair cosmetics	8	2.1
A reasonable price at purchase	Less than 50,000 won	140	36.8
	More than 50,000 won and less than 100,000 won	171	45.0
	More than 100,000 won and less than 150,000 won	50	13.2
	Over 150,000 won	19	5.0
Preferred types of basic customized cosmetics	Convergence, flexibility, influence, toiletries	111	29.2
	Essence	134	35.3
	Lotion	46	12.1
	Cream	64	16.8
Preferred color customized cosmetics types	Eye cream	25	6.6
	Makeup base	125	32.9
	Face powder, face cake	69	18.2
	Liquid cream foundation	120	31.6
Preferred types of Customized cosmetics to clean the body	Eyeshadow	14	3.7
	Lipstick	52	13.7
	Pum cleanser	245	64.5
	Body cleanser	57	15.0
Preferred type of customized cosmetics for hairstyles	Liquid soap and toilet soap soaps in solid form	69	18.2
	Vulva cleaning agent	9	2.4
	Hair conditioner	78	20.5
	Hair tonic	28	7.4
	Shampoo or conditioner	253	66.6
	Hair oil	21	5.5

TABLE 4 Descriptive statistics for each variable ($N = 380$)

Diagnosis	Number of questions	M	SD	Skewness	Kurtosis
Degree of inflow	4	3.99	0.72	-0.79	0.60
Usage environment	4	4.19	0.59	-0.48	-0.10
Purchase satisfaction	7	3.75	0.56	0.06	-0.09
Need for skin diagnosis	5	3.47	0.78	-0.68	0.44
Recognition	5	3.35	0.78	-0.31	-0.18
Direction of development	4	3.84	0.64	-0.32	0.03

model by utilizing the chedeo projection to satisfy the normal distribution assumption.

3.9 | Differences in the degree of inflow according to the characteristics of the survey subjects

The results of an independent sample *t*-test and a member placement analysis of variance (ANOVA) to investigate the difference in inflow according to the characteristics of the survey subjects are shown in Table 5. When the monthly purchase amount of mobile cosmetics is 200,000 won or more, the average is the highest at 4.55 ($SD = 0.38$) points, and the average of <50,000 won is the lowest at 3.75 ($SD = 0.77$) points, showing a significant difference ($F = 8.780$, $p < 0.001$), the highest monthly income is 4.21 ($SD = 0.59$) when the average monthly income is 5 million won or more, and the lowest is 3.64 ($SD = 0.73$) for less than 1 million won. There was a significant difference ($F = 8.183$, $p < 0.001$). The average for clerical/managerial occupations was highest at 4.13 ($SD = 0.67$) and lowest for sales/service occupations at 3.79 ($SD = 0.91$), showing a significant difference ($F = 2.721$, $p < 0.05$). Fourth-year college graduates had the highest score of 4.06 ($SD = 0.65$) and high school graduates had the lowest score of 3.85 ($SD = 0.81$), showing a significant difference ($F = 2.799$, $p < 0.05$). There was no difference, noting that for ages 48–50, the average was highest at 4.09 ($SD = 0.64$) and, for ages 56–60, lowest at 3.76 ($SD = 0.75$). Married or not married had a higher score of 4.01 ($SD = 0.70$) than unmarried 3.91 ($SD = 0.79$), but there was no significant difference. Therefore, it is interpreted that the higher the monthly purchase amount of mobile cosmetics, the higher the average monthly income, and the occupation is clerical/managerial, and the influx of people who have graduated from a fourth-year university is relatively high.

3.10 | Differences in the use environment according to the characteristics of the survey subjects

Table 6 shows the results of performing an independent sample *t*-test and member placement ANOVA in order to investigate the difference in usage environment according to the characteristics of the survey subjects. When the monthly purchase amount of mobile cosmetics was 200,000 won or more, the average was the highest at 4.59 ($SD = 0.38$) points, and the average of <50,000 won was

the lowest at 4.11 (SD = 0.64) points. However, when the average monthly income is 5 million won or more, it is the highest at 4.28 (SD = 0.51) points, and when it is 1 million won or more and <2 million won, it is the lowest at 4.00 (SD = 0.62) points. There was no. When the work was self-employed, the average was highest at 4.30 (SD = 0.68), and sales/service and housewives were the lowest at 4.16 (SD = 0.57) and 4.16 (SD = 0.63), respectively. There was no significant difference, and there was no significant difference in academic background, which was highest at 4.23 (SD = 0.63) and lowest at 4.06 (SD = 0.50) for masters and above. For ages 40–43 and younger, the average was highest at 4.27 (SD = 0.64) and lowest at 51–55 years 4.09 (SD = 0.56), with no significant difference and whether to marry somehow, when married, 4.20 (SD = 0.57) was higher than unmarried 4.17 (SD = 0.69), but there was no significant difference. Therefore, regardless of the characteristics of the survey

subjects, it is interpreted that they have a positive recognition of the mobile shopping environment, such as the convenience of payment methods, including the use of most time and place without restrictions.

3.11 | Differences in purchase satisfaction according to the characteristics of survey subjects

The results of an independent sample t-test and one-way ANOVA to investigate the difference in purchase satisfaction according to the characteristics of the survey subjects are shown in Table 7. When the monthly purchase amount of mobile cosmetics was 200,000 won or more, the average was the highest at 4.00 (SD = 0.48) points, and the average of less than 50,000 won was

TABLE 5 Differences in degree of inflow depending on characteristics of the person surveyed

Diagnosis		N	M	SD	t/F	p	Scheffe
Monthly purchase amount of mobile cosmetics	Less than 50,000 won(a)	151	3.75	0.77	8.780	0.000	a, b, c, d < e
	More than 50,000 won and less than 100,000 won(b)	135	4.11	0.63			
	More than 100,000 won and less than 150,000 won(c)	61	4.18	0.67			
	More than 150,000 won and less than 200,000 won(d)	22	4.14	0.66			
	Over 200,000 won(e)	11	4.55	0.38			
Average monthly income	Less than 1 million won(a)	44	3.64	0.73	8.183	0.000	a, b < c, d < e
	More than 1 million won - less than 2 million won(b)	51	3.68	0.81			
	More than 2 million won and less than 3.5 million won(c)	120	4.02	0.75			
	More than 3.5 million won less than 5 million won(d)	83	4.11	0.60			
	Over 5 million won(e)	82	4.21	0.59			
Occupation	Professional/technical jobs(a)	41	3.99	0.59	2.721	0.029	d < a, c, e < b
	Office/management positions(b)	139	4.13	0.67			
	Self-ownership(c)	25	3.97	0.68			
	Sales/service jobs(d)	40	3.79	0.91			
	The housewife(e)	135	3.91	0.73			
Academic background	High school graduation(a)	100	3.85	0.81	2.799	0.026	a < d < b, c
	A junior college degree(b)	73	4.05	0.69			
	A fourth-year college graduate(c)	175	4.06	0.65			
	Master's degree or higher(d)	32	3.92	0.79			
Age	Under the age of 40–43	118	4.06	0.76	-1.177	0.240	-
	44–47 years old	82	4.06	0.71			
	48–50 years old	70	4.09	0.64			
	51–55 years old	66	3.83	0.67			
	56–60 years old	44	3.76	0.75			
Marital status	Single	81	3.91	0.79	-1.143	0.254	-
	Married marriage	299	4.01	0.70			

* $p < 0.05$; *** $p < 0.001$.

the lowest at 3.67 (SD = 0.57) points, which was not a significant difference. When the average monthly income was 5 million won or more, it was the highest at 3.82 (SD = 0.52), and when it was <1 million won, it was the lowest at 3.62 (SD = 0.49), which was not a significant difference. Occupations were highest on average at 3.80 (SD = 0.60) for clerical/managerial positions and lowest at 3.64 (SD = 0.62) for sales/service positions, with no significant difference and academic background. For fourth-year college graduates, the highest score was 3.78 (SD = 0.52) and the lowest was vocational school graduation 3.66 (SD = 0.62), with no significant difference. For ages 48–50, the average was highest at 3.83 (SD = 0.50) and lowest at, 51–55 years, 3.66 (SD = 0.43), with no significant difference and whether to marry. Was 3.78 (SD = 0.58) points higher than married 3.73 (SD = 0.56) points when was unmarried, but there was no significant difference. Therefore,

regardless of the characteristics of the people surveyed, purchasing mobile shopping cosmetics is interpreted as more than usual for most reasons such as safety, caustic soda, and rain.

3.12 | Differences in perception according to the characteristics of the survey subjects

The results of an independent sample *t*-test and one-way ANOVA to investigate the difference in perception according to the characteristics of the survey subjects are shown in Table 8. When the monthly purchase amount of mobile cosmetics is 200,000 won or more, the average is the highest at 3.75 (SD = 0.68) points, and the average of <50,000 won is the lowest at 3.12 (SD = 0.75) points, showing a significant difference ($F = 8.684, p < 0.001$), when the monthly average income was 5 million

TABLE 6 Differences in the usage environment according to characteristics of the survey subjects

Diagnosis		N	M	SD	t/F	p	Scheffe
Monthly purchase number of mobile cosmetics	Less than 50,000 won	151	4.11	0.64	2.167	0.072	-
	More than 50,000 won and less than 100,000 won	135	4.24	0.54			
	More than 100,000 won and less than 150,000 won	61	4.21	0.59			
	More than 150,000 won and less than 200,000 won	22	4.20	0.57			
	Over 200,000 won	11	4.59	0.38			
Average monthly income	Less than 1 million won	44	4.15	0.64	2.149	0.074	-
	More than 1 million won - less than 2 million won	51	4.00	0.62			
	More than 2 million won and less than 3.5 million won	120	4.24	0.62			
	More than 3.5 million won less than 5 million won	83	4.18	0.57			
	Over 5 million won	82	4.28	0.51			
Occupation	Professional/technical jobs	41	4.29	0.48	0.598	0.664	-
	Office/management positions	139	4.19	0.58			
	Self-ownership	25	4.30	0.68			
	Sales/service jobs	40	4.16	0.57			
	The housewife	135	4.16	0.63			
Academic background	High school graduation	100	4.23	0.63	0.630	0.596	-
	A junior college degree	73	4.20	0.59			
	A fourth-year college graduate	175	4.19	0.59			
	Master's degree or higher	32	4.06	0.50			
Age	Under the age of 40–43	118	4.27	0.64	1.254	0.288	-
	44–47 years old	82	4.19	0.61			
	48–50 years old	70	4.21	0.52			
	51–55 years old	66	4.09	0.56			
	56–60 years old	44	4.12	0.58			
Marital status	Single	81	4.17	0.69	-0.343	0.733	-
	Married marriage	299	4.20	0.57			

TABLE 7 Differences in purchase satisfaction according to characteristics of the survey target

Diagnosis		N	M	SD	t/F	p	Scheffe
Monthly purchase number of mobile cosmetics	Less than 50,000 won	151	3.67	0.57	1.976	0.097	-
	More than 50,000 won and less than 100,000 won	135	3.82	0.55			
	More than 100,000 won and less than 150,000 won	61	3.73	0.53			
	More than 150,000 won and less than 200,000 won	22	3.73	0.66			
	Over 200,000 won	11	4.00	0.48			
Average monthly income	Less than 1 million won	44	3.62	0.49	1.419	0.227	-
	More than 1 million won - less than 2 million won	51	3.65	0.62			
	More than 2 million won and less than 3.5 million won	120	3.77	0.55			
	More than 3.5 million won less than 5 million won	83	3.76	0.60			
	Over 5 million won	82	3.82	0.52			
Occupation	Professional/technical jobs	41	3.78	0.49	0.797	0.462	-
	Office/management positions	139	3.80	0.60			
	Self-ownership	25	3.73	0.37			
	Sales/service jobs	40	3.64	0.62			
	The housewife	135	3.72	0.56			
Academic background	High school graduation	100	3.74	0.56	0.905	0.438	-
	A junior college degree	73	3.66	0.62			
	A fourth-year college graduate	175	3.78	0.52			
	Master's degree or higher	32	3.76	0.66			
Age	Under the age of 40-43	118	3.77	0.61	1.123	0.325	-
	44-47 years old	82	3.75	0.62			
	48-50 years old	70	3.83	0.50			
	51-55 years old	66	3.66	0.43			
	56-60 years old	44	3.67	0.58			
Marital status	Single	81	3.78	0.58	0.718	0.473	-
	Married marriage	299	3.73	0.56			

won or more, it was the highest at 3.50 (SD = 0.71) points, and when it was <1 million won, it was the lowest at 3.15 (SD = 0.94) points. There was no difference. Occupation The average for this clerical/managerial position was the highest at 3.40 (SD = 0.75) and the lowest for the professional/technical position at 3.24 (SD = 0.65), with no significant difference and educational background. The significant difference was the highest at 3.36 (SD = 0.90) and 3.36 (SD = 0.73), respectively, and the lowest at 3.29 (SD = 0.75) for master's and above when graduated from high school and junior college, respectively. The average for ages 44-47 was highest at 3.45 (SD = 0.71) and lowest at 56-60 years 3.28 (SD = 0.79), with no significant difference and whether or not to marry. Married people scored 3.36 (SD = 0.76), which was higher than unmarried 3.29 (SD = 0.85), but there was no significant difference. Therefore, the higher the monthly purchase price of mobile cosmetics, the more positive the recognition of customized cosmetics is.

3.13 | Differences in development direction according to the characteristics of the survey subjects

The results of an independent sample t-test and a member placement ANOVA to investigate the difference in the direction of development according to the characteristics of the survey subjects are shown in Table 9. When the monthly purchase amount of mobile cosmetics is 200,000 won or more, the average is the highest at 4.45 (SD = 0.31) points, and the average of less than 50,000 won is the lowest at 3.74 (SD = 0.65) points, showing a significant difference ($F = 3.971$, $p < 0.01$), monthly average income of 3.5 million won or more and <5 million won is the highest at 3.89 (SD = 0.58), and <1 million won is 3.65 (SD = 0.67). There was no significant difference, which was the lowest in terms of points. Occupations averaged 3.86 (SD = 0.65) points for sales/service

TABLE 8 Difference in Recognition according to characteristics of the person surveyed

Diagnosis		N	M	SD	t/F	p	Scheffe
Monthly purchase number of mobile cosmetics	Less than 50,000 won(a)	151	3.12	0.75	8.684***	0.000	a < b < c, d, e
	More than 50,000 won and less than 100,000 won(b)	135	3.35	0.78			
	More than 100,000 won and less than 150,000 won(c)	61	3.70	0.67			
	More than 150,000 won and less than 200,000 won(d)	22	3.69	0.73			
	Over 200,000 won(e)	11	3.75	0.68			
Average monthly income	Less than 1 million won	44	3.15	0.94	1.696	0.150	-
	More than 1 million won – less than 2 million won	51	3.26	0.71			
	More than 2 million won and less than 3.5 million won	120	3.32	0.82			
	More than 3.5 million won less than 5 million won	83	3.39	0.71			
	Over 5 million won	82	3.50	0.71			
Occupation	Professional/technical jobs	41	3.24	0.65	0.413	0.799	-
	Office/management positions	139	3.40	0.75			
	Self-ownership	25	3.28	0.95			
	Sales/service jobs	40	3.33	0.82			
	The housewife	135	3.34	0.79			
Academic background	High school graduation	100	3.36	0.90	0.065	0.978	-
	A junior college degree	73	3.36	0.73			
	A fourth-year college graduate	175	3.35	0.73			
	Master's degree or higher	32	3.29	0.75			
Age	Under the age of 40–43	118	3.31	0.85	0.526	0.717	-
	44–47 years old	82	3.45	0.71			
	48–50 years old	70	3.34	0.73			
	51–55 years old	66	3.34	0.77			
	56–60 years old	44	3.28	0.79			
Marital status	Single	81	3.29	0.85	-0.699	0.485	-
	Married marriage	299	3.36	0.76			

*** $p < 0.001$.

positions, with professional/technical positions and self-employed persons having 3.79 (SD = 0.70) points and 3.79 (SD = 0.73) points, respectively. There was no significant difference, which was the lowest in, and the highest was at 3.89 (SD = 0.75) for those with a high school diploma, and the lowest was at 3.67 (SD = 0.59) for masters and above. For ages 48–50, the average was highest at 3.88 (SD = 0.59), and for those under 40–43, it was lowest at 3.78 (SD = 0.61), with no significant difference. Married or not married had a higher score of 3.86 (SD = 0.64) than unmarried 3.76 (SD = 0.67), but there was no significant difference. Therefore, it is interpreted that the higher the monthly purchase price of mobile cosmetics, the more positive expectations are placed on the development of customized cosmetics in the purchase format of untact mobile shopping.

3.14 | Influence of the degree of inflow and the use environment on the necessity of mobile skin diagnosis

The results of multiple regression analyses conducted to investigate the effects of inflow and usage environment on the need for mobile skin diagnosis are shown in Table 10. The explanatory power of the model was about 14.7% ($R = 0.147$), indicating that the model was suitable ($F = 33.759$, $p < 0.001$). Looking at the factors that influence the need for mobile skin diagnosis, the degree of inflow ($B = 0.291$, $p < 0.001$) and the usage environment ($B = 0.217$, $p < 0.01$) indicate the need for mobile skin diagnosis. It was found that the static (+) effect that was taken into consideration appeared and that the degree of inflow (=0.268) had a higher influence than the usage environment (=0.164). Therefore, if the frequency and loyalty of mobile

TABLE 9 Differences in the direction of development according to the characteristics of those surveyed

Diagnosis		N	M	SD	t/F	p	Scheffe
Monthly purchase number of mobile cosmetics	Less than 50,000 won(a)	151	3.74	0.65	3.971**	0.004	a, b < c, d < e
	More than 50,000 won and less than 100,000 won(b)	135	3.84	0.61			
	More than 100,000 won and less than 150,000 won(c)	61	3.94	0.64			
	More than 150,000 won and less than 200,000 won(d)	22	3.90	0.70			
	Over 200,000 won(e)	11	4.45	0.31			
Average monthly income	Less than 1 million won	44	3.65	0.67	1.199	0.311	-
	More than 1 million won - less than 2 million won	51	3.81	0.72			
	More than 2 million won and less than 3.5 million won	120	3.87	0.66			
	More than 3.5 million won less than 5 million won	83	3.89	0.58			
	Over 5 million won	82	3.86	0.61			
Occupation	Professional/technical jobs	41	3.79	0.70	0.110	0.979	-
	Office/management positions	139	3.85	0.60			
	Self-ownership	25	3.79	0.73			
	Sales/service jobs	40	3.86	0.65			
	The housewife	135	3.84	0.66			
Academic background	High school graduation	100	3.89	0.75	1.031	0.379	-
	A junior college degree	73	3.80	0.60			
	A fourth-year college graduate	175	3.85	0.60			
	Master's degree or higher	32	3.67	0.59			
Age	Under the age of 40-43	118	3.78	0.61	0.355	0.840	-
	44-47 years old	82	3.86	0.70			
	48-50 years old	70	3.88	0.59			
	51-55 years old	66	3.86	0.71			
	56-60 years old	44	3.82	0.63			
Marital status	Single	81	3.76	0.67	-1.175	0.241	-
	Married marriage	299	3.86	0.64			

** $p < 0.01$.

shopping increase and the mobile shopping environment becomes more convenient, it is expected that the recognition of skin improvement through this will increase.

3.15 | Influence of inflow and usage environment on perception

Table 11 shows the results of multiple regression analyses to investigate the effect of inflow and usage environment on recognition. The explanatory power of the model was about 15.3% ($R = 153$), indicating that the model was suitable ($F = 35.337$, $p < 0.001$). Looking at the factors that influence cognition, it was found that the degree of inflow ($B = 0.391$, $p < 0.001$) has a significant static (+) effect on cognition. Therefore, when the frequency and loyalty of mobile

shopping increase, or when the mobile shopping environment becomes convenient, do you recognize the clear difference between existing cosmetics and custom products, or do you want to experience and use customized cosmetics? It is expected that positive recognition such as whether or not will increase.

3.16 | The influence of needs and perceptions of mobile skin diagnosis on development potential

It shows the results of multiple regression analyses to investigate the impact of the recognition of the need for mobile-based skin diagnosis in the direction of development. The explanatory power of the model was about 33.8% ($R = 0.338$), and it was found that the model was suitable ($F = 97.966$, $p < 0.001$). Looking at the factors

Diagnosis	1	2	3	4	5	6
Degree of inflow	1					
Usage environment	0.598**	1				
Purchase satisfaction	0.435**	0.344**	1			
Need for mobile skin diagnosis	0.367**	0.325**	0.087	1		
Recognition	0.395**	0.271**	0.059	0.692**	1	
Direction of development	0.384**	0.323**	0.252**	0.549**	0.525**	1

** $p < 0.01$.

influencing the direction of development, the need for skin diagnosis of mobile phones ($B = 0.294$, $p < 0.001$) and recognition ($B = 0.230$, $p < 0.001$) is significant in the direction of development. It was found that the need for mobile skin diagnosis ($=0.357$) was more influential than the recognition ($=0.277$), which appeared to have a target (+) effect. The higher the positive or willingness to use, the more uncontact (non-face-to-face) when purchasing customized cosmetics to utilize hands-on apps that have introduced technologies such as AR and VR. Eventually, we highly expect that skin diagnosis as development potential can be adapted for a non-face-to-face systematic system by application of mobile apps and shopping.

4 | DISCUSSION

In response to the global coronavirus (COVID-19) epidemic, many countries have taken precautions to slow the spread of the virus. In Australia, the federal government generally encouraged people to stay home and ordered the widespread closure of business services, including most elective and cosmetological treatments. Despite efforts to curb the spread of the disease worldwide, this pattern of community spread of the disease is still increasing its incidence. It is thought to begin with animal infections such as other coronavirus infections in bats and pangolins and later infect humans. Once in the human body, this coronavirus (SARS-CoV-2) is abundant in the non-pharyngeal and salivary secretions of infected patients, and its spread is predominantly in nature with respiratory droplets/contact. Animal-infectious SARS-CoV-2, allegedly derived from infected bats, is the seventh member of the outer skin RNA coronavirus. In particular, the entire genome sequence of SARS-CoV-2 is 96.2% identical to the genome sequence of the bat coronavirus BatCoV RaTG13. Currently, the 2% mortality rate is significantly lower than SARS (9.6%) and Middle East Respiratory Syndrome (MERS) (35%), but SARS-CoV-2 is transmitted as a human being during the incubation period. can do. As a result, modern knowledge-based economies are gaining more and more attention, especially in online shopping applications where all transactions and consumer opinions are recorded. Implicit knowledge can be extracted from logs using machine learning methods. Industries and businesses use their knowledge to better understand consumer behavior and the opportunities and threats that come with it. The COVID-19 epidemic has

TABLE 10 Correlation between the relevant variables

a significant impact on various aspects of our daily lives, especially shopping behavior. I experienced online shopping before the coronavirus epidemic, but during the period of my illness, the number of online shopping surged. COVID-19 high-speed radio waves must be used to observe individual and social health problems that may cause them to stay home at social distances.²¹⁻²³ These issues have a direct impact on consumer behavior in online shopping.²⁴

The recent spread of AR and VR applications that utilize smartphone technology has increased with the universalization of smartphone adoption. AR and VR technologies are widely used. Participants in the VR state pay more attention to the arbitrated environment when comparing the impact of AR and VR on knowledge retention when using the mobile phone platform and have a spatial presence and reported more fun in higher and AR states. In other words, the more VR the state is, the more psychological and cognitive reactions of the media are compared to the AR state. In addition, the psychological and cognitive responses of the media help maintain more knowledge visually presented to the mobile app.²⁵ VR technology is evolving rapidly. However, until recently, most approaches focused on sight and hearing, and a relatively small number of approaches dealt with touch. Researchers at Northwestern University are now creating a new way to experience VR, a flexible "tactile skin" that aims to create a physical interface between the virtual world and the user's skin. Cosmetic masks are a popular skin care product that is widely accepted by both adolescents and women.²⁶ The process to achieve a custom design for a beauty mask using a three-dimensional (3D) parametric face model derived from a large amount of scanned face data follows: The parametric model approximates individual faces using a non-linear regression model controlled by a set of easy-to-measure face parameters. A prototyping mask design system that acts as an effective reference geometry for performing 3D mask design and implements parametric modeling methods demonstrates a customized design process. The system allows the user to specify the internal and external boundary curves to form the mask shape directly from the 3D mesh of the face model. By realizing human-centered design customization, it enhances the practical value of large-scale anthropometric data.²⁷ In addition, a new evolution of 3D skin equivalents has been developed by optimizing 4D laser-assisted bioprinting and skin equivalent culture protocols. This makes it possible to produce fully bioprinted skin equivalents that are close to current skin equivalents and suitable

for testing cosmetic ingredients, and to reproduce the non-linear aspects of the dermis-epidermal junction, specific "Medium" active ingredients are applied to design "micropatterns" and produce bio-printed skin equivalents.²⁸ Consumers around the world today are more focused on their health and looks. These trends are increasing the demand for products manufactured with natural and functional food ingredients. Functional ingredients and innovative delivery systems are leading the development of new products in the cosmetics sector, with substantial benefits that consumers can perceive and personal management with optimized sensory attributes. A number of innovative formulations are currently in use.⁹ AI technology-based custom beauty services Platform Company La Belle Lab has provided personalized custom services such as skin measurement and analysis, daily chart storage, cosmetic curation, and O2O beauty care. We will provide the know-how of beauty specialists combined with AI technology to provide various beauty services such as skin, health, and makeup, and at the same time, aim for user-centered services that induce user participation. In collaboration with dermatologists, the possibility of utilizing patient skin data collected by conventional dermatologists, the applicability of AI, telemedicine, examination of legal issues such as personal information protection, and the problem of learning data are data (replace data with synonym). After confirming governance issues, we started developing a beauty journey platform that provides data directly to customers who do not go through hospitals. AI skin diagnostic service uses skin diagnostic deep learning algorithms to diagnose users' wrinkles, flashes, elasticity, troubles, degree of pigmentation, etc. and recommend optimized solutions to differentiate them from our customers. We are developing efficient skin condition diagnosis and prediction models using convolution neural network ensemble and developing solutions that utilize transfer learning and multi-task learning for the purpose of providing experience. Ing.²⁹ Revitalization plan through analysis of customized cases in the beauty industry—In the research of centered on domestic and foreign beauty companies, active collaborative marketing with corporate digital custom R & D is required, and hidden needs of customers. In addition to the needs, comprehensive elements such as life patterns (sleep, water intake, stress, etc.) with the analysis environment (temperature, humidity, ultraviolet rays, fine dust, etc.), weather effects, and DNA diagnosis are converted into data. Innovative services that utilize the company's digital technology to provide the best fit solution should be built, and the value of the brand based on the company's own philosophy through the promotion diversification of the company is used

by the users. It is necessary to establish an integrated service that extends to experience, selection, and sharing that can be directly felt by. Therefore, national-level institutional guidelines that reflect the opinions of related companies in the new industry should be secured, and more concretely, ahead of the full-scale start of the custom cosmetics system that will come into effect in March 2020. It was judged that systematic institutional establishment was an indispensable element.³⁰

Therefore, in this research, existing custom cosmetics are prepared and sold by face-to-face with customers through skin diagnosis and face-to-face consultation. Recently, the untact era started after COVID-19, and the 4th Industrial Revolution was rapid. We investigated the perceptions and potential for future development for the purchase of customized cosmetics for mobile shopping. In January 2020 (after the spread of COVID-19), the use of mobile shopping increased in the validity and reliability test of the inflow degree scale in Table 12, and cosmetics shopping will be carried out using mobile in the future. The Cronbach's alpha value calculated for the verification of reliability, which may continue, showed an inflow degree of 0.805 and a reference value of 6 or more, and the degree of internal agreement between each question item was very high. This means that after the spread of COVID-19, the purchasing form of consumers has changed from online to offline, and it is necessary to deal with the purchasing form in the full-scale untact era. During the COVID-19 pandemic, a study of women's hygiene and cosmetology habits in Poland compared data around COVID-19. Respondents declared that they had more showers when they washed their hands after returning home and using urban transportation. We also found that the use of disinfectants increased during the COVID-19 pandemic. On the contrary, the number of people who wash their hair has decreased a little. Increased use of hand creams and reduced structural cosmetics in work documents where the profile of cosmetics used were changed, nearly half of the respondents declared that they would maintain new habits even after the outbreak.³¹ This indicates that not only has mobile shopping increased around COVID-19, but hygiene and beauty management habits have also changed. Table 13 Mobile shopping can be purchased easily without restrictions on time and place, mobile shopping is more convenient to pay than PC, and mobile shopping is more mobile than PC. It is said that it will be used familiarly, and if the frequency and loyalty of mobile shopping increase, or if the mobile shopping environment becomes convenient, the clear difference between existing cosmetics and custom products will be recognized and customized. It is

TABLE 11 The effect of inflow and usage environment on the need for skin diagnosis

Dependent variable	Independent variable	Unstandardized coefficient		Standardized coefficient		VIF	R ²	F
		B	SE	β	t			
Need for mobile skin diagnosis	(Constant)	1.401***	0.272		5.159		0.147	33.759***
	Degree of inflow	0.291***	0.064	0.268	4.536	1.557		
	Usage environment	0.217**	0.078	0.164	2.779	1.557		

** $p < 0.01$; *** $p < 0.001$, Durbin-Watson: 1.869.

Diagnosis	Degree of inflow	Cronbach's α
I once bought cosmetics through mobile shopping	0.846	0.805
We will continue shopping for cosmetics using mobile in the future	0.842	
I often use mobile shopping	0.784	
Mobile shopping usage increased in January 2020 (after the spread of COVID-19)	0.707	
Eigenvalues	2.538	
% of variance	63.461	
Cumulative %	63.461	
Kaiser–Meyer–Olkin measure of sampling adequacy:0.734		
Bartlett's test of sphericity test [Approx. Chi-Square: 544.569, df: 6, $p < 0.001$]		

TABLE 12 Validity and reliability of the acquisition scale

Diagnosis	Usage environment	Cronbach's α
Mobile shopping is more familiar with mobile use than PC, so I often use it	0.821	0.700
Mobile shopping is better because it is more convenient to pay than PC	0.777	
Mobile shopping is good because you can buy conveniently without time limit	0.684	
There is a shopping mall app that you usually use for mobile shopping	0.633	
Eigenvalues	2.147	
% of Variance	53.678	
Cumulative %	53.678	
Kaiser–Meyer–Olkin measure of sampling adequacy:0.723		
Bartlett's test of sphericity test [Approx. Chi-Square: 284.240, df: 6, $p < 0.001$]		

TABLE 13 Validity and reliability of the usage environment scale

expected that positive awareness of the experience of using cosmetics and whether or not they want to use them will increase. This is because future consumer mobile shopping will be further expanded and increased, and it is expected that continuous research will be required accordingly. It is also a study to purchase behavior from the perspective of COVID-19 mission-critical system users, these custom and advanced when mobile merchants implement personalized marketing based on a survey of consumers' past purchase information. Targeted product recommendations are likely to provoke a strong emotional response from the consumer, causing them to feel a positive mental state, such as having an interesting and enjoyable awakening, and the consumer's desire for the product. For the same reason, they also unknowingly find the visual appeal of looking for more products, and with great awakening while facing sophisticated show information for products made at mobile merchants.⁸ Created fun. It also reveals the fact that customized proposals lead to much higher purchase intent than general-purpose proposals. Perceived fairness varied greatly depending on the promotion type (free shipping, \$ discount or temporary discount price) based on customized or universally offered to consumers, and customized online promotions provide design suggestions.³² Mobile shopping has become

widespread and has become an integral part of many people's daily lives. However, mobile shopping applications (apps), one of the major channels for mobile shopping, have not been thoroughly investigated and attitudes, subjective norms, and perceived behavioral control have an overall impact on purchasing intent. It was. These discoveries have strong theoretical and practical implications in the light of how to customize product information for mobile advertising.³³ Consumer and patient knowledge, behavior, and attitude navigation of medicines and lifestyle products were purchased online in 2015: A web-based survey^{34,35} survey results of 208 (65.0%). It was found that participants purchased lifestyle products on the Internet, primarily for convenience and cost savings. More than half of the participants (55.6%, 178/320) said they purchased cosmetics, indicating the rapid expansion of online health technology is an important need to ensure proper governance of future health areas. I'm doing it. Thus, it is expected that the use of online and mobile shopping will gradually increase in the future.

Tables 14 and 15 have shown the impact of recognition of the need for mobile skin diagnosis after COVID-19 on the possibility of development static with attention to the possibility of development of recognition with the need for non-face-to-face mobile diagnosis.

TABLE 14 Validity and reliability of the Development Direction Scale

Diagnosis	Direction of development	Cronbach's α
If there is a systematic system that can diagnose my skin when shopping for custom cosmetics Uncontact (non-face-to-face) mobile, it will be helpful to purchase	0.835	0.819
Untouch (non-face-to-face) mobile shopping and customized cosmetics purchases will increase in the future. COVID-19 after	0.802	
Using hands-on apps that introduce technologies such as augmented reality (AR) and virtual (VR), purchasing customized cosmetics will help with untact mobile shopping	0.795	
It would be helpful if there is a customized cosmetic preparation manager dedicated to untact mobile shopping	0.791	
Eigenvalues	2.600	
% of Variance	64.997	
Cumulative %	64.997	
Kaiser-Meyer-Olkin measure of sampling adequacy: 0.796 Bartlett's test of sphericity test [Approx. Chi-Square: 513.118, df: 6, $p < 0.001$]		

TABLE 15 The effect of Inflow and usage environment on recognition

Dependent variable	Independent variable	Unstandardized coefficient		Standardized coefficient		t	VIF	R^2	F
		B	SE	β					
Recognition	(Constant)	1.489***	0.269			5.536		0.153	35.337***
	Degree of inflow	0.391***	0.064	.363		6.148	1.557		
	Usage environment	0.071	0.077	.054		0.919	1.557		

*** $p < 0.001$, Durbin-Watson: 1.880.

It was found that the need for mobile skin diagnosis has a higher influence than the recognition. Olatz Lopez-Fernandez et al (2017) Young adults' dependence on mobile phones in their own right European cross-cultural empirical studies show that, despite many positive benefits, mobile phone use is harmful and can be associated with harmful behavior. However, Belgium, the United Kingdom and France say that the percentage of highly dependent mobile phone users has increased further.³⁶ Therefore, as the frequency and loyalty of mobile shopping increase and the mobile shopping environment becomes more convenient, it is expected that awareness of skin improvement through mobile experience-based apps will increase. Thus, even in esthetic skin procedure studies in the coronavirus era,³⁷ since the COVID-19 epidemic, all unnecessary outpatient appointments have been minimized, now accepting serious and urgent cases, and simple in the coronavirus era. In modern times, we wanted to use telemedicine, Whatsapp, email or phone for skin problems. An automated daily screening tool was developed and validated to quantify hair gloss. The individual properties of hair shine, such as specular and multiple reflections, of course, record additional features such as shine, hair fiber parallelism, and hair color, which have a significant impact on the subjective ranking of individual readers. An automated system that can compare side-by-side with other hair care and styling products in relation to

TABLE 16 Validity and reliability of the recognition scale

Diagnosis	Recognition	Cronbach's α
I think I need customized cosmetics for myself	0.840	0.804
I'd like to try customized cosmetics	0.823	
The use of customized cosmetics is expected to increase in the future	0.788	
I've heard about customized cosmetics	0.683	
I know the difference between existing cosmetics and customized cosmetics	0.625	
Eigenvalues	2.862	
% of Variance	57.250	
Cumulative %	57.250	
Kaiser-Meyer-Olkin measure of sampling adequacy: 0.757 Bartlett's test of sphericity test [Approx. Chi-Square: 747.251, df: 10, $p < 0.001$]		

hairgloss, using automated screening tools in parallel with standard panel ratings, ranks roughly the same. Automation tools that provide a tight hierarchy of hair fibers parallel to color can also favor panel

evaluation of hair gloss.³⁸ Table 16 The validity and reliability survey of the Custom Cosmetics Recognition Scale showed that I needed customized cosmetics for me and would like to use customized cosmetics, and the amount used is expected to increase in the future.

Therefore, it is interpreted that they have positive expectations for the development of custom cosmetics. Consumers these days are hungry for a personalized experience, and just putting someone's name in the title increases their chances of opening an email by more than 20%. According to Forrester, 77% of consumers recommend or buy more when they choose a brand that offers personalized service or experience. This is especially important in a beauty space where every product is essentially designed to look different to everyone personally, and the brand is just a shopping experience and recommendation. Not so much personalizing the product.¹¹ The 3D laser mouth system also uses a 2D translational stage of xy and a laser device that provides distance information in the z direction to provide relatively short hair prepared for the entire hair bundle or straight line, curly and curly hair. It shows the usefulness of techniques for receiving beauty treatments such as cleaning, conditioning, and dyeing by analyzing the part. An interpretation of the three-dimensional image of the hair assembly and the calculated volume of space occupied by the hair bundle was provided, and a device for measuring the gloss of human hair was also developed. The hairstyle and color of the subject did not affect the measurement, the device was small, and the time required for the measurement was only 0.2 s.^{5,39} Web-based and mobile health interventions are generally operated and transformed into behavior-based tools or treatments delivered via the Internet or mobile platforms, which allow patients to be informal caregivers, health. Includes and utilizes electronic tools for consumers and healthcare providers, and in critical developments for eHealth, the extensive adoption of Web 2.0 technologies and approaches has led to personal health application platforms and consistent with the recent emergence of personally controlled health records such as Google Health, Microsoft HealthVault and Dossia.^{40,41} Thus, the development of new technologies has encouraged the positive or willingness to use customized cosmetics. The higher it is, the more it recognizes that it will be useful for mobile shopping in the untact era after COVID-19 when purchasing customized cosmetics to utilize hands-on apps that have introduced technologies such as AR and VR. Expectations and Custom Cosmetics It is interpreted as a positive recognition of the potential for development, such as expectations for a systematic system that can diagnose and give skin during mobile shopping.

However, the limitation of this study is that only 380 people have not progressed in South Korea as small data. The reason is that because of COVID-19, consumer sentiment has shrunk, and small data, which have helped to secure a population parameter for mobile shopping, are certainly the basis of big data, but the population parameter is still very small. Therefore, it is necessary to expand the population parameter for the expansion of this study, and in this study, there is a deficiency in its validity as small data.

5 | CONCLUSION

The present study focused on the recognition and development potential of customized cosmetics on mobile shopping in the era of COVID-19 untact period. Our results suggested that the possibility of developing customized cosmetics through mobile shopping in the untact era after COVID-19 will be endless, and it is believed that various marketing strategies will be supported in the future.

CONFLICT OF INTEREST

The authors of this manuscript do not have any conflicts of interest to disclose.

AUTHOR CONTRIBUTIONS

Jinkyung Lee and Ki Han Kwon involved in conception or design of the work, data analysis, and interpretation, collected the data, drafted the article, and critically revised of the article. All authors finally approved the version to be published.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Jinkyung Lee  <https://orcid.org/0000-0003-3819-3066>

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