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The Mediating Role of Green Competencies and Awareness on the Emotional Green Marketing Advertising and Ecological Behaviour

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ABSTRACT

This study examines the behavioural mechanisms through which emotional drivers shape ecological behaviour by integrating cognitive and affective pathways within a structural framework. Specifically, it aims to (1) assess the direct effect of Emotional Green Marketing Advertisement (EGMA) on ecological behaviour, (2) determine the influence of EGMA on green competencies and awareness related to e-waste (AWA), and (3) evaluate the mediating roles of these constructs in translating emotional appeals into sustainable consumer actions. Adopting a quantitative, cross-sectional design, data were collected from 350 Malaysian consumers using a structured questionnaire with five-point Likert scales. The proposed model was tested using Partial Least Squares–Structural Equation Modelling (PLS-SEM) to simultaneously assess measurement validity and hypothesized structural relationships. The results indicate that EGMA significantly influences ecological behaviour both directly and indirectly through green competencies and awareness. Green competencies exhibit the strongest mediating effect, emphasizing the importance of enhancing consumers' environmental knowledge, skills, and problem-solving capabilities. Awareness related to e-waste also contributes meaningfully, demonstrating that emotional concern and risk perception motivate responsible disposal and consumption practices. Reliability and validity assessments confirm robust psychometric properties of the measurement model. Overall, the findings suggest that effective green marketing strategies should combine emotional resonance with competency-building and awareness initiatives to foster consistent and long-term ecological behaviour. The study offers theoretical and practical insights for designing sustainability communication in emerging economies.

Keywords: *Emotional green marketing, e-waste awareness, ecological behaviour, green competencies, sustainable consumption.*

INTRODUCTION

Growing environmental degradation and climate-related challenges have intensified scholarly and practical interest in green marketing as a strategic instrument for promoting sustainable consumption. Green marketing has evolved from a niche concept into a core domain within contemporary marketing research, as organizations increasingly integrate environmental considerations into product design, communication, and consumer engagement strategies (Kumar et al., 2025; Papadas et al., 2019). Governments and non-governmental organizations likewise employ green marketing campaigns to reshape public perceptions, foster environmental

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responsibility, and raise awareness of ecological issues. However, such efforts are not without challenges, as poorly designed green messages may trigger scepticism or perceptions of greenwashing, thereby weakening their intended behavioural impact (Sajid et al., 2024; Szabo & Webster, 2021). When strategically designed and credibly communicated, green marketing advertising remains one of the most effective mechanisms for encouraging environmentally responsible behaviour and supporting sustainability-oriented consumption patterns (Ward, 2020).

Among the most pressing environmental challenges associated with contemporary consumption is electronic waste or e-waste, defined as discarded or obsolete electrical and electronic equipment. Rapid technological advancement and shortened product life cycles have accelerated the generation of e-waste at a rate that exceeds global population growth, making it one of the fastest-growing waste streams worldwide (Widmer et al., 2005; Hussin et al., 2024). Electronic devices have become deeply embedded in everyday life, supporting communication, productivity, and digital participation, yet their widespread use has intensified environmental pollution through the accumulation of hazardous waste (Wardynski, 2019). E-waste contains both valuable materials and toxic substances, posing serious risks to ecosystems and human health if improperly managed. Global data indicate that approximately 62 million metric tons of e-waste were generated worldwide in 2022, with projections estimating an increase to 82 million metric tons by 2030, while only about 22.3 percent is formally recycled, highlighting the urgency of effective waste management systems and behavioural interventions at the consumer level (Green, 2025).

The challenges associated with e-waste management are particularly pronounced in developing countries, where formal recycling infrastructure, regulatory enforcement, and public awareness remain limited. In such contexts, obsolete electronic devices are often disposed of through informal channels, landfilling, or open burning, practices that exacerbate environmental pollution and health hazards (Kang & Schoenung, 2004). Although electronic products offer substantial social and economic benefits, their end-of-life impacts reveal a critical sustainability paradox, where technological progress simultaneously generates environmental risk (Sinha, 2007). While developed economies have implemented extended producer responsibility schemes and formal recycling systems, many developing countries continue to struggle with ineffective e-waste governance and low levels of household participation in responsible disposal practices (Faradillah et al., 2025). These conditions highlight the importance of demand-side approaches that emphasize awareness, behavioural change, and consumer engagement alongside structural solutions.

Dominant communication narratives often emphasize innovation, novelty, and convenience, while downplaying the environmental consequences of frequent device replacement (Erkmen et al., 2025). This imbalance contributes to low-risk perception and weak personal responsibility among consumers. Strategic environmental communication can play a critical role in reframing e-waste as a shared societal concern, promoting responsible consumption, repair, and recycling behaviours (Hasbi et al., 2025). Effective messaging that combines factual information, emotional appeals, and social norms is therefore essential to influence consumer attitudes and encourage pro-environmental action in managing electronic waste.

Within this context, emotional green marketing advertising has gained attention for its potential to influence pro-environmental behaviour by appealing to affective and cognitive processes (Rizal et al., 2023). Emotional appeals can make abstract environmental issues more personally relevant and salient, thereby enhancing message engagement and recall. However, emerging research suggests that emotional stimulation alone may be insufficient to produce sustained ecological behaviour unless individuals possess the internal capacities needed to interpret, evaluate, and act upon such messages. Green competencies, encompassing environmental knowledge, skills, and awareness, have therefore been identified as critical mechanisms that translate green marketing stimuli into consistent behavioural outcomes (Anwar et al., 2020). Understanding how these competencies interact with emotional green advertising is essential for explaining why some individuals adopt ecological behaviour while others do not.

Despite growing interest in green marketing and sustainability communication, significant gaps remain in explaining the behavioural mechanisms underlying ecological behaviour, particularly in the context of e-waste management in developing countries (Surya & Wan, 2025). Existing studies have predominantly examined the direct effects of green advertising on attitudes or intentions, often overlooking the mediating roles of green competencies and awareness related to e-waste. Addressing this gap, the present study investigates how emotional green marketing advertising influences ecological behaviour both directly and indirectly through green competencies and awareness related to e-waste (Hasbi et al., 2025). By focusing on Malaysian respondents, where digital consumption is rapidly expanding alongside mounting environmental challenges, this research offers context-specific insights that contribute to the refinement of green marketing theory and provide practical implications for designing more effective sustainability-oriented communication strategies.

LITERATURE REVIEW

From a communication perspective, the model draws on green marketing and environmental communication theories, which argue that pro-environmental behaviour is more likely when messages combine emotional appeals with informational content that builds knowledge, skills, and perceived capability (Hasbi et al., 2025). The mediating role of green competencies expects that communication effectiveness depends on audience empowerment, not merely exposure.

Emotional Green Marketing Advertising

Emotional green marketing advertising has emerged as a critical approach in promoting environmentally responsible consumption by complementing rational information with affective appeals (Taufique, 2022). Prior studies distinguish green advertising strategies into functional and emotional dimensions, where functional appeals emphasize factual information such as environmental impact, recycling benefits, and sustainability performance, while emotional appeals rely on affective cues, including visual aesthetics, natural imagery, and emotionally charged narratives to evoke feelings that influence consumer responses (Andersson et al., 2013; Hartmann et al., 2005). Although functional messages are essential for conveying objective environmental claims, their effectiveness is often constrained by consumers' limited cognitive processing capacity and information overload in real-world decision contexts. Consequently, emotionally driven green advertisements are increasingly favoured, as they can capture

attention, enhance message recall, and foster positive attitudes toward environmentally friendly initiatives more effectively than purely informational content (Lewinski et al., 2014; Lovett et al., 2013).

In the broader evolution of green marketing, emotional appeals have gained prominence alongside growing global environmental concerns and the institutionalization of sustainability within marketing practices. Green marketing is widely defined as the integration of environmental considerations into marketing activities to satisfy consumer needs while minimizing ecological harm (Widodo et al., 2025). Within this paradigm, advertising plays a pivotal role in shaping pro-environmental perceptions and behaviours, particularly when emotional cues are used to translate abstract environmental issues into personally meaningful experiences (Taufique, 2022). Research in branding and communication consistently shows that emotional values can exert an immediate and direct influence on behaviour by fostering trust, reducing perceived uncertainty, and strengthening personal relevance, especially when functional differences between offerings are minimal (Meng et al., 2025). Accordingly, contemporary green marketing literature emphasizes that emotional green advertising should not replace functional information but rather work synergistically with it, as sustainable behavioural change is more likely to occur when emotional resonance is reinforced by credible and comprehensible environmental claims (Wang et al., 2022).

Understanding Green Competencies

Green competencies are commonly conceptualized as a multidimensional capacity that enables individuals to understand environmental issues, evaluate their consequences, and translate such understanding into responsible actions. Prior literature defines green competencies as the combination of environmental knowledge, awareness, skills, and attitudes that allow individuals to interact with the natural environment in a proactive and sustainable manner (Leonidou et al., 2016; Subramanian et al., 2016). These competencies are not limited to factual knowledge alone but also encompass cognitive readiness and practical abilities related to resource conservation, waste reduction, and environmentally responsible decision-making (Fraijo-Sing et al., 2010). Empirical studies further position green competencies as a higher-order dispositional construct integrating environmental values, beliefs, and motivations that guide environmentally oriented behaviour across contexts (Corral-Verdugo, 2002; Jacobs et al., 2010; Widodo et al., 2025). In this sense, green competencies function as adaptive mechanisms that help individuals respond effectively to environmental challenges and sustainability demands.

Existing research highlights the critical role of environmental knowledge and awareness as foundational elements of green competencies. Green knowledge equips individuals with the ability to recognize environmental problems and understand cause–effect relationships, thereby enabling informed behavioural adjustments (Vicente-Molina et al., 2013; Yu et al., 2022). At the same time, awareness of environmental risks and impacts enhances sensitivity toward sustainability issues and strengthens motivation to engage in environmentally responsible actions (García-Alaminos et al., 2022; Zsóka et al., 2013). Studies across organizational and societal contexts consistently show that individuals with higher levels of green competencies are more likely to exhibit ecological behaviour, such as recycling, energy conservation, and pollution reduction, as these competencies reduce uncertainty and increase perceived behavioural control

(Cabral & Dhar, 2019; Subramanian et al., 2016). Moreover, green competencies are often strengthened through exposure to environmental communication and education, suggesting that marketing-related stimuli can play an important role in competency development (Liu et al., 2018).

Within the context of green marketing, emotional and functional message components are expected to interact with green competencies by shaping how environmental information is processed and internalized. Functional aspects of green marketing advertising provide concrete environmental information that enhances cognitive understanding, while emotional elements stimulate personal relevance and motivation, together reinforcing competency development and subsequent behaviour (Li et al., 2025). Prior behavioural research indicates that ecological behaviour is strongly associated with individuals' environmental knowledge, awareness, and concern, which together form the cognitive foundation of green competencies (Axelrod & Lehman, 1993; Chan et al., 2017; Kaiser, 1998). Building on this theoretical grounding, green competencies are positioned as a key explanatory mechanism linking green marketing communication to ecological behaviour. We created these proposed relationships based on the explanations:

H1: The functional aspects of emotional green marketing advertising have a significant relationship with ecological behaviour.

H2: Emotional green marketing have a significant relationship with green competencies.

H3: Green competencies have a significant relationship with ecological behaviour.

Understanding Awareness

Awareness related to e-waste refers to individuals' understanding of the environmental, health, and social consequences arising from improper disposal of electronic products, as well as their knowledge of responsible end-of-life management practices. Prior studies consistently demonstrate that consumer awareness plays a pivotal role in shaping intentions and actual behaviours related to e-waste handling and disposal (Ishak & Zabil, 2012; Makanyeza et al., 2021). Individuals with higher levels of environmental awareness are more likely to recognize the risks associated with hazardous substances embedded in electronic waste, such as heavy metals and toxic compounds, and consequently exhibit stronger tendencies toward responsible disposal and reuse behaviours (Kiddee et al., 2013; Robinson, 2009). Conversely, limited awareness and inadequate access to reliable information have been identified as major barriers to effective e-waste management, often leading consumers to store obsolete devices or dispose of them through informal and environmentally harmful channels (Kumar & Dixit, 2018; Shah, 2014).

The growing volume of e-waste, driven by rapid technological advancement and shortened product life cycles, further amplifies the importance of awareness as a behavioural determinant (Widmer et al., 2005; Widodo et al., 2025). Empirical evidence suggests that awareness of environmental and health risks significantly enhances individuals' willingness to engage in pro-environmental actions, including recycling, reuse, and participation in formal collection systems (Aboelmaged, 2021; Islam et al., 2020). However, awareness alone may not be sufficient when institutional support and clear disposal infrastructure are lacking, particularly in developing countries where e-waste systems remain fragmented (Borthakur & Govind, 2017; Saritha et al., 2015). In such contexts, marketing communication and informational campaigns

play a critical role in translating awareness into ecological behaviour by making e-waste issues personally relevant and emotionally salient. Building on this perspective, emotional green marketing advertising is expected to enhance awareness related to e-waste, which in turn promotes ecological behaviour. We created these proposed relationships based on the explanations:

H4: Emotional green marketing has a significant relationship with awareness.

H5: Awareness has a significant relationship with ecological behaviour.

Determining Factor of the Ecological Behaviour and Mediating Effect of Green Competencies and Awareness

Ecological behaviour is widely recognized as a multifaceted outcome influenced by cognitive, affective, and contextual factors that shape individuals' responses to environmental stimuli. Prior studies emphasize that exposure to green marketing messages alone is often insufficient to produce consistent ecological behaviour unless individuals possess the internal capacities required to interpret and act upon such messages (Widodo et al., 2025). In this regard, green competencies comprising environmental knowledge, skills, and confidence play a crucial role in bridging the gap between environmental concern and actual behaviour by enabling individuals to translate green marketing information into practical actions (Fraijo-Sing et al., 2010; Subramanian et al., 2016). Similarly, awareness related to e-waste enhances individuals' sensitivity to environmental risks and consequences, thereby strengthening their motivation to engage in responsible disposal and conservation behaviours (Aboelmaged, 2021; Islam et al., 2020). Emotional green marketing advertising can stimulate initial interest and concern; however, its behavioural impact is amplified when such emotional appeals are cognitively processed through green competencies and reinforced by heightened awareness. These mediating mechanisms allow both informational and emotional components of green marketing to be internalized and enacted in daily practices, resulting in more stable and sustained ecological behaviour (Bagozzi et al., 1999; Rezvani et al., 2018). We created these proposed relationships based on the explanations:

H6: Green competencies mediate the relationship between emotional green marketing and ecological behaviour.

H7: Awareness mediates the relationship between emotional green marketing and ecological behaviour.

METHODOLOGY

This study adopts a quantitative, cross-sectional research design grounded in a positivist paradigm, aiming to examine causal relationships among latent constructs related to emotional green marketing and ecological behaviour. Data was collected at a single point in time using a structured self-administered survey, allowing for the empirical testing of hypothesized relationships within a predictive and theory-driven framework.

Methodologically, the study utilizes a variance-based structural equation modelling (PLS-SEM) approach, which is suitable for complex models involving multiple latent variables, mediation paths, and predictive objectives. PLS-SEM enables simultaneous assessment of

measurement and structural models, ensuring rigorous evaluation of construct validity, reliability, and hypothesized relationships. The research model can be seen in figure 1.

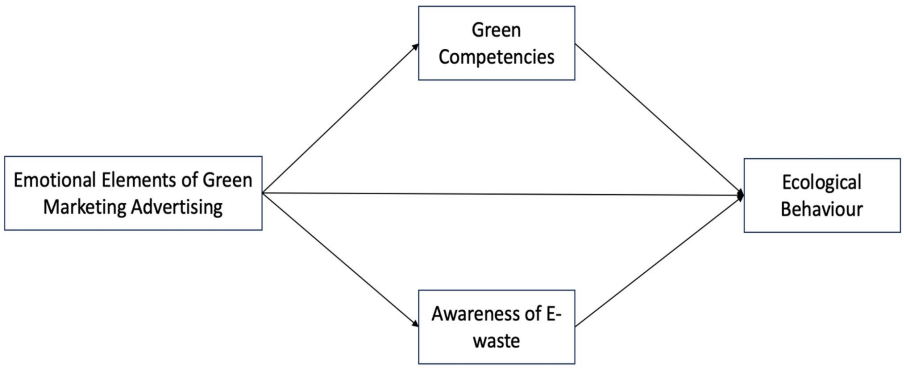

Figure 1: Research Model

Instrument Development

The survey instrument was developed by adapting and refining items from prior empirical studies, with linguistic and contextual adjustments to ensure suitability for respondents. The instrument is the combination between indicators from Ananno et al. (2021), Hasbi et al. (2025), Lavelle et al. (2015), and Liaw & Le (2017). The questionnaire consisted of demographic items and perceptual statements measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Measurement quality was evaluated using Cronbach's alpha, composite reliability, and average variance extracted, applying a minimum threshold of 0.70. The finalized instrument was administered to 350 respondents and analysed using PLS-SEM to confirm its psychometric soundness.

Data Analysis Approach

The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 3.3, which is well suited for predictive-oriented research and complex models involving latent constructs in marketing and consumer behaviour studies (Khalfi & Bami, 2025; Milhem et al., 2024). The analysis followed a two-stage procedure comprising measurement and structural model evaluation. Measurement quality was assessed through indicator loadings, internal consistency reliability (Cronbach's alpha and composite reliability > 0.70), and convergent validity (average variance extracted > 0.50). Discriminant validity was examined using the Fornell–Larcker criterion and heterotrait–monotrait ratio. The structural model was evaluated by estimating path coefficients, coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2), with hypothesis testing conducted via bootstrapping using 5000 resamples at a 95% confidence level to ensure statistical robustness (Hair et al., 2019).

Sampling Method and Sample Size

A non-probability sampling technique was employed using online survey dissemination to reach individuals who had experience with environmentally oriented products and marketing communications. With purposive sampling, data collection was conducted via widely used digital

platforms, enabling broad geographic and socio-demographic coverage. The final dataset comprised 350 valid responses. With 29 indicators included in the measurement model, this sample size exceeds the recommended minimum of five to ten observations per indicator for PLS-SEM analysis, thereby ensuring sufficient statistical power and reliable parameter estimation (Hair et al., 2019). The sample size also aligns with conventional confidence level and precision criteria in quantitative social science research, supporting the robustness and generalizability of the findings.

The final sample consisted of 350 valid respondents. The demographic composition indicates a predominance of male participants (60%), while female respondents accounted for the remaining proportion. In terms of educational attainment, the sample was relatively well educated, with more than 70% holding a university degree, reflecting adequate cognitive capacity to evaluate environmental information and green marketing messages. Regarding occupational status, over 54% of respondents were employees, followed by other categories such as entrepreneurs, students, and self-employed individuals. This demographic profile suggests that the respondents represent economically active consumers who are regularly exposed to marketing communications and consumption decisions related to electronic products, thereby providing a relevant and appropriate context for examining ecological behaviour and responses to emotional green marketing advertisements. The respondents' demographics can be seen in Table 1.

Table 1: Demographic characteristics of respondents

Demographic Variable	**Category**	**Frequency**	**Percentage (%)**
Gender	Male	210	60.0
	Female	140	40.0
Education Level	University graduate	245	70.0
	Non-university	105	30.0
Occupation	Employee	189	54.0
	Entrepreneurs	101	28.9.
	Others	60	17.1

Source: Author's analysis result (2026)

RESULT AND DISCUSSION

SmartPLS software employing Partial Least Squares Structural Equation Modelling (PLS-SEM) was used in this study. PLS-SEM is applied to examine the existence and strength of relationships among constructs in order to evaluate their predictive capabilities. The model assessment was conducted through two main components, namely the structural model and the measurement model. This two-step evaluation process is intended to ensure the validity and reliability of the proposed research model (Chin, 2009; Hair et al., 2017).

1) Measurement Validation

Convergent validity was evaluated by examining indicator loadings and Average Variance Extracted (AVE) using SmartPLS, following the criteria proposed in prior PLS-SEM studies (Hair et

al., 2017, 2019). As presented in Table 1, several indicators initially showed loading values below the recommended threshold of 0.50, indicating limited shared variance with their respective constructs. In line with established procedures, indicators marked with asterisks were iteratively removed to enhance construct consistency. After refinement, the majority of retained indicators demonstrated acceptable loading values (≥ 0.60), while composite reliability values remained above 0.70, confirming satisfactory internal consistency. After reanalysing the data, the AVE values finally reach the conventional cut-off of 0.50, which is considered adequate in exploratory and behavioural research when composite reliability is sufficiently high (Corral-Verdugo, 2002). Therefore, the convergent validity of the measurement model can be considered acceptable for further analysis, as seen in Table 2.

Table 2: AVE, CR and CA values

Construct	Indicator	Factor Loading	CA (> 0.7)	CR = (> 0.7)	AVE (> 0.5)
Emotional GMA	(E)GMA1	0.688*	0.888	0.915	0.645
	(E)GMA2	0.844			
	(E)GMA3	0.711			
	(E)GMA4	0.829			
	(E)GMA5	0.875			
	(E)GMA6	0.851			
Awareness	AWA1	0.734	0.785	0.843	0.510
	AWA2	0.750			
	AWA3	0.701			
	AWA4	0.685			
	AWA5	0.454*			
	AWA6	0,608			
	AWA7	0.507*			
	AWA8	0.600*			
Ecological behaviour	EB1	0.289*	0.703	0.796	0.655
	EB2	0.553			
	EB3	0.637			
	EB4	0.744			
	EB5	0.662			
	EB6	0.591			
	EB7	0.672			
Green competencies	GC1	0.751	0.769	0.834	0.597
	GC2	0.762			
	GC3	0.425*			
	GC4	0.388*			
	GC5	0.649			
	GC6	0.746			
	GC7	0.663			
	GC8	0.536			

Source: Author's analysis result (2026)

2) Discriminant Validity and Reliability Test

Discriminant validity was assessed using the Fornell–Larcker criterion by comparing the square roots of the Average Variance Extracted (AVE) with the inter-construct correlations (Hair et al., 2017, 2019). As presented in Table 2, the square roots of AVE are greater than their respective

correlations with other constructs, thereby confirming adequate discriminant validity. Reliability was further evaluated using Cronbach's alpha and composite reliability, with all constructs exceeding the minimum threshold of 0.60, indicating satisfactory internal consistency and measurement reliability (Hair et al., 2019). Although several constructs exhibited AVE values below the conventional benchmark of 0.50, the composite reliability values remained within acceptable ranges, supporting construct reliability (Fornell & Larcker, 1981). Consistent with prior empirical evidence, the coexistence of adequate reliability and acceptable discriminant validity suggests that the measurement model meets the required standards for subsequent structural model evaluation.

Table 3: Fornell-Larcker criterion

	AWA	EB	Emotional GMA	GC
AWA	0.638			
EB	0.587	0.608		
Emotional GMA	0.286	0.361	0.803	
GC	0.507	0.580	0.272	0.630

Source: Author's analysis result (2026)

Structural Model

Structural model evaluation was conducted by examining the coefficient of determination (R^2) for each endogenous construct, which reflects the proportion of variance explained by the exogenous variables in the model. Following established PLS-SEM guidelines, R^2 values of 0.75, 0.50, and 0.25 indicate substantial, moderate, and weak explanatory power, respectively (Hair et al., 2017).

Table 3: R-Square

	R Square	Q square	f^2 (Key Predictors)	VIF
AWA	0.082	>0	Small	<3
EB	0.475	>0	Small	<3
GC	0.074	>0	Small-medium	<3

Source: Author's analysis result (2026)

As shown in Table 3, the R^2 value for awareness is 0.082, indicating weak explanatory power, suggesting that the model explains 8.2% of the variance in awareness, while the remaining variance may be influenced by other factors not included in this study. Ecological Behaviour (EB) exhibits the highest coefficient of determination (R^2 = 0.475), indicating that Emotional Green Marketing Advertisement, green competencies, and awareness related to e-waste jointly explain 47.5% of the variance in ecological behaviour. This reflects a moderate explanatory power, which is considered substantial in consumer behaviour and environmental communication research, where behavioural outcomes are influenced by multiple psychological and contextual factors.

In contrast, awareness related to e-waste (AWA) and green competencies (GC) show lower R^2 values (0.082 and 0.074, respectively). These results suggest that while Emotional GMA significantly influences both constructs, a large proportion of their variance is likely driven by additional factors not captured in the current model, such as prior environmental knowledge, social norms, or personal values. Nevertheless, these R^2 levels remain acceptable given the mediating role of AWA and GC and the exploratory–predictive orientation of PLS-SEM. Effect size analysis (f^2) indicates that the key structural paths exert small to moderate effects on the endogenous constructs. This pattern is consistent with theory-driven behavioural models, where individual predictors typically contribute incremental explanatory power rather than dominant effects. Importantly, collinearity diagnostics reveal VIF values below recommended thresholds, indicating the absence of multicollinearity and confirming that the estimated path coefficients are not biased by redundant predictor relationships (Kalnins & Praitis Hill, 2025).

Finally, the assessment of predictive relevance (Q^2) shows that all endogenous constructs have Q^2 values greater than zero, confirming that the model has adequate out-of-sample predictive capability. This finding supports the suitability of the model for explaining and predicting ecological behaviour within the context of emotional green marketing communication (Nair & Little, 2016).

Following the establishment of an adequate measurement model, the structural model was evaluated using the PLS-SEM procedure in accordance with recommended guidelines, where path coefficients, t-statistics, and p-values were used to assess hypothesis significance at the 5% level ($t > 1.96$). As reported in Table 4, all proposed direct relationships are statistically supported. Emotional green marketing advertisement shows a positive and significant effect on ecological behaviour ($\beta = 0.161$, $t = 2.907$, $p = 0.004$) and green competencies ($\beta = 0.272$, $t = 3.575$, $p = 0.000$), supporting H1 and H2. Green competencies also exert a significant positive influence on ecological behaviour ($\beta = 0.352$, $t = 4.029$, $p = 0.000$), confirming H3. In addition, emotional green marketing advertisement significantly enhances awareness ($\beta = 0.286$, $t = 4.099$, $p = 0.000$), and awareness, in turn, positively affects ecological behaviour ($\beta = 0.362$, $t = 4.343$, $p = 0.000$), supporting H4 and H5. Regarding indirect effects, emotional green marketing advertisement demonstrates a significant mediated effect on ecological behaviour through green competencies ($\beta = 0.096$, $t = 2.193$, $p = 0.029$) and through awareness ($\beta = 0.104$, $t = 2.988$, $p = 0.003$), thereby supporting H6 and H7.

Table 4: Hypotheses testing results

Hypothes	Relationships	Path oefficient	Standard deviation	T-*statistics*	*P-values*	LLCI	ULCI	Results
Direct effect								
H_1	Emotional GMA → EB	0.161	0.055	2.907	0.004	0.071	0.251	Supported
H_2	Emotional GMA → GC	0.272	0.076	3.575	0.000	0.147	0.397	Supported
H_3	GC → EB	0.352	0.087	4.029	0.000	0.209	0.495	Supported
H_4	Emotional GMA → AWA	0.286	0.070	4.099	0.000	0.171	0.401	Supported
H_5	AWA → EB	0.362	0.083	4.343	0.000	0.225	0.499	Supported
Indirect effect								
H_6	Emotional GMA → GC → EB	0.096	0.044	2.193	0.029	0.024	0.168	Supported
H_7	Emotional GMA → AWA → EB	0.104	0.035	2.988	0.003	0.046	0.162	Supported

Source: Author's analysis result (2026)

The findings confirm that emotional green marketing advertisement exerts a significant influence on ecological behaviour, supporting the notion that affective communication is a central mechanism in shaping environmentally responsible actions (Taufique, 2022). This result aligns with green marketing literature emphasizing that marketing strategies integrating environmental considerations into promotional messages can effectively shape attitudes and behavioural intentions when they resonate with individuals' values and concerns (Papadas et al., 2019; Ward, 2020). Emotional appeals appear particularly effective in the context of e-waste, where environmental risks are often perceived as distant or abstract. By increasing emotional engagement, green marketing can reduce psychological distance and strengthen personal relevance, thereby encouraging consumers to adopt ecological behaviours such as responsible disposal and reduced electronic consumption. This finding is consistent with prior evidence showing that green marketing initiatives enhance pro-environmental behaviour when they move beyond symbolic messaging and are perceived as credible and meaningful (Szabo & Webster, 2021).

The mediating role of green competencies further highlights the importance of internal cognitive capacities in translating emotional green marketing messages into consistent ecological behaviour. Green competencies, encompassing environmental knowledge, skills, and awareness, enable individuals to operate sustainability messages into concrete actions, rather than limiting their impact to attitudinal change (Cabral & Dhar, 2021, 2019). The significant pathway from emotional green marketing to green competencies suggests that emotionally framed environmental messages may stimulate learning, reflection, and capability development related to sustainability. These findings echo prior research demonstrating that environmental knowledge and abilities serve as critical mediators between green initiatives and ecological behaviour, particularly in contexts where formal environmental education and institutional support are limited (Fawehinmi et al., 2020; Okumus et al., 2019). In line with studies on employee environmental behaviour, individuals who possess stronger green competencies are more likely to overcome practical and cognitive barriers to pro-environmental action, reinforcing the behavioural effectiveness of green marketing efforts.

In addition, awareness related to e-waste emerges as a complementary mediating mechanism that strengthens the behavioural impact of emotional green marketing. Environmental awareness has been widely recognized as a psychological factor influencing attitudes, intentions, and ecological behaviour by increasing sensitivity to environmental risks and consequences (Kollmuss & Agyeman, 2002; Mishal et al., 2017). The significant indirect effect through awareness suggests that emotional green marketing enhances consumers' understanding of the environmental and health implications of improper e-waste management, which in turn motivates responsible behaviour. This finding is consistent with prior studies indicating that heightened environmental consciousness and awareness significantly shape pro-environmental behaviours across consumption and disposal contexts (Farooq et al., 2022). Taken together, the mediating roles of green competencies and awareness indicate that emotional green marketing is most effective when it simultaneously activates affective concern and supports cognitive and awareness-based processes. This integrated mechanism helps explain how green marketing can foster more stable and sustained ecological behaviour, extending

existing green marketing research by demonstrating its effectiveness in addressing e-waste challenges in a developing-country context (Widodo et al., 2025).

CONCLUSION

This study provides empirical evidence that emotional green marketing advertisement significantly influences ecological behaviour, both directly and indirectly through green competencies and awareness related to e-waste in the Malaysian context. The findings confirm that emotional appeals in green marketing are more effective when they are supported by internal behavioural mechanisms, namely green competencies and awareness related to e-waste. Green competencies and awareness function as critical pathways through which emotional marketing messages are translated into consistent and meaningful ecological behaviour. By empirically validating these relationships, the study highlights that sustainable behavioural change requires more than persuasive messaging; it depends on individuals' capacity to understand, internalize, and act upon environmental information. Overall, the results provide evidence that integrating affective, cognitive, and awareness-based mechanisms is essential for fostering sustainable ecological behaviour in rapidly digitalizing and consumption-driven societies.

Theoretical Implications

From a theoretical perspective, this study extends green marketing and ecological behaviour literature by clarifying the behavioural mechanisms underlying the effectiveness of emotional green marketing advertisement. While prior studies have largely focused on the direct effects of green marketing on attitudes or intentions, this research advances theory by empirically demonstrating the mediating roles of green competencies and awareness related to e-waste. In line with green competency and environmental behaviour frameworks, the findings reinforce the view that environmental knowledge, skills, and awareness are not peripheral factors but core explanatory mechanisms that enable individuals to transform environmental concern into action (Cabral & Dhar, 2019; Farooq et al., 2021). By situating these mechanisms within a developing-country context, this study contributes novel insights to sustainability and green marketing theories, emphasizing the importance of integrating affective communication with cognitive and awareness-based processes to explain ecological behaviour.

Practical Implications

The findings offer important practical implications for policymakers, organizations, and marketers seeking to address the growing e-waste challenge. Rather than relying solely on emotionally charged messages, green marketing initiatives should be coupled with practical guidance that builds consumer capability, such as clear instructions on device lifespan extension, repair options, certified recycling points, and take-back programs. Emotional appeals that highlight environmental harm or moral responsibility are more effective when accompanied by information that enables consumers to act immediately and confidently.

In addition, awareness-building efforts related to e-waste should move beyond general environmental messaging and focus on specific, locally relevant risks, including health hazards from informal e-waste handling and the environmental consequences of improper disposal.

Campaigns that translate abstract risks into everyday experiences—such as household pollution or community health impacts—can strengthen personal relevance and encourage responsible disposal behaviour.

For practitioners, the results underline the importance of ensuring that green marketing claims are aligned with verifiable sustainability practices, such as transparent recycling processes or partnerships with accredited e-waste management providers. Failure to do so may heighten scepticism and reinforce perceptions of greenwashing, ultimately undermining consumer trust (Szabo & Webster, 2021). From a policy perspective, emotional green marketing can be strategically integrated into public education and digital literacy programs, particularly in contexts where rapid device turnover and high digital consumption coexist with limited formal e-waste infrastructure. In such settings, combining emotionally resonant communication with competency-building interventions offers a more realistic pathway to fostering sustained ecological behaviour.

Limitations and Future Research Directions

Despite its contributions, this study has several limitations that open avenues for future research. First, the cross-sectional research design restricts causal inference and does not capture changes in green competencies, awareness, or ecological behaviour over time. Future studies may adopt longitudinal designs to examine how sustained exposure to green marketing influences behavioural development. Second, this study relies on self-reported data, which may be subject to social desirability bias. Future research could incorporate mixed-method approaches or objective behavioural measures to enhance robustness. Third, the sample is limited to the Malaysian context, which may constrain generalizability. Comparative studies across different cultural and regulatory environments are recommended to explore how contextual factors shape responses to emotional green marketing. Finally, future research may extend the model by incorporating additional psychological or organizational variables, such as green self-efficacy, trust, or institutional support, to further enrich understanding of ecological behaviour formation.

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ETHICAL APPROVAL

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the ethical approval was obtained from Research Ethics Committee.

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APPENDIX

Construct	Indicator
Emotional GMA (Liaw and Le, 2017)	I understand the message of the advertisement
	I feel more emotionally connected to the advertisement
	I learn a new information
	Interesting to me
	I feel invested in the advertisement
	This advertisement attracts me
Awareness (Ananno et al., 2021; Hasbi et al., 2025)	I know what electronic waste is
	I know electronic waste is an ongoing issue
	Electronic waste can cause pollution
	Electronic waste can affect humans' health
	I am aware of any government regulation on e-waste management
	I know that some components of electronic devices contain toxic/hazardous materials
	I am aware of the recycling facilities in my area
	I am willing to drive to drop-off my electronic waste
Ecological behavior (Lavelle et al., 2015; Hasbi et al., 2025)	I re-use the old electronic devices for other purposes (old phone, TV, etc)
	I support the electronic waste campaign
	I support the trade-in old devices program
	I'd travel to the recycling centre to recycle electronic d.
	I am willing to pay recycling fees for electronic waste
	I am willing to support a higher tax on electronic devices if it helps to protect the environment
	I feel my own behaviour on electronic devices usage can bring a positive impact towards the environment
Green competencies (Ananno et al., 2021; Chen et al., 2022)	I know more about recycling compared to another person
	I am very knowledgeable in the environmental issues
	Stricter law is required in order to protect our environment
	I think we are doing enough to protect the environment
	For me, purchasing green product is: Good
	For me purchasing green product is: Enjoyable
	I separate electronic and electrical products for recycling
	I try to fix things rather throwing them away