The integrated model of green loyalty: Evidence from eco-friendly plastic products

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ABSTRACT

The rise of pollution due to massive use of plastic products has increased public awareness in environmental protection through the increased consumption of eco-friendly plastic products. However, as its cost of production is expensive, the consumption of eco-friendly plastic product is low. In this business environment, understanding and developing a strategy to create customer loyalty is a key factor to ensure business success. Driven by this research gap, this study is intended to gain a comprehensive understanding of loyalty formation towards eco-friendly plastic products by integrating the trust and perceived risk in the loyalty model. This study used data collected through the distribution of questionnaires to 400 consumers of eco-friendly plastic products in Bandung, Indonesia. This research used partial least squares structural equation modelling to examine the hypotheses proposed. The results note that the integration of green trust and green perceived risk in the Quality-Loyalty Model can increase the prediction of loyalty towards eco-friendly plastic products. Further, this research reveals that green perceived quality and green perceived value are the main drivers of loyalty towards eco-friendly plastic product. The identified relationships between the variables provide a guide for eco-friendly business players to enhance their innovative and competitive capabilities as well as encourage them to face the environmental challenges.

1. Introduction

Consuming disposable plastic packaging is hazardous to the Earth (Greenpeace, 2018) as it is difficult to decompose naturally and adversely affects the environment and living creatures. Globally, only 9% of plastic waste is recycled, 12% is eliminated by combustion, and the remaining ends up in landfills and flows into the ocean (Geyer et al., 2017). Due to rising environmental pollution from using plastic products, public awareness on environmental protection through consuming eco-friendly or green plastics increases (Chen and Chang, 2013). However, as the cost of production of eco-friendly plastic is much higher than that of the conventional ones, price of eco-friendly plastic is still much higher than conventional plastic (Greenpeace, 2018). Thus, although the awareness of consuming eco-friendly plastic products is relatively high, the real consumption of this product is unexpected. In this business environment, managing the demand of this eco-friendly product is challenging and understanding strategy to create customer favorable behavior are key factors to ensure business success in the future.

Having customer trust and loyalty are important aspects to win in a competitive and unique market, such as in the eco-friendly plastic market. Customer trust increases customer' confidence in the products and, subsequently, create their loyalty (Martínez, 2015), while customer loyalty causes a willingness for customers to repurchase and pay more and has been widely recognized as a flip coin of company's profitability (Dean and Suhartanto, 2019). In green or environmentally friendly products, scholars (Chen, 2010; Suki, 2015; Wang, 2017; Zhang et al., 2020) report that perceived quality, perceived value, and satisfaction as the crucial determinants of loyalty towards green products. Other studies in green products reveal that perceived quality, satisfaction, perceived value and perceived risk are reported as important determinants of customer green trust (Chen, 2013; Chen and Chang, 2013; Konuk, 2018). Although trust and loyalty toward green products share some similar determinants and literature (Cheung et al., 2015; Wu et al., 2018) show the link between trust and loyalty, surprisingly,

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none of past studies identified nor explored trust and perceived risk role in the loyalty formation as a single integrated model. As the consumer purchasing decision towards green products is complex (Tan et al., 2019), especially related to the trust that the product conforms to an environment safe requirement, the inclusion of trust in the loyalty formation model could potentially offer a better explanation on the nature of customer loyalty towards green products.

Driven from the identified research gap, this study is intended to gain a comprehensive understanding of loyalty formation towards eco-friendly plastic products by integrating the trust and perceived risk in the loyalty formation model. The association between perceived risk, perceived value, trust, quality, satisfaction, and loyalty is conceptually hypothesized and empirically tested in the Indonesian market. Indonesia is one of the largest emerging markets that offer a unique viewpoint because it is presently being deforested more quickly than other countries (Arli et al., 2018). Selecting the Indonesian market as the context of this study is a logical decision because of its large market for the environmentally friendly plastic products. Further, due to plastic pollution in the environment being real and ever present Indonesian consumers experience a significant increase in awareness of the need to consume environmentally friendly products and eagerly absorb products that are produced sustainably (Nielsen, 2014). However, the public's perception that green products are expensive and the unavailability of these products in stores are problems that prevent them from using green products (Firmansyah, 2018). On the other hand, the Indonesian eco-friendly product market has many players, both foreign and domestic, causing tight competition (Cochrane, 2015). In this highly competitive and demanding market, it is important to have loyal customers.

This paper is organized into eight sections. This study starts by discussing the introduction, then, literature review and hypotheses, methodology, results and theoretical implications, managerial implications, limitations and future research, and conclusion.

2. Literature review and hypotheses

2.1. Loyalty towards eco-friendly products

Customer loyalty is "a deeply held commitment to rebuy or patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1999, p. 34). Based on this definition, Chen (2010) proposes the notion of green loyalty as the degree of repurchase intention driven by a convincing attitude and commitment toward sustainable environment towards a product or service as well as a firm. In a similar vein, a recent study (Dabija et al., 2018) maintains that green loyalty is measured by the level of consumer repurchase intention that takes into account the company's attitude and commitment to a sustainable environment. Referring to these past studies, in this eco-friendly plastic study, green loyalty is defined as a customer's commitment to repurchase and recommend an eco-friendly plastic product.

In the green industry, having customer loyalty is imperative; and not surprisingly, many studies have been conducted to examine concept of green loyalty (Dabija et al., 2018; Hur et al., 2013). Although many studies have examined green loyalty, there has been a lack of study in plastic products specifically. There are two approaches used to examine loyalty: behavioral and attitudinal. Behavioral approach means loyalty as a behavior in which consumers buy products or services in a certain period systematically. In other words, the indicator of behavioral loyalty is repeated

buying. Through this approach, the performance of eco-friendly products can be accurately described. However, this approach has weaknesses in the lack of a conceptual basis and limited perspective on complex and dynamic consumer behavior (Suhartanto et al., 2019a,b). In addition, this approach presents difficulties to separate loyal customers from customers who use eco-friendly products for the reasons of usability and cost only. Thus, loyalty behavior cannot describe consumer loyalty towards eco-friendly products.

The second approach used to assess customer loyalty is the attitude approach. An attitude approach can also be interpreted as a loyalty intention (Dean and Suhartanto, 2019). The loyalty intention is an attitude where different passions form consumer loyalty to a product or service. Although the customer does not make a purchase, they recommend the product to other customers, this indicates an attitude of loyalty. Based on the Tripartite Theory of Attitude, the components of an attitude are cognitive, affective, and conative. Then, behavioral intention is a dimension of a conative attitude (Ajzen, 2005). Thus, consumers' attitudes towards eco-friendly plastic products must be considered based on future consumer behavior intentions. Furthermore, the attitude approach allows researchers to measure customer loyalty, from very disloyal to very loyal (Suhartanto et al., 2019a,b). Therefore, the conceptualization and measurement of loyalty that is built based on the attitude approach has been appropriate for assessing consumer loyalty to eco-friendly plastic products. The next section outlines the Quality-Loyalty Model, the role of green trust and green perceived risk.

2.2. Quality-Loyalty Model in green product context

The loyalty literature notes that there are few conceptual models to rationalize the loyalty and, arguably, Quality-Loyalty Model is the most widely acknowledged model (Dean and Suhartanto, 2019). The Quality-Loyalty Model is grounded on the cognitive-rational approach (Cronin et al., 2000), suggesting that the main driver of perceived value, satisfaction and loyalty is product quality. The reason for this suggestion is that if product quality is a consumer judgment of the product elements and perceived value is the customer assessment of the experience with the product; then, satisfaction is the impact of product quality and perceived value. This logic is in accordance with the American Customer Satisfaction Index model (Fornell et al., 1996) proposing that quality favorably influences satisfaction and, successively, influence loyalty. Previous studies including in green product (Fu et al., 2018; Suhartanto et al., 2019a,b; Zhang et al., 2020) verify that product quality and perceived value considerably affect customer satisfaction and customer loyalty. This discussion implies that the basic driver of the loyalty formation, including in green product, is product quality.

Literature in green product notes that an important factor that influences customer green behavior and the basis for maintaining relationships with the customers is perceived green product quality, i.e. a consumer evaluation of the superiority of the green product based on his or her experience in consuming the product (Sun et al., 2018). Further, although some studies reveal that perceived quality directly influences loyalty, studies in the context of green product show that perceived quality influences loyalty through strengthening perceived risk (Wang, 2017) and satisfaction (Suki, 2015). The argument for this indirect consequence of perceived quality on loyalty is that the perceived quality will only affect customer intention to repurchase if the product has a low risk, meets customer expectations and has performance as promised. Thus, this research proposes two hypotheses related to perceived quality as follows:

H1. Perceived quality positively influences satisfaction towards

eco-friendly plastic products.

H2. Perceived quality positively and indirectly influences loyalty towards eco-friendly plastic products.

The Quality-Loyalty Model suggests that perceived value is an important driver of loyalty. In eco-friendly products, green perceived value is a customer evaluation of the benefits received from a product compared to what is sacrificed based on the customers' environmental needs (Woo and Kim, 2019). What is received by consumers, include the benefits of high-quality products, while what is given by consumers, such as money, time or energy is sacrificed by consumers to obtain the green product. The relation between loyalty and perceived value and satisfaction has been well examined in past studies. In eco-friendly products, perceived value positively affects satisfaction (Hur et al., 2013). Further, the perceived value as a result of consumer evaluation of the product, sparks a word-of-mouth effect that significantly affects customer intention not only to repurchase but also to recommend (Wu et al., 2015). This discussion concluded that when consumers perceived that the product value exceeds their expectations, it will increase their confidence and loyalty towards the product. Thus, the hypotheses relating to perceived value, trust, and loyalty in environmentally friendly plastic products are as follows:

H3. Perceived value positively influences satisfaction towards eco-friendly plastic products.

H4. Perceived value positively influences loyalty towards eco-friendly plastic products.

Another key driver of green loyalty is green satisfaction, a feeling that the green product performance is better than their expectations (Papista and Dimitriadis, 2019). In the green product context, satisfaction is a pleasant level of feeling resulting from the capability of a product to fill a persons' needs and wants in a manner that is environmentally friendly and sustainable (Wang et al., 2018). Customer satisfaction itself can be affected by the customer's own circumstances and other factors beyond the firm control. When consumer expectations have been fulfilled as a result of firm strategy, it will form a belief in their minds that the company has kept its commitments. In addition, customers who feel satisfied after buying a product will be compelled to repurchase if the price rises and recommends the product to other parties (Suki, 2015). The study of environmentally friendly products (Hur et al., 2013) shows that satisfaction has a positive influence in developing green loyalty. Other studies in green hotels (Martínez, 2015) suggest that satisfaction positively influences customer loyalty. Thus, this research proposes a hypothesis related to the previous discussion of eco-friendly plastic products as follows:

H5. Satisfaction positively influences loyalty towards eco-friendly plastic products.

2.3. Green trust

Trust is the reason why consumers prefer one product from a particular brand. Trust represents the level of customer confidence that companies make environmentally friendly claims actually provide and prove the claims (Gupta et al., 2019). According to Martínez (2015, p. 12), green trust is "willingness to rely on an exchange partner in whom one has confidence because of its environmental performance". Based on this definition, customer will trust an eco-friendly product if the firms can prove that the performance of their product is environmentally friendly. The existence of trust can help consumers simplify information and

protect them from the uncertainty of several situations related to the product purchase process. Consumers will buy eco-friendly products if trusted information about products is available (Kang and Hur, 2012).

Chen (2013) tests the Green Trust Model and concludes that green perceived quality, green satisfaction, green perceived value and green perceived risk are reported as important determinants of customer green trust. Further examination in the subsequent studies (Konuk, 2018; Suki, 2015) offer evidence that perceived green quality effects positively on green satisfaction and green trust. Other studies report that green perceived value positively affects green satisfaction (Hur et al., 2013) and green trust (Cheung et al., 2015). Related to green loyalty, previous studies show a positive association between trust and loyalty (Konuk et al., 2015; Wang et al., 2018). Other studies in the green business-to-business context (Wu et al., 2018) notes that trust is significantly associated with loyalty. Thus, in terms of eco-friendly plastic products, this discussion can lead to the following hypotheses.

H6. Perceived quality positively influences trust towards eco-friendly plastic products.

H7. Perceived value positively influences trust towards eco-friendly plastic products.

H8. Satisfaction positively influences trust towards eco-friendly plastic products.

H9. Trust positively influences loyalty towards eco-friendly plastic products

2.4. Green perceived risk

Purchasing a product often creates a consequence that cannot be anticipated by consumers so that they will feel the risk in the buying process. Perceived risk is the possibility that consumers will face some unexpected difficulties and unpleasant events when using certain products including functional, physical, psychological, social, as well as financial risk (Chen and Chang, 2013). The higher the perceived risk, the more customers face uncertain purchases whether the purchase is right or wrong. This uncertainty often prevents consumer from purchasing products or services (Sun et al., 2018). In the current environmental issue, customers have more environmental problems that will boost perceived risk. If consumers have had experience in using the product, the uncertainty experienced by consumers when using these products will decrease. This argument corroborates with a previous research (Beneke et al., 2015) revealing an unfavorable perceived quality impact on perceived risk. Past studies reveal unfavorable effects of perceived risk on satisfaction and trust on green product (Chen and Chang, 2013). Further, perceived risk has an important role in determining the consumer behavior since they are often willing to reduce risk rather than escalate pleasure in the buying process. If the risk felt by consumers is low, it will have an impact on high customer loyalty (Wu et al., 2015). Hence, the hypotheses associated with green perceived risk are proposed as follow:

H10. Perceived risk negatively influences satisfaction towards eco-friendly products.

H11. Perceived risk negatively influences trust towards eco-friendly plastic products.

H12. Perceived risk negatively influences loyalty towards eco-friendly plastic products.

H13. Perceived quality negatively influences perceived risk towards eco-friendly plastic products.

Fig. 1 describes the form of customer loyalty towards eco-friendly plastic products.

3. Methodology

Previous studies have examined variables used in this study; thus, the measurement of the constructs in the context of eco-friendly plastic product refers to the extant literature. Table 1 illustrates how each construct is supported by the literature. Following scholars (Cheung et al., 2015; Marakanon and Panjakajornsak, 2017), this study measures green perceived quality as an uni-dimensional construct using six items that include best benchmarks, reliable, durable, excellent image, professional, and product safety. Green perceived value was assessed by three items that represent a comparison of benefits and costs for obtaining eco-friendly products, comparison of product benefit for the environment compared to other products, and comparison of product benefits to the environment compared to other products. Green satisfaction was gauged by three indicators and four indicators were employed to assess green trust. Green perceived risk is assessed by functional, physical, psychological, social, and financial risk. Finally, green loyalty was assessed by three items: recommending, repurchasing, and still using eco-friendly products although other products' prices are cheaper. The scale of a five-point Likert, "1: strongly disagree and 5: strongly agree" were used to assess construct indicators. In order to analyze ambiguities in terms, meanings, and other problems, questionnaires in Indonesian have been tested on 20 consumers who have experienced buying eco-friendly plastic products. This test resulted in a slight adjustment to the wording of the questionnaire (Appendix 1).

This research focused on customers who have experienced in purchasing eco-friendly plastic products. This research used purposive sampling rather than random sampling, as the eco-friendly plastic customers hardly can be listed. Data were collected in Bandung, Indonesia from January to March 2019. The self-administered questionnaires were distributed to the potential respondents in public spaces, such as universities, city squares, and parks. Prior to handing the questionnaires, to ensure that the

respondents were suitable for this study, they were asked whether they had used eco-friendly plastic products. Of the 414 respondents who participated in this research, 400 questionnaires could be used for further analysis. Thus, the requirements of 400 samples for the confidence level of 95% and ±4.9% the margin of sample error have been fulfilled (Burns et al., 2017).

Testing the hypothesis in this research was conducted by using variance-based partial least squares (PLS-SEM), SmartPLS 3. Measurement models and structural models were examined by PLS-SEM. The PLS-SEM was used as this study is intended to assess the association among constructs and to evaluate the predictive power of the exogenous construct variables. Considering this study is to validate a green loyalty theory and because the data was not normally distributed, assessing the loyalty model by using SEM-PLS is suitable (Hair et al., 2017). In addition, this study also uses IBM SPSS Statistics 23 to evaluate descriptive statistics. The research methodology used in this study is presented in Fig. 2.

4. Results

4.1. Respondents' profile

Table 2 shows that female (under 35 years old) and student customers are the dominant respondents of this research. This demographic characteristics is consistent with other eco-friendly products researches (Suki, 2015; Wang, 2017).

4.2. Measurement model

Testing full collinearity VIFs to evaluate common method variance before examining the proposed model is suggested by Kock and Lynn (2012). Following this suggestion, this test results in the value of 2.394, less than the cut-off value of 5 (Hair et al., 2017), indicating that this study does not have a problem related to common method variance. Following this assessment, the measurement model testing involves assessment of construct reliability and validity, the outcomes are depicted in Table 3 and Table 4.

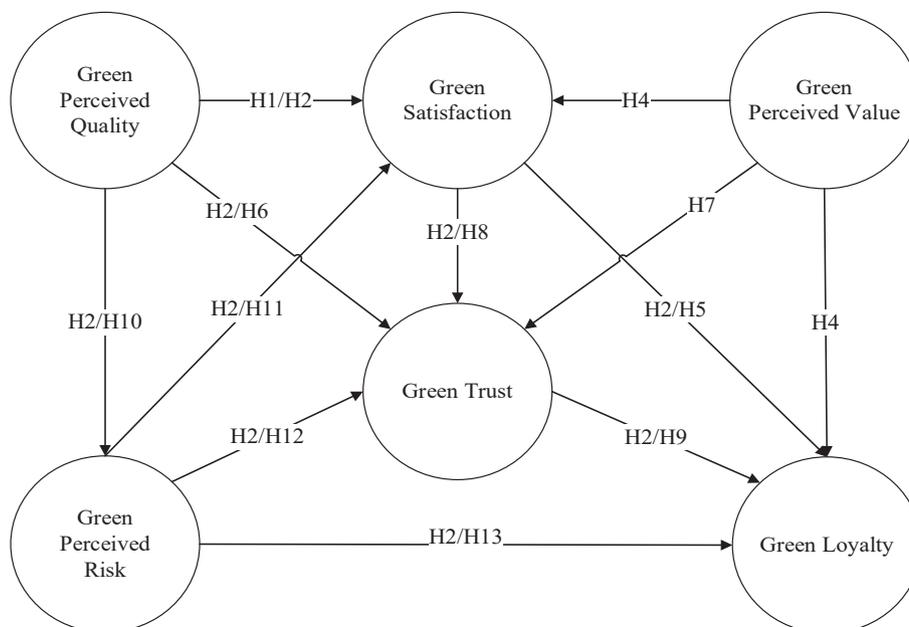Regarding internal consistency reliability, scholars suggested

Fig. 1. The integrated green loyalty model.

Table 1
Measurement scale and references.

Construct	Sources
Green perceived quality	Cheung et al. (2015); Konuk (2018); Suki (2015); (Marakanon and Panjakajornsak, 2017)
Green perceived value	Konuk (2018); Papista and Dimitriadis (2019); Woo and Kim (2019)
Green satisfaction	Hur et al. (2013); Kang and Hur (2012); Martínez (2015)
Green trust	Kang and Hur (2012); Martínez (2015); Wu et al. (2018)
Green perceived risk	Beneke et al. (2015); (Chen and Chang, 2013); (Marakanon and Panjakajornsak, 2017)
Green loyalty	Martínez (2015); Suki (2015); Wu et al. (2018)
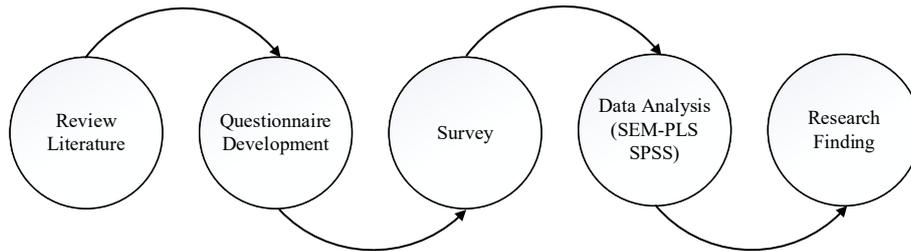
Fig. 2. The Flow chart of research methodology.

Table 2
Respondents' characteristics.

	Frequency	%
Gender		
Male	143	35.8
Female	257	64.2
Age		
17−23	220	55
24−35	110	27.5
36−55	62	15.5
>55	8	2
Occupation		
Student	222	55.5
Employee	79	19.75
Entrepreneur	30	7.5
Housewife	67	16.75
Others	2	0.5
Average income/month (Million IDR)		
<3	283	70.75
3−5	104	26
6−10	10	2.5
>10	3	0.75
Products used (year)		
<1	73	18.25
1−2	179	44.75
3−4	93	23.25
>4	55	13.75

applying composite reliability (CR) with cut-off value more than 0.7 (Hair et al., 2017). Testing for reliability indicators (Table 3) show that the requirement for reliability indicators is satisfied as indicator loadings exceeds 0.6. Further, the average variance extracted (AVE) is bigger than 0.5 where the criteria of convergent validity have been fulfilled (Hair et al., 2017). Furthermore, heterotrait-monotrait ratio of correlations (HTMT) with values not more than 0.9 is a suitable method to test discriminant validity (Henseler et al., 2015). This research has HTMT values less than 0.9 from each construct (see Table 4). Thus, this research has fulfilled all the criteria related to assessing the validity and reliability of the constructs. Fig. 3.

4.3. Structural model

To validate the PLS model as a whole, Tenenhaus et al. (2005) advise evaluating goodness-of-fit (GoF). The GoF value in this study (0.434) was included in the large category so that the proposed model was fit (Hair et al., 2017). By conducting a model fit test, it can possibly decide the approximate model fit. Approximate fit model criteria implemented for PLS-SEM are standardized residual root mean square (SRMR) with a cut-off value of 0.8 and normed fit index (NFI) with values above 0.9. This study has an SRMR value of 0.069 and NFI of 0.727. Although one of the criteria is not fulfilled, the other criteria have been fulfilled. Thus, this research still meets the requirements regarding the model fit so that the analysis can be carried out further.

Regarding to the R^2 value, the data analysis show that green perceived quality, green perceived value, and green satisfaction can predict 24% (R^2: 0.240) green loyalty. However, when green trust and green perceived risk are included in the green loyalty model, the predictive accuracy value increases to 27.9% (R^2: 0.279). Although this predictive accuracy is relatively low, this value is still in the range of R^2 values of most green loyalty studies, between 24% and 43% (Cheung et al., 2015; Suki and Suki, 2015; Zhang et al., 2020). In addition, the value of R^2 of 20% is considered relatively high in most studies aimed at explaining customer satisfaction and loyalty (Hair et al., 2017). To assess predictive relevance, Hair et al. (2017) states that the value of Q^2 higher than zero indicates that the exogenous construct has predictive relevance for the endogenous construct studied. This research has a Q^2 value of 0.091, 0.183, 0.295, and 0.167 respectively on the green perceived risk, green satisfaction, green trust, and green loyalty. Further, f^2 test results the range values from 0.015 to 0.249 indicating that the contribution of the predictor constructs to the value of R^2 of the endogenous construct is between medium and large (Hair et al., 2017). Thus, in overall, the model examined in this research has good relevance.

To assess the path coefficients, this study uses the bootstrapping method. Hair et al. (2017) suggest using 5000 bootstrap samples. Table 5 shows that the direct impact of green perceived quality on green satisfaction ($\beta = 0.125$, $p < 0.05$) as well as its indirect effect on green loyalty ($\beta = 0.160$, $p < 0.01$) is also noteworthy. Thus, H1and H2 are accepted. The direct impact of green perceived value on green satisfaction ($\beta = 0.327$, $p < 0.01$) on green loyalty ($\beta = 0.156$, $p < 0.05$) are significant, supporting for hypothesis H3 and H4. Further, the direct impact of green satisfaction on green loyalty ($\beta = 0.232$, $p < 0.01$) is significant,

Table 3
Loading, composite reliability and AVE.

Construct/item (mean; standard deviation)	Loading**	CR	AVE
Green perceived quality (3.974; 0.449)		0.857	0.501
- The best eco-friendly products	0.757		
- Reliable	0.689		
- Durable	0.632		
- Having a good image of the environment	0.786		
- Able to help preserve the environment	0.734		
- Made from safe ingredients	0.634		
Green perceived value (3.644; 0.494)		0.825	0.612
- Providing benefits that are more than the cost of getting it	0.724		
- Paying more attention to the environment than other products	0.839		
- More beneficial to the environment than other products	0.780		
Green satisfaction (4.027; 0.505)		0.888	0.725
- Feeling happy when using eco-friendly products	0.860		
- Buying eco-friendly products is the right decision	0.873		
- Overall satisfaction	0.820		
Green trust (3.8; 0.477)		0.869	0.624
- Having a good reputation for the environment	0.787		
- Reliable	0.757		
- The product used is an eco-friendly product	0.826		
- Keeping their commitments for environmental protection	0.789		
Green perceived risk (2.063; 0.519)		0.883	0.602
- Cannot function properly	0.702		
- Endangering health	0.823		
- Damaging reputation	0.819		
- Harming other people	0.770		
- Experiencing cost loss	0.759		
Green loyalty (3.705; 0.508)		0.843	0.643
- Recommending to other parties	0.826		
- Buying again in the future	0.838		
- Still using eco-friendly product, regardless its prices	0.738		

Note: **All of them is significant on $p < 0.01$.

Table 4
Heterotrait-monotrait ratio of correlations (HTMT).

|	1	2	3	4	5
(1) Green perceived quality					
(2) Green perceived value	0.526				
(3) Green satisfaction	0.433	0.564			
(4) Green trust	0.673	0.706	0.649		
(5) Green perceived risk	0.484	0.233	0.430	0.535	
(6) Green loyalty	0.366	0.551	0.557	0.601	0.290

thus H5 are accepted. The direct impact of green perceived quality on green trust ($\beta = 0.275$, $p < 0.01$) are significant, suggesting that H6 is accepted. Next, the direct impact of green perceived value on green trust ($\beta = 0.280$, $p < 0.01$), and are significant, thus hypothesis H7 are accepted. The direct impact of green satisfaction on green trust ($\beta = 0.241$, $p < 0.01$) is significant, meaning that H8 is accepted. Likewise, the direct impact of green trust on green loyalty ($\beta = 0.250$, $p < 0.01$) is significant so that hypothesis H9 is accepted. Then, green perceived risk negatively has a significant effect on green satisfaction ($\beta = -0.251$, $p < 0.01$) and on green trust ($\beta = -0.193$, $p < 0.01$), but not on green loyalty, thus H10 and H11 are accepted and H12 is rejected. Finally, hypothesis H13 is accepted as the negative association between green perceived quality on green perceived risk ($\beta = -0.403$, $p < 0.01$) is significant. The direct association between the tested variables is illustrated in Fig. 2.

5. Discussion and theoretical implications

First, this research examines green loyalty model toward plastic product by integrating green perceived quality, green perceived value, green perceived risk, and green trust as loyalty determinants.

The inclusion of these loyalty determinants, which in past studies were tested separately, reveal that green loyalty model is a fit. Further, the inclusion of green perceived risk and green trust in the green loyalty model increase the explanation power of green loyalty. From a theoretical perspective, this research confirms the loyalty model that exists in eco-friendly products. When green trust and green perceived risk are integrated into one model, this provides more explanation on how to establish loyalty towards eco-friendly plastic products. These findings are important because they extend the existing Quality-Loyalty Model in the context of eco-friendly plastic products. This finding suggests that in eco-friendly plastic products, the existence of green trust and green perceived risk in the loyalty model can strengthen the impact on green perceived quality, green perceived value, and green satisfaction simultaneously on customer loyalty. This argument is reinforced by several previous studies in the context of green products (Konuk et al., 2015; Marakanon and Panjakajornsak, 2017; Wang, 2017). Thus, future studies related to green plastic products should integrate green trust and green perceived risk into the loyalty model to provide a better explanation of the formation of green loyalty.

Second, this research applies green perceived quality, green perceived value, and green perceived risk as the determinants of green loyalty as well as green satisfaction and green trust. The results of this research reveal that only green perceived risk does not affect significantly on green loyalty. These results contradict past study (Wu et al., 2015) on eco-friendly electronic products. However, in overall effect (direct effects and indirect effects) these three determinants have an important total impact on green loyalty, green satisfaction, and green trust. Further, amongst the determinants, green perceived value is the factor that mostly influences green loyalty associated with green perceived quality and green perceived risk. This finding means that providing
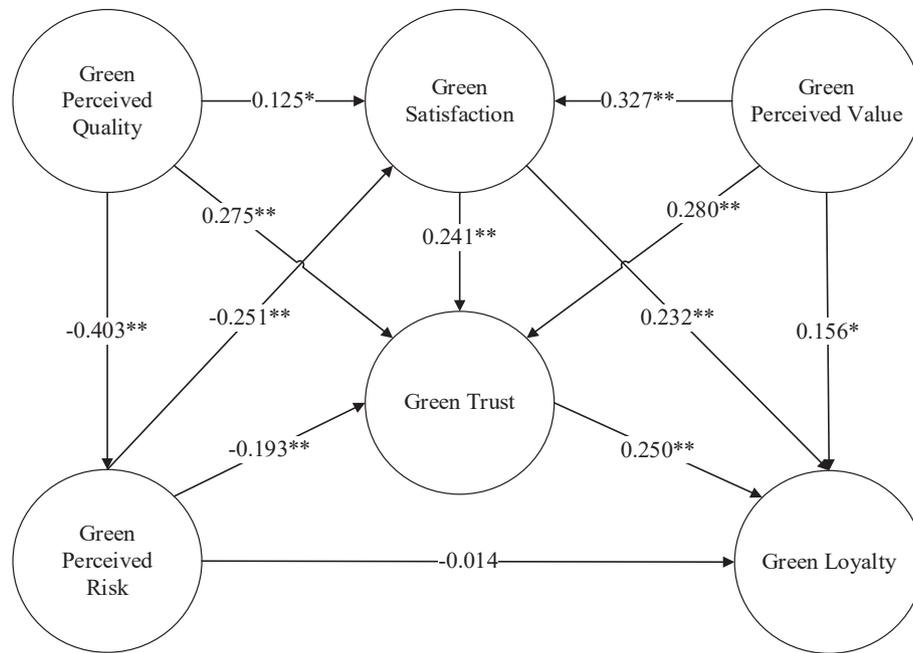
Note: **p < 0.01; *p < 0.05

Fig. 3. The summary of the relationship between variables.

Table 5
The results of hypotheses testing.

Path	Direct effect		Indirect effect		Total effect	
	β	t-value	β	t-value	β	t-value
Green perceived quality => Green loyalty	–	–	0.160	4.937**	0.160	4.937**
Green perceived quality => Green satisfaction	0.125	2.095*	0.101	4.284**	0.226	3.929**
Green perceived quality => Green trust	0.275	4.974**	0.132	4.702**	0.407	8.848**
Green perceived quality => Green perceived risk	−0.403	8.702**	–	–	−0.403	8.702**
Green perceived value => Green loyalty	0.156	2.536*	0.165	5.615**	0.321	5.967**
Green perceived value => Green satisfaction	0.327	6.714**	–	–	0.327	6.714**
Green perceived value => Green trust	0.280	6.854**	0.079	3.593**	0.358	8.509**
Green satisfaction => Green loyalty	0.232	3.992**	0.060	2.854**	0.292	5.421**
Green satisfaction => Green trust	0.241	4.819**	–	–	0.241	4.819**
Green trust => Green loyalty	0.250	3.903**	–	–	0.250	3.903**
Green perceived risk => Green loyalty	−0.014	0.267	−0.122	5.275**	−0.136	2.442*
Green perceived risk => Green satisfaction	−0.251	4.968**	–	–	−0.251	4.968**
Green perceived risk => Green trust	−0.193	4.093**	−0.060	3.744**	−0.253	5.558**

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

benefits that are more than merely sacrifices provide customers with an opportunity to create customers willingness to repurchase, recommend, and make eco-friendly plastic products their primary preference. These results broaden the understanding of previous studies relating to the loyalty (Chen, 2010; Cheung et al., 2015; Wu et al., 2015). In addition, this study also confirms previous studies (Marakanon and Panjakajornsak, 2017; Suki, 2015; Wang, 2017) related to the indirect impact of green perceived quality on green loyalty through strengthening risk, satisfaction, and trust.

Third, green perceived value is the factor that most influences customer satisfaction on eco-friendly plastic products compared to green perceived quality and green perceived risk. These findings indicate the importance of providing appropriate values expected by consumers who are concerned with the environment and this can provide more satisfaction in using eco-friendly plastic products. These results extend the explanation of previous studies that prove the influence of green perceived value, green

perceived risk, and green perceived quality on green satisfaction (Chen and Chang, 2013; Hur et al., 2013; Suki, 2015). In addition, green perceived quality is the most prominent factor in building green trust compared to green perceived value and green perceived risk. This finding implies that customers who experience high-quality eco-friendly plastic products will be more confident that the product has a good reputation, is reliable, and keeps its promise and commitment to the environment. These results provide evidence of the Green Trust Model (Chen, 2013; Cheung et al., 2015) in the context of eco-friendly plastic products.

Last, this study reveals significant findings in terms of the negative relation among green perceived quality and green perceived risk which have not been analyzed much by previous studies (Marakanon and Panjakajornsak, 2017). This study shows that green perceived quality is negative and significantly affects green perceived risk. Green perceived quality is the level of customer assessment of the advantages of a product that has a

positive influence on the environment (Konuk, 2018). Green perceived risk is the level of consumer concern regarding uncertainty in using eco-friendly products (Wu et al., 2015). Thus, the findings of this research show that if the quality perceived by customers is high, consumers will feel a lower risk when using eco-friendly plastic products. In other words, improving the quality of eco-friendly plastic products will reduce the functional, physical risk, psychological, social, and financial risk for consumers when using eco-friendly plastic products. These results corroborate the previous research in the context of electronics products (Chang and Chen, 2014) and cereal products (Beneke et al., 2015) which explore the negative relation among perceived quality and perceived risk.

6. Managerial implications

To create loyal customers toward eco-friendly plastic products, this study highlights the important role of perceived quality and perceived value. This finding offers a guidance for managers to create loyalty strategies toward their eco-plastic product. First, the managers need to ensure that the quality of their plastic products is at least as high as conventional plastic quality products to keep their customer loyal. Continuous innovation of the product is a key factor to ensure the perception that the eco-friendly plastic is perceived as a high-quality product. However, the eco-friendly plastic cost of production is significantly higher than that of conventional product. To overcome the cost of production issue and because the product has a role in contributing to a cleaner environment, it is suggested that the Government help the producers of eco-friendly plastic product competitiveness by, for instance, offering tax reductions for producers of eco-friendly plastic products.

Second, to develop customer loyalty, managers need to offer a product with a higher perceived value. This finding suggests that managers need to develop strategies to ensure that the benefit customers received is higher than their scarification (price paid). As the benefit of the green product offered is not only for the customers but also for environment and, indirectly, to the whole community, managers need to communicate and educate customers through their marketing campaign strategies. For instance, taking part in eco-friendly forums and sponsoring environmental projects to increase the positive image of their products is important. Also, the company could consider using environmental experts as endorsers to promote the green marketing campaign in the media by highlighting that the plastic has both high quality as well as having a positive contribution to environmental sustainability. The use of endorsement can convince customers that even though the price of eco-friendly plastic products is greater than that of conventional ones, their products are favorable for making a cleaner, greener, and healthy environment.

7. Limitations and future research

Although offering a significant contribution towards green loyalty, this study bears several limitations. The data in this research are limited to the perspective of eco-friendly plastic products customers from Bandung, Indonesia so that these findings may have a limit to generalization to other customers around the world. The consumption behavior of various countries can be studied and may include a cross-cultural study to assess the differences based on culture, including using participants from different regions or countries. Therefore, future research can examine the relationship between the variables in other regions or countries to broaden the generality. Furthermore, this study focused on perceived value, perceived risk, and perceived quality as determinants of satisfaction, trust, and loyalty towards eco-friendly plastic products. The results of this research indicate that there are other variables that have the potential to influence customer loyalty, such as product image and customer motivation. Future research can include these variables in the model. The extended loyalty model could be also applied in other eco-friendly products and service such as organic foods, vehicles, and hotels. Finally, to find out the differences between product life cycle or consumer experience, future research can also be conducted using the longitudinal method.

8. Conclusion

This study commenced with an idea to assess the formation of loyalty towards eco-friendly plastic product by integrating trust and perceived risk. Thus, besides including variables widely recognized as green loyalty drivers (green perceived quality, green perceived value, and green satisfaction) this study includes green trust and green perceived risk as loyalty drivers. The measurement of the variables was developed based on the extant literature. Prior to collecting the data, questionnaires had been tested on consumers who have experienced buying eco-friendly plastic products, resulting in a slight adjustment on the wordings. The data of this study was gathered from 400 respondents through a structurally constructed questionnaire. The data analysis, using partial least square, reveals that, except for the direct link between green perceived risk and green loyalty, all relationships hypothesized are supported. This result leads to three important conclusions. First, green perceived quality, green perceived value, and green satisfaction are important drivers of green loyalty. Second, the inclusion of green perceived risk and green trust as green loyalty determinants increase the prediction of green loyalty. Third, among the green loyalty determinants, green perceived quality and green perceived value have the biggest impact on green loyalty. Extending our understanding of loyalty formation theory in eco-friendly plastic products can now assist managers to understand customer loyalty formation towards eco-friendly plastic products, which enables them to develop appropriate marketing strategies. These include marketing strategies which focus on the high quality of the product and the high value of eco-friendly plastic products to the environment. Further, given that green loyalty toward eco-friendly plastic product is a relatively novel topic in this deteriorating global environment, further assessment of green loyalty formation towards eco-friendly products is necessary as there will no doubt be an increasing number of producers, manufacturers, marketeers and other stakeholders in the industry.

Declaration of competing interest

We declare that consumer behavior on eco-friendly product, as examined in our article "The Integrated Model of Green Loyalty: Evidence from Eco-friendly Plastic Products" is our research interest.

CRediT authorship contribution statement

Mohamad Reza Pahlevi: Conceptualization. **Dwi Suhartanto:** Writing - review & editing.

Appendix 1. Questionnaire

Constructs	Items
Green perceived quality	-The products are the best benchmark with respect to environmental concern -The products are reliable -The products are durable -The products have a good image of the environment -The products able to help preserve the environment -The products are made from safe ingredients
Green perceived value	-The products provide more benefit than the cost of getting it -The products pay more attention to the environment than other products -The products are more beneficial to the environment than other products
Green satisfaction	-I am glad to use the eco-friendly products -I believe that it is a right decision to purchase eco-friendly products -Overall, I am satisfied with eco-friendly products
Green trust	-I believe that the products have a good reputation for the environment -I believe that the products are reliable -I believe that the products used are eco-friendly products -I believe that the products keep their commitments for environmental protection
Green perceived risk	-The products cannot function properly -The products will endanger health -The products will damage your reputation -Using the products will harm other people -Using the products will experience cost loss
Green loyalty	-I will recommend to other parties -I will repurchase in the future -I am willing to use eco-friendly products, although other products' prices are cheaper

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