

Exploring the Gender-Moderated Effects of Greenwashing: A Multiple Group Analysis of Mediation and Moderation Relationships

Rahmawati^{1*}, Maslichah¹, Mawardi, M Cholid¹ and Khalikussabir¹

¹ University of Islam Malang, Indonesia

Abstract. With the rising consumer awareness of environmental issues, companies increasingly face scrutiny over claims of sustainability, giving rise to concerns about greenwashing and its impact on consumer behavior. This study examines how greenwashing influences green trust and green word of mouth (GWOM) and tries to figure out whether GWOM can be a mediated effect toward green trust, thus incorporating gender as a moderating variable in these relationships. We employed purposive sampling and a total of 262 respondents meet the criteria. Using multiple group analyses, eight hypotheses were tested. The findings reveal that greenwashing has a negative impact on both green trust and GWOM, while GWOM positively influences green trust. Additionally, GWOM mediates the relationship between greenwashing and green trust. Gender significantly moderates these relationships: the effect of greenwashing on green trust, as well as the influence of GWOM on green trust, varies between men and women. Moreover, the mediation effect of GWOM on the greenwashing-green trust relationship also differs by gender. These results highlight the importance of gender-sensitive approaches in green marketing strategies, as they reveal distinct patterns in how consumers of different genders respond to greenwashing and its effects on trust and communication behaviors.

Keyword. *Greenwashing, Green word of mouth, Green trust, Multigroup analysis, Gender moderation*

* Corresponding author: Rahmawati@unisma.ac.id

1 Introduction

With the rise of global environmental awareness, consumers are progressively selecting firms that demonstrate sustainable practices. Nonetheless, the increase in green marketing has come along with an upward trend in greenwashing—deceptive or inflated claims of environmental accountability. Greenwashing is the practice of a business using excessive communication and a presumably eco-friendly look to hide environmentally harmful content. For present stakeholders, while greenwashing may increase corporate revenues, it can negatively impact societal sustainability [1]. It can also make customer grow increasingly informed and skeptical of misleading sustainability claims. Greenwashing deceives consumers and diminishes the credibility of brands that authentically commit to sustainable initiatives and distrust towards corporate green advertising methods. Several studies have examined the correlation toward greenwashing and a variety of specific topics, including green trust, green brand loyalty, green perceived risk, green life style, green confidence, green skepticism, and green word of mouth, in the extensive literature on greenwashing, which concentrates on consumers' behavior.

Greenwashing affects not only a brand's credibility but also influences consumers' perception of environmental claims more broadly, leading to a decline in trust across the industry. The increasing skepticism surrounding such campaigns has resulted in a widespread inclination to distrust green products, green marketing, and advertising in general [2]. This skepticism is a result of the widespread perception among consumers that brands are exaggerating their green benefits or making highly vague and perplexing claims (greenwashing) in order to capitalize on their environmental concerns. Research has consistently shown that greenwashing can erode this trust, as consumers often view exaggerated environmental claims with suspicion. Based on indicate that as consumers detect greenwashing, they increasingly distrust brands, particularly those viewed as capitalizing on green trends without genuine environmental commitment. Suggest that greenwashing significantly undermines green trust, creating a perception that the brand is primarily profit-driven rather than value-driven.

Moreover, if consumers see a company as participating in greenwashing, it may result in adverse ramifications, as research indicates that perceived greenwashing adversely impacts green word-of-mouth communication (GWOM). When consumers perceive greenwashing, GWOM often declines, as trust in the brand is undermine. greenwashing reduces the likelihood of consumers sharing positive experiences, since deceptive marketing practices foster negative brand perceptions and erode consumer advocacy [3]. Highlight that greenwashing discourages GWOM, as consumers are reluctant to recommend brand they perceive as disingenuous. Further support this, suggesting that exposure to greenwashing not only reduces consumer trust but also inhibits their motivation to spread positive information.

GWOM has been found to enhance green trust, as consumers often rely on peer recommendations to verify the authenticity of brands' environmental claims. Indicate that consumers are more likely to trust brands that are supported by positive word of mouth, which they interpret as genuine endorsements from like-minded peers. Additionally, show that GWOM can strengthen green trust by reinforcing positive brand perceptions through credible consumer networks. Thus, trust in a brand reduces bad word-of-mouth and consumer disappointment. This is due to the fact that consumers who have confidence in a

brand are more inclined to endorse it and speak positively about it to others, which boosts word-of-mouth (WOM) behavior [4]. GWOM may also act as a mediator between greenwashing and green trust. Studies suggest that when consumers discuss a brand's greenwashing practices, the resulting skepticism can reduce overall trust. Therefore, Gender differences in environmental attitudes are well-documented, with women generally exhibiting higher eco-consciousness than men. Research indicates that women generally exhibit greater environmental awareness and are more likely to respond negatively to perceived greenwashing than men and women more knowledgeable than man in green consumption behavior.

Recent studies on greenwashing, green trust, and green word of mouth (GWOM) has yielded significant insights into consumer reactions to perceived deceptive green practices, influencing their trust and communication behaviors concerning eco-friendly brands. While existing studies have individually explored the negative effects of greenwashing on green trust, and on GWOM there is a limited understanding of how these relationships may interact within a holistic model, especially when moderated by demographic variables such as gender. The role of gender as a moderator is also relatively underdeveloped in green marketing literature. While some research suggests that gender may influence perceptions of green claims, few studies have empirically tested gender's moderating effect within greenwashing models. This study aims how greenwashing influences green trust and green word of mouth (GWOM) and tries to figure out whether GWOM can be a mediated effect toward green trust, thus incorporating gender as a moderating variable in these relationships. This study uses a multiple-group analysis to examine gender's moderating effect on all interactions, including direct and indirect links between greenwashing, green trust, and GWOM. This study also tests gender disparities in a unified framework to understand how men and women react to greenwashing, how this affects GWOM, and how GWOM may moderate its effect on green trust. This method will cover crucial gaps in green marketing research by providing gender-sensitive tactics for building green trust and reducing greenwashing.

2 Literature review

Greenwashing Perception and Green Trust

The concept of "greenwashing" originated in the 1980s and is defined as the practice by which companies make exaggerated or misleading claims regarding their sustainability efforts to enhance their market position. This concept, known as eco-bleaching, whitewashing, eco-washing, green washing, green makeup, or green image washing, refers to deceptive advertising intended to amplify a product's perceived environmental advantages through the promotion of company policies, objectives, or products [5], define greenwashing as the selective emphasis on advantageous aspects of a company's social or environmental initiatives, while omitting any negative information. Characterized greenwashing as a disparity between symbolic and genuine corporate social actions, highlighting issues associated with image advertising, visuals, and vague assertions. This concept highlights issues in corporate communication that may cause individuals to perceive an organization's environmental activities or products more favorably than warranted.

Greenwashing is a marketing strategy that is being scrutinized more and more. It involves companies portraying themselves as eco-friendly in order to meet the growing demand from consumers for sustainable products. The prevalence of greenwashing is confirmed by numerous studies, which frequently attribute it to businesses' attempts to obtain a competitive edge without a sincere commitment to sustainable practices. Furthermore, greenwashing produces adverse externalities, as one brand's deceptive environmental claims may diminish consumers' propensity to purchase eco-friendly products from other companies in the marketplace [6]. The correlation between greenwashing and green trust is well-established, as evidenced by numerous studies that suggest that greenwashing undermines consumers' perceptions of brand credibility. Consumers frequently exhibit distrust, skepticism, and diminished loyalty when they encounter misleading green claims. Greenwashing frequently entails ambiguous or misleading claims thereby diminishing the perceived openness of a brand's environmental intentions. Consumers exposed to such claims may question the brand's integrity, leading to a decline in green trust. Thus, we proposed the following hypotheses:

H1: Greenwashing has negative effect on green trust

Greenwashing Perception and Green word of mouth (GWOM)

Organizations engage in greenwashing to create the perception among consumers that they possess superior environmental credentials, hence fostering favorable word-of-mouth communication. The relationship between greenwashing and green word of mouth (GWOM) has attracted much attention in recent studies due to its implications for sustainable marketing and consumer behavior. GWOM, defined as positive word-of-mouth communication regarding a brand's environmental practices, is a valuable asset for companies striving to build a reputation for authenticity and eco-consciousness. A substantial body of literature suggests that greenwashing negatively affects GWOM by diminishing consumers' trust in the brand's environmental integrity. The perception of greenwashing can affect green word of mouth (GWOM), as consumers communicate their distrust to peers, thereby dissuading others from endorsing the brand [7]. When consumers perceive greenwashing, they are less inclined to engage in GWOM, as they doubt the authenticity of the brand's eco-friendly claims. Found that consumers exposed to greenwashed claims expressed skepticism toward the brand and were unwilling to recommend it to others, thereby reducing GWOM. Additionally, highlighted that greenwashing damages brand image, reducing the likelihood of positive GWOM among environmentally conscious consumers. In a comparative study, found that greenwashing not only led to decreased GWOM but also negatively impacted consumers' perceptions of green brands more broadly, creating challenges for all brands operating within the green sector. Lastly, notes that greenwashing leads to cognitive dissonance, which causes consumers to avoid GWOM due to the misalignment between their values and the brand's actions. Thus, we proposed the following hypotheses:

H2: Greenwashing has negative effect on green word of mouth (GWOM)

Green Word of Mouth (GWOM) and Green Trust (GT)

Word of mouth (WOM) denotes verbal contact between consumers and many entities, including channels, manufacturers of products or services, experts, friends, and family. Favorable word of mouth for environmentally sustainable products, services, or companies is referred to as green WOM [8]. Green WOM refers to informal discourse among friends, relatives, and colleagues on favorable environmental signals linked to a product or brand. Green WOM is categorized into two types: positive and negative. When consumers disseminate their favorable experiences to others, it constitutes positive green word of mouth (WOM) will emerge. Customers experience increased confidence when purchasing products that have positive green word of mouth (WOM). When consumers share their unfavorable experiences with others and convey dissatisfaction, negative green word of mouth (WOM) will emerge.

GWOM involves the sharing of positive information among consumers about a brand's eco-friendly practices, products, or overall environmental impact [9]. It acts as a form of peer endorsement, providing social proof that reinforces the credibility of a brand's green claims. GWOM strengthens green trust through mechanisms such as social proof, perceived credibility, and emotional connection. Research indicates that consumers significantly depend on information from peers when assessing the trustworthiness of a brand's green claims, as such information is perceived as unbiased. Green trust and green WOM have a very close relationship and influence each other when consumers buy green products. This literature review examines recent studies to explore the hypothesis that GWOM has a positive effect on green trust, thus we proposed the following hypotheses:

H3: Green word of mouth (GWOM) has positive effect on green trust

Green Word of Mouth (GWOM) Mediates Between Greenwashing and Green Trust.

The perception of greenwashing can notably influence consumer attitudes regarding environmentally friendly products and brands. Consumers who identify misleading green claims tend to form unfavorable views of the brand, resulting in diminished trust and reduced purchase intention. Greenwashing undermines a brand's credibility regarding its environmental claims. The perception of greenwashing can affect green word of mouth (GWOM), as consumers communicate their distrust to peers, thereby dissuading others from endorsing the brand [7]. Suggest that when consumers engage in positive GWOM, it can mediate the effect of greenwashing by restoring some level of trust through consumer reinforcement of perceived genuine actions. Similar with, argue that GWOM, depending on its sentiment, can either buffer against or reinforce the negative impacts of greenwashing on trust. GWOM can act as a mediator by shaping consumer trust perceptions in response to greenwashing. Positive GWOM from peers lessens the damaging impact on trust, while negative GWOM amplifies it [10]. The findings from these studies highlight that GWOM plays a mediating role in the connection between greenwashing and green trust, potentially either mitigating or amplifying distrust depending on the sentiment conveyed. Positive GWOM can potentially correct trust issues, whereas negative GWOM exacerbates the detrimental effects of greenwashing on trust. Thus, we proposed the hypotheses:

H4: Green word of mouth (GWOM) mediates the relationship between greenwashing and green trust between men and women

Gender Differences

Gender plays an important influence on shaping perceptions and responses to greenwashing. Research indicates that women typically demonstrate greater environmental concern and are more inclined to participate in pro-environmental behaviors than men [11]. This heightened awareness among women may make them more sensitive to greenwashing practices, potentially lowering their green trust when they perceive inauthentic sustainability efforts. On the other hand, men may exhibit a lower initial concern for environmental claims but are influenced differently based on brand loyalty and trust cues [12]. Moreover, gender differences are also seen in green WOM: women are more likely to discuss and share information on environmental issues, including perceptions of greenwashing, making them both influential advocates and critics of green trust. Given these differences, gender appears to shape not only the direct effect of greenwashing on green trust but also the role of green WOM as a mediating factor. Women, with higher environmental sensitivity and more active engagement in green WOM, could experience a more pronounced mediating effect, where greenwashing leads to a larger decline in trust through the influence of negative WOM. In contrast, men may show a different pattern, possibly due to lower engagement in green WOM and different trust dynamics. Understanding gender differences in the greenwashing-green trust dynamic, particularly with green WOM as a mediator thus we proposed the following hypotheses:

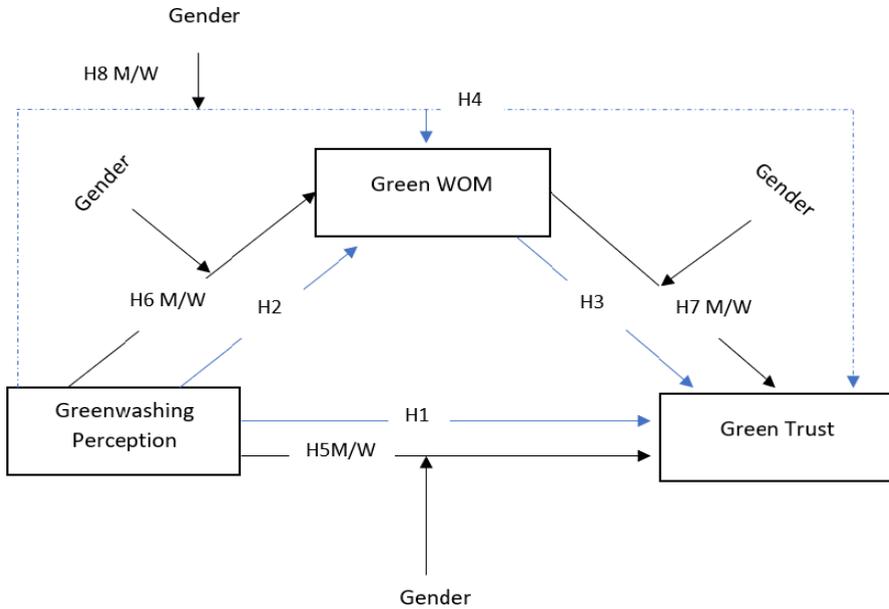
H5: The relationship between greenwashing and green trust is moderated by gender, where this relationship differs between men and women.

H6: The relationship between greenwashing and green word of mouth (GWOM) is moderated by gender, where this relationship differs between men and women.

H7: The relationship between green word of mouth (GWOM) and green trust is moderated by gender, where this relationship differs between men and women.

H8: The mediating effect of green word of mouth (GWOM) in the relationship between greenwashing and green trust is moderated by gender, where this mediation effect differs between men and women.

Research Framework



3 Research methods

This research is classified as exploratory in nature, utilizing a quantitative methodology. A total of 276 data points was collected; however, 14 were excluded as they did not fulfil our criteria. In total, we processed 262 data points. We focused on the demographic of young consumer, as they represent 27.9% of the population, while millennials account for 25.87%. This indicates that over 50% of Indonesians are of working age, and young consumer demonstrates a strong intention to purchase. An online questionnaire was utilized to gather data. The sample is categorized as follows: middle social economic class at 71.1% and upper social class at 28.9%. Furthermore, this study indicates a distribution of 38% male and 62% female participants, spread across various cities in Indonesia encompasses various regions, including Surabaya, Jakarta, Malang, Banyuwangi, Madura, Pasuruan, Sulawesi, Lampung, Jambi, Riau, Bali, Kalimantan, NTB, Lombok, NTT, Maluku, Papua, among others.

We utilized purposive sampling, selecting research participants according to specific criteria that corresponded with the research objectives. This study utilized a questionnaire as the main tool for data collection. An online questionnaire was utilized to guarantee the relevance and appropriateness of the collected data, and a set of inclusion criteria was established. The formulation of these criteria was guided by the objectives of the study, taking into account various factors throughout the process. As a result, the subsequent inclusion criteria were defined: (1) Individuals must be born between 1997 and 2012, (2) reside in Indonesia, (3) possess knowledge of green products, (4) have a monthly income. Each item of the constructs was evaluated using a five-point Likert Scale: 5- Strongly Agree, 4- Agree, 3- Neutral, 2- Disagree, and 1- Strongly Disagree.

This research employed partial least squares structural equation modelling (PLS-SEM), adhering to the model validation procedure and hypothesis testing. It is often utilized for estimating complex path models involving latent variables [13]. PLS-SEM comprises two measurement models: the measurement model and the structural model [13]. Furthermore, this study employed PLS-multi-group analysis (PLS-MGA) as a method to investigate differences among various groups of respondents while utilizing the same estimation models [13]. The primary purpose of using PLS-MGA is to prove whether there is a statistically significant difference between individual group models (Men and Women) with observed characteristics [13].

4 Result and discussion

Respondent Profile

We have disseminated online surveys to young consumer in Indonesian cities. The respondents in our study were aged between 17 and 24 years. The distribution for the age group 17 - 20 is 56.4%, while for the age group 21 - 24, it is 43.6%. The respondents were predominantly female, at 62%, while males constituted 38%. Moreover, the educational background predominantly consists of college degrees at 69.2%, followed by diplomas at 9.1%, and high school education at 21.7%. The respondent's income is primarily between the range of IDR 1,500,000 to 3,000,000, indicating it is less than IDR 1,500,000. The table below will describe the respondent profile,

Table 1 Respondent Profile

Description		Frequency	%
Age	17 – 20	148	56.4
	21 – 24	114	43.6
	Total	262	100
Gender	Man	99	38
	Women	163	62
	Total	262	100
Education Background	High School	56	21.7
	Diploma	24	9.1
	Undergraduate	182	69.2
	Total	262	100
Monthly Income	Less Than IDR 1.500.000	99	37.7
	IDR 1.500.000 – 3.000.000	130	49.6
	IDR 3.000.000 – 4.500.000	33	12.7
	Total	262	100

Assessment of measurement model

The assessment for convergent validity was initiated at the beginning of the inquiry. Following this, an assessment of the item loadings factor, average variance extracted (AVE), and composite reliability (CR) is performed to confirm the validity of the measurement model. The results of the measurement complete model are displayed in Table 2. The data in the table indicates that the item loadings have exceeded the recommended threshold of 0.6, as advised. The current investigation produced AVEs that resided within the acceptable parameters, spanning from 0.654 to 0.749. Moreover, the composite reliability (CR) demonstrated a range from 0.788 to 0.923, consistent with the proposed value that stipulates the average variance extracted (AVE) should surpass 0.5. and for the Cronbach alpha that suggested should surpass 0.6.

Table 2 Result of measurement complete model

		Loading	AVE	CR	Cronbach Alpha
Greenwashing Perception	GWP1	0.724	0.654	0.788	0.597
	GWP2	0.808			
	GWP3	0.797			
Green Trust	GT1	0.829	0.699	0.903	0.857
	GT2	0.851			
	GT3	0.850			
	GT4	0.814			
Green word of mouth	GWOM1	0.849	0.749	0.923	0.888
	GWOM2	0.895			
	GWOM3	0.886			
	GWOM4	0.831			

Table 3 displays the results of the measurement model comparing men and women. The item loadings exceed the recommended threshold of 0.6, as indicated in the provided table by [60]. The present study yielded AVEs that fell within the acceptable range, ranging between men and women with display value range of 0.571-0.781. Furthermore, the composite reliability (CR) between men and women exhibited a range of 0.719 to 0.934, aligning with the value posited that stipulates the average variance extracted (AVE) should surpass 0.5. and for the Cronbach alpha that suggested should surpass 0.6.

Table 3 Result of measurement model between men and women

Variable	Items	Loading		AVE		CR		Cronbach Alpha	
		Men	Women	Men	Women	Men	Women	Men	Women
Greenwashing Perception	GWP1	0.847	0.793	0.595	0.571	0.810	0.719	0.664	0.602
	GWP2	0.864	0.788						
	GWP3	0.666	0.835						
Green Trust	GT1	0.841	0.813	0.693	0.709	0.900	0.907	0.853	0.863
	GT2	0.834	0.874						
	GT3	0.862	0.831						
	GT4	0.790	0.848						
Green word of mouth	GWOM1	0.833	0.877	0.726	0.781	0.914	0.934	0.873	0.906
	GWOM2	0.889	0.900						
	GWOM3	0.887	0.881						
	GWOM4	0.795	0.877						

After completing the assessment of convergent validity, the next stage was the evaluation of discriminant validity. This test was utilized by [15] based on the existing literature. Table 4, 5 and 6 demonstrates that the square root of AVE (diagonal) is higher than the correlations (off-diagonal) for all reflective constructs.

Table 4 Discriminant validity using Fornell and Lacker criterion complete model

	Greenwashing	Green Trust	Green word of mouth
Greenwashing	0.745		
Green Trust	-0.285	0.836	
Green Word of Mouth	-0.291	0.634	0.865

Table 5 Discriminant validity using Fornell and Lacker criterion by Men

	Greenwashing	Green Trust	Green word of mouth
Greenwashing	0.771		
Green Trust	-0.270	0.832	
Green Word of Mouth	-0.256	0.637	0.852

Table 6 Discriminant validity using Fornell and Lacker criterion by Women

	Greenwashing	Green Trust	Green word of mouth
Greenwashing	0.687		
Green Trust	-0.381	0.842	
Green Word of Mouth	-0.392	0.634	0.884

Assessment of structural model

Before executing the subsequent procedure, we also assess the R^2 . The R^2 value serves as a metric for assessing the accuracy of the structural model. Indicate that R^2 can be employed to ascertain the coefficient of determination and the significance level of the beta values linked to a specific route. The coefficient of determination (R^2) for complete model for green trust outcomes was 0.413, in the complete sample, 41.3% of the variance in green trust is explained by greenwashing and green word of mouth. Green Word of Mouth ($R^2 = 0.085$), it means that for the complete sample, 8.5% of the variance in green WOM is explained by greenwashing. This suggests that greenwashing has a low explanatory power on green WOM in the general population, implying other factors may contribute more substantially to green WOM. The model explains green trust similarly for both men and women, with slightly higher explanatory power for women ($R^2 = 0.421$) than for men ($R^2 = 0.418$). This suggests that greenwashing, potentially through green WOM, affects green trust similarly across genders, though slightly more for women. Greenwashing explains a higher proportion of variance in green WOM for men ($R^2 = 0.165$) than for women ($R^2 = 0.157$). This may indicate that men are more influenced by greenwashing in terms of sharing or talking about green information, though the difference is slight.

Table 7 The R Square

	Complete	R Square	
		Men	Women
Green Trust	0.413	0.418	0.421
Green word of Mouth	0.085	0.165	0.157

The research performed a statistical analysis to estimate the path coefficients of the structural model and utilized bootstrap analysis to determine the statistical significance of the findings. Table 8 indicates a statistically significant value for the entire variable. A significance level of 5% (0.05) was employed to test the hypotheses. H1, H2, and H3 address the direct relationship between greenwashing and both green trust and green word of mouth, while also exploring the direct relationship between green word of mouth and green trust. Based on the result we were accept for the hypotheses (H1, $t\ value=2.291$, $p\ value=0.000$, H2, $t\ value=4.771$, $p\ value=0.000$, H3, $t\ value=16.416$, $p\ value=0.022$) and the path coefficient were negative for H1 and H2, positive for H3 ($H1=-0.110$, $H2=-0.291$ $H3=0.602$). H4 was proposed mediated effect of greenwashing on green trust through green word of mouth ($t\ value=4.686$, $p\ value=0.000$) thus we accept H4.

Furthermore, H5 was gender-based analysis of greenwashing’s direct effect on green trust the result. This effect is not significant for men ($t\ value = 1.885$, $p\ value = 0.060$), but it is significant for women ($t\ value = 2.250$, $p\ value = 0.025$). This effect is supported for women but not for men, implying that greenwashing’s direct negative impact on green trust is more relevant for female consumers. For H6, gender-based analysis of greenwashing’s direct effect on green word of mouth. The significant for both genders, with t-values of 2.781 ($p\ value = 0.006$) for men and 5.206 ($p\ value = 0.000$) for women. This hypothesis is supported for both genders, confirming that greenwashing reduces green word of mouth for both men and women, with a stronger impact on women (path coefficients ($M = -0.256$, $W = -0.396$)). The next is H7, Gender-based analysis of green word of mouth’s effect on green

trust. The effect is significant for both genders, with t-values of 13.176 (*p value = 0.000*) for men and 9.510 (*p value = 0.000*) for women. This hypothesis is supported for both genders, indicating that green word of mouth positively impacts green trust for both men and women. The last hypotheses H8, Gender-based analysis of moderating effect of greenwashing on green trust through green word of mouth. The moderating effect is significant for both genders, with t-values of 2.751 (*p value = 0.006*) for men and 4.884 (*p value = 0.000*) for women. This hypothesis is supported for both men and women, indicating that greenwashing indirectly decreases green trust through its negative effect on green word of mouth for both genders, with a stronger impact for women.

Table 8 Hypotheses testing

Relationship	Path Coef		t-Value		P-value		Accepted	
	M/W	C	M	W	C	M	W	
H1 GW→GT	-0.110	2.291			0.000			Yes
H2 GW→GWOM	-0.291	4.771			0.000			Yes
H3 GWOM→GT	0.602	16.416			0.022			Yes
H4 GW→GWOM→GT	-0.175	4.686			0.000			Yes
H5 GW→GT (M/W)	-0.115/- 0.154		1.885	2.250		0.060	0.025	No/Yes
H6 GW→GWOM (M/W)	-0.256/- 0.396		2.781	5.206		0.006	0.000	Yes/Yes
H7 GWOM→GT (M/W)	0.607/0.573		13.176	9.510		0.000	0.000	Yes/Yes
H8 GW→GWOM→GT (M/W)	- 0.155/0.227		2.751	4.884		0.006	0.000	Yes/Yes

Notes:

C : Complete model

M: Men

W: Women

$p < 0.05$

Discussion

Businesses must exercise extreme caution when making environmental claims in order to allay consumer concerns and negative reviews, as public perceptions of greenwashing play a significant role in shaping consumers' opinions of brands. When customers see a disconnect amongst a company's stated environmental goals and its actual actions, they may begin to suspect greenwashing. This study investigates how greenwashing affects green trust and green word of mouth (GWOM) and if GWOM can mitigate this effect, using gender as a moderating variable. A multiple-group analysis examines gender's moderating effect on all interactions, including direct and indirect linkages between greenwashing, green trust, and GWOM. A unified framework is used to examine how men and women react to greenwashing, how it affects GWOM, and how it may lessen its effect on green trust. Based on the research finding, greenwashing has significant negative effect on green trust. When consumers see a company engaging in greenwashing—like making exaggerated, misleading, or false claims about being environmentally friendly—it really hurts their trust in that company's commitment to the environment. The findings show that how consumers view greenwashing really affects their trust in the company's true dedication to sustainability.

Being environmentally responsible is the right thing to do, so customers are really paying attention to any misinformation about it. This finding is consistent with prior research that demonstrates greenwashing undermines consumer trust, as it is perceived by consumers as deceptive and manipulative. Same with assert that greenwashing undermines customer trust, as green trust relies a company's dedication to environmental sustainability. Furthermore, According, perceived dishonesty in green marketing initiatives not only erodes trust but also establishes a permanent unfavorable perception that is challenging for organizations to rectify.

Greenwashing has significant negative effect on green word of mouth. This indicates that greenwashing inhibits consumers from participating in positive word of mouth. When consumers perceive that a company is greenwashing, they are less likely to engage in positive word of mouth because they feel misled and disappointed by the brand's lack of authenticity. Consumers tend to support brands they view as authentic and dedicated to environmental sustainability. When a brand is found to engage in greenwashing, consumers view its environmental initiatives as lacking authenticity, which reduces the perceived value of its products or services and, subsequently, the likelihood of positive word of mouth. This finding is similar discovered that greenwashing resulted in diminished GWOM and adversely affected consumers' impressions of green brands in general, posing difficulties for all brands within the green sector. Points out that when brands engage in greenwashing, it creates cognitive dissonance, which makes customers wary of GWOM since their beliefs don't match up with the company's practices.

Green word of mouth also has significant effect on green trust. Previous research shown that GWOM plays a crucial role in building consumer trust in brands that promote eco-friendly practices. When consumers discuss a brand's green initiatives or eco-friendly attributes with others, it can enhance trust in the brand's commitment to sustainability. For instance, similar found that consumers who receive positive environmental information from others are more likely to trust the brand, as they perceive it as being genuinely committed to sustainability. This positive GWOM creates a form of social proof, where consumers rely on the recommendations and experiences of others to validate a brand's green claims. Furthermore, research suggests that GWOM not only increases awareness of a brand's green efforts but also reassures consumers of the brand's credibility and authenticity. In turn, this builds green trust, as consumers are more likely to believe that the brand is sincere in its environmental commitments rather than merely engaging in greenwashing. These findings align with the theory of social influence, which posits that individuals often trust the information they receive from their social networks, especially when it concerns value-driven decisions like sustainability. Thus, green word of mouth is a powerful mechanism through which consumers' perceptions of trust in eco-friendly brands can be enhanced, supporting the hypothesis that GWOM has significant effect on green trust.

The hypothesis that green word of mouth (GWOM) mediates the relationship between greenwashing and green trust also supported. Studies show that greenwashing, defined as deceptive environmental claims, frequently results in skepticism and diminished trust among consumers. Consumer perception of greenwashing diminishes trust in a brand's

environmental claims. Positive GWOM can mitigate negative perceptions by offering alternative, consumer-driven messages that may restore or enhance trust. GWOM enables consumers to share positive experiences, assisting others in validating the authenticity of green claims, notwithstanding potential greenwashing. This research inline with it can be argued that GWOM, based on its sentiment, may either mitigate or exacerbate the detrimental effects of greenwashing on trust.

Gender differences in response to greenwashing, green trust and GWOM have also been observed. The result indicated that there are differences between men and women in the context of greenwashing, green trust and GWOM. The result reveals the strength of the negative impact of greenwashing on green trust, as well as the mediating function of GWOM, varies between genders as a result of unique psychological and social influences. Research indicates that consumers' reactions to greenwashing and their perceptions of it are significantly influenced by gender differences. For instance, women are more susceptible to ethical and environmental concerns and may demonstrate a more robust adverse response to greenwashing than their male counterparts. The degree to which women rely on and value GWOM to restore or enhance trust in green brands can be influenced by this heightened sensitivity, which can lead to a greater likelihood of her being cautious and skeptical of green claims.

Additionally, research indicates that GWOM is a potent tool for establishing trust, particularly among women. In general, women are more likely to rely on social proof and peer feedback, and they frequently regard GWOM as a credible source of information to verify or challenge the green claims made. Women may more effectively mediate the relationship between greenwashing and green trust than men, as evidenced by their increased dependence on GWOM as a metric for evaluating a brand's authenticity. Conversely, males are less susceptible to the effects of greenwashing, as they are generally less skeptical of green claims and prioritize brand performance over social validation.

5 Conclusion and implication

This study presents a detailed examination of how greenwashing influences green trust, green word of mouth (GWOM), and the moderating role of gender in these dynamics. The results indicate that greenwashing adversely affects both green trust and GWOM. This suggests that consumers who recognize greenwashing in a brand's practices exhibit a diminished level of trust towards that brand and show a reduced tendency to engage in positive word of mouth. Furthermore, GWOM has a beneficial effect on green trust, indicating that peer recommendations and favorable word of mouth can strengthen consumers' confidence in a brand's environmental assertions. The study further illustrates the mediation effect of GWOM in the relationship between greenwashing and green trust, indicating that positive GWOM can partially alleviate the adverse impacts of greenwashing on trust.

The findings indicate distinct gender differences in these relationships. The influence of gender on the effects of greenwashing is evident, as it affects both green trust and GWOM. This suggests that men and women exhibit distinct reactions to perceived greenwashing, impacting their levels of trust and their propensity to engage in word-of-mouth sharing. Additionally, the impact of GWOM on green trust is moderated by gender, indicating that the effectiveness of GWOM in building trust differs between men and women. Ultimately,

gender influences the mediating effect of GWOM in the relationship between greenwashing and green trust, indicating that the route from greenwashing to green trust through GWOM varies by gender. The findings underscore the necessity of incorporating gender-specific strategies to tackle consumer skepticism regarding greenwashing. Additionally, they emphasize the value of utilizing positive word of mouth to foster trust in green claims among various consumer segments. These results have important implications for marketers striving in a gender-sensitive way to create or rebuild green trust. To offset such greenwashing skepticism companies should concentrate on developing real green projects and using positive GWOM. Moreover, knowing gender variations would enable companies to better match their plans to involve men and women in green marketing campaigns.

This investigation enhances comprehension of the detrimental effects of greenwashing on consumer confidence. It contributes to the theory of green consumer skepticism by emphasizing the effect of greenwashing on green trust, which in turn addresses the broader implications of deceptive environmental marketing. The research offers novel insights into the manner in which gender influences the relationships between greenwashing, GWOM, and green trust. This research provides a nuanced understanding of how men and women respond differently to greenwashing and rely on GWOM as a trust mechanism by examining gender differences, thereby extending social influence and gender socialization theories. It emphasizes the distinctive manner in which gender influences the relationships within green marketing, a topic that has been largely overlooked in the literature. The study's also have limitation of research, sample diversity may be restricted by its emphasis on a specific cultural or demographic group. This could potentially restrict the potential generalizability of the findings to other cultural contexts or age groups, particularly because environmental concerns and responses to greenwashing may differ across cultures. The research analyses gender as a binary variable, which may result in the oversimplification of intricate gender dynamics. This method may fail to consider non-binary gender identities or nuanced factors such as gender roles and attitudes, which could further influence responses to green marketing. In the future, research could investigate whether the effects of greenwashing, GWOM, and green trust are influenced by cultural differences. A cross-cultural study could elucidate the ways in which cultural norms influence consumers' responses to greenwashing and their dependence on GWOM, thereby enhancing theories of consumer trust in global green marketing. In light of the growing influence of social media, future research could investigate the impact of various digital platforms (e.g., TikTok, Instagram) on green trust and GWOM. This could offer practical implications for digital green marketing strategies by revealing which platforms amplify or mitigate greenwashing effects more effectively.

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