An Empirical Testing on Quality Label Equity Model

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Abstract

This paper aims to test empirically a conceptual model of quality label equity proposed by previous study. More specifically this study tests the goodness of fit, validity, and reliability of the model. Data were collected through a survey using questionnaire to the 183 SNI-labeled helmet users in Jakarta area who bought helmet less than a year. Sample selection was done by convenience sampling technique. The goodness of fit and validity analyzes were done by Confirmatory Factor Analysis-Structural Equation Modeling (CFA-SEM) and the model reliability analysis using Cronbach Alpha. This study had proved that the conceptual model of quality label equity satisfies the goodness of fit, validity, and reliability criteria of the model. The Fit, valid, and reliable model of quality label equity can be used by governments and corporations to measure the equity of quality labels or the effectiveness of the policy of quality labeling. The effectiveness of quality labeling can be evaluated from the five dimensions of quality label equity, including the awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward quality label, and intention to use quality label.

Keywords

Conceptual Model, Measurement Model, Quality, Quality Label, Label Equity, Structural Equation Modeling

1. Introduction

Product quality is an important factor for the success of both manufacturing and service companies. A number of studies have proved that the quality of both goods and services has an effect on satisfaction (e.g. Sumaedi, Bakti, and Yarmen, 2012; Wen et al., 2005; Lai and Chen, 2011; Jahanshahi et al., 2011) and customer loyalty indirectly (e.g. Sumaedi, Bakti, and Yarmen, 2012; Jahanshahi et al., 2011; Ismail et al., 2006). Therefore, many companies strive to maintain and improve the quality of their products. Then, as product quality information to consumers as

well as for marketing purposes, producers include quality labels on products and product packaging (Bernues, Olaizola, and Corcoran, 2003). Quality labels are listed to inform consumers that the product meets certain quality requirements (Yarmen et al., 2015). In other words, quality labels are used as a signal of product quality to their consumers (Bernues, Olaizola, and Corcoran, 2003; Yarmen et al., 2015).

According to Timmermans (2014), product labels are information attached to product with the purpose of naming and explaining the use, hazards, ingredients, producer of products, etc. Quality label is one of the most frequently labeled on a product. Velčovska and Marhounova (2005) as cited in VelčoVská and Sadílek (2014) define quality label as a symbol attached to product or packaging of product indicating that the product or process for producing the product complies with the standard, and compliance with the standard has been certified by a third party.

Quality labeling on product or product packaging is important because consumers can't assess or test product quality thoroughly before consuming it (Yarmen et al, 2015). To meet consumer needs for product quality information when choosing a product, they tend to evaluate product quality through quality cues (Steenkamp, 1990) or extrinsic attributes of product such as quality label on product or packaging (Caswell, 2006). The quality label helps to convince consumers of product quality (Jeddi and Zaiem, 2010).

Quality labeling on product or product packaging in some studies has been proven to influence consumer decisions in making purchases (e.g. Jeddi and Zaiem, 2010; Padilla et al., 2007) and enhance the competitive position of the product over products that do not have a quality label (e.g. van Trijp, Steenkamp, and Candel, 1997). This is because quality labels can lead to consumer confidence in the product even if they have not consumed it. Furthermore, the influence of the quality label will be stronger with higher perceived risk, namely the uncertainty relative to the efficiency of the decision and the possibility of losses due to the purchase or consumption of a product (Jeddi and Zaiem, 2010).

Although there have been several studies on the influence of quality labels on consumer behavior, there is no consensus on the dimensions that can be used to measure the equity of quality labels from the viewpoint of community as consumers (Yarmen et al., 2015). To fill this gap, Yarmen et al. (2015) developed a conceptual model of quality label equity. In detail, they identified the dimensions of quality label equity from a community's point of view. In the model built by Yarmen et al. (2015), the concept of quality label equity is defined as "the ability of a quality label to increase the added value of the product".

The conceptual model of quality label equity proposed by Yarmen et al. (2015) makes a valuable contribution. The model can be used to measure quality label equity. The model can also be used to measure how effectively quality labeling on product. The more effective quality label, the higher value of the quality label equity dimensions. Unfortunately, the model never been tested empirically. Based on that background, this study aims to test the conceptual model of quality label equity proposed by Yarmen et al. (2015). More specifically this study will test the goodness of fit, validity, and reliability of the model.

2. Literature Review

2.1 Quality Label Equity

The concept of quality label equity arises from the concept of brand equity (Yarmen et al., 2015). The concept of brand equity emerged in the 1980s and has raised the importance of brand in marketing strategies (Kotler and Keller, 2012). This concept was introduced by the Marketing Science Institute (Kotler and Keller, 2012). According to them, brand equity is "the set of associations and behaviors on the part of the brand's customers, channel members, and parent corporation that permits the brand to earn greater volume or greater margins than it could without the brand name" (Keller, 1998, p. 43 in Carpenter and Larceneux, 2008). Some others brand equity definitions are:

- "a set of brand assets and liabilities linked to a brand, its name and symbol, that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers" (Aaker, 1991)
- "the added value endowed to products and services" (Kotler and Keller, 2012)
- The value of the brand (Jones, 2005)

- Brand value from the customer's point of view and the long-term financial consequences of the brand for the company (Barwise, 1993)
- The added value provided by the brand to the product (Park and Srinivasan, 1994)

Similar to the brand equity definition, the label equity according to Carpenter and Larceneux (2008) is "the capacity of the label to generate positive associations about both intrinsic and extrinsic dimensions of the product quality (Roe et al., 1999) which, when combined with a sufficient level of credibility for the label, increase overall perceived quality (Zeithaml, 1988)". In other words, label equity is the ability of label to build positive associations related to product quality in the point of view of consumers. If the label is credible, it will be able to improve the consumers' perceived quality.

Based on the definition of brand equity and label equity, the quality label equity can be defined as the ability of the quality label to produce positive associations about the intrinsic and extrinsic dimensions of product quality. In addition, it can also be defined as a set of values and beliefs generated by a quality label. In other words, it can be said that quality label equity is "the ability of a quality label to increase the added value of the product" (Yarmen et al., 2015).

2.2 Conceptual Model of Quality Label Equity and Hypotheses

Yarmen et al. (2015) developed a conceptual model of quality label equity measurement (figure 1) based on the associative network theory. The theory says that humans store information in the form of interconnected nodes and when a node is activated, the other nodes connected with that node will also be activated (Yarmen et al., 2015). Likewise information about quality labels is stored by humans. If the quality label node is activated, then other nodes containing information related to the quality label will also be activated (Yarmen et al., 2015). Based on this idea, Yarmen et al. (2015) argue that quality label equity is a concept consisting of several dimensions representing information related to quality label known to people, such as the awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward quality label, and intention to use quality label. The definitions for each dimension can be seen in Table 1.

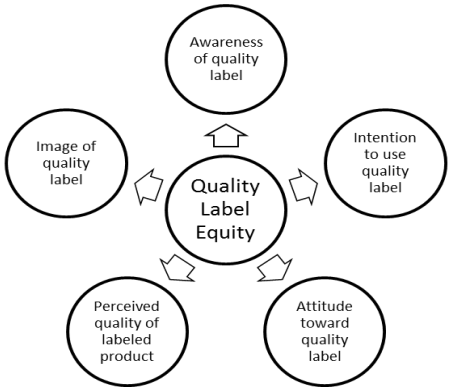

Figure 1. Conceptual Model of Quality Label Equity
Source: Adapted from Yarmen et al. (2015)

Table 1. Definition of Quality Label Equity Dimensions

Dimensions	Definition
Awareness of quality label	Consumer's ability to identify and recognize quality label in their mind
Image of quality label	Consumer's perception on quality label, which is reflected with certain associations in their mind.
Perceived quality of labeled product	Consumer's perception of the overall superiority of a product with quality label
Attitude toward quality label	Consumer's overall and general evaluation on quality label, which is shown with a positive or negative feelings
Intention to use quality label	Consumer's intention to use quality label as a product evaluation consideration

Source: Yarmen et al. (2015)

As described in the introduction, this study aims to test the conceptual model for measuring quality label equity proposed by Yarmen et al. (2015). Therefore, the hypotheses to be proved in testing model are as follows:

H1: Awareness of quality label is a dimension of quality label equity
H2: Image of quality label is a dimension of quality label equity
H3: Perceived quality of labeled product is the dimension of quality label equity
H4: Attitude toward quality label is a dimension of the quality label equity
H5: Intention to use quality label is a dimension of quality label equity

3. Methodology

3.1 Research Design

This research uses quantitative approach with hypotheses testing and field research (field study). This approach is chosen with the following considerations: (1) the design of the study allows the researcher to know the goodness of fit of a model and its generalization ability (Sekaran and Bougie, 2010), and (2) the previous studies on phenomena involving consumer behavior also used hypothesis testing and field research design. Quality label in this research is label of Indonesian National Standard (SNI) on motorcycle helmet. The Government of Indonesia through the Ministry of Industry in 2010 has required all helmets circulating in Indonesia, both local and imported products must meet the SNI. Any helmet brand that has been tested and declared fulfilling SNI shall be labeled with SNI label.

3.2 Operationalization and Indicators of Research Variables

The model involved 5 variables proposed as dimensions of quality label equity (i.e. awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward label quality, and intention to use quality label). The indicators for measuring these variables were determined through literature studies related to theories and literature relevant to the research topic and exploratory studies. This was to ensure the content validity of each variable (Sekaran and Bougie, 2010).

Exploratory study was conducted by interviewing 30 users of SNI-labeled helmets. At the time of interview, respondents were asked about their knowledge of the SNI label and the effect of the presence or absence of SNI label when purchasing a helmet. The indicators obtained through literature review and exploratory studies were then re-examined to ensure that each indicator was capable of measuring the research variables. Given that Confirmatory Factor Analysis-Structural Equation Modeling (CFA-SEM) will be used as a statistical analysis tool, the number of indicators for each variable was set to a minimum of 4. This was in accordance with the requirement of SEM (Diamantopoulos et al., 2012). From this process, there were 34 indicators for quality label equity variables that represent awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward quality label, and intention to use quality label.

3.3 Development of Instrument and Wording Test

This research used questionnaire as research instrument. The questionnaire was divided into three sections. The first part contains the screening questions to screen respondents according to the research needs. The second section contains statements relating to research indicators. In this section, respondents were asked to state their perception of their level of agreement on statements with scale 1 (strongly disagree) - 5 (strongly agree). Finally, the third section contains questions related to the demographic profile of the respondents.

To ensure that the prepared questionnaire had been understood and to check its comparability, the wording test was performed (Buil, de Chernatony, and Martinez, 2012). The wording test was conducted by interviewing 15 helmet users. At the interview, the interviewee was asked to read the questions or statements in the questionnaire and then was asked about his or her understanding of the questions and statements. The results of the wording test serve as input for textual improvement of the questionnaire.

3.4 Sample and Procedure

This study population was the SNI-labeled helmet users in Jakarta area. The data collection was conducted through a survey. The selected samples were SNI-labeled helmet users in Jakarta area that bought helmet less than 1 year before the survey was conducted. It was based on the following considerations. First, the literature has proved that user experience of a product affects consumer behavior (Venkatesh et al., 2003). On the other hand, this study sought to investigate psychological conditions when users purchased a helmet. If the experience of the sample is more than one year, it is feared that the response of the sample will be biased. Second, one year is expected not too long for the sample to "recall" his/her memory of the purchase of his/her helmet.

Sampling was done using convenience sampling technique. The selection of this technique was due to several reasons. First, the original characteristics of the study population were unknown (Sekaran and Bougie, 2010). Second, consumer behavior-related studies also employ such techniques, such as Wen et al (2005), Lai and Chen (2011), Jen, Tu, and Lu (2011), Hsiao (2010), and Joo and Sang (2013). Third, convenience sampling is still acceptable to do when research is designed as testing of a theoretical model such as this research (Calder et al, 1981).

A total of 200 questionnaires were distributed to respondents. This number had qualified the use of Confirmatory Factor Analysis-Structural Equation Modeling (CFA-SEM) as an analytical tool (Hair et al., 2009). The minimum number of respondents allowed to use this tool is 5 times the number of indicators (Hair et al., 2009; Bagozzi and Yi, 2012). In this study, the number of indicators to test quality label equity model as many as 34 indicators so that the minimum number of respondents required was 170.

3.5 Data Analysis

The data analysis consists of respondent demographic profile analysis and analysis of quality label equity measurement model. The analysis of quality label equity measurement model includes goodness of fit analysis, validity analysis, and reliability analysis. Following Jen, Tu, and Lu (2011), the goodness of fit test was a hypothetical test (H1-H5). Hypotheses 1-5 (H1-H5) were accepted if the goodness of fit test indicates that the model was fit. Table 2 shows criteria and thresholds in goodness of fit testing.

Table 2. Goodness of Fit Criteria

Criteria Goodness of Fit	Thresholds (Source)
Chi-Square/df	< 5 (Chi-Square/df) (Wheaton et al., 1977; Cheng, Lam, and Yeung, 2006; Hooper, Coughlan, and Mullen, 2008)
NFI	> 0.9 (Hair et al., 2009)
NNFI	> 0.9 (Hair et al., 2009)
CFI	> 0.9 (Hair et al., 2009)
IFI	> 0.9 (Hair et al., 2009)
RFI	> 0.9 (Hair et al., 2009)
RMSEA	≤ 0.08 (MacCallum, Browne, and Sugawara, 1996; Hooper, Coughlan, and Mullen, 2008)

Construct validity analysis was conducted to see if the indicators used to measure latent variables can measure these variables statistically (Hair et al., 2009). The criterion used is standardized factor loading (SFL). Indicator having SFL value above or equal to 0.5 means that indicator is valid to measure variable (Hair et al., 2009).

Once the measurement model was declared fit and valid, the next step was to test the reliability of the measurement model, i.e. how consistent the indicator used to measure the variables (Sekaran and Bougie, 2010). The analysis used was Cronbach Alpha. If the value of coefficient Cronbach Alpha was above 0.6, then measurement model declared reliable (Sekaran and Bougie, 2010).

The goodness of fit and validity analyzes of the model were done using Confirmatory Factor Analysis-Structural Equation Modeling (CFA-SEM) while the model reliability analysis was done using Cronbach Alpha. CFA-SEM

was selected based on several considerations. First, previous consumer behavior studies also used CFA-SEM, such as Wen et al (2005), Lai and Chen (2010), and Jen, Tu, and Lu (2011). Second, SEM provides an advantage because it can test models that have more than 1 dependent variables and can model errors, as well as it is appropriate for research attempting to test a model (Hair et al., 2009; Iacobucci et al., 2007). CFA-SEM and Cronbach Alpha were respectively performed using LISREL and SPSS software.

4. Result and Discussion

4.1 Demographic Profile of Respondents

Of the 200 questionnaires distributed to SNI-labeled helmet users, 183 questionnaires could be processed and analyzed (response rate = 91.5%). The rest could not be processed and analyzed because they did not pass the screening process. The profile of the respondents can be seen in table 3.

Table 3. Demographic Profile of Respondents

Criteria	Categories	Number
Gender	Male	122
	Female	61
Age	≤ 20 years old	40
	21-30 years old	64
	31 – 40 years old	43
	41 – 50 years old	28
	≥ 50 years old	8
Occupation	Unemployment	23
	Labor	25
	Student	37
	Civil servants	2
	TNI / POLRI	5
	Private sector worker	39
	Entrepreneur	38
	Others	14
Last education	Not graduated from elementary school	4
	Elementary school	15
	Junior high school	28
	Senior high school	111
	Diploma I	2
	Diploma III	5
	Bachelor degree	17
	Master	1
Income	Has no income	52
	< Rp. 600.000	9
	Rp. 600.000 – Rp. 1.199.999	11
	Rp. 1.200.000 – Rp. 1.799.999	12
	Rp. 1.800.000 – Rp. 2.399.999	25
	Rp. 2.400.000 – Rp. 2.999.999	25
	Rp. 3.000.000 – Rp. 3.599.999	23
	Rp. 3.600.000 – Rp. 4.199.999	6
	Rp. 4.200.000 – Rp. 4.799.999	4
	Rp. 4.800.000 – Rp. 5.399.999	4
	Rp. 5.400.000 – Rp. 5.999.999	5
	≥ Rp. 6.000.000	7
Marital status	Single	93
	Married	86
	Widow/widower	4

4.2 Result of Goodness of Fit, Validity, and Reliability Testing of Quality Label Equity Model

The analysis of quality label equity measurement models consists of goodness of fit analysis, validity analysis, and reliability. Table 4 shows the results of model goodness of fit testing using CFA-SEM. In the table can be seen that all goodness of fit criteria are met so that it can be said that the measurement model of quality label equity is fit. Thus the hypotheses 1-5 (H1-H5) are proven empirically. Furthermore, the results of the model validity test are shown in table 5. These results show that all dimensions used to measure the quality label equity meet the criteria of construct validity. This is evidenced by factor loading values above 0.5 for all dimensions (awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward quality label, and intention to use quality label) and significant at the 5% significance level. In addition, all indicators also proved valid to measure the dimensions of the quality label equity because they have factor loading value above 0.5 and significant at the 5% significance level. Finally, the reliability test of the quality label equity measurement model with Cronbach Alpha shows that the model is reliable. This is indicated by the Cronbach Alpha coefficient value of all the dimensions of the quality label equity greater than 0.6 (see table 6). Based on the results of the three tests, it can be said that the quality label equity model is fit, valid, and reliable so that it can be used for further analysis.

Table 4. Result of Goodness of Fit Testing

Criteria Goodness of Fit	Thresholds (Source)	Measurement Results
Chi-Square/df	< 5 (Chi-Square/df) (Wheaton et al., 1977; Cheng, Lam, and Yeung, 2006; Hooper, Coughlan, and Mullen, 2008)	1164.82/522
NFI	> 0.9 (Hair et al., 2009)	0.95
NNFI	> 0.9 (Hair et al., 2009)	0.97
CFI	> 0.9 (Hair et al., 2009)	0.97
IFI	> 0.9 (Hair et al., 2009)	0.97
RFI	> 0.9 (Hair et al., 2009)	0.94
RMSEA	≤ 0.08 (MacCallum, Browne, and Sugawara, 1996; Hooper, Coughlan, and Mullen, 2008)	0.080

Table 5. Result of Validity Testing

Latent Variables/Indicator	Factor Loading	P-value*
Awareness of quality label (AW)	0.90	9.67
A15_1	0.70	-
A15_2	0.82	10.36
A15_3	0.78	9.83
A15_4	0.79	9.96
A15_5	0.74	9.35
A15_6	0.76	9.60
Image of quality label (IM)	0.95	11.68
A15_7	0.78	-
A15_8	0.70	9.93
A15_9	0.73	10.40
A15_10	0.76	11.00
A15_11	0.71	10.10
A15_12	0.71	10.13
A15_13	0.70	10.02
A15_14	0.71	10.08
Perceived quality of labeled product (PQ)	0.96	11.05
A15_15	0.74	-
A15_16	0.74	10.04
A15_17	0.78	10.74

A15_18	0.80	10.98
A15_19	0.79	10.81
Attitude toward quality label (AT)	0.89	10.60
A15_20	0.76	-
A15_21	0.74	10.24
A15_22	0.74	10.31
A15_23	0.82	11.53
A15_24	0.80	11.16
A15_25	0.68	9.37
Intention to use quality label (BI)	0.78	7.87
A15_26	0.60	-
A15_27	0.67	7.49
A15_28	0.68	7.53
A15_29	0.74	8.00
A15_30	0.77	8.23
A15_31	0.71	7.77
A15_32	0.68	7.57
A15_33	0.75	8.06
A15_34	0.76	8.19

*significant at 5%

Table 6. Result of Reliability Testing

Variables	Cronbach alpha
Awareness of quality label	0.891
Image of quality label	0.897
Perceived quality of labeled product	0.876
Attitude toward quality label	0.888
Intention to use quality label	0.899

4.3 Discussion

This study aims to test a conceptual model of quality label equity proposed by Yarmen et al. (2015). A quality label equity model was developed to understand the phenomenon of product quality label effectiveness from the community's point of view as a consumer. The more effective quality label, the higher value of the quality label equity dimensions. For example, if a phenomenon is found that products that shall be labeled of a certain quality label but not be labeled and are still purchased by the public, it is understood that the quality label equity on those products is low and needs to be improved.

Through empirical studies, this study has proven that a conceptual model of quality label equity proposed by Yarmen et al. (2015) meets the criteria of goodness of fit, construct validity, and reliability. Thus, the model can be used according to the purpose of developing the model. A quality label equity model can be used to understand the effectiveness of the application of quality labels from the perspective of community as a consumer. In the context of SNI label, the higher the quality label equity, the greater the consumer awareness of SNI label, the better the consumer perception about the quality of the SNI-labeled product, the better the SNI label image in the perception of the consumers, the more positive the consumer attitude towards the SNI label, the higher consumer intention to use the SNI label as a basis in making purchasing decisions, so it can be said the higher the effectiveness of quality labels.

Furthermore, this empirical evidence also supports the argument of Yarmen et al. (2015) that the quality label has the same function with the brand as a signal for consumers (Kotler and Keller, 2012). A signal has certain added value to the consumer in making a purchase decision of a product (Erdem and Swait, 1998). The added value in the brand literature is called equity (Keller, 1993). The higher the equity of a signal, the greater the potential the signal

is used in consumer decision making (Erdem and Swait, 1998). In the context of quality label, the higher the label equity, the greater the label will be used by consumers as the basis for making purchasing decisions.

5. Conclusion

This study has proved that the conceptual model of quality label equity proposed by Yarmen et al. (2015) meets the goodness of fit criteria. Furthermore, this study concludes that quality label equity is a multidimensional construct that includes awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward quality label, and intention to use quality label. This construct has proven its empirical goodness of fit, validity, and reliability. Government and Corporate management that apply product quality label can utilize the conceptualization and measurement model of quality label equity to measure the effectiveness of the policy of quality labeling. Specifically, the effectiveness of quality labeling needs to be evaluated from the five dimensions of quality label equity, including the awareness of quality label, image of quality label, perceived quality of labeled product, attitude toward quality label, and intention to use quality label.

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Appendix 1: Indicators of Research Variables

No	Variables	Indicators (in the form of statement in questionnaire)
1	Awareness of quality label	1. I've heard about the SNI label on the helmet 2. I know the usefulness of the SNI label on the helmet 3. I have a particular view of the SNI label on the helmet 4. I can quickly recognize the symbol or logo of the SNI label on the helmet 5. I can quickly recall some characteristics of the SNI label on the helmet 6. I can quickly recognize the SNI label on the helmet even though there are other labels on the helmet
2	Image of quality label	1. I trust the SNI label on the helmet 2. I categorize a SNI-labeled helmet into a good helmet category 3. I describe a SNI-labeled helmet as a helmet that takes into account the security aspect 4. I describe a SNI-labeled helmet as a helmet that pays attention to safety aspects 5. I describe a SNI-labeled helmet as a helmet that takes into account the health aspects 6. I describe a SNI-labeled helmet as a helmet manufactured with attention to the issue of environmental friendliness 7. I feel proud to use a SNI-labeled helmet 8. I am sure the existence of SNI label on helmet is not intended to trick buyers
3	Perceived quality of labeled product	1. The SNI-labeled helmet has good quality 2. The SNI-labeled helmet has better quality than helmets that are not SNI-labeled 3. All SNI-labeled helmets have consistent quality 4. The SNI-labeled helmet is reliable (trustworthy) 5. The SNI-labeled helmet has superior features
4	Attitude toward quality label	1. Buying a SNI-labeled helmet makes me feel calm 2. I like when the helmet sold is a SNI-labeled helmet 3. When I buy a SNI-labeled helmet, I always feel that I have made the right purchase 4. I feel happy to have a SNI-labeled helmet 5. I have positive feelings about the SNI label on the helmet 6. I appreciate people who use SNI-labeled helmet

5	Intention to use quality label	1. When buying a helmet, usually I will look for a SNI-labeled helmet 2. One of my considerations when purchasing a helmet is the presence of a SNI label on helmet 3. If there are two helmets have the same features, I will choose a SNI-labeled helmet 4. When purchasing a helmet, I have a strong intention to buy a SNI-labeled helmet 5. When purchasing a helmet, I have a high tendency to buy a SNI-labeled helmet 6. When purchasing a helmet, I want to buy a purchasing 7. I am willing to pay more for a SNI-labeled helmet 8. I am interested in information on SNI label on helmet products 9. I would recommend my friends to buy SNI-labeled helmets