Abstract

**Purpose:** This study presents the direction for the development of the cosmetics industry and the revitalization of the customized cosmetics industry. By using natural raw materials that are harmless to the human body as raw materials for customized cosmetics, it was conducted with the aim of raising positive awareness among consumers and inducing purchases. Customized cosmetics can contribute to solving the problem of the unemployed as small-scale start-ups are possible, since only those with professional qualifications can manufacture customized cosmetics. We want to research how we can fulfill consumers' desire for safety and their desire to own cosmetics that are right for their skin.

**Method:** A total of 306 questionnaires were administered to men and women in their 20s and 60s who had experience in purchasing cosmetics living in Korea, and a frequency analysis, descriptive statistical analysis, exploratory factor analysis, and reliability analysis using Cronbach’s alpha coefficient were conducted using SPSS 25.0 program as the analysis data, and an independent sample t test was conducted to test the hypotheses. We also conducted correlation analysis, multiple regression analysis, and mediation analysis using SPSS process macros to verify mediation effects.

**Results:** First, it can be said that the higher the Awareness of selective attributes and Reliability of selective attributes of customized cosmetics, the higher the Purchase intention. Second, emphasizing the use of natural ingredients in the formulation of customized cosmetics will further enhance purchase intent. Third, since the awareness of customized cosmetics is high enough, supporting it in various ways will not only expand the market, but also allow customers to purchase customized cosmetics with confidence. Fourth, it means that the trust in the customized cosmetics formulation manager who received professional education the state had a positive effect on the choice of customized cosmetics.

**Conclusion:** Using natural raw materials for customized cosmetics can contribute to solving international environmental problems. For the first time in the world, only those with professional qualifications can prepare customized cosmetics. It will be able to satisfy consumers’ desire to own cosmetics that are safe and suitable for their skin. Therefore, in a situation where customized cosmetics are attracting worldwide attention, this study aims to increase consumers’ positive awareness and help skin health by using harmless natural raw materials as raw materials for customized cosmetics. It will be able to suggest a direction as a new growth engine for K-beauty. Even as an international subject, it is considered to have original value.

**Keywords:** Customized Cosmetics, Selective Attributes, Perceived Natural Raw Materials, Awareness of Selective Attributes, Reliability of Selective Attribute

1. Introduction

In modern times, beauty is regarded as an important value of life, and the general public also has a high interest in beauty. As the industry develops, the value consumption trend of selecting
brands and products that can satisfy individual consumption needs is becoming more important[1][2]. In the field of cosmetics, customized cosmetics have emerged to reflect the trend of consumers who prefer products that can reveal their individual values and self[3]. Custom makeup tailored to individual tastes and skin types for your own satisfaction and confidence has become a 'hot keyword' in the beauty industry[4].

Customized cosmetics are “cosmetics that are mixed by adding the contents of other cosmetics or raw materials specified by the minister of food and drug safety to the contents of manufactured or imported cosmetics”, "A cosmetic product that contains a small portion of the contents of a manufactured or imported cosmetic product", The cosmetics act defines cosmetics as excluding cosmetics in which the contents of cosmetics such as solid soap are simply divided into small portions”[4]. In the cosmetics industry, it refers to products that are mixed and subdivided into suitable contents for each customer through skin diagnosis and consultation according to the individual's skin condition[5]. In other words, customized cosmetics are consumer-centered, not producer-centered, and can be said to be products that can satisfy the needs of consumers and increase satisfaction[6][7].

In addition to individual consumption patterns, as interest in environmental pollution increases, the cosmetics industry is increasing the number of products using natural ingredients. Our children are being poisoned by toxic chemicals while eating, drinking, and applying carelessly[8]. Chemicals used in cosmetics that come into direct contact with the skin can accumulate in the body, and these ingredients can cause contact dermatitis or allergies[9]. Accordingly, checksumer, which checks ingredients and consumer reviews one by one before purchasing cosmetics, has emerged[10]. In the cosmetics industry, research and development of natural cosmetics are actively progressing, and keywords such as ‘natural’, ‘organic’, and ‘naturalism’ are in the limelight as major topics in the recent cosmetics industry[11]. Even in customized cosmetics, the ‘natural’ keyword was analyzed as a major concern of consumers[12][13].

Consumer selective attributes may play a role in the purchase of cosmetics[14]. It was verified that the more consumers pursue brands and perceptual values, the higher their purchase intentions, and the more they pursue prices, the lower their purchase intentions[15][16]. In general, many researchers agree that selective attributes have a significant effect on purchase intention. Improving the purchase intention of In addition, using natural raw materials in customized cosmetics can contribute to solving environmental problems[17], and can have a positive impact on the cosmetics industry by reflecting consumer tastes[18][19].

This study was conducted for the purpose of suggesting a direction for the development of the cosmetics industry and revitalization of the customized cosmetics industry, and increasing consumers' positive awareness and encouraging purchase by using natural raw materials harmless to the human body as raw materials for customized cosmetics. Customized cosmetics can contribute to solving the problem of unemployment by enabling small-scale business startups, and the fact that only professionally qualified people can dispense customized cosmetics can also satisfy consumers' safety and desire to own cosmetics that are specific to their skin[20]. This study aims to increase consumers' positive awareness and help skin health by using natural raw materials that are harmless to the human body as raw materials for customized cosmetics. In addition, in a situation where customized cosmetics are starting to gain global attention, it will be able to suggest a direction as a new growth engine for K-beauty[21].

2. Theoretical Background

2.1. Definition of custom cosmetics

Cosmetics, unlike other consumer products, is an industry that emphasizes individual taste,
and has become an important necessity of life due to technological development and consumption level improvement[22]. Due to rapid changes in the cosmetics industry and changes in consumption behavior, the cosmetics market has reached the stage of producing customized cosmetics that can identify and respond to individual needs, and produce specialized and segmented products according to the taste, personality, values, and personality of the cosmetics consumer class. It is time for various cosmetics sales strategies[23].

The ministry of food and drug safety prepared a plan to improve the cosmetics system based on the contents of the revitalization of the customized cosmetics sales business, and promoted the customized cosmetics pilot project in March 2016[24], “Customized cosmetics” specified in the cosmetics act means “Cosmetics made by adding the contents of other cosmetics or raw materials specified by the minister of food and drug safety to the contents of manufactured or imported cosmetics, or mixing the contents of manufactured or imported cosmetics into subdivisions. It refers to a single cosmetic product, excluding cosmetics in which the contents of cosmetics prescribed by ordinance of the prime minister, such as solid soap, are simply subdivided[25].

In the future, the customized cosmetics market will meet the diverse needs of consumers through a new beauty industry paradigm and diversification of sales methods. In addition, rapid growth, such as the increasing number of companies preparing for the customized cosmetics business, is expected to serve as a new driving force for the cosmetics market[26].

2.2. Custom cosmetics type

Customized cosmetics centered on consumer thinking have diversified the distribution structure, and recently, interest in personalized cosmetics through a multi-product small quantity system optimized for individuals, centered on young consumers, is steadily increasing[27]. If the existing cosmetics market focused on the producer-centered 'what to sell?', the changed market focused on the consumer-centered thinking 'what do you want to buy?'[28].

The number of customized cosmetics in Korea is on the rise, centered on Amorepacific and LG Household & Health, which participated in the pilot project, with Amorepacific's main products being color cosmetics and LG Household & Health's basic cosmetics[29]. Amorepacific is operating customized services for consumers by launching customized color cosmetics and launching about 50 types of ‘My foundation’ from affiliate Innisfree[30].

The types of cosmetics according to the cosmetics act revised on September 10, 2021 are 5 types of products for infants and toddlers under 3 years of age, 4 types of bath products, 6 types of products for body cleansing, 6 types of eye makeup products, 5 types of fragrance products, 5 types of hair dye products, 9 types of color makeup products, 12 types of hair products, 6 types of nail products, 6 types of shaving products, 11 types of basic makeup products, 2 types of body odor prevention products, 3 types of hair removal products classified as a species.

2.3. Selective attributes

Attribute generally refers to the tangible and intangible characteristics of a product, and refers to specific characteristics of a product, and consumers associate a specific result through a specific attribute. Selection attributes are defined as the factors that consumers place the most importance on when choosing a product, and when considering the purchase of a product or service, it means the importance and perceived satisfaction after choosing and using it[31].

The need for 'customization' is rapidly emerging amidst recent social development and environmental changes, and in particular, the cosmetics sector is a market that mixes and sells raw materials and desired fragrances in finished products to meet the needs of consumers seeking diversity and individuality. A new form of sales that did not exist before is appearing[32].
Selection attributes represent what consumers feel important when choosing a product or service based on their criteria, which means importance and satisfaction. Since it can be selected differently depending on the type or purpose of the consumer, and this is to achieve the purpose of the consumer’s visit or purchase, it can be used as a useful data for understanding effective marketing strategies and consumer behavior[33]. Customized cosmetics are a form of consumption in individual areas where the various and segmented consumption trends of modern people and consumer needs are actively reflected, and it can be said that the characteristics of cosmetics and the needs of consumers are well combined[34].

2.4. Purchase intention

Purchase intention is determined by an individual’s attitude and subjective standards. As a compound word of ‘purchase' and 'intention', 'intention' is generally an individual's intended or planned future action, belief and attitude. means that it is translated into action through[15]. In other words, purchase intention means that the determinants from the individual's point of view, such as consumers' disposition, demand, attitude, and social awareness, are acted upon as a product or service[35]. Since purchase results are related to the consumer's intention to purchase, the purchase intention is influenced by the tendency toward the purchase object[36].

Purchase intention can be said to be the link between purchase intention and behavior in understanding consumer purchase behavior, and has been known as a variable suitable for predicting actual purchase results, and is relatively easy to measure[37]. The purchase intention and purchase probability are predicted through the consumer’s attitude toward the product, and it is generally assumed that the purchase intention and purchase probability are high when the consumer's attitude is favorable[38].

2.5. Perceived natural raw materials

As environmental pollution due to the development of modern science and technology and industrialization become serious, global warming becomes more serious day by day, and as a result, interest in environmental problems such as ozone layer destruction and energy resource depletion is gradually increasing[39]. In the past, environmental problems were limited to future problems, but now they are urgent problems that cannot be postponed any longer. Interest in eco-friendly products is also increasing as awareness increases that eco-friendly living habits improve the global environment and affect individual physical and mental well-being. In the trend of healthy life and well-being, which has recently become a social issue, the demand for natural cosmetics is steadily increasing, and the size of the market is gradually increasing, and many efforts are being made to enjoy a healthy life[12]. As interest in health increases, consumers who prefer natural cosmetics are growing with awareness that natural cosmetics are safe for the skin, unlike cosmetics composed of chemical components[9].

3. Research Method

3.1. Study subject

This study hypothesizes that there will be a mediating effect of perceived natural raw materials when selection attributes affect purchase intention. Online samples were collected for men and women in their 20s to 60s with experience, and data from 306 people were analyzed.

3.2. Survey design and definition of variables

The contents of the questionnaire were modified and supplemented according to the purpose of the study by referring to the results of previous studies. This study used an online survey method as a research tool to empirically analyze the research questions, and measured a total
of 47 questions, including 7 questions on awareness, 8 questions on trust[8], 4 questions on perceived natural ingredients, 8 questions on Purchase intention, 5 questions on demographic characteristics using a 5-point Likert scale, and 15 questions on customized cosmetic characteristics.

### 3.3. Research model

This study is to investigate the effect of Selective attributes of customized cosmetics on purchase intention. Focusing on the mediating effect of perceived natural raw materials, the independent variable is selective attributes, and the sub-factors are awareness of selective attributes and reliability of selective attributes has been set. The parameters presented in this study suggested perceived natural raw materials. The dependent variable presented in this study is purchase intention. In this study, three variables were set, and the research model according to the relationship is shown in <Figure 1>.

**Figure 1.** Research model.

![Research Model Diagram]

### 3.4. Statistical analysis method

For the data of this study, the following statistical analysis was performed using the SPSS 25.0 program. A research model is presented as a research method, the validity and reliability of the analysis method and measurement tool are verified according to the results of reviewing previous studies through hypothesis setting, and frequency analysis is conducted to identify the general characteristics of the research subject. Hypotheses were tested using an independent t-test, Pearson's correlation, multiple regression analysis, and Process Macro. In the above statistical analysis, statistical significance was determined based on the significance level of 5%.

### 4. Research Results

#### 4.1. General characteristics of the study subjects

The general characteristics of the study subjects are as follows. By gender, there were 56 males(18.3%) and 250 females(81.7%). By age, 20-29 years old 23 people(7.5%), 30-39 years old 39 people(12.7%), 40-49 years old 98 people persons(32.0%), 113(36.9%) aged 50-59, and 33(10.8%) aged 60 or older. The final level of education was 39(12.7%) high school graduates, 170(55.6%) university graduates(including current students), 90(29.4%) graduates(including current students), and 7 others(2.3%). By occupation, self-employment/business 91(29.7%), sales/service 31(10.1%), office/management 36(11.8%), production/technical 2(0.7%), professional 65(21.2%), 11 students(3.6%), 39 housewives(12.7%), and 31 others(10.1%).
4.2. Validity and reliability analysis of measurement tools

1) Selective attributes

As for selective attributes, one item (Reliability of selective attributes 1) that hindered validity was excluded, and factor analysis was finally conducted with 14 items. As a result of the analysis, the KMO measure was .937, and the result of Bartlett's sphericity test was also significant (p<.001), so the factor analysis model was judged to be suitable. Selective attributes were classified into two factors, and the two factors showed a factor explanatory power of 69.310%. The first factor consisted of 7 items, 'Awareness of selective attributes', and the second factor consisted of 7 items, 'Reliability of selective attributes'.

2) Perceived natural raw materials

For perceived natural raw materials, factor analysis was conducted with a total of 4 items. As a result of the analysis, the KMO measure was .839, and the result of Bartlett's sphericity test was also significant (p<.001), so the factor analysis model was judged to be suitable. Perceived natural raw materials were classified as one factor and showed a factor explanatory power of 83.132%.

3) Purchase intention

For purchase intention, a factor analysis was conducted with a total of 8 items. As a result of the analysis, the KMO measure was .920, and the result of Bartlett's sphericity test was also significant (p<.001), so the factor analysis model was judged to be suitable. Purchase intention was classified as one factor and showed 71.262% explanatory power.

4.3. Correlation analysis

Reliability analysis was conducted to determine whether the respondents answered the survey consistently through the survey in this study. The alpha coefficient of all variables was 0.6 or higher, indicating that the reliability was generally good. The result is shown in Table 1.

Table 1. Correlation analysis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of questions</th>
<th>Cronbach's α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective attributes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness of selective attributes</td>
<td>7</td>
<td>0.935</td>
</tr>
<tr>
<td>Reliability of selective attributes</td>
<td>7</td>
<td>0.911</td>
</tr>
<tr>
<td>Entire</td>
<td>14</td>
<td>0.946</td>
</tr>
<tr>
<td>Perceived natural raw materials</td>
<td>4</td>
<td>0.932</td>
</tr>
<tr>
<td>Purchase intention</td>
<td>8</td>
<td>0.941</td>
</tr>
</tbody>
</table>

4.4. Multiple regression analysis results

Multiple regression analysis was conducted to determine the effect of awareness of selective attributes and reliability of selective attributes, which are sub-factors of selective attributes, on purchase intention. As a result of regression model verification, the regression model was suitable with F=304.975 (p<.001), and the explanatory power of the model was about 66.8%. The Durbin-Watson statistic was 2.056, which is close to 2, so the assumption of independence of the residuals was not challenged, and the tolerances were all above 0.1 and the VIF was below 10, indicating no multicollinearity issues. As a result of the significance verification of the regression coefficient, it was found that the recognition of the selected attribute and the reliability of the selected attribute had a positive (+) effect on the Purchase intention. In other words, it can be said that the higher the recognition of the selected attribute and the higher the relia-
bility of the selected attribute, the higher the purchase intention awareness of selective attributes(β=.484, p<.001), reliability of selective attributes(β=.391, p<.001) appeared to have an effect on purchase intention in the order. The results are shown in <Table 2>.

**Table 2.** The effects of awareness of selective attributes and reliability of selective attributes on purchase intention.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>B</th>
<th>S.E</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>A constant</td>
<td>0.261</td>
<td>0.144</td>
<td>1.817</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness of selective attributes</td>
<td>0.537</td>
<td>0.055</td>
<td>0.484</td>
<td>9.805***</td>
<td>&lt;.001</td>
<td>0.449</td>
<td>2.228</td>
</tr>
<tr>
<td>Reliability of selective attributes</td>
<td>0.373</td>
<td>0.047</td>
<td>0.391</td>
<td>7.907***</td>
<td>&lt;.001</td>
<td>0.449</td>
<td>2.228</td>
</tr>
</tbody>
</table>

F=304.975(p<.001), R²=.668, adjusted R²=.666, Durbin-Watson=2.056

Note:* p<.05 ** p<.01 *** p<.001.

**4.5. Verification of mediating effect of perceived natural raw materials in the relationship between selective attributes and purchase intention of customized cosmetics**

1) Mediating effect of perceived natural raw materials in the relationship between selective attributes and purchase intention of customized cosmetics

In order to verify the mediating effect of perceived natural raw materials in the relationship between Selective attributes and Purchase intention of customized cosmetics, an analysis using process macro model No. 4 was conducted. First, in Model 1, the independent variable selective attributes has a statistically significant positive(+) influence on the parameter perceived natural raw materials(β=.549, p<.001), and the selective attributes for perceived natural raw materials was 30.1%. In Model 2, the independent variable, selective attributes, has a significant positive impact on the dependent variable, purchase intention(β=.815, p<.001), and the explanatory power of selective attributes on purchase intention is 66.5%. In Model 3, the independent variable, selective attributes(β=.749, p<.001), and the parameter, perceived natural raw materials(β=.121, p<.01), had a significant positive(+) effect on purchase intention, and the explanatory power of selective attributes and perceived natural raw materials for purchase intention was 67.5%. In Model 1, the independent variable, selective attributes, had a significant positive(+) effect on the parameter, perceived natural raw materials. In Model 3, the parameter, perceived natural raw materials, and the dependent variable, purchase intention, had a significant positive effect. has influenced significant positive(+). In addition, the indirect effect was found to be significant on the Purchase intention of optional attributes through perceived natural raw materials. Since selective attributes had a direct effect on purchase intention, it can be said that perceived natural raw materials partially mediate the relationship between selective attributes and purchase intention. That is, optional attributes have an effect on purchase intention, and perceived natural raw materials can further influence purchase intention. The results are shown in <Table 3>.

**Table 3.** Verification of mediating effect of perceived natural raw materials in the relationship between selective attributes and purchase intention of customized cosmetics.

<table>
<thead>
<tr>
<th>Model</th>
<th>DV</th>
<th>IV</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>F(R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceived natural raw materials</td>
<td>Selective attributes</td>
<td>0.597</td>
<td>0.052</td>
<td>0.549</td>
<td>11.451***</td>
<td>&lt;.001</td>
<td>131.121***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.301</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.301</td>
</tr>
</tbody>
</table>
In addition, 5,000 samples were generated according to the bootstrap procedure to further verify the mediating effect of perceived natural raw materials in the 95% confidence interval. Since the confidence interval of the indirect effect of selective attributes of customized cosmetics on purchase intention through perceived natural raw materials is [0.026, 0.129] and does not include zero, the mediating effect of perceived natural raw materials on the relationship between selective attributes and purchase intention is considered statistically significant. The results are shown in <Table 4>.

**Table 4.** Verification of mediating effect of perceived natural raw materials in the relationship between selective attributes and purchase intention of customized cosmetics through bootstrap.

<table>
<thead>
<tr>
<th>Path</th>
<th>B</th>
<th>S.E.</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective attributes → perceived natural raw materials → purchase intention</td>
<td>0.073</td>
<td>0.026</td>
<td>0.026 - 0.129</td>
</tr>
</tbody>
</table>

**2) Mediating effect of perceived natural raw materials in the relationship between awareness of selective attributes and purchase intention of customized cosmetics**

In order to verify the mediating effect of perceived natural raw materials in the relationship between awareness of selective attributes and purchase intention of customized cosmetics, procsmacro model No. 4 was used for analysis. First, in Model 1, the independent variable, awareness of selective attributes, has a statistically significant positive (+) influence on the parameter, perceived natural raw materials ($β = 0.566$, $p < .001$), and on perceived natural raw materials the explanatory power of awareness of selective attributes was 32.0%. In Model 2, the independent variable, awareness of selective attributes, has a significant positive (+) influence on the dependent variable, purchase intention ($β = 0.774$, $p < .001$), and the explanatory power of the awareness of selective attributes for purchase intention is 60.0% appeared. In Model 3, the independent variable, awareness of selective attributes ($β = 0.696$, $p < .001$), and the parameter, perceived natural raw materials ($β = 0.138$, $p < .01$), were significantly positive (+), and the recognition of selection attributes for purchase intention and the explanatory power of perceived natural raw materials were 61.3%. In Model 1, the independent variable, awareness of selective attributes, had a significant positive (+) effect on perceived natural raw materials, which was a parameter, and in Model 3, perceived natural raw materials, a parameter, had a significant positive effect on purchase intention, which was a dependent variable. Since it had a positive (+) effect, it was found that the indirect effect on the Purchase intention of the recognition of the selected attribute through perceived natural raw materials was significant. Since awareness of selective attributes had a direct effect on purchase intention, it can be said that perceived natural raw materials partially mediates the relationship between awareness of selective attributes and purchase intention. In other words, it can be said that awareness of optional attributes has a direct effect on purchase intention, and also has an indirect effect on purchase intention through perceived natural raw materials. The result is shown in <Table 5>.
Table 5. Verification of mediating effect of perceived natural raw materials in the relationship between awareness of selective attributes and purchase intention of customized cosmetics.

<table>
<thead>
<tr>
<th>Model</th>
<th>DV</th>
<th>IV</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>F(R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceived natural raw materials</td>
<td>Awareness of selected attributes</td>
<td>0.621</td>
<td>0.052</td>
<td>0.566</td>
<td>11.963***</td>
<td>&lt;.001</td>
<td>143.103***</td>
</tr>
<tr>
<td>2</td>
<td>Purchase intention</td>
<td>Awareness of selected attributes</td>
<td>0.859</td>
<td>0.04</td>
<td>0.774</td>
<td>21.338***</td>
<td>&lt;.001</td>
<td>455.306***</td>
</tr>
<tr>
<td>3</td>
<td>Purchase intention</td>
<td>Awareness of selected attributes</td>
<td>0.772</td>
<td>0.048</td>
<td>0.696</td>
<td>16.057***</td>
<td>&lt;.001</td>
<td>239.548***</td>
</tr>
<tr>
<td></td>
<td>Perceived natural raw materials</td>
<td>0.14</td>
<td>0.044</td>
<td>0.138</td>
<td>3.182***</td>
<td>0.002</td>
<td>-0.613</td>
<td></td>
</tr>
</tbody>
</table>

Note:* p<.05 ** p<.01 *** p<.001.

In addition, 5,000 samples were generated according to the bootstrap procedure to further verify the mediating effect of natural ingredients perceived in the 95% confidence interval. The confidence interval of the indirect effect that awareness of selective attributes of customized cosmetics affects purchase intention through perceived natural raw materials is[0.031, 0.153], and 0 is not included in the interval, so awareness of selective attributes and purchase intention in the relationship of the figure, the mediating effect of perceived natural raw materials was judged to be statistically significant. The results are shown in <Table 6>.

Table 6. Verification of mediating effect of perceived natural raw materials in the relationship between awareness of selective attributes and purchase intention of customized cosmetics through bootstrap.

<table>
<thead>
<tr>
<th>Path</th>
<th>B</th>
<th>S.E.</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of selected attributes →</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>perceived natural raw materials → Purchase intention</td>
<td>0.087</td>
<td>0.031</td>
<td>0.031 0.153</td>
</tr>
</tbody>
</table>

3) Mediating effect of perceived natural raw materials in the relationship between reliability of selective attributes and purchase intention of customized cosmetics

In order to verify the mediating effect of the perceived natural raw materials in the relationship between the reliability of the selection attributes of customized cosmetics and the purchase intention, an analysis was conducted using the process macro model No. 4. First, in Model 1, the independent variable reliability of selective attributes has a statistically significant positive(+) influence on the parameter perceived natural raw materials(β=.467, p<.001), and the perceived natural raw materials The explanatory power of the reliability of the selection attribute was 21.8%. In Model 2, the independent variable, reliability of selective attributes, has a significant positive(+) influence on the dependent variable, purchase intention(β=.750, p<.001), and the explanatory power of the reliability of selective attributes for purchase intention is 56.3% appeared. In Model 3, the independent variable, selection attribute reliability(β=.642, p<.001) and the parameter perceived natural raw materials(β=.232, p<.001) were significantly positive(+) for purchase intention, and the explanatory power of reliability of selective attributes and perceived natural raw materials for purchase intention was 60.5%. In Model 1, the independent variable, reliability of selective attributes, had a significant positive(+) effect on the parameter, perceived natural raw materials, and in Model 3, the parameter, perceived natural materials, had a significant effect on the dependent variable, purchase intention. Since it had a positive(+) effect, the indirect effect on the purchase intention of the reliability of the selection attribute through the perceived natural raw material was found to be significant.
Since reliability of selective attributes had a direct effect on purchase intention, it can be said that perceived natural raw materials partially mediates the relationship between reliability of selective attributes and purchase intention. In other words, reliability of selective attributes directly affect purchase intention, and through perceived natural raw materials, it can be said to have an indirect effect on purchase intention. The result is shown in <Table 7>.

**Table 7.** Perceived natural raw materials in the relationship between reliability of selective attributes and purchase intention of customized cosmetics.

<table>
<thead>
<tr>
<th>Model</th>
<th>DV</th>
<th>IV</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>F(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perceived natural raw materials</td>
<td>Reliability of selective attributes</td>
<td>0.441</td>
<td>0.048</td>
<td>0.467</td>
<td>9.205***</td>
<td>&lt;.001</td>
<td>84.724***</td>
</tr>
<tr>
<td>2</td>
<td>Purchase intention</td>
<td>Reliability of selective attributes</td>
<td>0.716</td>
<td>0.036</td>
<td>0.75</td>
<td>19.783***</td>
<td>&lt;.001</td>
<td>391.347***</td>
</tr>
<tr>
<td>3</td>
<td>Purchase intention</td>
<td>Reliability of selective attributes</td>
<td>0.612</td>
<td>0.039</td>
<td>0.642</td>
<td>15.719***</td>
<td>&lt;.001</td>
<td>232.055***</td>
</tr>
<tr>
<td>4</td>
<td>Perceived natural raw materials</td>
<td></td>
<td>0.235</td>
<td>0.041</td>
<td>0.232</td>
<td>5.690***</td>
<td>&lt;.001</td>
<td>-0.605</td>
</tr>
</tbody>
</table>

Note: *p<0.05 **p<0.01 ***p<0.001.

In addition, 5,000 samples were created according to the bootstrap procedure to further verify perceived natural raw materials perceived at the 95% confidence interval. The confidence interval of the indirect effect that reliability of selective attributes of customized cosmetics affects purchase intention through perceived natural raw materials is [0.056, 0.162], and 0 is not included in the interval, so reliability of selective attributes and purchase It was judged that the mediating effect of natural raw materials perceived in the relationship of degree was statistically significant. The results are shown in <Table 8>.

**Table 8.** Verification of mediating effect of perceived natural raw materials in the relationship between reliability of selective attributes and purchase intention of customized cosmetics through bootstrap.

<table>
<thead>
<tr>
<th>Path</th>
<th>B</th>
<th>S.E.</th>
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<td></td>
<td></td>
<td></td>
<td>LLCI</td>
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<tr>
<td>Reliability of selective attributes→ perceived natural raw materials → purchase intention</td>
<td>0.104</td>
<td>0.027</td>
<td>0.056</td>
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5. Summary and Discussion

In the question of whether or not to recognize customized cosmetics, 68.6% of the respondents said that cosmetics were made for their skin type as the first image, and 31.4% of respondents answered 'I don’t know'. When comparing questions on this, 50.2% of 'I have heard of' and 59.1% of 'I know' and 'I know very well'[33], indicating that the awareness of customized cosmetics has increased significantly compared to the past.

Customized cosmetics awareness of selective attributes and reliability of selective attributes showed a significant positive(+) effect on purchase intention. In other words, the higher the awareness of selective attributes and reliability of selective attributes of customized cosmetics, the higher the purchase intention. As a result of the study in the previous paper[40], selective attributes of customized cosmetics, safety awareness, and purchase behavior intentions
showed a significant correlation', and 'The tendency analysis of the effect of selective attributes on purchase intention will have a significant positive(+) effect on purchase intention’ [41].

As interest in health increases, consumers who prefer natural cosmetics with awareness that natural cosmetics are safe for the skin, unlike cosmetics composed of chemical components, are increasing. The result that perceived natural raw materials partially mediate the influence of customized cosmetics selective attributes on purchase intention suggests that it is not necessary to compose advertisement contents only with hard information to improve selective attributes. In other words, when preparing customized cosmetics, just emphasizing the use of natural raw materials can further improve purchase intention. In fact, the influence of ingredients was analyzed to be the most important factor in the purchase of customized cosmetics, confirming that consumers preferentially consider natural ingredients when purchasing customized cosmetics[42].

Most of the reasons for trust among women who trust natural cosmetics were 'no chemical ingredients, so they will be harmless’[43]. Although many consumers are aware of natural cosmetics, it is difficult to accurately distinguish them from organic cosmetics, and most do not know about the introduction of the newly established natural cosmetics definition and certification system. As clear standards are presented by law, active publicity is needed so that consumers can clearly distinguish and know the difference between natural and organic cosmetics[44]. Accordingly, we propose a direction for the development of the cosmetics industry and the revitalization of the customized cosmetics industry. This study, which was conducted for the purpose of raising positive awareness of consumers and inducing purchase by using natural raw materials harmless to the human body as raw materials, is judged to have sufficient differentiation from previous studies.

In addition, perceived natural raw materials mediated the positive influence of awareness of selective attributes and reliability of selective attributes, which are sub-factors of custom cosmetics selection attributes, on purchase intention. The emphasis on the use of natural raw materials is expected to have a positive effect on consumers purchasing customized cosmetics[45].

As shown in the results of this study, awareness of customized cosmetics has been sufficiently raised, so if supported in various ways, not only the market will expand, but also customers will be able to purchase customized cosmetics with confidence. However, the domestic reality is that the customized cosmetics market is still in its infancy. Therefore, there are many cases where the concept of cosmetics DIY and customized cosmetics formulation are confused. The number of customized cosmetics stores is still small, so it is difficult to access them, and there are few customers who actually use customized cosmetics.

Suggestions according to the limitations of this study are as follows. There is a possibility that the responses were confused with the concepts of customized cosmetics preparation and DIY(Do It Yourself). In order to sell customized cosmetics, a customized cosmetics preparation manager must be placed in the store, and customized cosmetics are prepared through skin diagnosis and consultation. Due to the confusion of these concepts, it is difficult to say that this study is entirely a study on customized cosmetics. Therefore, a comparative study on cosmetics DIY and customized cosmetics is suggested as a follow-up study. In addition, there were not many subjects who actually used customized cosmetics in this study. In the future, if the customized cosmetics market expands and many people use customized cosmetics, follow-up research will be needed. Therefore, we suggest a follow-up study targeting only customers who actually use customized cosmetics.

6. References
6.1. Journal articles


6.2. Thesis degree


7. Appendix

7.1. Author’s contribution

<table>
<thead>
<tr>
<th>Initial name</th>
<th>Contribution</th>
</tr>
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<tr>
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<td></td>
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<td></td>
<td>- Design ☑️</td>
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<td>- Getting results ☑️</td>
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<td>- Make a significant contribution to collection ☑️</td>
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<td>- Final approval of the paper ☑️</td>
</tr>
<tr>
<td></td>
<td>- Corresponding ☑️</td>
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<td>- Play a decisive role in modification ☑️</td>
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<tr>
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<th>EC</th>
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<tbody>
<tr>
<td></td>
<td>- Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑️</td>
</tr>
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<td>- Participants in Drafting and Revising Papers ☑️</td>
</tr>
<tr>
<td></td>
<td>- Someone who can explain all aspects of the paper ☑️</td>
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