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Indonesian, Korean, and French Sheet Masks: Three Alternatives in a Hybrid Choice Model of Indonesian Women's Choice Decision

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Abstract: Women's choice decision has gained lots of attention in the literature, particularly regarding how they evaluate attributes that are similarly important. The Indonesian skincare market is one of the most attractive markets, not only for local but also global producers of skincare products. This paper aims to provide an in-depth analysis of factors that affect Indonesians when they choose facial sheet masks (SM) from three countries—Indonesia, South Korea, and France—and to examine respondents' preferences with regard to local or imported SM products. This study used a mixed method, starting with exploratory research to find the levels of attribute for each alternative. A hybrid choice model is later established with Python Biogeme to find significant factors, demand elasticities, and willingness to pay. From its exploratory research, this study ascertained several attributes such as price, packaging, quality, brand, refreshing effect, halal essence, and attitudes. This study found that price, quality, refreshing effect, halal essence, and attitude significantly influence SM choice decisions from the discrete choice. The results fill a gap in the literature by comprehensively examining product properties and attitudes that affect women's decisions regarding skincare products. It also contributes—particularly for the skincare industry and marketers—to further improve the SM market share, particularly in the Indonesian and Southeast Asian markets.

Keywords: beauty product, choice-based conjoint, hybrid choice model, sheet mask, women consumers
JEL Classification: C51, C52, C90, M31

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Introduction

In the last decade, Asia has led in the worldwide sales of skincare commodities and now accounts for half of the global business (Morganti et al., 2019). Notably, in countries in the Association of Southeast Asian Nations (ASEAN), skincare has become a daily need. As the primary consumers, women in ASEAN are so enthusiastic about skincare that the they hold more far-reaching roles, not only as users but also as co-producers and innovators at the same time (Nguyen et al., 2018). One of those ASEAN countries, Indonesia, has contributed to the total growth of the skincare business as evidenced by its spending: USD 1,406 million in 2012, increasing to USD 1,882 million in 2018. Moreover, Statista (2019) predicted spending would increase to USD 2,454 million USD by 2023.

Women's shopping behavior and decision-making have gained considerable attention in the marketing literature (Mehta, 2020). Women have different behavioral patterns than men (Windasari and Albashrawi, 2020). This is why conducting this study is vital. First, considering the complexity of women's decision-making, the selectivity hypothesis (Meyers-Levy, 1986) mentions how women evaluate products based on different amounts and types of product information than men. Women rely on multiple sources of information before making a decision (Lin et al., 2019). It becomes tricky for marketers to understand which factors influence women's decision-making, particularly when facing several alternatives. Second, when it comes to skincare and makeup products, there have been numerous brands with different countries of origin which means that alternatives have flooded the current market. Thus, women's selections from what is available in the marketplace require close attention.

To explore the promising growth in the skincare industry, this study conducted preliminary research involving women in Bandung, Indonesia. The initial groundwork was conducted with 30 participants divided equally into three age groups 18-22, 23-35, and 35-65 years old. This study assessed the women's answers to three key questions. First, the participants were asked about their most frequently used skincare products: facial wash, moisturizer, sheet masks, toner, eye cream, clay masks, serum, sunscreen, acne cream, and exfoliator. The preliminary results showed that 63% of the respondents chose sheet masks, which confirmed the result of the Beautinesia survey conducted by Larasati (2019) which stated that dullness is one of the subtropical-country skin problems and this drives the consumption of sheet masks. The second question concerned the preferences for skincare producer countries listed by Larasati (2019): American, French, Indonesian, Japanese, and South Korean. The respondents selected South Korean products as their favorite option. The third question was, "Other than the country brand you have chosen, which one do you also use regularly?". For this, the respondents could no longer choose

their first preferred option, and the second most popular choice was French products.

This study's pilot research showed that Indonesian women agreed that facial sheet masks were their top skincare priority. Furthermore, they are more willing to choose imported skincare goods instead of domestic products. Most imported skincare brands—although considered equal in ingredients and quality—have a lower price and are more accessible for Indonesian women. Widiyarti (2019) reveals that high variation in imported skincare products is also the reason for the tendency. There is no sign that the demand for imported skincare products will decrease, which only means that domestic skincare producers must improve their strategy to stay competitive (Octavia, 2020). According to Anjana (2018), brand, quality, price, advertising, and packaging are influential factors affecting consumer choice decisions regarding domestic skincare products. Kamwendo and Maharaj (2022) find that quality and value for money are the most influential factors. Besides, Firdausi and Dharmmesta (2023) also mention that, whether organic and natural ingredients are used might be influential as well, regardless of the origin. Further, Widiyarti (2019) supports the statement by adding that local skincare companies have need to urgently analyze other relevant factors in the choice of skincare products. To the best of our knowledge, this paper is the first to compare the choice between local and imported products for Indonesian consumers. These imported products are not necessarily global brands, but may be foreign brands that are perceived favorably by the consumers. Thus, this research aims to analyze in more depth the factors that affect Indonesian women's choice of skincare products, especially the differences between local (Indonesian) products, on the one hand, and. Korean and French products that have flooded the market on the other. Skincare products can be categorized as groceries which belong to the experienced goods type, with the characteristic that they need to be physically tried or inspected (Schmid and Axhausen, 2019). The comparison objects in the experiment are facial sheet masks (SM) from three different countries: Indonesia, South Korea, and France. This research also examines respondents' preferences between local or imported SM products. Finally, an idea to build a resilient SM national industry is proposed based on the analysis of this study's results.

The rest of the manuscript is structured as follows. Section 2 reviews the fundamental literature on existing attributes relevant to SM choice decisions and the implementation of choice-based modeling in studying consumer decision-making and choice. Then, in Section 3, this study describes the steps of the methodology: data collection and processing. The data has been gathered using a preliminary focus group and a choice-based conjoint (CBC) experiment. This study used a hybrid choice model to process the collected data. In Section 4, this study discusses the results of the models with additional commentary on demand elasticities and willingness to pay to contextualize them. The

paper concludes with a summary of points in Section 5: theoretical and methodological contributions, managerial implications and shortcomings, and future study recommendations.

Literature Review

The Influence of Packaging on Choice Decision

In the context of sheet masks as one of the beauty products, this study hypothesizes six variables that influence the consumers' choice decisions: packaging, product quality, brand, price, attitude, and subjective norms. Packaging can portray the manufacturer as the carrier of advertising messages and company slogans (Kohli et al., 2007). Besides, proper packaging can create distinctions between companies (Yang and Raghubir, 2005). At the point of sale, the form of packaging seems to be one of the essential factors in purchase decisions (Chen et al., 2020). The importance of packaging design increases in competitive market conditions as the package becomes a primary instrument for communication and branding (Rettie and Brewer, 2000). Packaging is essential for consumers in purchasing cosmetics (Anjana, 2018). Thus, for the first hypothesis, the propositions are as follows:

H1a: Packaging positively and significantly influences Indonesian sheet mask choice decisions.

H1b: Packaging positively and significantly influences Korean sheet mask choice decisions.

H1c: Packaging positively and significantly influences French sheet mask choice decisions.

The Influence of Quality on Choice Decision

The second attribute is product quality. It is often associated with the price of products. When the product's price is high, the quality of the product offered is also high, and vice versa. If customers' expectations are fulfilled with a product, they consider the price acceptable or even higher in quality (Sigurdsson et al., 2020). Product quality plays a significant role in assessing purchases as it always has a positive relationship with the customer's buying decision. Also, Choi, Ko, and Kim (2016) state that quality is one of the significant factors influencing brand evaluation.

Thus, for the second hypothesis, the propositions are as follows:

H2a: Quality positively and significantly influences Indonesian sheet mask choice decisions.

H2b: Quality positively and significantly influences Korean sheet mask choice

decisions.

H2c: Quality positively and significantly influences French sheet mask choice decisions.

The Influence of Brand on Choice Decision

Another possible important attribute is brand. A brand is a term, name, sign, symbol, or design, or it could be a combination thereof. A brand identifies the goods and services of producers and differentiates them from those of the competition (Gaski, 2020). A brand is also the strongest influence on purchase intention (Choi et al., 2016; Khodabandeh and Lindh, 2020; Medina-Molina et al., 2021). According to previous research findings, high brand awareness of skincare products results in favorable consumer choice decisions. If the brand is unknown or consumers are aware that there are other brands they think are more worthy of spending their money on, they will choose those other brands (Sulu et al., 2016).

Thus, for the third hypothesis, the propositions are as follows:

H3a: Brand positively and significantly influences Indonesian sheet mask choice decisions.

H3b: Brand positively and significantly influences Korean sheet mask choice decisions.

H3c: Brand positively and significantly influences French sheet mask choice decisions.

The Influence of Price on Choice Decision

The next attribute is price. Atilgan, Kangal, and Talaslioglu (2024) state that product price is one of the vital stimuli affecting consumers' purchase decisions, particularly with retail products. Palade (2011) adds that price is the only marketing mix variable that leads to profits, while the other variables are more likely to generate expenses and or the need for investments. Most consumers evaluate value by combining price and quality to assess the product (Atilgan et al., 2024; Baker et al., 2020; Pino et al., 2020). Price is a substantial competing factor in buying facial skincare products (Anjana, 2018). Rosenbaum, Ramirez, Campbell, and Klaus (2019) confirm the significance of the price aspect in facial skincare choice as the impact of the unusual luxury perception embedded in the products. The effect emerges in the willingness of consumers to pay a premium price for a small luxury skincare product.

Thus, for the fourth hypothesis, the statements are as follows:

H4a: Price negatively and significantly influences Indonesian sheet mask choice

decisions.

H4b: Price negatively and significantly influences Korean sheet mask choice decisions.

H4c: Price negatively and significantly influences French sheet mask choice decisions.

The Influence of Sociodemographic and Attitudes on Choice Decision

Besides the four attributes above, this study hypothesizes that sociodemographic and psychological factors might influence decisions about SMs. Studies have shown that attitudes correlate highly with behavioral intention (Sheppard et al., 1988), which is also confirmed among Southeast Asian customers (Ramayah et al., 2004). Ajzen (1991) describes attitude as a representation of personal evaluation of the object or behavior under consideration. In the theory of planned behavior, attitude has a significant relationship with intention. In his research, McFadden (2001) articulates that attitude plays a significant role in determining how consumers define the decision-making task. Other studies have also found that attitude has a significant relationship with consumer choice decisions (Kim et al., 2001; Sipilä et al., 2017).

Thus, for the fifth and sixth hypotheses, the propositions are as follows:

H5: Sociodemography positively and significantly influences sheet mask choice decisions.

H6a: Attitudes towards Indonesian sheet masks positively and significantly influence Indonesian sheet mask choice decisions.

H6a: Attitudes towards Korean sheet masks positively and significantly influence Korean sheet mask choice decisions.

H6b: Attitudes towards French sheet masks positively and significantly influence French sheet mask choice decisions.

The Influence of Sociodemographic and Attitudes on Choice Decision

The conceptual framework is adapted from the hybrid choice model (HCM) (Ben-Akiva et al., 2002; Walker and Ben-Akiva, 2002) developed using manifest and latent variables, indicator constructs, and utility that applies to the specific context of the study (Figure 1). HCM has been widely utilized by studies published in top marketing journals showing the rigorousness of this method which is suited, in particular, to research on customer choice decisions (Ashok et al., 2002; Ben-Akiva et al., 2012, 2002; Bodapati and Drolet, 2005; Burke et al., 2020; Danthurebandara et al., 2013; de Jong et al., 2022; Hao et al., 2022; Jimenez-Martin and Ladrón-de-Guevara, 2007; Kim et al., 2016; Masiero and Hrankai,

2022; Oppewal et al., 1994; Swait et al., 2018; Wang et al., 2023).

Concerning the effect on choice decisions of the independent variables brand, packaging, product quality, price, attitude, and subjective norms, they are the critical attributes of analysis related to SM choice decisions. The black arrows in Figure 1 represent each hypothesis illustrating the relationships between the quality of the packaging (H1a-c), product quality (H2a-c), brand (H3a-c), price (H4a-c), sociodemography (H5), and consumer attitude toward an SM choice decision (H6a-c). Note that this study added sociodemographic variables since, in the HCM literature, it is hypothesized that those variables influence the psychological construct. The dashed arrows in Figure 1 represent indicator constructs of the latent variable and choice model constructs by the utility. The rectangular boxes display the observed and manifest variables that apply to the SM producer countries selected as the object of this study (country i): Indonesian, Korean, and French. The oval box depicts the latent variable. Multiple indicator questions are needed to construct each variable in the conceptual framework (Ben-Akiva et al., 2002; Walker and Ben-Akiva, 2002).

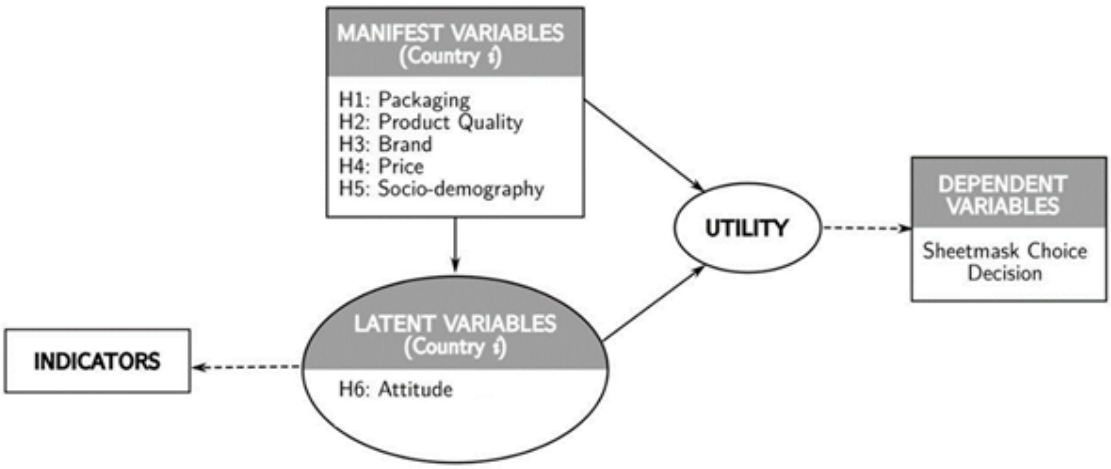

Figure 1. Initial Conceptual Framework

Methods

Estimation Model

Following the preliminary focus group mentioned in Section 1, this study conducted an experiment with ten women (four students, three young professionals, and three from the older age group). Having ten participants in the focus group accords with the minimum number of participants according to Malhotra, Nunan, and Birks (2017). This study used two Indonesian, two Korean, and two French sheet masks for this experiment. All masks

used were similar in terms of ingredients and efficacy, so the mask producer country was the only difference the participants paid attention to. In the exploratory experiment, this study incorporated all masks from the three countries into the combination design. Figure 2 illustrates the first-choice design, combining Indonesian, Korean, and French sheet mask samples. There were eight whole combinations presented to the participants. This study covered the sheet mask brand so that the participants only knew about their brand origin and the price of the sheet mask in IDR[1].

Estimation Model

Rationally, people will choose an alternative at a lower price. However, they may choose a higher price if an alternative attribute maximizes the utility. In other words, there is a trade-off from the other attributes. Therefore, this experiment aims to find an attribute that might influence the decision to choose a particular sheet mask.

Combination	Indonesia	Korean	French
1			
	Indonesia Sheet Mask 1 IDR 17.000, -	Korean Sheet Mask 1 IDR 20.500, -	French Sheet Mask 1 IDR19.000, -

Figure 2. Example of a sheet mask combination for exploratory research.

The participants were asked to mention all aspects that made them choose the preferred sheet mask. For instance, Participant A chose the Indonesian-produced sheet mask in the first combination because of the low price and calming-effect claim written on the package. In addition to what was found in the literature, this study discovered additional essential attributes from this preliminary experiment: price, product packaging, quality, claim, natural ingredients, eco-friendly ingredients, halal essence, side effects after usage, easily absorbed essence, and making a healthier skin for one week.

In the next research phase, this study conducted another experiment to select the substantive attributes and the levels. Thirteen participants were involved in the follow-up experiment, ten of whom were from the previous experiment. This study also added one female participant for each age group to control the result. This study added a scale from

1-10 for every attribute from the previous experiment and asked the participants to rate those attributes for the sheet mask brand of the three countries (Figure 3).

For this experiment, the price was not included because this research employed the products' actual prices for the next choice-based conjoint experiment (CBC). After obtaining the scores from the thirteen participants, this study ranked the attributes from the highest to the lowest rank. According to Ben-Akiva, McFadden, and Train (2019), the respondents have trouble processing more than six attributes and more than four or five products for CBC experiments. Therefore, this study only used six attributes for the CBC experiments to reduce the response burden. Since this research decided to use price as one of the attributes, only the top five attributes from the rank were taken. Those attributes are packaging (H1a-c), quality (H2a-c), brand (H3a-c), refreshing effects, and halal essence.

Consequently, this study added more hypothesis statements for the seventh and eighth hypotheses:

H7a: Refreshing effects positively and significantly influence Indonesian sheet mask choice decisions.

H7b: Price significantly and positively influences Korean sheet mask choice decisions.

H7c: Price significantly and positively influences French sheet mask choice decisions.

H8a: Halal essence positively and significantly influences Indonesian sheet mask choice decisions.

H8b: Halal essence positively and significantly influences Korean sheet mask choice decisions.

H8c: Halal essence positively and significantly influences French sheet mask choice decisions

Figure 3. Example of attribute scaling for each sheet mask (in Indonesian).

Table 1 shows all six attributes and their levels. The first and second attributes are the packaging and product quality. The participants' assessments show that the Korean and French sheet mask trends are similar. The next attribute is the brand. This experiment has four brands available in Indonesia's cosmetic or drug stores for each producer country. Out of the 10-point scale, the participants' rates range from 1-8 for Indonesian brands and 3-10 for Korean and French brands.

This study adopted the actual retail price for each sheet mask: IDR 12,000 to IDR 17,000 (USD 0.83-1.17) for Indonesian-produced masks, IDR 11,000 to IDR 21,000 (USD 0.76-1.45) for Korean-produced masks, and IDR 14,000 to IDR 60,000 (USD 0.97-4.14) for French-produced masks. The latter selection price is the highest, almost four times the price for Indonesian and Korean sheet masks. All countries' masks score similarly for the fifth attribute: the refreshing effect. Finally, for the halal essence attribute, the participants scored Indonesian and Korean sheet masks similarly.

Table 1. Alternative attributes and their level for CBC.

Attributes	**Indonesian Sheet Mask**	**Korean Sheet Mask**	**France Sheet Mask**
Packaging (level) (H1)	1, 3, 6, 9	1, 3, 7, 10	3, 6, 8, 10
Quality (level) (H2)	3, 5, 7, 9	1, 3, 7, 10	3, 6, 8, 10
Brand (level) (H3)	1, 3, 6, 8	3, 5, 8, 10	3, 5, 7, 10
Price (IDR 1K.) (H4)	12, 13, 15, 17	11, 14, 19, 21	14, 19, 50, 60
Refreshing Effect (level) (H7)	6, 8, 10	6, 8, 10	6, 8, 10
Halal Essence (level) (H8)	4, 6, 8, 10	4, 6, 8, 10	3, 5, 7, 10

Estimation Model

The next step was finding the best combination of attributes for the CBC experiment with a d-efficient design in Ngene (Bliemer et al., 2009). Rose and Bliemer (2013) state that, for the number of the parameter to be estimated k of six, the minimum number of the choice task s is six. Ideally, with four attribute levels, the number of the choice tasks is varied from six to 27 since more than that would be problematic (Rose and Bliemer, 2013). This study designed a 24-choice task divided into four blocks. The division means these 24 scenarios were divided equally into four types of questionnaires. Consequently, the subject only had to work on six scenarios, easing the response burden. This is a common approach to reduce the complexity of the experiment and ensure participants focus on making choices (Gudono, 2010).

This study designed four questionnaires with three sections after receiving the 24 optimum scenarios from Ngene (ChoiceMetrics, 2018). The first section was the CBC

experiment (Figure 4), where there are six scenarios for each respondent. For the first attribute, price, this study leaves the level as it is. However, for the other five attributes, it is difficult for the respondents to comprehend between brands 2 and 4. Therefore, this research rephrased the level into a readily understandable Likert scale statement. This study reworded the 1-10 score for the brand item from very unpopular to popular.

Also, this research translated the score into very unattractive and very attractive for the packaging items, very low to very high for quality, and very unrefreshing to very refreshing for the refreshing effect. Finally, this research was extra attentive to rephrasing the halal essence, with the lowest score being no halal information, followed by questionable halal information, and 100% halal.

The next section is about attitude. This study asked the respondents to express their agreement with these three attitudinal statements for the attitudinal question. The responses were on a seven-point Likert scale (strongly disagree to agree strongly). There were statements in this section: "I am happy to use Indonesian sheet masks in my daily life.", "If I buy sheet masks, I will choose an Indonesian sheet masks.", and "I choose to use an Indonesian sheet mask daily." This study duplicated all three statements for the survey of both the Korean and French masks.

The final section is about respondent socio-demographics, which consists of age (8-22 years old, 23-35 years old, and more than 35 years old) and income (IDR 0 to IDR500,000, IDR501,000 to IDR 1,500,000, IDR 1500,001 to IDR 2,500,000, IDR2,500,001 to IDR 5,000,000, IDR5,000,001 - IDR7,500,000, IDR 7,500,001 to IDR 10,000,000, IDR 10,000,001 to IDR 15,000,000, IDR 15,000,001 to IDR 20,000,000, and more than IDR 20,000,001). The questionnaire was distributed online using the Google Forms survey platform. The target respondents were women who live in Jakarta, Surabaya, and Bandung within the age and income categories. This study equipped the survey with instructions illustrating the situation where the respondents must make a purchase decision on their preferred sheet mask; the data collection period coincided with the COVID-19 pandemic timeline, that is from early March 2020 to the end of April 2020. The sampling method that we used was convenience sampling. According to Malhotra et al. (2017), the typical range of samples for problem-solving research is between 300-500 respondents, our sample target was 500 respondents. With six scenarios asked for each respondent, we could get 3,000 observations for our model.

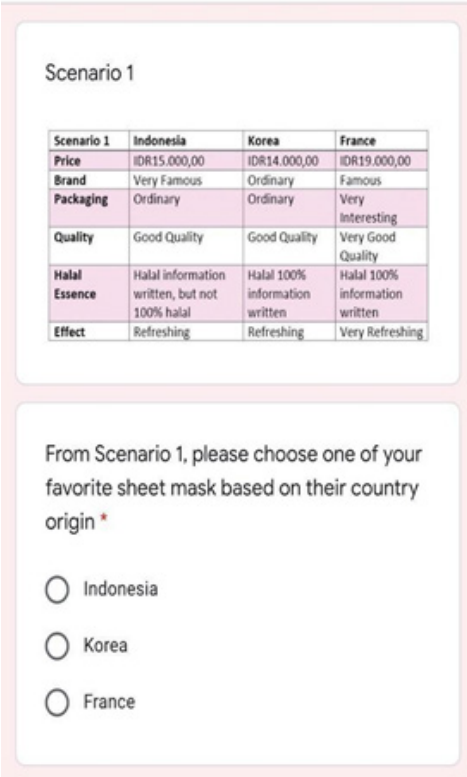

Figure 4. Example of the CBC experiment

Data Processing Method

The hybrid choice model (HCM) is a model that can incorporate behavioral aspects (such as attitudinal factors) into the RUM model (Ben-Akiva et al., 2002; Walker and Ben-Akiva, 2002). HCM integrates a discrete choice model with latent/unobserved variables. This study estimated an HCM with three attitudinal factors. Table 2 summarizes the indicators for latent variables, choice-related attributes, and respondents' characteristics as the explanatory variables for mode choice decisions. This study chose the discrete choice model since it predicts better results than SEM (Wang et al., 2007).

Table 2. Measurement of indicators, choice attributes, and respondents' characteristics.

	Variables		Indicators	Measurement
Latent Variables				
F_{AI}	Attitude towards Indonesian sheet mask (H6a)	I_1	I am happy to use an Indonesian sheet mask in my daily life (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = neutral; 5 = somewhat agree; 6 = agree; 7 = strongly agree
		I_2	If I buy sheet masks, I will choose an Indonesian sheet mask (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
		I_3	I choose to use an Indonesian sheet mask in my daily life (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
F_{AK}	Attitude toward Korean sheet mask (H6b)	I_4	I am happy to use a Korean sheet mask in my daily life (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	

	Variables		Indicators	Measurement
		I_5	If I buy sheet masks, I will choose a Korean sheet mask (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
		I_6	I choose to use a Korean sheet mask in my daily life (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
F_{AK}	Attitude toward French sheet mask (H6c)	I_7	I am happy to use a French sheet mask in my daily life (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
		I_8	If I buy sheet masks, I will choose a French sheet mMask (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
		I_9	I choose to use a French sheet mask in my daily life (Ajzen, 1991; Kim et al., 2001; Sipilä et al., 2017)	
Attribute of alternatives				
PC_i	Packaging for alternative *i* (H1a-c)			Continuous
Q_i	Quality for alternative *i* (H2a-c)			Continuous
B_i	A brand for alternative *i* (H3a-c)			Continuous
PR_i	Price for alternative *i* (H4a-c)			Continuous
RE_i	Refreshing effect for alternative *i* (H7a-c)			Continuous
HE_i	Halal essence for alternative *i* (H8a-c)			Continuous
Respondents characteristics				
A	Age (H5a)			Category
IC	Income (H5b-f)			Continuous

Three indicators were used to construct the three latent variables. The general model framework can be seen in Figure 5. Rectangles represent observable variables consisting of two individual characteristics (age and income), six attributes of alternatives, and nine latent factor indicators. Ellipses indicate latent factors, three latent attitudinal factors, and the utility of alternatives. Solid arrows denote structural regression relationships, while dashed arrows denote the indicators' measurement relationships. There are also three disturbance variables.

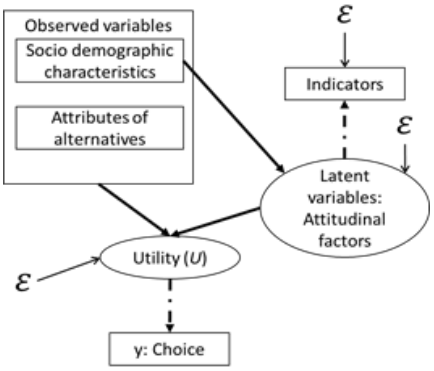

Figure 5. Hybrid choice model framework

According to RUM theory, the probability of a person, denoted by *n*, choosing an alternative *I* over a set of alternatives *j*, which maximizes their utility U_{in}, is depicted in

Eq.1.

$$P_{in} = Pr\,(U_{in} > U_{jn},\ \ \forall\, j \in C_n, j \neq i) \qquad \text{(Eq.1)}$$

Where Cn is a feasible choice set, in this study, the feasible alternatives are the Indonesian sheet mask (IM), Korean sheet mask (KM), and France sheet mask (FM). The utility U_{in} is then decomposed into the deterministic part represented by V_{in}, and the random part represented by ε_{in} , as shown in Eq.2

$$U_{in} = V_{in} + \varepsilon_{in} \qquad \text{(Eq.2)}$$

The utility function for three alternatives can be seen in Eq.3.

$$U_{in} = \alpha_i + \sum_{k=1}^{K} \beta_{ki} X_{ki} + \beta_{FAi} F_{Ain} + \varepsilon_{in} \qquad \text{(Eq.3)}$$

Where α_i Represents an alternative specific constant for the person *n* choosing mask *i*. For this study, the ASC for the Indonesian sheet mask is set as the reference. β_{ki} Beta (ki) is the parameter that defines the direction and importance of attribute k on the utility of alternative *i*. Attributes X_{ki} It is a vector of alternative specific attributes: packaging, quality, brand, price, refreshing effect, and halal essence. F_{Ain} F(Ain) represents an attitude towards sheet masks from the country *I* for an individual *n*. β_{FAi} Beta (FAI) is an estimable parameter for latent attitudinal factors for attitude towards sheet mask from alternative *i*.

This study assumed that the error term of the utility underlying the dependent variable mode choice is independently and identically distributed with ε~*Logistic* $\left(0, \frac{\pi^2}{3}\right)$. This study also assumed that all latent variables are normally distributed across the population, i.e. $F_{AI} \sim N(0, \sigma_{AI}^2)$, $F_{AK} \sim N(0, \sigma_{AK}^2)$ and $F_{AF} \sim N(0, \sigma_{AF}^2)$ F(AI), F(AK), and F(AF) are orthogonal with each other. The σ_i^2 terms refer to variances of the latent variables, which are to be estimated in Eq. 4.

$$F_i = \delta_i + \sum_{q=1}^{Q} \gamma_q S_q + \sigma_i^2 \qquad \text{(Eq.4)}$$

Where δ_i Delta (i) represents the intercept for each latent factor of attitude towards

Indonesian, Korean, and French sheet masks. While γ_q Y(q) is a parameter for sociodemographic characteristic *S* for element *q*. Those elements are age and income variables. The choice for the alternative is assumed to be based on utility maximization. It can be expressed in Eq.5:

$$y_i = \{One\ if\ U_i \geq U_j\ , \forall j \neq i\ 0\ otherwise \quad , i = chosen\ alternative \qquad \text{(Eq.5)}$$

Where y_i Y(i) is a choice, one for alternative *i* is chosen, and 0 otherwise.
The psychometric indicators for both latent variables are treated as continuous variables. The structural equation for the latent variables can be seen in Eq. 6-8:

$$I_r = \lambda_r F_{AI} + \upsilon_r \text{ with } r = 1, 2, 3 \qquad \text{(Eq.6)}$$

$$I_r = \lambda_r F_{AK} + \upsilon_r \text{ with } r = 4, 5, 6 \qquad \text{(Eq.7)}$$

$$I_r = \lambda_r F_{AF} + \upsilon_r \text{ with } r = 7, 8, 9 \qquad \text{(Eq.8)}$$

Where: I_r I(r) is the psychometric indicator for *r*-th indicators. Furthermore, υ_r is the disturbance term to be estimated, assumed to be normally distributed $\upsilon_r \sim N(0, \sigma^2_{\upsilon_r})$, uncorrelated, with means zero and standard deviation $\sigma^2 \upsilon_r$. This study fixed λ_1=1 (for latent variable AI); λ_4=1 (for latent variable AK); and λ_7=1 (for latent variable AF).
The joint probability of the choice and psychometric indicators can be seen in Eq.9:

$$P(y, I) = \int_{-\infty}^{\infty}\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} P(y|X_{ki}, F_{AI}, F_{AK}, F_{AF})\, g_1(I_1|F_{AI}) \dots g_3(I_3|F_{AI})\, g_4(I_4|F_{AK}) \dots g_6(I_6|F_{AK})$$
$$g_7(I_7|F_{AF}) \dots g_9(I_9|F_{AF}) f_{AI}(z_{AI}) f_{AK}(z_{AK}) f_{AF}(z_{AF}) dF_{AI} dF_{AK} dF_{AF} \qquad \text{(Eq.9)}$$

g is the probability density which functions for the indicators *I*; and *f* the probability for density functions of the latent constructs. This study estimates the model with 1,000 Halton draws. The estimation method is maximum likelihood estimation with PythonBiogeme (Bierlaire, 2016).

Demand Elasticity

This study then performed a demand elasticity test to anticipate the influence of change value in an attribute on an individual's choice. Demand elasticity is tested on the attributes that have a significance level from the previous HCM results. To measure the disaggre-

gated direct point elasticities of the RUM model, this study employed the formula from Ben-Akiva and Lerman (1985), as shown in Eq. 10.

$$E_{inX_{kin}} = \frac{\partial P_{in}}{\partial X_{kin}} \cdot \frac{X_{kin}}{P_{in}} = (1 - P_{in}) \cdot \beta_{ki} \cdot X_{kin} \qquad \text{(Eq.10)}$$

Where $E_{in}X_{kin}$ E (in) is the elasticities of attribute *k* of alternative *I* for person *n*.

Willingness to Pay

The willingness to pay WTP_k WTP (k) for an attribute *k* of alternative *I* can be calculated from the ratio of the marginal utility of the attribute to the marginal utility of the price attribute PR_i. The formula can be seen in Eq. 11.

$$WTP_k = \frac{\frac{\partial U_i}{\partial X_{ki}}}{\frac{\partial U_i}{\partial PR_i}} = \frac{\beta_{ki}}{\beta_{PR_i}} \qquad \text{(Eq.11)}$$

As for the WTP for each attitudinal indicator, this study used the example provided by Vij and Walker (2016), as shown in Eq.12.

$$WTP_{I_r} = \frac{\beta_{FAi}}{\beta_{PRi}\lambda_r} \qquad \text{(Eq.12)}$$

With this formula, suppose two women responded differently regarding attitudinal indicators AI3. *I choose to use an Indonesian sheet mask in my daily life.* For example, the first one might pick agree (Likert scale response 6), and the other might pick strongly agree (Likert scale response 7). Ceteris paribus, the first person would be willing to pay more to buy Indonesian SM compared to the second person.

Results

Descriptive Analysis

From the online survey, this study obtained 505 respondents, who were all female. The age range of the respondents is 18-22 years old (67.13 %), 23-35 years old (16.04 %), and over 35 years old (16.83 %). The distribution of their income categories was below IDR 4 million (68.52 %), between IDR 4 million and 10 million (18.61 %), and above IDR 10 million (12.87 %). The details of the sociodemographic distributions of the respondents can be seen in Table 3.

Table 3. Sociodemographic characteristics

	Sociodemographic characteristics	Frequency	Percentage
Age	18-22	339	67.13%
	23-35	81	16.04%
	>35	85	16.83%
	TOTAL	505	100%
Monthly Income (IDR)	0 – 4,000,000	346	69%
	4,000,000-6,000,000	50	10%
	6,000,000-8,000,000	25	5%
	8,000,000-10,000,000	19	4%
	>10.000.000	65	13%
	TOTAL	505	100.00%

Table 4 presents the mean and standard deviation of latent attitudinal indicators. From the mean, it can be seen that the respondents have positive attitudes toward Korean sheet masks. This study can therefore say that a Korean sheet mask is more favorable to an Indonesian woman than the other two sheet masks. The respondents also had rather negative attitudes towards Indonesian and French sheet masks.

Another important thing to be measured is Cronbach's alpha because it can ensure that the indicators are reliable to construct the latent variables in the subsequent model. The Cronbach's alpha for the six psychological factors can be seen in the right hand column of Table 4, in which the score for all six factors is above 0.7. It indicates that these indicators are reliable and can be used in the subsequent hybrid choice model estimation. During CBC experiments, each of the 505 respondents faced eight scenarios. In total, 3,030 choice observations were obtained. In the responses, 43.83% chose a Korean sheet mask, 34.98% chose an Indonesian sheet mask, and 21.19% chose a French sheet mask.

Table 4. Psychological factors indicators

Code	Indicators	Mean	Std. Dev	Cr. Alpha
AI1	I am happy to use Indonesian SMs in my daily life	3.45	1.63	0.93
AI2	If I buy SMs, I will choose an Indonesian SM	3.10	1.48	
AI3	I choose to use Indonesian SMs in my daily	3.16	1.55	
AK1	I am happy to use Korean SMs in my daily life	5.44	1.32	0.92
AK2	If I buy SMs, I will choose a Korean SM	5.49	1.31	
AK3	I choose to use Korean SMs in my daily	5.54	1.32	
AF1	I am happy to use French SMs in my daily life	3.57	1.67	0.96
AF2	If I buy SMs, I will choose a French SM	3.44	1.63	
AF3	I choose to use French SMs in my daily	3.52	1.66	

Table 5 displays a detailed evaluation of the chosen alternatives and non-trading respondents. With CBC, it is expected that to maximize the respondents' utility, the respondents can evaluate the alternative based on attributes and their level to choose alternatives. Eight scenarios with different attribute levels were presented to each respondent. However, there is a possibility that the respondent only chooses one alternative for every scenario. The respondent did not make a trade-off between attributes of alternative to choose the best alternative, which is called non-trading behavior (Belgiawan et al., 2019). From Table 5, the total number of non-traders is 9.11%. It shows that 38 out of 505 respondents (7.52%) did not do a trade-off for Korean sheet masks. Six and two respondents are non-traders of Indonesian and French sheet masks. It is a good sign that 90% of the respondents did a trade-off in the CBC experiment.

Table 5. Chosen alternative and non-traders

Chosen Alternative	Frequency	Percentage	Non-trading respondents	Percentage of total respondents
Indonesian sheet mask	1,060	34.98%	6	1.19%
Korean sheet mask	1,328	43.83%	38	7.52%
French sheet mask	642	21.19%	2	0.40%
Total	3030	100%	46	9.11%

Discrete Choice Model Results

The results of the HCM model can be seen in Table 6. This study presented the parameter estimate and the t-statistics of all variables estimated in the model.

Table 6. Hybrid choice model results

Variables	Est.	t-stat	Variables	Est.	t-stat
Alternative specific constant			*Sociodemographic characteristics*		
ASC Korean sheet mask	3.44	2.19	Age more than 22 (H5a)	0.28	6.99
ASC French sheet mask	0.12	0.07	Income less than IDR 4M (H5b)	-0.1	-6.48
Attributes of sheet mask (SM) alternative			Income IDR 4M-6M (H5c)	0.07	2.96
Packaging Indonesian SM (H1a)	0.03	1.85	Income IDR 6M-8M (H5d)	-0.29	-4.55
Packaging Korean SM (H1b)	0.01	0.75	Income IDR 8M-10M (H5e)	0.26	4.02
Packaging French SM (H1c)	0.04	1.67	Income more than IDR 10 M (H5f)	-0.02	-3.29
Quality Indonesian SM (H2a)	0.21	6.66	*Latent variables Indicators*		
Quality Korean SM (H2b)	0.20	14.05	λ AI1 (λ_1)	1	NA
Quality French SM (H2c)	0.28	10.11	λ AI2 (λ_2)	1.73	3.16
Brand Indonesian SM (H3a)	0.04	1.74	λ AI3 (λ_3)	1.83	3.11
Brand Korean SM (H3b)	0.03	1.63	σ AI1 ($\sigma^2_{v_1}$)	1.51	30.96
Brand French SM (H3c)	0.03	1.27	σ AI2 ($\sigma^2_{v_2}$)	1.3	33.37
Price Indonesian SM (H4a)	-0.06	-1.16	σ AI3 ($\sigma^2_{v_3}$)	1.35	34.04

Variables	Est.	t-stat	Variables	Est.	t-stat
Price Korean SM (H4b)	-0.16	-10.87	λ AK1 (λ_4)	1	NA
Price French SM (H4c)	-0.07	-15.77	λ AK2 (λ_5)	1.12	60.23
Refreshing effects of Indonesian SM (H7a)	0.16	2.74	λ AK3 (λ_6)	1.12	61.21
Refreshing effects of Korean SM (H7b)	0.06	1.38	σ AK1 ($\sigma^2_{v_4}$)	0.8	36.24
Refreshing effects of French SM (H7c)	0.19	4.41	σ AK2 ($\sigma^2_{v_5}$)	0.51	25.22
Halal essence Indonesian SM (H8a)	0.16	4.99	σ AK3 ($\sigma^2_{v_6}$)	0.56	29.98
Halal essence Korean SM (H8b)	0.13	5.42	λ AF1 (λ_7)	1	NA
Halal essence French SM (H8c)	0.08	3.56	λ AF2 (λ_8)	1.01	99.1
Psychological factors			λ AF3 (λ_9)	1.02	107.11
Attitudes towards Indonesian SM (H6a)	1.19	2.75	σ AF1 ($\sigma^2_{v_7}$)	0.76	35.72
σ Att. towards Indonesian SM	0.48	2.20	σ AF2 ($\sigma^2_{v_8}$)	0.63	30.75
Attitudes toward Korean SM (H6b)	0.30	6.69	σ AF3 ($\sigma^2_{v_9}$)	0.66	32.82
σ Att. towards Korean SM	-1.11	-44.66			
Attitudes towards French SM (H6c)	0.33	8.11			
σ Att. towards French SM	1.54	59.32			
Model fit					
Number of estimated parameters		50			
Number of observations		3030			
Init log-likelihood		-46,713.67			
Final log-likelihood		-44,173.37			
Rho-square-bar		0.05			
Number of draws		1,000			

The accepted hypotheses are those with t-statistics results above 1.96 (absolute). It means that for packaging (H1a-c), it can be seen that all packaging hypotheses are rejected. For the second hypothesis, quality is significant for Indonesian, Korean, and French sheet masks. It means that H2a, H2b, and H2c can not be rejected. For the third hypothesis, brand, it can be seen that H3a, H3b, and H3c are all rejected.

For the fourth hypothesis, the result is rejected for the Indonesian case (H4a) and can not be rejected for Korean (H4b) and French (H4c). For the fifth hypothesis, it can be seen that age (H5a) and income (H5b-f) can not be rejected. For the sixth hypothesis, all of the attitudes (H6a-c) can not be rejected. As for the seventh hypothesis, the refreshing effect is rejected for Korean SM (H7b) and can not be rejected for Indonesian and France (H7a and H7c). Finally, for the last hypothesis, it can be seen that all halal essence (H8a-c) can not be rejected.

The results of the elasticities and willingness to pay (WTP) calculation can be seen in Table 7. This study only calculated attributes that are found significant in Table 6. For the elasticities results, for the Indonesian SM alternative, all the attributes are inelastic. It means that a 10% increase in the attribute level will correspond to a decrease in the probability of choosing the particular alternative by less than 10%. Of the three signifi-

cant attributes of Korean SM, only price attributes are elastic. This means that a 10% price increase in Korean SM will contribute to a 15.8% decrease in the probability of choosing Korean SM. For the next alternative, French SM, three out of four significant attributes, such as price quality, is elastic. A 10% price increase in French SM will correspond to a 20.6% decrease in the probability of choosing French SM. Conversely, a 10% increase in quality and refreshing effects will result in a 15% and 11.8% increase in the probability of choosing French SM.

This study presented two types of WTP, IDR version and USD purchasing power parities conversion of IDR. The WTP for Indonesian SM is almost similar in quality, refreshing effects, and halal essence. IDR 2,844 (USD 0.60) is an amount the respondents are willing to pay for a quality increase of Indonesian SM. Similarly, the respondents are willing to pay as much as IDR 2,000 (USD 0.4) to increase the refreshing effect and guarantee that the product is halal. As for Korean SM, the Indonesian respondents would like to pay less for a quality increase and halal guarantee than Indonesian SM. Interestingly, for French SM, the amount of money the respondents are willing to pay for a quality increase is twice the amount for Indonesian SM, around IDR 4,437 (USD 0.9). The price that the respondents are eager to pay to increase the refreshing effects of French SM is also higher than the Indonesian SM. However, the French SM halal guarantee WTP is much cheaper than the Indonesian SM.

Table 7. Demand elasticities and willingness to pay

Attribute	Elasticity	Willingness to pay (IDR)	Willingness to pay (USD) *
Indonesia sheet mask quality	0.80	IDR 2,844.04	USD 0.60
Indonesia sheet mask effect	0.79	IDR 2,005.24	USD 0.42
Indonesia sheet mask halal essence	0.70	IDR 2,096.99	USD 0.44
Korean sheet mask price	-1.58	NA	NA
Korean sheet mask quality	0.49	IDR 1,226.99	USD 0.26
Korean sheet mask halal essence	0.49	IDR 785.28	USD 0.17
French sheet mask price	-2.06	NA	NA
French sheet mask quality	1.50	IDR 4,437.69	USD 0.93
French sheet mask effect	1.18	IDR 2,887.54	USD 0.61
French sheet mask halal essence	0.44	IDR 1,346.51	USD 0.28

* 1 USD = IDR 4,753 (purchase power parity).

Source: https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm#indicator-chart

Dicussion

Several parameters are estimated, such as the alternative specific constants and attributes of sheet mask (SM) alternatives for all models. The ASC Korean SM is positive. It indicates that ceteris paribus, the respondents would prefer Korean SM rather than Indonesian SM (as the reference category).

Regarding attributes of alternatives, the price for Korean and French SM is significant with a negative sign, as expected. It indicates that the higher the price, the less likely the respondents will choose either Korean or French SM. Brand and packaging are not significant for all three alternatives. Thus, this study could ignore these attributes for further analysis. Quality and halal essence are significant for all alternatives, indicating that the better the quality of SM products for all alternatives and the halal essence guarantee, the more likely the respondents will choose the respected alternative.

Interestingly, the refreshing effects attribute is not significant for Korean SM alternatives, even though it is positively significant for Indonesian and French SM. Attitudinal factors appear to be positive and significant for all alternatives. It indicates that those with a more positive attitude towards, for example, Indonesian SM are likelier to choose Indonesian SM.

Furthermore, this study also estimates sociodemographic characteristics. The dependent variable is the attitude towards SM alternatives. Those older than 22 have a more positive attitude towards SM alternatives than those under 22. The results are a mix of income categories, and all of them are significant. Finally, all error components are significant, indicating substantial preference heterogeneity for SM alternatives. Compared to others, the higher coefficient of Korean SM error components shows higher alternative specific variance heterogeneity in the unobserved effects for Korean SM compared to other alternatives.

Conclusion

This paper started by presenting a two-time exploratory study to determine the influential attributes for the decision to buy a sheet mask. This study contributes to the theory by combining the attributes obtained from the preliminary study and the literature review; it asked the participants to rate the attributes excluding the price for each alternative. Then, this study incorporated those attributes for the data collection. From the descriptive statistics, this study found that the most chosen alternative is Korean SM, which confirms Larasati (2019) who states that Korean cosmetics are popular among Indonesian women. Looking at the non-trading behavior information, this study can ascertain that most re-

spondents (more than 90%) are doing a trade-off to choose the best SM alternative. It is a good indication since it is evident that attributes do play a role in deciding the alternatives. It is not just because of fanaticism regarding one particular choice. The additional attributes found to be significant might contribute to the body of research on cosmetics purchase decisions.

The methodological contribution of this paper is the estimation of HCM for cosmetics choice decisions. HCM can simultaneously measure the correlation of sociodemographic characteristics towards latent variables, the correlation of latent variables, and the effect of attributes on choice decisions. With HCM, this study confirmed that latent attitudes significantly correlate with a choice decision (Ajzen, 1991; McFadden, 2001). Furthermore, this study presented the demand elasticities and willingness to pay derived from the model. With demand elasticities, this study can measure the percentage change of one attribute of an alternative in response to a change in the probability of choosing one option. Finally, this study presented the willingness to pay, which shows how much a person is willing to pay for a change in an attribute.

The skincare manufacturer may consider several things to improve its market share in the Indonesian and Southeast Asia context. Marketers should prioritize quality to attract Indonesian women to buy skincare products because quality has a significant value in every option of sheet masks. Also, the willingness to pay for the three alternatives is high for improved quality. For French SM manufacturers in particular, since the quality aspect is elastic, they should pay more attention to this aspect if they want to compete in the Indonesian market. Another attribute that marketers should also pay attention to is the refreshing effects. Even though Korean SM manufacturers do not need to pay attention to this aspect since it is insignificant, the other two countries' manufacturers need to improve this aspect to increase the market share of respected alternatives. Finally, regarding the attribute, the manufacturers must pay attention to the halal aspect of the product. Since Muslim women dominate the Indonesian market, it considers the halal aspect. This aspect might be unique to the Indonesian context, and manufacturers should consider it an interesting finding.

Marketers should also pay attention to attitudinal factors. Attitudes are significant with positive aspects, indicating that the more positive attitudes the respondents have, the more likely they will choose a particular alternative. Since the attitude towards Korean cosmetics is already positively high, Korean SM marketers might not need to work harder to promote Korean SM in Indonesia. On the contrary, Indonesian and French SM marketers must work harder to promote their SM. They should also consider having more intense and interesting promotions, especially in skincare. Most of the respondents can be considered millennials, who buy something exciting and often see it in the ads. Therefore,

Korean cosmetics are more familiar and have become the top of mind. Even though the brand image is not significant for choice decisions, Indonesian and French SM marketers should improve the brand image to create a positive attitude from the customer. Benchmarking how the Korean sheet mask creates a good brand image could be something to consider since the attitude value is positive.

Limitation

There are several shortcomings in this research. One example is that the choices are limited to only three countries' products. Hence, some respondents who have not used products from those three countries might have difficulty filling out the form. Second, having a balanced number of respondents of all ages is hard. In addition to the challenges posed by the pandemic, this study was able to find only a limited number of respondents aged 23-35 years old, and those older than 35 do not use sheet masks because they are more likely to use anti-aging products. Finally, as mentioned in the background, there are possibilities that the choice decision to buy sheet masks can be influenced by K-pop/Hallyu culture. However, the exploratory research found no influence of this phenomenon.

For future studies, the number of choices could be increased and not limited to three countries' cosmetics. Japanese or US cosmetics could be added besides Indonesian, Korean, and French cosmetics. The current research is limited to a sheet mask, where not all stages of people using a sheet mask are used. For future research, it would be better to know the suitable and exact target of the skincare products, such as anti-aging products for people over 35 years old. Finally, future studies could also start by analyzing the K-pop/Hallyu culture, solving and better understanding the external factors that influence the choice decision.

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