

# Perceived Circular Economy as a Mediator between Green Advertising and Circular Buying Behaviour of Green Products

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## ABSTRACT

The circular economy has gained attention as the outcome of Sustainable Development Goals (SDGs), which focus on Responsible Consumption and Production (SDG-12). Although the circular economy is a good initiative to make the environment more sustainable, however, consumers' perceptions of circular products are not always favorable. Therefore, this study aims to examine green advertising on the buying behavior of circular products, mediated by the circular economy. The study utilized Signaling Theory as the underpinning theory. The study applied a quantitative approach by using the survey method. The valid 183 respondents were collected via the purposive sampling technique and analyzed using Partial Least Square Structural Equation Modeling. The findings revealed that green advertising positively impacts circular buying behavior and the perception of circular economy. In addition, the circular economy positively impacts circular buying behavior. The study also found that circular economy mediates between green advertising and circular buying behavior. The study provides insightful implications for circular product businesses to embrace green advertising strategies to attract young consumers. In addition, educational institutions and consumer society should inculcate the concept of circular economy and help enrich knowledge and understanding to achieve the SDGs' goals and contribute to sustainable marketing scholarship.

**KEYWORDS:** Circular economy, Green advertising, Circular buying behavior, Sustainable consumption and production, SDG-12

Received 1 December 2024; Revised 4 January 2025; Accepted 15 January 2025

Doi: <https://doi.org/10.59953/paperasia.v4i1b.358>

## 1. INTRODUCTION

Green and circular economy products have gained research interest (Cam, 2023), which aligned with the sustainable development goal (SDG) on sustainable consumption and production (SDG-12) (Nekmahmud et al., 2022; Shahzabeen et al., 2023). Segal (2023), stated that consumers are willing to pay 12% of the premium for sustainable/ green products as a reference from the Bain survey. This was further strengthened by Doshi and Noble (2023), which highlighted the data by McKinsey and NielsenIQ that consumers are shifting their purchases toward the products related to the ESG (Environmental, Social, Governance) claims. Thus, it has shown that sustainable consumption is going to be a practice in the near future (Fischer et al., 2023),

and aligned with the concept of circular economy (Shahzabeen et al., 2023).

Purchasing green products as a practice is welcoming around the globe, however, in developing countries like Malaysia, the purchasing of green products is still at the early stage, as highlighted by Rusli et al. (2022), where the majority of the young consumers their awareness of the green products and its benefits in the Malaysia setting are still low to mediocre, which supported the study of Ur Rehman et al. (2023) where they found that the Malaysian consumers their intention to purchase green products is at the average level. In addition, the circular economy is still at the infancy stage in the Malaysian context (Agamuthu & Mehran, 2020), where the global production of municipal solid garbage is

anticipated to have grown by nearly 70 percent to 3.4 billion metric tonnes by 2050 (Zailani, 2023). Thus, circular economy practices can turn waste into wealth and sustain Malaysian economic growth (Sarpong & Alarussi, 2022).

Therefore, it has urged various bodies especially marketers to come out the marketing strategies and initiatives to attract potential consumers to purchase green products. Although there are many past studies on green products (Sun & Wang, 2020; Sun et al., 2022; Simanjuntak et al., 2023) and sustaining tourism products (Yang & Tan, 2025) have been carried out, there are mainly looking from the green marketing mix perspective (Nguyen-Viet, 2023; Sultan et al., 2023; Mahmoud et al., 2024). However, the study that focused on the promotion part of green marketing communication (e.g., green advertising) required an extension of the study (Wenting et al., 2022; Bi et al., 2023; Correia et al., 2023).

Although numerous studies examined circular economy (Chu & Yahya, 2024; Le et al., 2024). However, studies that examine the circular economy as the mediator are still scarce and various scholars have proposed to test the circular economy as a mediating variable (e.g. Samadhiya et al., 2023; Riggs et al., 2024). In addition, Tetteh et al. (2024) found that circular economy implementation has partial mediating effects on business analytics capability and sustainable performance. Based on the discussion, it is justified that the circular economy can play a mediating role between green advertising and buying behavior. Therefore, this study aims to examine green advertising on the circular buying behavior of green products with circular economy as the mediator.

## 2. LITERATURE REVIEW

### 2.1 Theoretical Underpinning

The formation of Signaling theory was first established by Micheal Spence in 1973 (Spence, 1973). As modeled by Bafera and Kleinert (2023), the main components of the Signaling theory are the signaler, signal, receiver, and the environment. In the marketing and advertising sector, signals are utilized to overcome seller and customer barriers. As customers are less inclined to know the true qualities of the products, compared to the sellers. Hence, firms can implement signals to showcase the true qualities of the product. This may include price, brand name, license, and advertising channels (Connelly et al., 2011). The theory provides a framework where firms can effectively communicate their green advertising to consumers who will interpret the signals. To further persuade consumers to purchase green products. In green marketing, signals could include pricing, external certifications, and the brand's reputation. They are allowing consumers to evaluate and infer regarding

the organization's green positions before purchasing the products (Ramirez et al., 2023). Thereupon, the Signalling theory concerning green advertising should be used to disseminate positive information to motivate consumers into buying green products, benefiting both the organizations and consumers.

### 2.2 Hypothesis Development

#### 2.2.1 Green Advertising and Buying Behavior

Luthfiana (2023) examined green advertising, eco-literacy, and green purchase behavior through green awareness as a mediator. The results indicate the positive impact of green advertising and green purchase behavior. In addition, Obaid and Rashid (2024), also found that green advertising positively impacts purchase intention and green purchase behavior. This also aligned with numerous studies that environmental/green advertisements have a positive and significant relationship with purchase behavior (Ahmad et al., 2020; Gu et al., 2022). This has synchronized with the notion of Signalling Theory, where the green advertisement from the firms acts as the signal and influences the received (customers) to form the buying behavior. Thus, this study postulated that:

H1: Green advertising positively impacts the circular buying behavior of green products.

#### 2.2.2 Green Advertising and Circular Economy

Green marketing communication (appeals and messages) in the campaign are signals that raise the awareness of the public on environmental issues and the circular economy. For instance, Mostaghel et al. (2023) and Rejeb et al. (2022) projected that marketing and circular economy are related and relevant. For instance, Gutentag and Antonia Russell (2024) found that the abstractness of green advertising can be reduced with the circular economy message, and will lead to effectiveness of the green advertising. Besides, Jan (2024) examined caused-related marketing as the promotional tool of the circular economy and supported that it positively leads to purchase intention. Therefore, the current study hypothesized that:

H2: Green advertising positively impacts the circular economy.

#### 2.2.3 Circular Economy and Circular Buying Behavior

The circular economy has emerged as a potential concept to regenerate business or economic activities while generating less waste and harm to the environment through reducing, reusing, recycling, and recovering materials (Kirchherr et al., 2023). Ramadhanti et al. (2024) intend to study the green purchase behavior in circular packaging in the Indonesian context and found that the circular packaging will make consumers purchase the products. Besides, Vidal-Ayuso et al. (2023)

utilized SLR and found that circular economy impacts many consumers' behavior including purchase intention and decision-making. In addition, Stangherlin et al. (2023) also found that consumers practice recycling behavior (circular economy) more, which will motivate them to buy circular products, which also aligned with the notion of Majeed et al. (2022) that the circular economy does impact green purchase intentions. Based on the discussion, the study ascertained that:

H3: Circular economy positively impacts the circular buying behavior of green products.

2.2.4 Mediating Role of Circular Economy

Samadhiya et al. (2023) investigate the total productive Maintenance, Industry 4.0 on circular economy and sustainable performance of firms. The results indicated that the circular economy partially mediated the relationship between Industry 4.0, total productive maintenance, and sustainable performance. Besides, Riggs et al. (2024) also found that circular economy practices can mediate the information systems capabilities and business performance relationship. In addition, Birgovan et al. (2022) also found a positive impact between corporate environmental responsibility practices and the readiness for change, mediated by perceived circular economy drivers. This has been further strengthened by the study of Tetteh et al. (2024) who found that circular economy implementation has a partial mediating effect on business analytics capability and sustainable performance. Based on this notion, hence, this study demonstrated that:

H4: Circular economy mediates the relationship between green advertising and the circular buying behavior of green products.

2.2.5 Control Variables

Gender and income have been incorporated as the

control variables to avoid spurious explanations in the proposed hypotheses (Figure 1). In the consumer behavior literature, gender plays a crucial role in influencing green buying behavior (Migheli, 2021; Zhao et al., 2021). Prior research has also indicated significant income differences in purchasing green products (Witek & Kuźniar, 2021; Barbu et al., 2022). Thus, the current study includes gender and income as the control variables.

3. METHODOLOGY

3.1 Research Design

Quantitative research was carried out, where the study used a survey questionnaire. A survey entails the utilization of a structured questionnaire to measure the variables using numerical and statistical analysis (Ponto, 2015). Furthermore, quantitative research is often used in studying consumer behavior of green products (Barbu et al., 2022; Yener et al., 2023).

3.2 Sampling Procedure

This study focused on the respondents in Klang Valley, Malaysia. People in Klang Valley have strong buying power due to the rapid urban development and higher incomes. Due to the researchers not being able to get the entire population of respondents who purchase circular products, researchers have utilized the G-power analysis to estimate the sample size, and the minimum sample size of 119 is needed (predictors: 3, effect size: 0.15; power: 0.95), but the current study managed to get 183 valid samples, hence, it is still deemed sufficient for statistical analysis. Purposive sampling was applied and supported by numerous past literatures on consumer buying behavior of green products (Warmadewa & Paramita, 2021; Ramany et al., 2022), where the respondents must be aware of green advertisements and have purchased the green/ circular products to eligible to answer the survey.

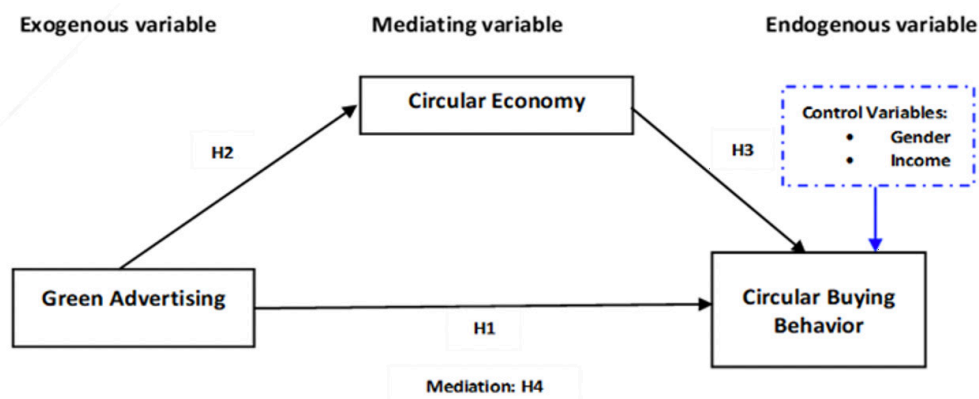


Figure 1: Conceptual framework

### 3.3 Measurement

Section A contains the items on the demographic characteristics such as gender, age, education, income, and frequency of buying organic food products. In addition, two screening questions were included, namely “Do you buy green products before?” and “Have you seen any of the green advertisements related to green products?” to filter the valid responses.

Section B contains items on the three variables. The items related to green advertising were adapted from Haytko and Matulich (2008), while the items on circular buying behavior of green products were adapted and modified from Kabir and Islam (2022). The items for the circular economy were adapted and modified from (Geissdoerfer et al., 2017; Elia et al., 2017; Kirchherr et al. 2023). The statements were measured based on a 5-point Likert-type scale whereby 1 (strongly disagree) to 5 (strongly agree). (Refer **Table 1**)

### 3.4 Data Collection Procedure

The Google form link was shared through various social media platforms, mainly via Instagram, Facebook,

and WhatsApp. Before answering the survey, the respondents are notified that their responses will be used exclusively for research purposes which is stated on the cover page of the Google form. Besides, anonymity and confidentiality of the respondents' information were also granted by the researcher which abides by the research ethics on human participation.

### 3.5 Statistical Significance

Descriptive and inferential statistics were performed. Researchers utilized the Partial Least Square Structural Equation Modelling (PLS-SEM) to test the hypotheses. PLS-SEM was recommended for use when out-of-sample prediction is the focus to support the external validity (Hair & Alamer, 2022), which aligned with the aim of this study to find out the prediction.

### 3.6 Common Method Variance

Common method variance (CMV) needs to be addressed before testing the measurement model and it is single source data to measure each variable and common happened in survey design (Wall et al., 2021).

**Table 1:** Operationalization of variables

Variable(s)	Definition	Items	Sources
Circular economy	An economic system that regenerates business or economic activities while generating less waste and harm to the environment through reducing, reusing, recycling, and recovering materials (Kirchherr et al. 2023).	CE1: The business is engaged in reducing resources used in the production, distribution, and consumption processes. CE2: The business is engaged in reusing resources in production, distribution, and consumption. CE3: The business is engaged in recycling resources in the production, distribution, and consumption processes. CE4: The business is engaged in recovering resources in the production, distribution, and consumption processes. CE5: The business is engaged in the regeneration of resources through production, distribution, and consumption processes. <i>(deleted)</i>	(Geissdoerfer et al., 2017; Elia et al., 2017; Kirchherr et al. 2023)
Green advertising	Efficient means to influence consumers to buy products that are eco-friendly to our environment (Yeng & Yazdanifard, 2015).	GA1: I plan to buy green/ circular products that are being advertised as green. GA2: I would pay premium prices for green/ circular products that are being advertised as green. GA3: I am more likely to buy green/ circular products from brands that practice green advertising.	(Haytko & Matulich, 2008)
Circular buying behaviour	The needs, motives, and mental processes of consumers when choosing green/ circular products over other products (Auf et al., 2018)	CBB1: If green/ circular products are available, I am willing to buy them. CBB2: If green/ circular products are affordable, I would buy them. <i>(deleted)</i> CBB3: I prefer to consume green/ circular products.	(Kabir & Islam, 2022)

Hence, to test the CMV, the researchers used a full collinearity assessment to produce a variance inflation factor (VIF), and the value that should be less than 3.3 as suggested by (Hair et al., 2022; Kock, 2015) (see **Table 2**). Thus, there is no serious bias in the data set.

**Table 2:** Full collinearity assessment

Variables	(Dummy Variable) VIF
CBB	1.997
GA	2.233
CE	1.794

**4. RESULTS & DISCUSSION**

More than half (65.0%) were females than males. Besides, more than half of the respondents were less than 26 years old (64.5%), which indicates the respondents are mostly young consumers. About education, more than half of them have earned a bachelor's degree (67.2%), which shows that they are educated and able to make wise decisions. For the income, more than half of the respondents earned less than RM1000. (51.4%).

**4.1 Measurement Model Assessment**

Henseler et al. (2009) and Hair et al. (2022) highlighted that reliability can be measured using factor loading and composite reliability (CR). As shown in **Table 2**, the loading of all items is more than 0.60 as suggested by Bryne (2016), however, item CBB2 was deleted as it was less than the value of 0.60. Following Cronbach's alpha surpassed the value of 0.7 (Hair et al., 2024). Discriminant validity was carried out to test the validity of constructs. Hair et al. (2024) highlighted that the CR should exceed 0.70, while the Average Variance Extracted (AVE) should be more than 0.50. Thus, the convergent validity is

confirmed (see **Table 3**).

Heterotrait-Monotrait Ratio of Correlations (HTMT) was used to examine the discriminant validity (Henseler et al., 2015). Based on Cheung et al. (2023), the value of HTMT should not exceed 0.85. As demonstrated in **Table 4**, all HTMT values did not surpass 0.85. which ascertained the discriminant validity. The researchers used the variance inflation factor (VIF) to detect the collinearity issue, Diamantopoulos and Siguaw (2006) mentioned that the VIF value should not more than 3.3. Thus, there is no severe collinearity issue.

**Table 4:** HTMT ratio

	CBB	CE	GA
CBB			
CE	0.668		
GA	0.806	0.698	

**4.2 Structural Model Assessment**

Researchers used the bootstrapping technique with 5,000 resamples (Preacher & Hayes, 2008) to test the structural model. The results depicted in **Table 5** show that green advertising has a positive impact on the circular buying behavior of green products ( $\beta = 0.516$ ,  $t$ -value = 6.266,  $p < 0.05$ ). Thus, H1 is supported. In a similar vein, the circular economy is significantly and positively impacted by green advertising ( $\beta = 0.650$ ,  $t$ -value = 15.596,  $p < 0.05$ ), thus, sustaining H2. In addition, the circular buying behavior of green products was also significantly impacted by the circular economy ( $\beta = 0.253$ ,  $t$ -value = 2.586,  $p < 0.05$ ). Accordingly, H1, H2, and H3 are retained. Green advertising can explain 50.4% of circular buying behavior and 42.2% of circular economy.

**Table 3:** Convergent validity

Variables	Items	Item deleted	Loadings	Cronbach	CR	AVE
Circular buying behaviour	CBB1	CBB2	0.918	0.817	0.916	0.845
	CBB3		0.921			
			0.912			
Green Advertising	GA1		0.912	0.873	0.922	0.797
	GA2		0.873			
	GA3		0.894			
			0.717			
Circular economy	CE1		0.717	0.736	0.820	0.535
	CE2		0.743			
	CE3		0.610			
	CE4	CE5	0.836			

**Table 5:** Direct effects

Paths	Std. Beta	Std. error	T	P	LLCI (5%)	ULCI (95%)	D	R <sup>2</sup>	f <sup>2</sup>	VIF
H1: GA -> CBB	0.516	0.082	6.266	0.000	0.385	0.656	S	0.504	0.308	1.739
H2: GA -> CE	0.650	0.042	15.596	0.000	0.569	0.708	S	0.422	0.731	1.000
H3: CE -> CBB	0.253	0.098	2.586	0.005	0.078	0.404	S		0.074	1.753
<b>Control variables</b>										
Gender -> CBB	-0.043	0.109	0.397	0.346	-0.214	0.144	NS			
Income -> CBB	0.045	0.055	0.826	0.204	-0.042	0.14	NS			

ULCI = Upper Level Confident Interval, LLCI = Lower Level Confident Interval; D= Decision; S= Supported; NS = Not supported  
1-tailed test

### 4.3 Mediation Analysis

Circular economy as a mediator was incorporated to test the relationship between green advertising, and circular buying behavior of green products (Figure 2). The empirical findings show the circular economy was affirmed as a mediator on the path between green advertising and the circular buying behavior of green products ( $\beta = 0.164$ ,  $t$ -value = 2.491,  $p < 0.05$ ) (Table 6). Thus, H4 is accepted.

### 4.4 PLS-Predict Analysis

PLS-predict was used to solve the apparent dichotomy between explanation and prediction (Shmueli et al., 2019; Sharma et al., 2021). Since the results of Q2 predict values were all more than zero (see Table 7), the Q2 predict indicates the model has sufficient predictive relevance. Hence, it indicated that the circular buying behavior of green products and circular economy has a medium predictive power.

The study affirmed that green advertising has a positive impact on circular buying behavior, which supported the H1. This is also supported by numerous past studies

(e.g. Ahmad et al., 2020; Gu et al., 2022; Obaid & Rashid, 2024). This is further aligned with the Signaling theory that green advertising is an effective marketing signal that influences the consumers (receiver) to buy the circular/green products (actions).

Besides, green advertising also positively impacts the circular economy, which supports H2. The concepts of green advertising (promotional element) and circular economy are relevant and related, which aligned with the notion of (Rejeb et al., 2022; Mostaghel et al., 2023). In addition, it is also supported by Jan (2024) that caused-related marketing as the promotional tool of circular economy positively leads to purchase intention.

In addition, this study also found that perceived circular economy positively influences circular buying behavior, which affirmed the H3. This has also been congruent with numerous studies (Majeed et al., 2022; Stangherlin et al., 2023; Vidal-Ayuso et al., 2023;). When consumers perceive the circular economy as an activity that benefits the environment, it will shape their perception and will motivate them to purchase circular products.

Table 6: Indirect effect

Path	Std. Beta	Std. error	T	P	LLCI (2.5%)	ULCI (97.5%)	D
H4: GA -> CE -> CBB	0.164	0.066	2.491	0.013	0.028	0.285	S

ULCI = Upper Level Confident Interval, LLCI = Lower Level Confident Interval; D= Decision; S = supported 2-tailed test

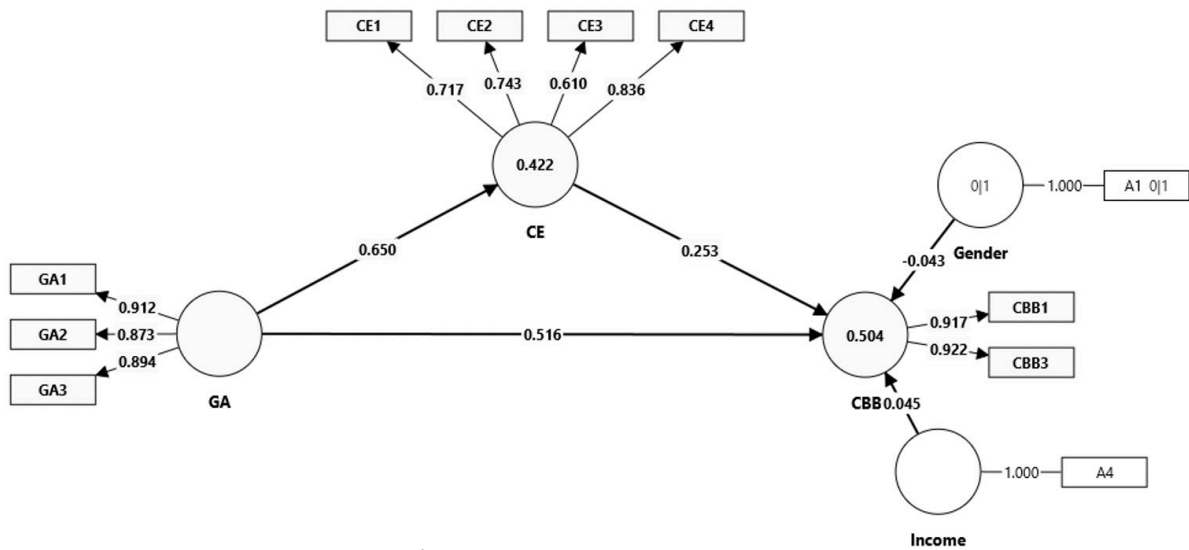


Figure 2: Structural model assessment

Table 7: PLS Predict

	Q <sup>2</sup> predict	PLS-SEM_RMSE	LM_RMSE	PLS-SEM - LM	Interpretation
CBB1	0.386	0.621	0.631	-0.010	Medium
CBB3	0.360	0.738	0.730	0.008	
CE1	0.088	0.687	0.69	-0.003	Medium
CE2	0.105	0.865	0.874	-0.009	
CE3	0.033	0.651	0.644	0.007	
CE4	0.484	0.764	0.751	0.013	

In this case, the circular economy as a mediator was also found to have a significant mediating effect between green advertising and circular buying behavior, which this also congruent with past studies (Bîrgovan et al., 2022; Samadhiya et al., 2023; Riggs et al., 2024).

## 5. CONCLUSION

In conclusion, the study found that green advertising positively impacts circular buying behavior and circular economy, and circular economy also has a positive influence on circular buying behavior. Furthermore, this study affirmed the mediating role of the circular economy on the relationship between green advertising and circular buying behavior.

### 5.1 Academic Implications

This study contributes to the Signaling theory of circular purchasing behavior. The results confirm that green advertising is an effective signal that influences consumers. The green advertising messages/ signals are perceived as credible and trustworthy by consumers. Furthermore, it highlights their role in making the green information asymmetry between businesses and consumers regarding environmental practices (Liu, 2024). Therefore, this study provides a further perspective on Signaling theory and circular purchasing behavior (Fu et al., 2024; Santos et al., 2024) in the Malaysian context. This study contributed to sustainable marketing literature by examining circular economy as a mediator which has not been sufficiently explored in an emerging nation context.

### 5.2 Practical Implications

This study offers valuable insights for governments and policymakers, where governments and policymakers can develop educational campaigns to spread awareness regarding environmental concerns and practices. This will help to normalize environmental practices and reduce waste in Malaysia (Sarpong & Alarussi, 2022).

Besides, businesses can apply this study as a guideline to understand what attracts green consumers in Malaysia. For instance, the practitioners can focus on consumers' attitudes towards green products by highlighting their benefits and advantages through point-of-displays or other promotions to improve consumer experience. In addition, businesses can advance their green advertising strategies through transparent and credible green messaging to overcome the threat of greenwashing and green scepticism. Thus, businesses must carefully craft their green messages, so that the messages are truthful, transparent and do not over-promise the benefits of green products to lessen the negative impact of greenwashing and green scepticism. This will surely help to stand out amongst the noises from other sources to convey credible and engaging green

advertising messages to reach consumers.

Policymakers and regulators in the government should take the initiative to address serious issues such as wrong claims or deceptive green labelling or promotions by enforcing rules and policies. For instance, Malaysian policymakers should reinforce the SIRIM QAS International Eco-Labeling Scheme and ensure that green businesses are qualified and certified under the MyHIJAU Mark to prevent misleading green product labels and claims.

### 5.3 Limitations and Future Research Directions

This study posed several limitations. Firstly, this study only focuses on circular products in general. Hence, future research could benefit from examining different circular products such as second-hand clothing (Koay et al., 2024), and home appliances to name a few to provide better insights.

Secondly, this study is based in Malaysia. However, due to cultural, social, and economic differences, investigating how other countries perceive circular economy and circular purchasing behavior would be interesting to be carried out as different countries have different policies when comes to the circular economy.

The current study only focused on green advertising as the green promotional strategy, therefore, other green promotional communication elements such as green branding, green user-generated content, and green social media messages can be further incorporated to enhance the green promotional communication elements. In addition, this study only included a mediator, future studies can further include other variables such as green altruistic motivation (Alam et al., 2023; Cao & Yu, 2024), eco innovation (Le et al., 2023; Chu & Yahya, 2024), greenwashing, information sharing (Santos et al., 2024) and green self-efficacy (Alam et al., 2024; Ho & Lin, 2024) to further expand the current framework and contribute significantly to the green and sustainable marketing scholarship to aligned with the SDG initiatives.

## ACKNOWLEDGMENT

The authors would also like to thank Multimedia University for providing financial support to publish this article.

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