

RATIONAL AND EMOTIONAL ADVERTISING FOR SUSTAINABLE TRANSPORTATION

Experimental Analysis of Persuasion Through Normative Appeals

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KEYWORDS

*Sustainable Transport
Green Advertising
Persuasion
Social Norms
ELM*

ABSTRACT

Urban transportation constitutes an environmental problem due to its contribution to pollution and its effects on health. This study examined the influence of rational messages (central route of the ELM) and emotional messages (peripheral route), combined with social norms, on attitudes toward sustainable transportation advertising and intentions to use sustainable transportation in Bogotá, Colombia. An experimental design was employed with 240 participants (120 women and 120 men) who were exposed to graphic advertisements. Results showed that emotional messages generated more favorable attitudes and stronger usage intentions, particularly when combined with subjective norms. Women reported stronger usage intentions when exposed to emotional messages and subjective norms, whereas among men, altruism was associated with stronger usage intentions. These findings highlight the importance of considering gender, persuasion strategies, and social norms when designing advertising strategies aimed at promoting sustainable mobility.

Received: 10/23/2025

Accepted: 01/11/2026

1. Introduction

Mobility and transport are major environmental issues facing large cities, as they are associated with high levels of air and noise pollution. These conditions have negative effects on citizens, including increased stress, impacts on mental health, and respiratory problems, among others (World Health Organisation, 2019).

Consequently, sustainable transport has emerged as one of the main challenges in addressing environmental problems. In this context, communication and advertising play a key role in promoting behavioural change towards more environmentally friendly options, particularly in sectors traditionally considered unecological, such as transport. Indeed, transport is responsible for a significant proportion of global carbon dioxide (CO₂) emissions (Borowski et al., 2020).

In this sense, advertising that encourages the use of sustainable transport has increasingly become a strategic tool for generating behavioural change among consumers. This is achieved through messages embedded in everyday contexts that connect with value frameworks and normative behaviours favouring the adoption of eco-friendly practices (Bertucci et al., 2024).

For example, green advertising can directly influence intentions to purchase electric vehicles when it appeals to environmental values, consumers' sense of personal efficacy, and pro-environmental attitudes (Bi et al., 2023). However, research also shows that such communicative actions are effective only insofar as they connect with personal motivations, such as the need for self-expression or the desire to feel good about oneself and others. In these cases, the use of purely practical arguments is insufficient (Kathuria, 2024).

The impact of communication aimed at promoting sustainable transport can be further enhanced when messages emphasise both the ecological benefits of the product and the active role of the consumer in contributing to collective sustainability. This approach activates adherence to personal norms and biospheric values that benefit both human beings and the natural environment (Arya & Chaturvedi, 2022). Indeed, several studies indicate that increased awareness of environmental issues and the advantages of sustainable transport can lead to greater acceptance of ecological alternatives, particularly when supported by clear public policies and campaigns focused on self-transcendence (Waqas et al., 2018).

Similarly, psychological benefits such as the satisfaction derived from contributing to collective well-being and environmental awareness have been shown to increase individuals' motivation to make sustainable decisions more deliberately (Jha & Singh, 2024). These effects are closely linked to biospheric and altruistic values, including concern for the environment and for collective welfare (Arya & Chaturvedi, 2022). However, the presence of self-oriented values focused on comfort or social status can counteract these tendencies, which highlights the need for communication approaches that balance personal benefits with collective interests (Arya & Chaturvedi, 2022).

In addition to value-based motivations, cultural and symbolic barriers also play a significant role. For instance, the association of private car use with social status can limit the adoption of sustainable transport options. Addressing these barriers requires integrative strategies that go beyond communication alone and include improvements in infrastructure and incentive policies that support sustainable mobility choices (Waqas et al., 2018).

Nevertheless, research has shown that positive attitudes towards green transport do not necessarily translate into behavioural change unless clear incentives are in place and users perceive facilitating conditions, along with clear guidance regarding expected rules of conduct. In this context, advertising can function as a mechanism for reinforcing beliefs, particularly when it highlights personal advantages such as financial savings and convenience in the use of collective transport services, alongside broader benefits for the community and the environment, including reductions in CO₂ emissions (Hwang, 2024).

Advertising campaigns that employ role models, such as celebrities, social leaders, or influencers, can further reinforce and legitimise sustainable behaviour. These figures may help reduce the perception that sustainable transport involves sacrifice or offers limited benefits to users. However, the effectiveness of such campaigns depends largely on the credibility of the

individuals featured and the extent to which their values align with those of the intended audience (Hanna et al., 2018).

The use of interactive technologies in this type of campaign has also gained momentum through the incorporation of digital nudges and interactive tools. These digital approaches are emerging as an effective alternative for promoting sustainable mobility practices. For example, graphical interfaces that employ interactive animations to demonstrate the environmental impact of driver behaviour have proven more effective than traditional methods in encouraging eco-driving (Potvin-Bernal et al., 2020). In addition, personalised digital recommendations, particularly for short journeys, have been shown to increase public transport use when they highlight specific benefits such as time or cost savings (Zimmermann et al., 2024).

Nevertheless, although these digital tools have demonstrated considerable persuasive potential, their actual impact continues to depend on cultural and economic context. In some geographical settings, for instance, the automotive industry is using sustainability narratives to add brand value and strengthen market positioning through digital advertising supported by regulatory frameworks and climate change discourse (Bonales-Daimiel et al., 2024). Despite this, such factors are not yet decisive in the purchase of sustainable vehicles, as price and design remain the primary considerations for consumers (Phuah et al., 2022). This reveals a clear imbalance between the messages conveyed by brand advertising campaigns and consumer priorities. Consequently, there is a need for communication strategies that are more closely aligned with genuine environmental concerns, as well as for the exploration of diversified and coherent communication formats that resonate more effectively with new generations of consumers (Bonales-Daimiel et al., 2024).

With regard to consumers' intentions and willingness to adopt sustainable transport alternatives, research has shown, for example in the context of air travel, that users are willing to pay a surcharge for carbon offsetting. This willingness is influenced by the perceived credibility and clarity of the information and communication provided to the end consumer (Wendt et al., 2024). Beyond direct payment mechanisms, green marketing strategies therefore play a key role in shaping purchasing decisions. In this sense, airlines have begun to incorporate practices such as improving flight efficiency or promoting public transport at destinations. At the same time, these actions are used to construct a brand image centred on environmental responsibility, aligned with both regulatory frameworks and social expectations (Koç, 2023). A comparable dynamic can be observed in the automotive sector, where perceptions of environmental commitment, particularly in relation to ESG criteria, together with government incentives such as subsidies, can increase intentions to purchase electric vehicles (Panyagometh & Bian, 2023).

Building on this perspective, a range of complementary public policies can support progress towards a more sustainable mobility model. These include physical interventions, such as infrastructure development; soft interventions, such as education and behavioural incentives; and knowledge-based interventions linked to research and development (Santos et al., 2010). However, the broad acceptance of sustainable transport modes depends more strongly on education and research policies than on infrastructure alone. Ultimately, what is required is a substantial shift in citizens' behaviour. In this context, strategic advertising that highlights the symbolic value of sustainable and active mobility, drawing on emotional factors such as prestige or a sense of belonging, may be more effective than communication based solely on pro-environmental arguments (Herberz et al., 2020). Such approaches can also contribute to reframing urban mobility as a desirable experience by linking public green spaces with mental and physical health benefits (Kim & Hall, 2022).

From the perspective of behaviour change through advertising communication, factors such as environmental awareness, attitudes and perceived behavioural control are essential in encouraging the adoption of sustainable transport (Kim & Hall, 2022). Young people, for example, tend to be more receptive to campaigns that integrate technology and the sharing economy, such as bike-sharing services, where perceived usefulness and ease of use are decisive factors (Khan et al., 2024; Waqas & Najmi, 2023). In addition, the perception of ecological value plays a significant role. Research has identified a positive relationship between perceived green value and sustainable transport behaviour, particularly when advertising highlights both functional and

emotional benefits, such as the personal satisfaction derived from contributing to environmental protection (Boztepe, 2016; Kathuria, 2024).

This perception of ecological value is further reinforced when consumers possess greater environmental knowledge and a stronger sense of responsibility, as observed in the use of shared transport services in urban contexts. Such dynamics are especially relevant in cities facing complex mobility challenges, such as Bogotá, Colombia, where the adoption of sustainable transport requires overcoming both practical and cultural barriers. Recent research conducted in the Colombian capital shows that the uptake of alternatives such as electric scooters is feasible when communication strategies combine incentives with clear information about their functional benefits and environmental impact (Marroquín-Ciendúa et al., 2025).

Social support and value creation also influence intentions to use environmentally friendly transport, encouraging decisions such as choosing eco-friendly ride-hailing platforms, which can generate additional social and environmental benefits (Khan et al., 2024). These dynamics interact with perceptions of sustainability-focused advertising in the automotive sector, which in some cultural contexts is still regarded as superficial, creating a gap between communicated narratives and actual practices (Bonales-Daimiel et al., 2024). Although traditional advertising has shown limited effectiveness in transforming mobility habits, factors such as message originality, clarity of content and the strategic use of digital media can significantly enhance its impact (Išoraitė et al., 2023). This is partly because decisions related to sustainable mobility are not purely rational but also symbolic, allowing advertising to associate eco-friendly transport with values such as progress, health and responsibility (Santos et al., 2010). In emerging markets, transparency in eco-certifications and consumer education are therefore essential to reduce scepticism and to support the integration of sustainable transport models into everyday practices (Kumar, 2025).

Credibility in sustainability communication is a key factor in motivating consumers to adopt behaviours that benefit the environment. When brands communicate environmental commitments supported by tangible actions, such as the introduction of electric buses or incentives for carpooling, they tend to achieve higher levels of acceptance and trust (Delgado Cadavid et al., 2020; Nadanyiova, 2018). One of the most persistent challenges lies in translating sustainable intentions into concrete actions. Although many individuals express general support for reducing emissions (Gaker et al., 2011), in practice they often prioritise considerations such as cost, convenience, and the influence of their social environment (Herberz et al., 2020).

In this context, advertising can function as a mediating mechanism, provided it avoids greenwashing and clearly communicates both personal benefits, such as financial savings and health improvements, and collective benefits related to air quality and climate change mitigation (Hwang, 2024). Younger generations, including Millennials and Generation Z, appear to be particularly receptive to this approach, as they place a strong emphasis on authenticity and consistency in brand communication (Kanchana, 2024).

Advertising aimed at promoting sustainable transport has also incorporated normative messages to strengthen its persuasive impact. Messages that appeal to injunctive norms, understood as perceptions of what others approve or disapprove of, have been shown to significantly reduce intentions to use private cars and to increase willingness to adopt more sustainable alternatives, such as public transport or cycling. By contrast, descriptive norms, which refer to aligning behaviour with what the majority does, tend to have a more limited effect on encouraging practices such as walking or cycling (Piras et al., 2021).

The effectiveness of normative appeals can be further enhanced when they are disseminated through digital media, particularly social networks. In these environments, the circulation of opinions by opinion leaders can amplify the reach and impact of pro-environmental messages related to sustainable transport choices (Borowski et al., 2020).

Combining persuasion models such as AIDA (Attention, Interest, Desire, Action) with approaches based on social norms has proved useful for understanding how individuals make sustainable decisions in innovative contexts. From this perspective, decisions in favour of sustainable transport are shaped by environmental awareness, personal norms and emotional factors (Kang, 2022). This multifactorial view aligns with findings from other areas of sustainable

consumption, where elements such as information framing, the use of eco-labels and social pressure directly influence purchasing decisions, particularly when they resonate with more conscious and environmentally committed lifestyles (Truong & Ngo, 2024).

The interaction between rational and emotional motivations also plays a central role. Factors such as cost savings and efficiency coexist with emotions including pride, guilt and moral responsibility, all of which act as strong drivers of sustainable transport behaviours. In certain demographic and cultural contexts, values linked to social altruism encourage the use of public transport. By contrast, motivations associated with personal exaltation or social status tend to hinder the adoption of these alternatives. These findings underline the importance of aligning advertising campaigns with local cultural values (Arya & Chaturvedi, 2022; Kulkarni et al., 2025), while also highlighting long-term economic savings and low maintenance costs as relevant determinants in the adoption of green vehicles (Phuah et al., 2022).

Contextual conditions further shape the effectiveness of communication strategies. In regions with limited infrastructure, emphasising immediate benefits such as reduced travel time or affordability may be more persuasive than appeals based solely on environmental awareness (Shabbir, 2024). In contrast, in areas affected by high levels of pollution, environmental awareness and government support play a more decisive role in promoting sustainable mobility (Jha & Singh, 2024). Service quality and subjective norms, including the influence of family and friends, are also key factors in the intention to use sustainable transport, particularly when these options are perceived as reliable and socially valued (Terengganu et al., 2021).

Technological innovation offers additional opportunities for communicating the advantages of sustainable mobility, especially when its lower environmental impact is contrasted with that of traditional technologies (Ganjipour & Edrisi, 2023a; 2023b). For instance, smart applications that integrate route planning with environmental impact information can encourage active transport modes, such as walking or cycling, by making their convenience and environmental contribution more visible. These small, individual actions can gradually support broader collective change (Kim & Hall, 2022). However, the effectiveness of such tools depends on the availability of adequate infrastructure, including safe cycle paths and efficient public transport networks, as their absence can significantly limit impact (Nogueira et al., 2023; Santos et al., 2010).

In line with the above, advertising campaigns that encourage the use of sustainable transport tend to be more effective when they activate altruistic values and personal norms, rather than focusing solely on superficial attitudes (Kulkarni et al., 2025). A similar effect can be observed when brands appeal to identity and a sense of belonging, as this increases young consumers' willingness to adopt new eco-friendly travel habits (Jahari et al., 2022). Even in relation to issues such as CO₂ reduction, individuals, particularly younger generations, are capable of assigning value to these objectives and modifying their behaviour when environmental information is presented in a clear and meaningful way (Gaker et al., 2011). This effect is further reinforced when environmental knowledge, opportunities for self-expression and the emotional well-being associated with sustainable consumption come into play (Kathuria, 2024).

With regard to the study of pro-environmental attitudes, considerable emphasis has been placed on the capacity of persuasive communication to promote changes in both disposition and behaviour towards more sustainable practices (Gifford & Sussman, 2012; Marroquín-Ciendúa et al., 2026; Marroquín & Palacios, 2018; Palacios-Chavarro et al., 2021). Various theoretical models have attempted to explain the cognitive processes involved when individuals are exposed to persuasive messages, among which Petty and Cacioppo's (1986) Elaboration Likelihood Model (ELM) is particularly relevant. This model proposes two distinct persuasion routes. The central route is characterised by rational processing based on strong arguments, while the peripheral route relies on emotional appeals and formal message elements (Marañón et al., 2019). Whereas the central route requires greater cognitive effort and reflection, leading to more stable attitudinal change, the peripheral route involves lower involvement and less elaborate responses (Petty et al., 2008).

In the field of pro-environmental advertising, research has examined the effectiveness of both rational and emotional arguments in encouraging sustainable behaviours (Palacios-Chavarro et al., 2023). This includes behaviours related to the adoption of sustainable transport alternatives,

often mediated by the learning of new technologies and the presence of incentives (Marroquín-Ciendúa et al., 2025).

In parallel, other attitudinal models have explored how norms and values influence behavioural intentions. The Theory of Planned Behaviour argues that attitudes, subjective norms and perceived behavioural control directly shape the intention to act (Ajzen, 1991; Lee & Back, 2007). Subjective norms, in particular, are based on the perception of expectations held by reference groups such as family, friends or colleagues (Ajzen, 1991, 2009; Armitage & Conner, 1999). The Theory of Values, Beliefs and Norms, for its part, highlights the role of altruism as a personal norm activated by concern for the welfare of other living beings and the environment (Gifford & Sussman, 2012; Stern, 2000). Normative Focus Theory further suggests that individuals tend to act in accordance with what they perceive as common or accepted behaviour, through processes of imitation and social modelling (Cialdini et al., 1990; Cialdini, 2003; White et al., 2009).

Taken together, these theoretical perspectives allow persuasive communication to be understood as a motivating force capable of influencing the transition towards sustainable transport habits. This can be achieved by integrating cognitive persuasion routes, both rational and emotional, with normative appeals of a descriptive, subjective and altruistic nature. Such an approach enables the identification of the combinations of messages that are most effective in designing campaigns that foster positive attitudes towards sustainable mobility advertising and strengthen the intention to use sustainable transport.

Accordingly, the present study aims to analyse the impact of sustainable transport advertising messages constructed using rational and emotional appeals, corresponding to the central and peripheral routes of the ELM, and combined with normative appeals of a descriptive, subjective and altruistic nature. The objective is to identify the most influential persuasive factors in this context, thereby contributing to the development of more effective and personalised communication strategies that connect with citizens' values, emphasise the environmental benefits of sustainable mobility, and reinforce responsible decision-making in urban transport.

2. Methodology

The study presented here is grounded in the Elaboration Likelihood Model (ELM) (Hogg & Vaughan, 2010; Petty & Cacioppo, 1986), combined with the principles of three types of social norms: descriptive social norms (Cialdini et al., 1990), subjective social norms (Ajzen, 1991) and personal social norms related to altruism (Stern, 2000). Through this theoretical integration, persuasive messages were developed in the form of graphic advertisements in order to examine their effects on attitudes towards sustainable transport advertising and on the intention to use sustainable transport among women and men in the city of Bogotá.

An experimental study was conducted using a $2 \times 2 \times 3$ between-groups factorial design. The factors were defined as follows. The first factor was gender, with two levels: male and female. The second factor was the persuasion route, with two levels: central route, corresponding to rational messages about sustainable transport, and peripheral route, corresponding to emotional messages about sustainable transport. The third factor was social norms, with three levels: messages appealing to descriptive norms, messages appealing to subjective norms, and messages appealing to personal norms based on altruism.

Based on this design, the following hypotheses were proposed.

H1: Persuasive messages in graphic advertisements designed using the central and peripheral routes of persuasion, combined with appeals to social norms (descriptive, subjective and altruistic), produce statistically significant differences between women and men in attitudes towards the advertisement.

H2: Persuasive messages in graphic advertisements designed using the central and peripheral routes of persuasion, combined with appeals to social norms (descriptive, subjective and altruistic), produce statistically significant differences between women and men in intentions to use sustainable transport.

H3: The use of persuasive messages appealing to social norms (descriptive, subjective and altruistic) in graphic advertisements constructed with either rational messages (central route of

persuasion) or emotional messages (peripheral route of persuasion) have significant effects on attitudes towards sustainable transport advertising and on the intention to use sustainable transport.

2.1. Participants

This research involved a sample of 120 women and 120 men aged between 25 and 45, all residing in the city of Bogotá, Colombia and belonging to a medium socioeconomic status. At the start of the experimental procedure, participants were informed about the objectives of the study, and their informed consent was obtained. Eligibility criteria were verified to ensure that all participants met the conditions required for participation. Subsequently, women and men were assigned to the corresponding experimental conditions.

2.2. Analysis Instruments and Techniques

The print advertisements were developed through a two-phase evaluation process.

Phase (a) focused on the structure and design of multiple advertising proposals incorporating rational (central route) and emotional (peripheral route) images and texts. These proposals were evaluated by three experts, who assessed the coherence between the messages and the visual elements. Based on this evaluation, six advertisements were selected, each corresponding to one of the six experimental conditions.

Phase (b) involved the validation of the messages accompanying the images. Rational and emotional messages were formulated in combination with appeals to descriptive, subjective, and personal social norms (altruism). These messages were tested in a pilot study, and those yielding the highest mean scores for attitudes and behavioural intentions were selected. The final messages were as follows:

Central route: 'Reduce pollution by 75%. Transport generates almost half of carbon dioxide emissions. When you choose sustainable alternatives, you can help reduce the pollution in the air we breathe by up to 75%.'

Peripheral route: 'What mark do you want to leave? Every time you choose sustainable transport, you are taking care of the air that your loved ones breathe.'

Descriptive norm: 'Use sustainable transport. Most people are already doing so.'

Subjective norm: 'Use sustainable transport. Your family will thank you for it.'

Personal norm (altruism): 'Use sustainable transport. The environment will thank you for it.'

Using these messages, six print advertisements were created by combining persuasion routes and social norm appeals in accordance with the experimental design: three advertisements featuring rational messages (central route × descriptive, subjective, and personal norms) and three featuring emotional messages (peripheral route × descriptive, subjective, and personal norms), as illustrated in the following image.

Image 1. Experimental advertisements

	Mensaje racional (Ruta Central)	Mensaje emocional (Ruta Periférica)
Norma Descriptiva	Reduce el 75% de la contaminación El transporte genera casi la mitad de las emisiones de dióxido de carbono. Cuando eliges alternativas sostenibles puedes ayudar a reducir hasta en un 75% la contaminación del aire que respiramos. Usa transporte sostenible. La mayoría ya lo está haciendo.	¿QUÉ HUELLA QUIERES DEJAR? Cada vez que eliges un transporte sostenible, estás cuidando el aire que respiran los que amas. Usa transporte sostenible. La mayoría ya lo está haciendo.
Norma Subjetiva	Reduce el 75% de la contaminación El transporte genera casi la mitad de las emisiones de dióxido de carbono. Cuando eliges alternativas sostenibles puedes ayudar a reducir hasta en un 75% la contaminación del aire que respiramos. Usa transporte sostenible. Tu familia te lo agradecerá.	¿QUÉ HUELLA QUIERES DEJAR? Cada vez que eliges un transporte sostenible, estás cuidando el aire que respiran los que amas. Usa transporte sostenible. Tu familia te lo agradecerá.
Norma Personal (Altruismo)	Reduce el 75% de la contaminación El transporte genera casi la mitad de las emisiones de dióxido de carbono. Cuando eliges alternativas sostenibles puedes ayudar a reducir hasta en un 75% la contaminación del aire que respiramos. Usa transporte sostenible. El medio ambiente te lo agradecerá.	¿QUÉ HUELLA QUIERES DEJAR? Cada vez que eliges un transporte sostenible, estás cuidando el aire que respiran los que amas. Usa transporte sostenible. El medio ambiente te lo agradecerá.

Source: Own elaboration, 2026.

The instrument used to measure participants' attitudes and intentions in relation to the different experimental advertising conditions was cognitively validated through a pilot study with a sample of 30 women and 30 men who shared the same experimental profile as the main study participants. The internal consistency of the instrument was satisfactory, with a Cronbach's α of .82.

Attitudes towards the advertisements were measured using seven-point semantic differential scales (1–7), through which participants evaluated the image, text, and informational content of each advertisement.

Intentions to use and recommend sustainable transport after exposure to the advertisements were assessed using two Likert-type scales measuring the perceived probability of use and recommendation. Responses ranged from 1 ('totally unlikely' / 'totally not recommendable') to 5 ('totally likely' / 'totally recommendable').

2.3. Procedure

The experiment employed six print advertisements constructed by combining persuasion routes derived from the Elaboration Likelihood Model (ELM) with appeals to social norms. Each advertisement was presented to 20 women and 20 men, resulting in a total sample of 120 women and 120 men. Throughout the experimental procedure, consistent spatial and environmental conditions were maintained to ensure standardisation across all exposure settings.

3. Analysis and Results

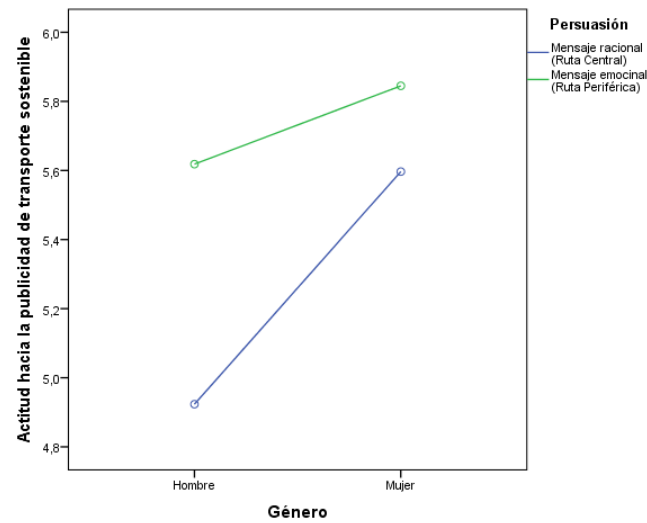
3.1. Attitudes Towards Advertising for Sustainable Transport

The study adopted a $2 \times 2 \times 3$ factorial design, and variance was analysed using analysis of variance (ANOVA) to compare multiple means. Specifically, attitudes towards graphic advertisements were examined according to the combination of persuasion routes, like rational messages (central route) and emotional messages (peripheral route), and appeals to descriptive, subjective, and personal social norms (altruism). In addition, intentions to use and recommend sustainable transport were analysed as outcome variables derived from the persuasive effects of the advertisements.

Overall, women reported more favourable attitudes towards the advertisements than men ($M_{\text{women}} = 5.73$, $SD = 0.61$; $M_{\text{men}} = 5.17$, $SD = 1.00$; $F(1, N = 240) = 20.61$, $p = .000$; $f = 0.29$; $1 - \beta = 0.95$). Attitudes were also significantly more positive for advertisements featuring emotional messages (peripheral route) compared with those employing rational messages (central route) ($M_{\text{peripheral}} = 5.73$, $SD = 0.66$; $M_{\text{central}} = 5.26$, $SD = 0.97$; $F(1, N = 240) = 22.65$, $p = .000$; $f = 0.31$; $1 - \beta = 0.96$).

An interaction effect further indicated that emotional messages generated more favourable attitudes among both women and men, with the highest evaluations observed among women exposed to peripheral-route messages ($M_{\text{peripheral women}} = 5.88$, $SD = 0.50$; $M_{\text{peripheral men}} = 5.61$, $SD = 0.77$). In contrast, attitudes towards rational messages were comparatively lower, particularly among men ($M_{\text{central women}} = 5.59$, $SD = 0.67$; $M_{\text{central men}} = 4.92$, $SD = 1.11$). This interaction was statistically significant ($F(1, N = 240) = 4.30$, $p = .039$; $f = 0.15$; $1 - \beta = 0.66$), as illustrated in Figure 1.

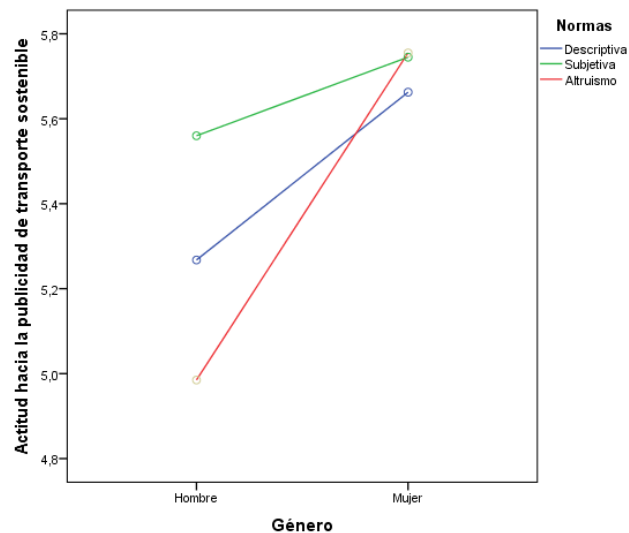
Figure 1. Attitude towards the advertisement: 2 genders (male vs female) x 2 types of message; persuasive routes (rational-central vs emotional-peripheral).



Source: Own elaboration, 2026.

With respect to normative appeals, the persuasive effect associated with subjective norms was significantly stronger than that of descriptive norms. Advertisements incorporating subjective normative messages yielded higher attitudinal evaluations ($M_{\text{subjective}} = 5.68$, $SD = 0.89$) than those appealing to descriptive norms ($M_{\text{descriptive}} = 5.46$, $SD = 0.86$), while messages based on personal norms (altruism) showed slightly lower mean scores ($M_{\text{altruism}} = 5.37$, $SD = 0.82$). This difference was statistically significant ($F(2, N = 240) = 3.44$, $p = .034$; $f = 0.17$; $1 - \beta = 0.74$), as illustrated in Figure 2.

Figure 2. Attitude towards the advertisement: 2 gender (male vs female) x 3 normative messages (descriptive, subjective, altruism).

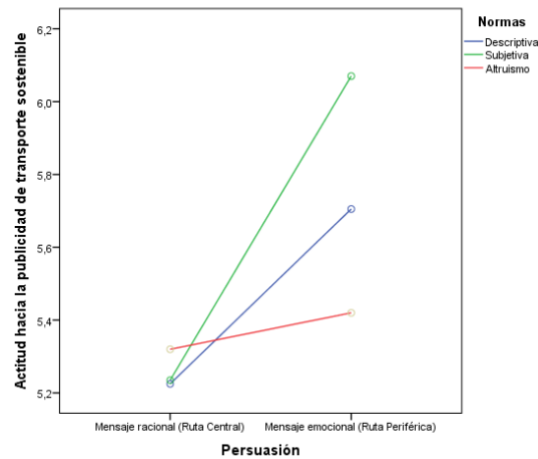


Source: Own elaboration, 2026.

Likewise, significant differences were observed between rational (central route) and emotional (peripheral route) messages when combined with different normative appeals. Overall, message effectiveness varied according to the interaction between persuasion route and type of social norm. In particular, the combination of an emotional message and a subjective norm demonstrated the greatest persuasive potential.

As shown in Figure 3, advertisements combining rational messages with normative appeals produced relatively similar attitudinal outcomes across conditions ($M_{\text{rational-descriptive}} = 5.22$, $SD = 0.99$; $M_{\text{rational-subjective}} = 5.23$, $SD = 1.00$; $M_{\text{rational-altruism}} = 5.32$, $SD = 0.95$). In contrast, emotional messages generated higher attitudinal evaluations, especially when paired with subjective norms ($M_{\text{emotional-descriptive}} = 5.70$, $SD = 0.64$; $M_{\text{emotional-subjective}} = 6.12$, $SD = 0.47$; $M_{\text{emotional-altruism}} = 5.42$, $SD = 0.67$). This interaction effect was statistically significant ($F(1, N = 240) = 5.32$, $p = .005$; $f = 0.15$; $1 - \beta = 0.68$).

Figure 3. Attitude towards the advertisement: 2 types of message-persuasive routes (rational-central vs emotional-peripheral) x 3 normative messages.

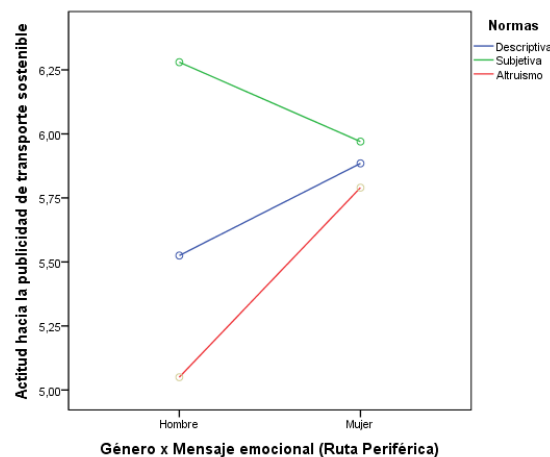


Source: Own elaboration, 2026.

On the other hand, a significant three-way interaction effect was also observed between gender, message type (rational/central route vs emotional/peripheral route), and normative appeal ($F(2, N = 240) = 3.70$, $p = .032$; $f = 0.18$; $1 - \beta = 0.76$). This result indicates that the persuasive effectiveness of the advertisements varied depending on the combined influence of these three factors.

Specifically, among men, the emotional message combined with a subjective normative appeal produced the strongest effect on attitudes towards the advertisements ($M_{\text{men} \times \text{emotional} \times \text{subjective norm}} = 6.28$, $SD = 0.34$). In contrast, for women, the emotional message that generated the most favourable attitudinal response was the one combined with a descriptive normative appeal ($M_{\text{women} \times \text{emotional} \times \text{descriptive norm}} = 5.88$, $SD = 0.36$), as shown in Figure 4.

Figure 4. Attitude towards advertising: 2 Gender (Male vs Female) x 3 normative messages.



Source: Own elaboration, 2026.

These results indicate that advertising designed using emotional messages (peripheral route) becomes more persuasive when combined with appeals to subjective norms. In other words, messages that emphasise emotional elements linked to visual design or the use of representative models, when articulated in relation to caring for family members or loved ones, may exert a stronger influence on persuasive processes.

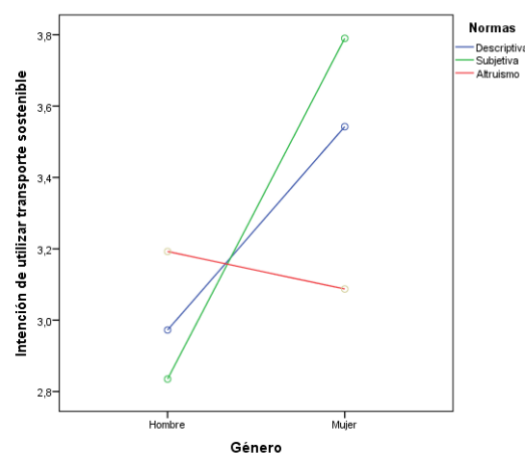
3.2. Intentions Regarding the Use of Sustainable Transport

It was also evident that intentions to use sustainable transport were higher following exposure to advertisements designed with emotional messages (peripheral route) than to those structured with rational messages (central route) ($M_{\text{peripheral}} = 3.42$, $SD = .71$; $M_{\text{central}} = 3.05$, $SD = .88$; $F(1, N = 240) = 16.31$, $p < .001$; $f = .26$; $1-\beta = .80$).

With regard to gender differences, statistically significant effects were observed, with women reporting greater intentions to use sustainable transport after exposure to the advertisements compared to men ($M_{\text{women}} = 3.47$, $SD = .94$; $M_{\text{men}} = 3.00$, $SD = .60$; $F(1, N = 240) = 26.22$, $p < .001$; $f = .33$; $1-\beta = .80$).

Likewise, the interaction effect between gender and normative appeals revealed significant differences. Among women, messages structured around subjective norms produced the highest intentions to use sustainable transport ($M_{\text{descriptive}} = 3.54$, $SD = .79$; $M_{\text{subjective}} = 3.79$, $SD = .84$; $M_{\text{altruism}} = 3.08$, $SD = 1.06$; $F(2, N = 240) = 11.23$, $p < .001$; $f = .31$; $1-\beta = .80$). In contrast, among men, appeals to personal norms (altruism) generated stronger intentions to use sustainable transport when exposed to the advertisements ($M_{\text{descriptive}} = 2.97$, $SD = .60$; $M_{\text{subjective}} = 2.83$, $SD = .71$; $M_{\text{altruism}} = 3.19$, $SD = 1.19$; $F(2, N = 240) = 3.53$, $p = .031$; $f = .17$; $1-\beta = .60$), as shown in Figure 5.

Figure 5. Intention to use transport. 2 gender (male vs female) x 3 normative messages.

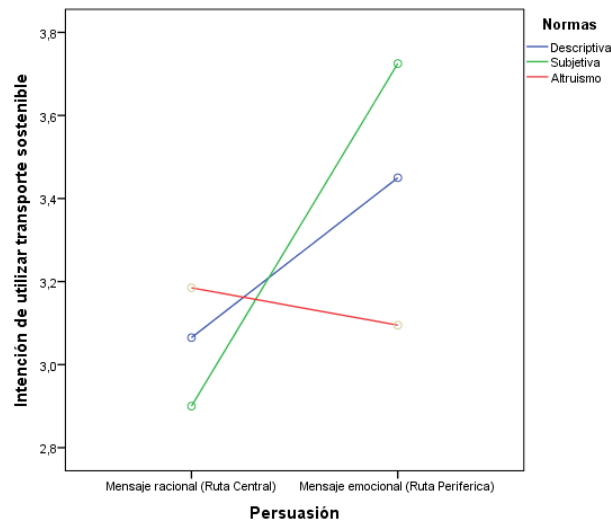


Source: Own elaboration, 2026.

In addition, a significant interaction was observed between persuasion routes and normative appeals, revealing clear differences in intentions to use sustainable transport. Advertisements combining emotional messages (peripheral route) with subjective norm appeals produced the highest intention scores ($M_{\text{descriptive}} = 3.45$, $SD = .64$; $M_{\text{subjective}} = 3.72$, $SD = .70$; $M_{\text{altruism}} = 3.09$, $SD = .68$; $F(2, N = 240) = 8.17$, $p < .001$; $f = .26$; $1-\beta = .80$).

By contrast, advertisements structured around rational messages (central route) showed a different pattern, with intentions varying less markedly across normative appeals and with altruistic norms producing the highest mean scores ($M_{\text{descriptive}} = 3.06$, $SD = .81$; $M_{\text{subjective}} = 2.90$, $SD = .92$; $M_{\text{altruism}} = 3.18$, $SD = .91$; $F(2, N = 240) = 8.17$, $p < .001$; $f = .26$; $1-\beta = .80$), as illustrated in Figure 6.

Figure 6. Intention to use transport. 2 types of message (rational-central vs emotional-peripheral) x 3 normative messages.

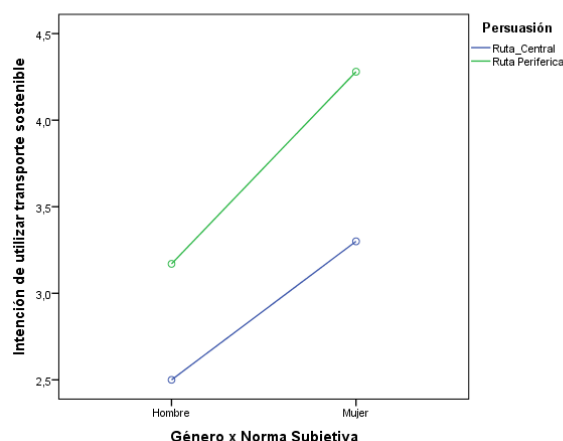


Source: Own elaboration, 2026.

Finally, a significant three-way interaction was observed between gender, persuasion route (central vs peripheral) and normative appeals. Among women, exposure to advertisements combining emotional messages (peripheral route) with subjective norm appeals produced the highest intentions to use sustainable transport ($M_{\text{descriptive}} = 3.75$, $SD = .63$; $M_{\text{subjective}} = 4.28$, $SD = .32$; $M_{\text{altruism}} = .87$, $SD = .37$; $F(2, N = 240) = 3.11$, $p = .046$; $f = .16$; $1-\beta = .60$).

A similar pattern was observed among men, for whom advertisements structured around the peripheral route also generated higher intentions to use sustainable transport. However, these effects were consistently lower than those observed for women ($M_{\text{descriptive}} = 3.15$, $SD = .50$; $M_{\text{subjective}} = 3.17$, $SD = .50$; $M_{\text{altruism}} = 3.34$, $SD = .24$; $F(2, N = 240) = 3.11$, $p = .046$; $f = .16$; $1-\beta = .60$), as shown in Figure 7.

Figure 7. Intention to use transport. 2 gender (male vs female) 2 persuasive routes (central vs peripheral) x 3 normative messages.



Source: Own elaboration, 2026.

4. Discussion and Conclusions

This research examined the impact of sustainable transport advertising on attitudes towards advertisements and intentions to use sustainable transport among male and female participants exposed to different persuasive messages. The advertisements combined rational messages

(central route of persuasion) and emotional messages (peripheral route of persuasion) with descriptive, subjective and altruistic normative appeals.

Overall, the findings indicate that emotional messages, aligned with the peripheral route of persuasion, generate more favourable attitudes towards advertisements and stronger intentions to use sustainable transport than rational messages based on the central route. This result is consistent with the literature on green advertising, which suggests that emotional appeals are particularly effective in mobilising behavioural change by engaging symbolic values and social identity, rather than relying solely on technical or efficiency-based arguments (Bi, 2023; Kathuria, 2024). Previous research further shows that emotions such as pride, satisfaction and a sense of well-being reinforce pro-environmental behaviour by offering both personal and collective forms of gratification (Arya & Chaturvedi, 2022; Jha & Singh, 2024;).

In addition, the results demonstrate that subjective norms exert a stronger persuasive effect than descriptive or altruistic norms. In particular, advertisements combining emotional messages with subjective normative appeals produced the strongest attitudinal responses, especially among men. This suggests that messages emphasising social approval from close reference groups may be especially effective when paired with emotionally framed content.

These findings align with the Theory of Planned Behaviour (Ajzen, 1991), which highlights the role of perceived social pressure from significant others, such as family and friends, in shaping behavioural intentions. They also support previous research identifying social norms as powerful drivers of responsible and sustainable consumption practices (Piras et al., 2021; Truong & Ngo, 2024;).

With regard to intentions to use sustainable transport following exposure to the advertisements, women showed stronger intentions when messages appealed to subjective norms. By contrast, among men, altruistic appeals generated higher intentions to adopt sustainable transport. These findings are consistent with previous research indicating that women tend to respond more strongly to community-oriented messages in contexts aimed at fostering sustainable behaviour (Khan et al., 2024; Waqas & Najmi, 2023;). In the case of men, altruistic appeals appear to be more effective, possibly because they reinforce a prosocial self-image that supports engagement in sustainable mobility practices (Kulkarni et al., 2025).

Further analysis of the interaction between gender, persuasive routes (central and peripheral) and normative appeals revealed that women exposed to advertisements combining emotional messages (peripheral route) with subjective normative appeals reported the highest intentions to use sustainable transport, compared with men. This finding underscores the relevance of emotionally framed messages that emphasise social approval when targeting female audiences.

These results may also be interpreted in light of the importance of credibility in sustainability-related advertising, particularly given the negative effects associated with greenwashing, which can undermine trust and limit the effectiveness of green communication (Bonales-Daimiel et al., 2024; Hwang, 2024). Accordingly, advertising strategies that combine emotional and normative appeals should be supported by tangible actions that deliver clear benefits to citizens. Measures such as improved access to electric vehicles or incentives for public transport use may help sustain user confidence and reinforce message credibility.

Moreover, emotional advertising aligned with social norms may be especially effective when it incorporates role models, community leaders or influencers who resonate with the cultural values of the target audience (Borowski et al., 2020; Hanna et al., 2018). This highlights the need for diversified communication strategies that integrate both individual benefits, such as cost savings, convenience, and health, and collective benefits, including CO₂ reduction and improved air quality.

Finally, digital strategies such as interactive nudges and personalised messages have demonstrated their capacity to enhance perceptions of personal efficacy and motivate the adoption of public or alternative transport options (Potvin-Bernal et al., 2020; Zimmermann et al., 2024). In the context of Bogotá, previous studies show that sustainable alternatives such as electric scooters can gain public acceptance when communication through interactive media is combined with initiatives that support learning and adaptation to new technologies (Marroquín-Ciendúa et al., 2025). Nevertheless, persistent cultural associations between private car use and social status remain a challenge, reinforcing the need for advertising campaigns that reframe

sustainable mobility as a marker of modernity, social belonging and responsibility (Kim & Hall, 2022).

In addition, this study shows that sociodemographic characteristics influence perceptions, attitudes and intentions regarding the use, or potential use, of sustainable transport. This constitutes a limitation of the research, since although gender was included in the analyses, other social and demographic variables should also be considered, as they undoubtedly shape users' responses to advertising stimuli related to sustainable mobility, particularly in relation to compliance with social norms (Bohner & Schluter, 2014). Furthermore, cultural principles, value systems and economic factors play a decisive role in shaping sustainable citizen behaviour and therefore affect transport-related consumption decisions.

In line with previous research, environmental awareness tends to be higher among women than among men (Hao-Chen et al., 2014). Accordingly, a greater impact on the adoption of sustainable transport may be achieved when communication directed at women is linked to incentives that address their specific needs and concerns (Marroquín et al., 2019; Omidí & Lashgarara, 2017).

In conclusion, this study demonstrates that emotional messages have a greater persuasive capacity than rational messages in promoting positive attitudes towards sustainable transport and increasing intentions to use it in Bogotá. These findings reinforce existing research on green advertising that highlights the effectiveness of affective appeals in motivating pro-environmental behaviour (Bi et al., 2023; Kathuria, 2024). Moreover, the results confirm that subjective norms constitute the most influential normative factor, particularly among women, supporting the relevance of social influence in which the protection of loved ones operates as a key driver of behavioural change (Ajzen, 1991; Truong & Ngo, 2024).

By contrast, among men, altruistic appeals exerted a stronger influence on attitudes and intentions, suggesting that messages emphasising prosocial values and moral self-expression are more effective for this group (Kulkarni et al., 2025). Overall, these findings highlight the importance of designing environmental advertising strategies that take into account the interaction between gender, message type and normative framing. Such strategies should move beyond the mere transmission of environmental benefits and aim to generate genuine behavioural intentions towards sustainable transport (Hwang, 2024; Marroquín-Ciendúa et al., 2025).

Advertising campaigns focused on sustainable mobility should therefore prioritise emotional messaging while also incorporating ongoing monitoring of audience perceptions, credibility and trust in environmental communication (Palacios-Chavarro et al., 2024). This approach enhances persuasive effectiveness and increases the likelihood of adopting sustainable behaviours, particularly among women. In the case of men, the findings suggest that appeals to altruism, social responsibility and collective well-being are especially appropriate (Arya & Chaturvedi, 2022; Kulkarni et al., 2025).

Additionally, the strategic use of local role models and influencers may strengthen message credibility and public trust, thereby reinforcing the impact of advertising communication (Bonales-Daimiel et al., 2024; Hwang, 2024). However, such communication efforts should be accompanied by public policy measures and structural improvements, including economic incentives, expanded cycling infrastructure and enhancements to public transport systems. Advertising proves most effective when persuasive messages are aligned with tangible and accessible mobility conditions (Kim & Hall, 2022; Santos et al., 2010).

Finally, future research should extend this line of inquiry by examining interactions between cultural contexts, social norms and psychological variables such as self-efficacy and perceived behavioural control. Further exploration of immersive and interactive digital technologies is also recommended, as these tools have demonstrated their capacity to enhance and predict consumer experiences in international settings and show strong potential for adaptation to Latin American contexts (Hauslbauer et al., 2022; Marroquín-Ciendúa et al., 2025; Potvin-Bernal et al., 2020; Zimmermann et al., 2024).

5. Acknowledgements

This research was supported by Jorge Tadeo Lozano University of Bogotá within the framework of the project *Persuasive communication for the circular economy* (Code 5494)

References

- Ajzen, I., (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50 (2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I., (2009). A Theory of Planned Behavior. <https://people.umass.edu/aizen/tpb.html>
- Armitage, Ch., & Conner, M. (1999). The theory of planned behaviour: Assessment of predictive validity and perceived control. *British Journal of Social Psychology*, 38, 35-54. <https://doi.org/10.1348/014466699164022>
- Arya, B., & Chaturvedi, S. (2022). Psychological predictors of sustainable transportation behaviour: Implications for low carbon economy and society. *IOP conference series. Earth and environmental science*, 1084(1), 012045. <https://doi.org/10.1088/1755-1315/1084/1/012045>
- Bertucci, P., Sartori, F., Ribeiro, H., Macielb, S., Barberio, E., & Elgaaied-Gambier, L. (2024). From green advertising to sustainable behavior: a systematic literature review through the lens of value-belief-norm framework. *International Journal of Advertising*, 43(1), 53–96.
- Bi, C., Jin, S., Li, S., & Li, Y. (2023). Can green advertising increase consumers' purchase intention of electric vehicles? An experimental study from China. *Journal of Cleaner Production*, 419(138260), 138260. <https://doi.org/10.1016/j.jclepro.2023.138260>
- Bonales-Daimiel, G., Giraldo-Dávila, A., & Gil-Jerez, M. (2024). La sostenibilidad como valor de marca en la publicidad automotriz de España. *AD research*, 31, e281. <https://doi.org/10.7263/adresic-31-281>
- Bohner, G., & Schlüter, L. E. (2014). A room with a viewpoint revisited: descriptive norms and hotel guests' towel reuse behavior. *PloS one*, 9(8), e104086. <https://doi.org/10.1371/journal.pone.0104086>
- Borowski, E., Chen, Y., & Mahmassani, H. (2020). Social media effects on sustainable mobility opinion diffusion: Model framework and implications for behavior change. *Travel Behaviour & Society*, 19, 170–183. <https://doi.org/10.1016/j.tbs.2020.01.003>
- Boztepe, Aysel. (2016). Green Marketing and Its Impact on Consumer Buying Behavior. *European Journal of Economic and Political Studies*. 5. 5-21.
- Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Curent Directions in Psychological Science*, 12, 105–109. DOI: <https://doi.org/10.1111/1467-8721.01242>
- Cialdini, R. B., Reno, R. R. & Kallgren, A. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58 (6), 1015–1026. DOI: <https://doi.org/10.1037/0022-3514.58.6.1015>
- Delgado Cadavid, G., Olaya Mora, S., & Isaza Álvarez, J. (2020). Estrategias de marketing de las marcas de automóviles verdes. Entre la colaboración y la competición. *Pensar la Publicidad Revista Internacional de Investigaciones Publicitarias*, 14(2). <https://doi.org/10.5209/pepu.72166>
- Gaker, D., Vautin, D., Vij, A., & Walker, J. L. (2011). The power and value of green in promoting sustainable transport behavior. *Environmental research letters*, 6(3), 034010. <https://doi.org/10.1088/1748-9326/6/3/034010>
- Ganjipour, H., & Edrisi, A. (2023). Applying the integrated model to understanding online buyers' intention to adopt delivery drones in Iran. *Transportation Letters*, 15(2), 98–110. <https://doi.org/10.1080/19427867.2022.2035130>
- Ganjipour, H., & Edrisi, A. (2023b). Consumers' intention to use delivery robots in Iran: An integration of NAM, DOI, and TAM. *Case Studies on Transport Policy*, 13(101024), 101024. <https://doi.org/10.1016/j.cstp.2023.101024>
- Gifford, R. & Sussman, R. (2012). Environmental attitudes. En S. D. Clayton (Ed.), *The Oxford Handbook of Environmental and Conservation Psychology*. *Oxford University Press*. <http://libgen.is/book/index.php?md5=475BF1F6C76B299723FAA6BA10C43F92>

- Hanna, P., Kantenbacher, J., Cohen, S., & Gössling, S. (2018). Role model advocacy for sustainable transport. *Transportation Research. Part D, Transport and Environment*, 61, 373–382. <https://doi.org/10.1016/j.trd.2017.07.028>
- Hao-Chen, H., Tzong-Huei, L., & Mei-Chi, L. (2014). Environmental consciousness and green customer behavior: An examination of motivation crowding effect. *International Journal of Hospitality Management*, (40), 139-149. DOI: <https://doi.org/10.1016/j.ijhm.2014.04.006>
- Hauslbauer, A. L., Schade, J., Drexler, C. E., & Petzoldt, T. (2022). Extending the theory of planned behavior to predict and nudge toward the subscription to a public transport ticket. *European Transport Research Review*, 14(1). <http://doi.org/10.1186/s12544-022-00528>
- Herberz, M., Hahnel, U. J. J., & Brosch, T. (2020). The importance of consumer motives for green mobility: A multi-modal perspective. *Transportation Research. Part A, Policy and Practice*, 139, 102–118. <https://doi.org/10.1016/j.tra.2020.06.021>
- Hogg, M., & Vaughan, G. (2010). *Psicología social*. Madrid: Editorial Médica Panamericana.
- Hwang, J. (2024). Green marketing and consumer attitudes. *Open Access Research Journal of Multidisciplinary Studies*, 8(2), 076–084. <https://doi.org/10.53022/oarjms.2024.8.2.0068>
- Išoraitė, M., Jarašūnienė, A., & Samašonok, K. (2023). Assessment of the impact of advertising in promoting sustainable mobility and multimodality in the urban transport system. *Future Transportation*, 3(1), 210–235. <https://doi.org/10.3390/futuretransp3010013>
- Jahari, S. A., Hass, A., Idris, I. B., & Joseph, M. (2022). An integrated framework examining sustainable green behavior among young consumers. *The Journal of Consumer Marketing*, 39(4), 333–344. <https://doi.org/10.1108/jcm-04-2021-4593>
- Jha, R., & Singh, M. K. (2024). Analysing the impact of social influence on electric vehicle adoption: A deep learning-based simulation study in Jharkhand, India. *International journal of computational and experimental science and engineering*, 10(4). <https://doi.org/10.22399/ijcesen.371>
- Kang, S.-E. (2022). Travelers' pro-environmental behaviors in the Hyperloop context: Integrating norm activation and AIDA models. *International Journal of Tourism Research*, 24(6), 813–826. <https://doi.org/10.1002/jtr.2547>
- Kanchana P. (2024). Green marketing in the age of sustainability: Consumer perceptions and brand strategy. *Nanotechnology perceptions*, 154–163. <https://doi.org/10.62441/nano-ntp.vi.3624>.
- Kathuria, A. (2024). Analysis of the impact of green marketing on purchase intention in the automobile sector: Roles of environmental knowledge and green psychological benefits. *Journal of electrical systems*, 20(11s), 1249–1260. <https://doi.org/10.52783/jes.7431>
- Khan, M. I., Shah, S. A. M., Ali, M., & Naim, A. F. A. (2024). To sustainably ride or not to ride: Examining the Green consumption intention of ride-hailing services in the sharing economy by university students. *Sustainability*, 16(20), 9047. <https://doi.org/10.3390/su16209047>
- Kim, M. J., & Hall, C. M. (2022). Application of EMGB to study impacts of public green space on active transport behavior: Evidence from South Korea. *International Journal of Environmental Research and Public Health*, 19(12), 7459. <https://doi.org/10.3390/ijerph19127459>
- Koç, E. (2023). Green marketing strategies and climate change awareness in sustainable transportation: The case of airline companies. *Marine science and technology bulletin*, 12(4), 459–472. <https://doi.org/10.33714/masteb.1375842>
- Kulkarni, S. D., Kaur, S., Ray, A., & Mishra, V. (2025). Does values impact intention to use sustainable mobility? An evidence from metropolitan cities of India. *Research in Transportation Business & Management*, 59(101290), 101290. <https://doi.org/10.1016/j.rtbm.2025.101290>

- Kumar, V., & Ph.D. Research Scholar, Department of Commerce, Himachal Pradesh University, Summer Hill, Shimla, India. (2025). Green marketing and its influence on consumer purchasing decisions in the Indian market. *Journal of Management and Entrepreneurship*, 18(4), 56–73. <https://doi.org/10.70906/20241804056073>
- Lee, M.J., & Back, K. (2007). Association members' meeting participation behaviors: development of meeting participation model. *Journal of Travel & Tourism Marketing* 22 (2), 15–33. https://doi.org/10.1300/J073v22n02_02
- Marañón, F., Barrientos, R., & Piñeiro-Naval, V. (2019). Ruta central versus Ruta periférica. Análisis del proceso de persuasión en la campaña “Mover a México”. *Revista mexicana de opinión pública*, (26), 119-133. <http://dx.doi.org/10.22201/fcpys.24484911e.2019.26.62958>
- Marroquín, F., & Palacios, J. (2018). Panorama de los estudios alrededor del Marketing Verde. Un análisis desde los factores que afectan el consumo ecológico. En: *La gestión de la comunicación organizacional. Un enfoque ecléctico desde la publicidad y las relaciones públicas*. Madrid: Egregius Ediciones. <https://n9.cl/smf>
- Marroquín, F., Palacios, J., Sandoval, M., & Sierra, M. (2019). Consumo ecológico. Estudio exploratorio sobre el comportamiento de mujeres en Colombia. *Revista ESPACIOS*, 40(24). <http://www.revistaespacios.com/a19v40n24/19402424.html>
- Marroquín-Ciendúa, F., Medina-Labrador, M., Hurtado Méndez, L. C., Mora Hernández, L. P., & Puentes Guzmán, C. N. (2025). Use of UTAUT for analyzing the acceptance and use of electric scooters in the public transport system. *Urban, Planning and Transport Research*, 13(1). <https://doi.org/10.1080/21650020.2025.2458548>
- Marroquín-Ciendúa, F., Medina-Labrador, M., Palacios-Chavarro, J. A., & Marroquín-Ciendúa, P. (2026). Rational and Normative Advertising in Ecological Purchasing: A Quasi-experimental Analysis of Persuasion on Consumption and Attitudes. *Cleaner and Responsible Consumption*, 22. 100447. <https://doi.org/10.1016/j.clrc.2026.100447>
- Nadanyiova, M. (2018). Green Marketing and its Use in a Transport Company. *LOGI – Scientific Journal on Transport and Logistics*, 9(1), 58–69. <https://doi.org/10.2478/logi-2018-0008>
- Nogueira, M., Dias, F., & Santos, V. (2023). Sustainable mobility choices: Exploring the impact of consumers' values, attitudes, perceived behavioural control and subjective norms on the likelihood to choose sustainable mobility options. *Journal of Consumer Behaviour*. <https://doi.org/10.1002/cb.2144>
- Omidi, M., & Lashgarara, F. (2017). Influencing factors on the green marketing of medicinal herbs: a case study of the Zahra Rosewater Company. *International Journal of Agricultural Resources, Governance and Ecology*, 404 - 424. <https://doi.org/10.1504/IJARGE.2017.10009415>
- Organización Mundial de la Salud [OMS].(2019) Los efectos sobre la Salud <https://bit.ly/2nllczY>
- Palacios-Chavarro, J. A., Marroquín Ciendúa, F. & Bohórquez-Lazdhaluz, R. (2021). Social campaigns to encourage responsible fashion consumption: qualitative study with university students. *Communication & Society*, 34(3), 153-168. DOI: <https://doi.org/10.15581/003.34.3.153-168>
- Palacios-Chavarro, Janneth Arley, Marroquín-Ciendúa, Fernando, & Pérez-Portillo, Miguel Ángel. (2023). Campaña de comunicación sobre consumo responsable de productos de la industria de la moda: percepción del mensaje e influencia en el comportamiento de millennials en Colombia. *Revista de Comunicación*, 22(1), 355-375. <https://dx.doi.org/10.26441/rc22.1-2023-3007>
- Palacios-Chavarro, Janneth-Arley; Marroquín-Ciendúa, Fernando; Palacios-Chavarro, Sara (2024). “Instagram como escenario para el análisis de polaridad y subjetividad en comentarios respecto a contenidos ambientales: caso CNNClimate”. *Profesional de la información*, v. 33, n. 3, e330315. <https://doi.org/10.3145/epi.2024.0315>

- Panyagometh, A., & Bian, X. (2023). The influence of perceived ESG and policy incentives on consumers' intention to purchase new energy vehicles: Empirical evidence from China. *Innovative marketing*, 19(4), 187–198. [https://doi.org/10.21511/im.19\(4\).2023.15](https://doi.org/10.21511/im.19(4).2023.15)
- Petty R., & Cacioppo J. (1986), The Elaboration Likelihood Model of Persuasion. *Advances in experimental social psychology*, 19, 123-205. https://link.springer.com/chapter/10.1007/978-1-4612-4964-1_1
- Petty, R., Brinol, P., & Priester, J. (2008). Implications of the elaboration likelihood model of persuasion. *Media effects: Advances in theory and research*, 2, 125-64. https://link.springer.com/chapter/10.1007/978-1-4612-4964-1_1
- Phuah, K. T., Wong, H. F., Lai, C. G., Siti Intan Nurdiana Wong Abdullah, & Lim, B. J. H. (2022). Driving the Green vehicles shift: An evaluation of Malaysian consumers' acceptance. *International journal of business and society*, 23(3), 1771–1791. <https://doi.org/10.33736/ijbs.5211.2022>
- Piras, F., Manca, S., Sottile, E., Meloni, I., Mosca, O., Tuveri, G., & Fornara, F. (2021). Can persuasive normative messages encourage sustainable transportation usage? *Transportation Research. Part F, Traffic Psychology and Behaviour*, 83, 304–322. <https://doi.org/10.1016/j.trf.2021.10.014>
- Potvin-Bernal, J., Hansma, B., Donmez, B., Lockwood, P., & Shu, L. H. (2020). Influencing greater adoption of Eco-driving practices using an associative graphical display. *Journal of Mechanical Design* (New York, N.Y.: 1990), 142(3), 1–19. <https://doi.org/10.1115/1.4045968>
- Santos, G., Behrendt, H., & Teytelboym, A. (2010). Part II: Policy instruments for sustainable road transport. *Research in Transportation Economics*, 28(1), 46–91. <https://doi.org/10.1016/j.retrec.2010.03.002>
- Shabbir, M. S. (2024). Exploring consumer behavioral intentions toward energy-efficient vehicles: an empirical study for advancing sustainable development goals. *International Journal of Energy Sector Management*, 1750–6220. <https://doi.org/10.1108/IJESM-04-2024-0014>
- Stern, P. C. (2000). New environmental theories: toward a coherent theory of environmentally significant behavior. *Journal of social issues*, 56 (3), 407-424. DOI: <https://doi.org/10.1111/0022-4537.00175>
- Terengganu, U. M., Samy, P., Ismail, S., Ramayah, T., & Malaysia, U. S. (2021). Promoting green environment by predicting green public transportation usage. *Journal of sustainability science and management*, 16(4), 174–189. <https://doi.org/10.46754/jssm.2021.06.0015>
- Truong, T.-T., & Ngo, N.-Q.-N. (2024). Green Marketing, Green Perceived Value, and Green Consumer Behavior. <https://doi.org/10.2139/ssrn.4941142>
- Waqas, M., & Najmi, A. (2023). Enhancing consumption of sustainable transportation: Determinants and outcome of consumer engagement with bike-sharing service. *Environmental Science and Pollution Research International*, 30(18), 53411–53423. <https://doi.org/10.1007/s11356-023-26067-5>
- Waqas, M., Dong, Q.-L., Ahmad, N., Zhu, Y., & Nadeem, M. (2018). Understanding acceptability towards sustainable transportation behavior: A case study of China. *Sustainability*, 10(10), 3686. <https://doi.org/10.3390/su10103686>
- Wendt, N., Kipperberg, G., & Lindhjem, H. (2024). Consumer willingness to pay for emission reduction in air travel: A meta-analysis. *Transportation Research. Part D, Transport and Environment*, 134(104347), 104347. <https://doi.org/10.1016/j.trd.2024.104347>
- White, K. M., Smith, J. R., Terry, D. J., Greenslade, J. H. & McKimmie, B. M. (2009). Social influence in the theory of planned behaviour: The role of descriptive, injunctive, and in-group norms. *British Journal of Social Psychology*, 48, 135–158. DOI: <https://doi.org/10.1348/014466608X295207>

Zimmermann, S., Schulz, T., Hein, A., Gewalt, H., & Krcmar, H. (2024). Motivating change in commuters' mobility behaviour: Digital nudging for public transportation use. *Journal of Decision System*, 33(1), 79–105. <https://doi.org/10.1080/12460125.2023.2198056>