




The (in)ability of consumers to perceive greenwashing and its influence on purchase intent and willingness to pay



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Background: Environmental concerns have led to consumers increasingly being willing to pay a premium for environmentally friendlier products. Unfortunately, this has led to the practice 'greenwashing', which yields handsome financial rewards. Consumers are not sufficiently aware of greenwashing, and little is known about the effects of such knowledge.

Aim: This article explores how consumers who become aware of greenwashing, respond in terms of purchase intent and willingness to pay.

Setting: The population was South African middle- to upper-income consumers. The findings were based on 120 responses.

Methods: The study used a 2 × 2 experimental design in which greenwashing knowledge and greenwashing presence were manipulated.

Results: We found that consumers reward greenwashing when it is undetected. Educating consumers about environmental issues does not develop their ability to identify greenwashing. In contrast, consumers who are educated about greenwashing and become aware of it, penalise such products through what we term a 'greenwash penalty'. We define the greenwash penalty as the shift in consumers' willingness to pay a premium for a product when they become aware of greenwashing. Purchase intent (PI) is also impacted by greenwashing.

Conclusion: Companies often try to drive awareness of environmental problems. Our research shows that such initiatives reward all companies that make claims, even when such claims are false. Companies that sell truly green products must educate consumers about the potential harm of misleading information. Once consumers are able to spot greenwashing attempts, companies that sell real green products should then provide true and transparent information about their own products.

Keywords: greenwashing; willingness to pay; purchase intent; environmental knowledge; greenwashing knowledge; greenwash penalty.

Introduction

Concern about environmental issues such as climate change, plastics pollution, and loss of biodiversity is likely at its highest point in history. Many of the environmental issues faced by humanity were non-existent until the mid-1900s, and the general population was mostly unaware of them (Cohen 2015). The high levels of awareness and concern observed currently, can partly be explained by increased media coverage (particularly social media), activism, and data and images of environmental problems having become ubiquitous.

Consumer attitudes towards the environment have gradually changed, due to the growing number of people who realise the added impact of their behaviour on climate change and environmental degradation (Kong et al. 2014). Increased levels of consumers' environmental awareness have resulted in a greater demand for environmentally friendly (green) products (Baum 2012; Parguel, Benoît-Moreau & Russell 2015; Pimonenko et al. 2020; Zhang & Sun 2021). Green products are considered less damaging to the environment than their 'non-green' counterparts, because they are recyclable, organic, made from recycled materials, or their production has a smaller carbon footprint.

As the demand for green products increased, so did the supply, as did the claims that organisations made about their products (Delmas & Burbano 2011). Whatever green claims are made about

products, such claims should be clear, true, and accurate (Chen & Chang 2013). Consumers' willingness to pay a price premium for goods and services that they perceive as environmentally friendly has, unfortunately, led to some organisations making untrue claims in order to get ahead of their competition (Nguyen et al. 2019; Parguel, Benoît-Moreau & Larceneux 2011; Pimonenko et al. 2020). This phenomenon is called 'greenwashing', and refers to environmental claims that are vague, exaggerated, or even false (Nguyen et al. 2019; Parguel et al. 2011). Organisations utilise greenwashing to intentionally mislead or deceive consumers about the actual environmental impact of their practices, products, and/or services (Nyilasy, Gangadharbatla & Paladino 2013).

Despite increased efforts by researchers to investigate the effects of greenwashing on marketing to consumers, many of these studies have largely lacked any theoretical approach that considers the underlying mechanisms and boundary conditions (De Medeiros & Ribeiro 2017; Schmuck, Matthes & Naderer 2018; Schuitema & De Groot 2015). Naderer and Oprea (2021) further noted that there is scant research about the efficacy of greenwashing literacy interventions. Consumers' attitudes towards products greatly affect their interactions with these products, including what they think they know, how they feel about the products, and their purchase intentions (Zhang & Sun 2021). Concerns around greenwashing include the average consumer being unaware of and/or unable to identify this practice (Aji & Sutikno 2015; Delmas & Burbano 2011; Smith & Brower 2012). While educating consumers about environmental issues may appear to be the obvious solution to developing their ability to identify greenwashing, educational initiatives have had mixed results (Chan & Lau 2000; Connell 2010; Eze & Ndubisi 2013; Scott & Vigar-Ellis 2014; Urbanski & Haque 2020; Zsóka et al. 2013).

An alternative strategy is to educate consumers about greenwashing itself, resulting in more critical consumer thinking regarding green marketing and greenwashing. Developing a critical consumer attitude towards green claims in marketing may be a more effective strategy to combat greenwashing than educating consumers about environmental issues (Nadányiová 2016; Wang et al. 2018; Wood 2015). Educating consumers about the practice of greenwashing itself may lead to consumers becoming skeptical of marketing claiming greenness (Do Paço & Reis 2013; Krafft & Saito 2014; Nyilasy et al. 2013). Eng et al. (2021) also suggested that the efficacy of greenwashing literacy interventions should be assessed, while controlling for knowledge about the environment. Yet, limited research is available that shows the positive impact of educating consumers about greenwashing itself as a means of modifying consumer attitudes towards green claims about operations, products and services (Nadányiová 2016; Wang et al. 2018; Wood 2015). The aim of this article is to show the impact of consumers' knowledge of greenwashing and their attitudes toward marketing claims of greenness of products on their purchase intention and their willingness to pay a certain price for a product.

A review of prior research and fundamental constructs

Green marketing and greenwashing

Green marketing was developed as a marketing strategy aimed at reversing the wasteful and unsustainable consumer practices imbedded in society (McEachern & Carrigan 2012), and has shown to improve consumers' attitudes towards products, as they feel they are contributing to conservation of the environment (González et al. 2015; Green & Peloza 2014; Olsen, Slotegraaf & Chandukala 2014; Townsend 2017). Green marketing is a holistic concept that explicitly or implicitly addresses the relationship between a product and the biophysical environment. It promotes a green lifestyle, with or without highlighting a product, represents an organisation's image of being environmentally responsible; focuses on the beneficial environmental attributes of a product, internal production techniques, or disposal methods within an organisation; and positively associates the organisation with environmental causes (Krafft & Saito 2014; Kumar & Kumar 2013).

The change in consumers' attitudes towards the environment has increased the pressure on organisations to operate in an environmentally friendly and sustainable manner (Aji & Sutikno 2015; Kumar & Kumar 2013; Prody 2016). Thus, organisations have seen green marketing as a way to address consumer demands regarding environmental issues (Aji & Sutikno 2015). However, green marketing can easily be exploited by organisations for financial gain (Alves 2009; Nyilasy et al. 2013). For example, organisations that greenwash could use deceptive green marketing to create a façade of environmental sustainability and conservation (Aji & Sutikno 2015; Alves 2009; Kong et al. 2014; Nyilasy et al. 2013). Consequently, concerns around greenwashing practices have grown (Aji & Sutikno 2015; Delmas & Burbano 2011; Smith & Brower 2012).

As greenwashing relates to environmental claims that are vague, exaggerated, or even false (Nguyen et al. 2019; Parguel et al. 2011), many consumers are often unaware of and unable to identify deceptive green marketing messages about the environmental impact of practices, products, and services (Nyilasy et al. 2013; Urbanski & Haque 2020). Greenwashing is commonly found in instances where organisations apply an eco-branding strategy to portray their products and services as being more environmentally beneficial than these truly are (Bäverstam & Larsson 2009; Orsato 2016; Zhang & Sun 2021). For example, companies could use environmental terminology such as *biodegradable*, *environmentally friendly*, and *ozone friendly* (Alves 2009; Do Paço & Reis 2013; Krafft & Saito 2014), coupled with ambiguous, unclear, or unsupported claims about their products. These claims often capitalise on consumers' lack of knowledge or understanding of environmental terminology (Borin, Cerf & Krishnan 2011; Do Paço & Reis 2013; Krafft & Saito 2014).

Grimmer and Woolley (2014) suggest that consumers who are knowledgeable and concerned about the environment

are attracted to clearer green claims, but consumers with low to no knowledge and concern for the environment are not. Various researchers (Alves 2009; Do Paço & Reis 2013; Townsend 2017; Urbanski & Haque 2020) have highlighted that it is becoming increasingly difficult for consumers to differentiate between true and false green marketing claims, because consumers are constantly bombarded with such claims, and are also faced with an increasing number of deceptive green marketing claims that cannot be corroborated.

Environmental awareness

Environmental awareness refers to consumers' beliefs, knowledge, and experience of the environmental effects of green products (Paladino & Ng 2013). Many consumers are increasingly paying attention to environmental issues, and their environmental awareness positively impacts their feelings towards green products (Diamantopoulos et al. 2003; Paladino & Ng 2013). When consumers exhibit environmental knowledge, they understand the environment and the key attributes of green products (Gleim et al. 2013; Li et al. 2016). Research suggests that consumers' knowledge of environmental issues could influence their feelings towards green products and the environment (Chan & Lau 2000; Connell 2010; Eze & Ndubisi 2013; Paladino & Ng 2013; Polonsky et al. 2012).

Green products, purchase intent, and willingness to pay

Green purchasing is defined as the specific purchase of environmentally beneficial products and avoiding products that are harmful to the environment (Chan 2001). Furthermore, *green purchasing*, most often measured as *green purchase intention*, refers to the consumer's willingness to purchase a certain product (Chen, Chen & Tung 2018; Joshi & Rahman 2015). *Willingness to purchase* or *willingness to pay* is also often expressed as the intention of a consumer to pay a stated amount (in research using dichotomous choice questions), or as the maximum a consumer is willing to pay (in research using open-ended questions) (Chan et al. 2011).

According to Chen et al. (2018), consumers' feelings towards the environmental impact of a green product are significantly affected by their environmental awareness, compared to other behavioral component factors, a finding corroborated by Chen and Chai (2010) and Diamantopoulos et al. (2003). Specifically, the more consumers care about the environment, pay attention to social well-being, and desire to protect the environment, the more favourable their attitudes are toward society and the environment. This provides them with an incentive to participate in environmentally responsible behaviour (Chen et al. 2018).

De Medeiros and Ribeiro (2017) define consumers' feelings towards the environmental impact of green products as their emotions regarding environmental activities and issues, while Kim (2002) reported that these feelings enhance green purchase intentions. Various studies have indicated that

consumers' feelings towards the green attributes of products positively influence purchase intention and willingness to pay a premium for green products (Costa Pinto et al. 2016; Paladino & Ng 2013; Tung et al. 2012; Young et al. 2010).

Consumers' attitudes towards products largely influence their interactions with those products. Consumers' attitudes include what they think they know, how they feel about the product, their purchase intentions towards the product, and their willingness to pay for the product (Zhang & Sun 2021). While educating consumers about environmental issues may appear to be an obvious solution to developing their ability to identify greenwashing, educating consumers about environmental issues has had mixed results in terms of changing their attitudes towards green products (Chan & Lau 2000; Connell 2010; Eze & Ndubisi 2013; Scott & Vigar-Ellis 2014; Zsóka et al. 2013). Some researchers have suggested that consumers' attitudes to purchasing green products could be influenced by the opinions of social influencers and consumers' cognitive values (Paladino & Ng 2013).

The higher the consumer's evaluation of greenness is, the greater their intention to purchase green products becomes (Chen et al. 2018). Yet, consumers' feelings towards the negative environmental impact of green products have been found to influence their purchase intentions more than their feelings towards the environmental benefits (i.e. positive impact) of the green product (Chen et al. 2018; Leonidou, Leonidou & Kvasova 2010; Nyilasy et al. 2013; Sun & Willson 2008).

Research has shown that increasing consumers' knowledge of environmental issues enhances neither their ability to identify greenwashing (Krafft & Saito 2014; Smith & Brower 2012; Urbanski & Haque 2020) nor their purchase intentions (Chan & Lau 2000; Connell 2010; Eze & Ndubisi 2013; Scott & Vigar-Ellis 2014; Zsóka et al. 2013). De Medeiros and Ribeiro (2017) and Schuitema and De Groot (2015) suggest that educating consumers about greenwashing itself, could lead to positive outcomes in terms of making consumers more critical about green claims. In light of this, we postulate the following:

H₁: Consumers' willingness to pay and purchase intent (PI) are influenced by their knowledge of greenwashing.

Research method

The experiment

To investigate consumers' PI under conditions of greenwashing advertising, a 2 × 2 full-factorial experiment was conducted. In the process of identifying a suitable product for the experiment, the theories of FCB's grid was applied. The grid is an instrument with which to assess the relationship between consumers' attitudes and product choices, based on their involvement (high or low in terms of consumption) and motive. Purchase intention is classified as rational or irrational (Krafft & Saito 2014; Lee, Edwards & La Ferle 2014). As respondents were required to make fair

and rapid judgments based on the advertisement used in the experiment (cf. Krafft & Saito 2014), a product that was typically classified as a low-involvement, rational motive product on the FCB grid had to be selected; we chose washing detergent. As green advertisements are often used to market detergents, it is a product category that is affected by greenwashing (Krafft & Saito 2014; Lee et al. 2014). It is also a product category with which consumers are familiar and which they purchase often (Krafft & Saito 2014). To negate the halo effect of brands, a fictitious detergent brand *Kleen* was used.

The greenwashed advertisement of *Kleen* washing powder mirrored detergent advertisements that claim the use of natural ingredients that make detergents less harmful to the environment. However, such claims often lack proof of testing and results, fail to stipulate the amount of natural ingredients, and the products contain the same toxic ingredients, in comparable amounts, found in other detergents.

The *Kleen* detergent advertisement was manipulated by either stating that the detergent contained natural ingredients (i.e. greenwashing) or no claims about its environmental friendliness were made in the advertisement (i.e. no greenwashing). Consumers' knowledge about greenwashing was manipulated by giving them a leaflet containing information on greenwashing or not giving them any information on greenwashing (cf. Chan & Lau 2000; Connell 2010; Eze & Ndubisi 2013; Scott & Vigar-Ellis 2014; Zsóka et al. 2013).

Research has shown that middle- and upper-income consumer segments have higher purchase intentions towards green products (Oliver, Volschenk & Smit 2011; Wong 2017), and are thus at a higher risk of being misled by greenwashing claims. Previous researchers have shown that even environmentally concerned and educated consumers will perceive greenwashed advertising in a positive light (Do Paço & Reis 2013; Krafft & Saito 2014; Townsend 2017). Therefore, middle- to upper-income consumers were considered a suitable target population for the current research. A screening question about their income-bracket was used to ensure that respondents were, in fact, part of this demographic.

Data collection

Shoppers were approached in a shopping mall and asked to participate in the study. A total of 131 shoppers agreed to participate, of which 120 were eligible for participation based on their reply to the screening question. The shoppers were then randomly exposed to the non-greenwashed advertisement or the greenwashed advertisement, and were either provided with information about greenwashing or not. Thereafter, respondents were asked to answer a questionnaire to ascertain the effect of the experimental conditions on their intent to purchase *Kleen*, as well as the price they would be willing to pay for the product.

Measurement

To measure the dependent variables, *Purchase intent* and *Willingness to pay*, a questionnaire was designed. *Purchase intent* was measured using an adaptation of Suki's (2016) three-item measurement by dropping one item. *Willingness to pay* was measured using an open-ended question: 'How much would you pay for 1 kg of *Kleen* washing powder?' To control for respondents' knowledge of and feelings toward the environment, Flynn and Goldsmith's (1999) eight-item measure of subjective knowledge (SK) was shortened to six items and Suki's (2016) six-item measure of attitude towards the environment was adapted to only include the four items on individuals' feelings toward the environment. In all instances, question wording was adapted to include reference to *Kleen*. Respondents had to indicate their PI, and rate their knowledge of and feelings towards *Kleen* washing powder's impact on the environment on a five-point Likert scale (1 = *Strongly disagree*; 5 = *Strongly disagree*).

Assessing unidimensionality: Purchase intent, knowledge of and feelings toward the environment

Even though scale adaptation is a common practice in business research, evidence should support the validity of the adapted scale (Heggstad et al. 2019). Consequently, validity of the various adaptations was assessed. As the items within each subscale was designed to measure a single underlying latent variable, these items needed to operate as a unidimensional scale. To test this assumption of unidimensionality, Principal Components Analysis (PCA) was utilised as it is an appropriate method to assess covariation amongst items when scales are modified (Skrondal & Rabe-Hesketh 2004). Principal Components Analysis was further utilised to determine the number of components to extract from the data and assess the underlying structure of items in each scale. The internal consistency of the scales (i.e., reliability) was also assessed by calculating Cronbach alpha (as depicted in Table 1).

The sampling adequacy and inter-item correlations of each measurement scale were determined using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. Based on Field (2017), the KMO statistic was found to be satisfactory in all instances (KMO: PI = 0.500; SK = 799; F = 768 i.e. KMO > 0.665) and Bartlett's Test of Sphericity significant (PI: $\chi^2 = 149.895$, $df = 1$; $p < 0.05$; SK: $\chi^2 = 858.06$, $df = 66$, $p < 0.01$; F: $\chi^2 = 272.444$, $df = 6$, $p < 0.05$), indicating that the data was suitable for factor analysis. Using the Kaiser criterion (i.e., retaining factors with Eigenvalues (λ) greater than 1), the results indicated that, in all instances, one component should be retained (Eigenvalue: PI = 1.849 i.e., $\lambda > 1$, explaining 92.45% of variance; SK = 3.03 i.e., $\lambda > 1$, explaining 50.5% of variance; F = 2.969 i.e., $\lambda > 1$, explaining 74.23% variance). Results of the PCA, therefore, confirmed the unidimensionality of the three scales; in other words, confirming the construct validity of the adapted scales (PI, SK, F). As depicted in Table 1, the factor

TABLE 1: Construct validity check of scale adaptations.

Items	Purchase intent (PI)	Subjective knowledge (SK)	Feelings (F)
I expect to purchase <i>Kleen</i> in the future because of its environmental benefits.	0.962	-	-
I intend to buy <i>Kleen</i> because of my environmental concern.	0.962	-	-
I know a lot about the environmental impact of detergents.	-	0.779	-
I know if the prices of environmentally friendly detergents are worth it or not.	-	0.767	-
I know enough about the environmental impact of detergents to feel confident when I make a purchase.	-	0.753	-
I do not feel very knowledgeable about the environmental impact of the detergent.	-	0.707	-
I know less about the environmental impact of detergent products than other people.	-	0.647	-
When it comes to environmentally friendly detergents, I really don't know a lot.	-	0.592	-
I feel that <i>Kleen</i> washing powder's environmental claims are generally trustworthy.	-	-	0.894
I feel that <i>Kleen</i> washing powder's environmental concern meets my expectations.	-	-	0.870
I feel that <i>Kleen</i> washing powder keeps its promises and responsibilities for environmental protection.	-	-	0.864
I feel that <i>Kleen</i> washing powder's environmental performance is generally dependable.	-	-	0.817
Eigenvalue	1.849	3.030	2.969
% Variance explained	92.45	50.50	74.23
Cronbach alpha value	0.802	0.883	0.918

loadings for the three scales were all found to be greater than 0.4 (Field 2017). The Cronbach's alpha coefficient was calculated and found to be satisfactory (Cronbach alpha: PI = 0.802; SK = 0.883; F = 0.918). Based on the above evidence, it is possible to assume that the adapted scales for PI, SK and Feelings toward the environment (F) were found to be both valid and reliable and appropriate for use in further analyses.

Realised sample

For purposes of this research, the target population consisted of consumers who considered their effect on the environment before purchasing everyday household products. Only respondents who indicated a high level of environmental mindfulness towards their consumer behavior were included, yielding a sample of respondents from the middle- to upper-income segments. This is aligned with literature that posits that middle- to upper-income segments are more mindful of their environmental impact as consumers (Wong 2017). There was a high women-to-men ratio in each of the four sample groups; approximately two-thirds of the respondents in each sample group were women. This was to be expected, as many female consumers do the purchasing of general household goods such as washing powder. There was a positive skew in the age range of the respondents, with the majority of the respondents in the younger age ranges. This is aligned with literature that posits that younger generations are more

mindful of their environment, and may also have contributed to the positive skew in the responses to the screening question (Barber 2010).

Results

Preliminary analysis

Because our study involved a 2×2 design, we conducted a two-way multivariate analysis of variance (MANOVA). Preliminary analysis showed no violation of the assumptions of normality (Purchase intention: skewness and kurtosis $Z < 3.29$, $p > 0.05$; Willingness to pay: skewness and kurtosis $Z < 3.29$, $p > 0.05$ for sample size $50 < n < 300$). Preliminary analyses also revealed that the dependent variables, Knowledge of greenwashing and Feelings towards the environment are not highly correlated to each other ($r < 0.0$), and that the variance between groups is equal ($F[3; 1030.389] = 1.751$; $p > 0.05$).

Manipulation check

Before testing our hypothesis, we checked the effectiveness of our manipulations. To check the manipulations when measuring *Purchase intent*, a two-sample *t*-test revealed that there was a significant difference ($t[118] = -6.623$; $p < 0.05$) between the conditions *Knowledge of greenwashing* ($M = 1.76$; $s = 0.801$) and *No knowledge of greenwashing* ($M = 3.05$; $s = 1.267$). Similarly, there was a significant difference ($t[117] = 2.110$; $p < 0.05$) between the conditions *Greenwashing advertisement* ($M = 2.66$; $s = 1.514$) and *No greenwashing advertisement* ($M = 2.18$; $s = 0.871$). With regard to the manipulations when measuring the variable *Willingness to pay*, a two-sample *t*-test also revealed a significant difference ($t[118] = -4.511$; $p < 0.05$) between the conditions *Knowledge of greenwashing* ($M = 26.12$; $s = 5.861$) and *No knowledge of greenwashing* ($M = 32.44$; $s = 9.095$). Similarly, there was a significant difference ($t[117] = 2.305$; $p < 0.05$) between the conditions *Greenwashing advertisement* ($M = 31.05$; $s = 9.822$) and *No greenwashing advertisement* ($M = 27.61$; $s = 6.152$). These results showed the effectiveness of the two manipulations when measuring both *Purchase intent* and *Willingness to pay*.

Hypothesis testing

To assess the possible influence of respondents' knowledge of greenwashing and their feelings toward greenwashing, we included *Knowledge* and *Feelings toward greenwashing* in our model. The results revealed that *Knowledge of greenwashing* and *Greenwashing advertisement* respectively explained 36% of the variance in *Willingness to pay* ($F[5] = 14.438$; $p < 0.05$) and 65% in the variance of *Purchase intent* ($F[5] = 45.055$; $p < 0.05$). Only *Feelings toward greenwashing* correlated with *Purchase intent* ($F[1] = 26.215$; $p < 0.05$), as illustrated in Table 2.

Results revealed a two-way interaction effect between Knowledge of greenwashing and Greenwashed advertisement for both PI ($F[1] = 26.096$, $p < 0.05$) and

Willingness to pay ($F[1] = 18.605; p < 0.05$). Further analysis revealed that *Willingness to pay* was significantly higher in instances where greenwashing was present in the advertisement and respondents had no knowledge of greenwashing ($M = 37.79; s = 8.862$). *Willingness to purchase* was significantly lower in instances where greenwashing was present in the advertisement and respondents had knowledge of greenwashing ($M = 24.31; s = 4.870$). *Purchase intent* was significantly higher in instances where greenwashing was present in the advertisement and respondents had no knowledge of greenwashing ($M = 3.93; s = 1.067$), and significantly lower in instances where greenwashing was present in the advertisement and respondents did have knowledge of greenwashing ($M = 1.38; s = 0.393$). In instances where the advertisement had not been greenwashed, no significant differences were evident (illustrated in Figure 1).

To verify our results, we performed a bootstrap with 1000 iterations, the results of which confirmed the results of our experiment (illustrated in Table 3).

TABLE 2: Model explaining variance in *Willingness to pay* and *Purchase intent*.

Constructs	Sum of squares	df	Mean square	F
Intercept				
Willingness to pay	6507.768	1	6507.768	148.380**
Purchase intent	4.735	1	4.735	8.760**
Willingness to pay				
Knowledge of green detergents	166.814	1	166.814	3.803*
Feelings about the environment	55.004	1	55.004	1.254
Greenwashed advertisement	283.846	1	283.846	6.472**
Knowledge of greenwashing	690.492	1	690.492	15.744**
Knowledge of greenwashing * Greenwashed advertisement	816.010	1	816.010	18.605**
Purchase intent				
Knowledge of green detergents	0.721	1	0.721	1.335
Feelings about the environment	14.168	1	14.168	26.215**
Greenwashed advertisement	4.326	1	4.326	8.004**
Knowledge of greenwashing	15.308	1	15.308	28.324**
Knowledge of greenwashing * Greenwashed advertisement	14.104	1	14.104	26.096**

*, Significant at 0.01 level.

**, Significant at 0.05 level.

TABLE 3: Bootstrap results.

Constructs	Experiment			Bootstrap	
	B	t	95% CI	Bias	95% CI
Willingness to pay					
Intercept	24.310	19.602**	[21.854; 26.767]	-0.008**	[22.607; 26.273]
Knowledge of greenwashing	13.483	7.687**	[10.009; 16.957]	0.011**	[10.151; 17.252]
Greenwashed advertisement	3.556	2.045*	[0.111; 7.001]	-0.023**	[0.770; 6.373]
Knowledge of greenwashing * Greenwashed advertisement	-13.995	-5.712**	[-18.847; -9.142]	-0.040**	[-18.602; -9.258]
Purchase intent					
Intercept	1.379	8.819**	[1.070; 1.689]	0.002**	[1.240; 1.537]
Knowledge of greenwashing	2.552	11.537**	[2.114; 2.990]	0.000**	[2.122; 2.939]
Greenwashed advertisement	0.754	3.438**	[0.320; 1.188]	0.001**	[0.403; 1.133]
Knowledge of greenwashing * Greenwashed advertisement	-2.459	-7.960***	[-3.071; -1.847]	-0.001**	[-3.064; -1.809]

*, Significant at 0.01 level.

**, Significant at 0.05 level.

***, Significant at 0.001 level.

The results suggest that, when a product is greenwashed, the amount that consumers are willing to pay differs significantly ($p < 0.05$) when consumers do have knowledge of greenwashing, compared to when consumers do not have knowledge about greenwashing (R24.31 and R37.79 respectively). However, when a product is not greenwashed, there is no significant difference ($p > 0.05$) between the amount consumers with knowledge of greenwashing and

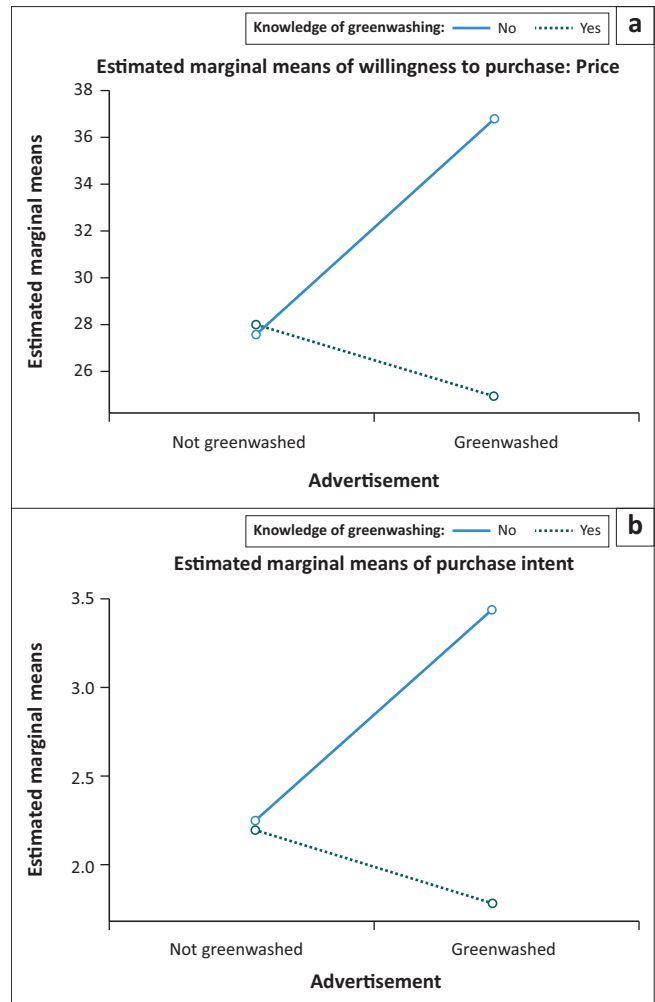


FIGURE 1: Two-way interaction effect on *Willingness to pay* and *Purchase intent* (a–b).

those without are willing to pay (R27.87 and R27.35 respectively). It would seem that, although consumers are willing to pay a premium for products that are (seemingly) green (i.e. R37.79 compared to R27.35), they would pay even less for a product that is greenwashed (i.e. R24.31 compared to R27.87). Consumers' willingness to pay less for a product because of greenwashing could suggest that consumers penalise organisations for greenwashing once they have sufficient knowledge about greenwashing.

Discussion

Implications

Green companies often try to drive awareness about environmental problems to increase sales of their products. Our research shows that such initiatives reward all companies that make claims, even when such claims are false. Our results also confirm that educating consumers about environmental issues does not develop the ability of consumers to identify greenwashing, confirming a large body of prior research (Chan & Lau 2000; Connell 2010; Eze & Ndubisi 2013; Scott & Vigar-Ellis 2014; Zsóka et al. 2013).

This study set out to determine what the impact would be on consumers' PI and their willingness to pay a premium if they are aware of greenwashing. We therefore had to create an experiment that firstly contrasted a product that was greenwashed with one that was not. We also had to distinguish two groups of consumers: those who had knowledge about greenwashing (through an intervention) and those who did not. Knowledge and feelings about environmental issues were not manipulated and thus served as control variables.

Our results show that, when the advertisement had been greenwashed and respondents had no knowledge of greenwashing, their PI and willingness to pay were high. However, when the advertisement had been greenwashed and respondents had knowledge of greenwashing, both their PI and willingness to pay were lower. Results from this research, therefore, show that greenwashing has a negative influence on consumer behaviour, confirming the findings of Urbanski and Haque (2020) and Zhang and Sun (2021). In the case where the advertisement had not been greenwashed, PI and willingness to pay did not differ between respondents who were knowledgeable about greenwashing and those who were not.

Consumers' willingness to pay less for a product because of greenwashing, suggests a greenwash penalty once they have sufficient knowledge about greenwashing. We noted a reduction of more than a third (R24.31 vs R37.79) in the average price that consumers were willing to pay for a greenwashed product once they became aware of the deception. The price that 'greenwash-knowledgeable' consumers are willing to pay for a greenwashed product is even lower than what they would pay for the conventional product (i.e. no green claim) (i.e. R24.31 compared to R27.87).

All four manipulations of the 2 × 2 experiment had similar levels of environmental awareness and feelings (a control

variable), implying that the results of the manipulation were not due to respondents' level of environmental awareness or feelings towards the environment. On the contrary, the results show that, despite having environmental knowledge (i.e., a control variable), the greenwashed advertisement succeeded in misleading the respondents with less knowledge about greenwashing.

The more knowledgeable consumers are about greenwashing, the higher the likelihood is that they would be able to identify greenwashing in advertisements. Consequently, not only could 'greenwash-knowledgeable' consumers be less likely to pay a premium for products with greenwashed advertisements, but the likelihood of these consumers purchasing those products could decrease.

Recommendations

The greenwash penalty is not an indictment of the quality of a product. The greenwash penalty is an expression of distrust in the brand. As a result, consumers (like the respondents in this study) would rather choose products that make no claims above products that make false claims. The implications of this study are relevant for companies that sell truly green products, as well as those that attempt to deceive consumers.

Marketers of truly green products and services should educate consumers about greenwashing so that they are able to distinguish real green from fake green products. This will benefit their own products, while it could impact the legitimacy and credibility of competing, but fake green products.

In industries in which there are a few companies that show superior environmental performance, it may be sensible to collaborate to educate consumers or to create credible environmental certifications. There are mainly two benefits to collaborating with competitors around raising awareness of greenwashing.

Firstly, co-competition among real green companies would reduce the risk of free-riding behaviour from fake green companies on green marketing campaigns. Collaboration would also reduce free riding between real green firms. If one company does a greenwashing awareness campaign, it would benefit other real green companies too. Because it is in the interest of all real green companies, collaboration makes sense.

The second reason for collaboration is to share the costs of creating awareness about greenwashing. Education of consumers may be an expensive, difficult, and long process. Multiple companies providing complementary but marginally different messages, may confuse consumers. Alignment around the purpose and message of greenwashing awareness campaigns will increase the efficacy of such campaigns while reducing costs for individual companies.

Once consumers are able to recognise greenwashing, truly green companies should provide consumers with certifications and information that would enable consumers to make the right choices. Again, competition would benefit all green companies in such endeavours.

For a sole leading green company, there may be a potential premium in marketing its products as green. As competitors respond by also introducing green products, green attributes or certification no longer would allow premium prices. When leading performance becomes the standard, certification can be used as a barrier to entry for fake green companies.

The study should pose a warning to companies that greenwash. When consumers become aware of attempts to deceive them, they are less willing to buy, and less willing to spend their money on such products compared to products that make no claims.

Future research

This study only focused on two aspects of how consumers respond to greenwashing of a low-involvement, rational motive product, namely PI and willingness to pay. We see three broad areas for further research.

The first opportunity is for studies that explore how consumers would respond to other types of products such as high-involvement products. Secondly, studies should investigate how companies should think about green services, where green attributes may be less tangible. Thirdly, more studies are needed to explore penalties for greenwashing that go beyond PI and willingness to pay.

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Competing interests

The authors have declared that no competing interest exists.

Authors' contributions

J.W.V. proposed the original idea of the article. B.S. was a Master's student under his supervision, and C.G. advised throughout about the methodology and analysis. B.S. operationalised the conceptual thinking and collected the data. J.W.V. and C.G. assisted with the refinement of the experiment. After his Master's was completed, B.S. stepped out from the project and J.W.V. and C.G. wrote the article and did further analysis on the data.

Ethical considerations

Before commencement with data collection, ethical clearance was granted by Stellenbosch University (USB-2018-8019). The university of Stellenbosch ethics committee approved the research. There were no major risks for participants or the researcher in the execution of this study. 30/08/2018.

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Data availability

The data that support the findings of this study are available on request from the corresponding author.

Disclaimer

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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