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mbr Multidisciplinary Business Review

FACTORS INFLUENCING CONSUMERS' INTENTIONS TOWARDS THE ADOPTION OF ENVIRONMENTALLY FRIENDLY CARS

FACTORES QUE INFLUYEN EN LAS INTENCIONES DE LOS CONSUMIDORES HACIA LA ADOPCIÓN DE AUTOMÓVILES ECOLÓGICOS

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Classification: Empirical paper – research
Received: March, 2022 / Revised: April 30, 2022 / Accepted: May 5, 2022

Abstract

The purpose of this paper was to examine the factors that influence millennials' intentions to adopt plug-in hybrid electric vehicles (PHEVs) in Gauteng, South Africa. This study was based on the theory of consumption values (TCV), using structured questionnaires and convenience sampling. Data was collected from 504 respondents in Gauteng, South Africa. A multiple regression analysis was performed to test the proposed hypotheses. The findings revealed a significant relationship between social, emotional and conditional values and millennials' behavioural intentions to adopt PHEVs and demonstrated a non-significant relationship between functional and epistemic values and behavioural intentions. Online data collection was used owing to COVID-19 pandemic restrictions, which limited the researcher's abilities to explain items in the questionnaire. Also, the study focused only on millennials residing in Gauteng, which does not accurately represent the behavioural intentions of the entire country. Nevertheless, this study offers useful information to environmentally friendly car manufacturers, car dealerships and the government, for developing strategies aimed at encouraging the adoption of PHEVs among South African millennial consumers.

Keywords: conditional values, emotional values, epistemic values, functional values, millennials, social values, South Africa, theory of consumption values.

Resumen

El propósito de este artículo fue examinar los factores que influyen en las intenciones de los *millennials* de adoptar vehículos eléctricos híbridos enchufables (PHEV) en Gauteng, Sudáfrica. Este estudio se basó en la teoría de los valores de consumo (TCV), utilizando cuestionarios estructurados y muestreo por conveniencia. Los datos se recopilaron de 504 encuestados en Gauteng, Sudáfrica. Se realizó un análisis de regresión múltiple para probar las hipótesis propuestas. Los hallazgos mostraron una relación significativa entre los valores sociales, emocionales y condicionales con las intenciones de comportamiento de los *millennials* para adoptar PHEV y demostraron una relación no significativa entre los valores funcionales y epistémicos con las intenciones de comportamiento. Se utilizó la recopilación de datos en línea debido a las restricciones de la pandemia de COVID-19, que limitaron la capacidad del investigador para explicar los elementos del cuestionario. Además, el estudio solo se centró en los *millennials* que residen en Gauteng, lo que no representa con precisión las intenciones de comportamiento de todo el país. No obstante, este estudio ofrece información útil para los fabricantes de automóviles ecológicos, los concesionarios de automóviles y el gobierno, en el desarrollo de estrategias destinadas a fomentar la adopción de PHEV entre los consumidores *millennials* de Sudáfrica.

Palabras clave: valores condicionales, valores emocionales, valores epistémicos, valores funcionales, millennials, valores sociales, Sudáfrica, teoría de los valores de consumo.

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Introduction

Sustainability in vehicle manufacturing is an increasingly important priority, as climate change has had an adverse effect on global warming, causing an imbalance in the environment as well as societal-, economic- and technology-related issues (Abeydeera et al., 2019). These problems can be credited to the global increase of greenhouse gases (GHGs), in which carbon dioxide (CO2) emissions have flattened to 33 gigatons owing to the advanced economies reducing their impact on the environment (Abeydeera et al., 2019; International Energy Agency, 2020).

South Africa's Low-Emission Development Strategy 2050 (Department of Forestry, Fisheries and the Environment, 2018) requires different divisions of the economy to implement policies aimed at minimising their CO2 emissions by 2050, and this includes the transport sector. The more cost-effective alternative, which is the focus of the larger study on which this article is based, is plug-in hybrid electric vehicles (PHEVs) (Wilberforce et al., 2017).

The study reported in this paper set out to evaluate the factors which affect South African consumers' intentions to purchase environmentally friendly cars, and the theory of consumption values (TCV), proposed by Sheth et al. (1991), was used for this purpose. The five consumption values that affect consumers' choices include social, functional, epistemic, conditional and emotional values – all of which have been proven to have a favourable relationship with consumers' choice behaviour (Sheth et al., 1991, p. 160) and are presumed to play a role in the intention to buy PHEVs. Millennials (born between 1980 and 2000), who are regarded as being environmentally conscious and eager to reduce their environmental impact, were targeted in this research. The objective was to determine what influences this cohort's intention to adopt PHEVs in order to reduce their GHG emissions.

The adoption rate of EVs (electric vehicles) is influenced by cost of ownership, driving range, consumer characteristics, charging time and network availability (Coffman et al., 2017). Although concerns regarding climate change have steadily increased, late adopters are not concerned about switching to disruptive technologies such as EVs, despite being perceived as expensive (Kim et al., 2017). Studies in developed nations such as Japan, South Korea, the United States of America (USA) and Germany, have focused on the effect which government incentives and environmental concerns have on EV adoption rates (Chu et al., 2018).

A review of the literature suggests that a limited number of studies have been conducted on the factors influencing the intention to adopt PHEVs in developing countries and emerging markets. Some of these studies have focused on sustainable green transport in Egypt (Ahmed & El Monem, 2020); green purchasing intentions in China (Awuni & Du, 2016); consumers' green product choices in Pakistan (Khan & Mohsin, 2017) and drivers' willingness to use biofuels in Malaysia (Zailani et al., 2019). Researchers have also examined green choice behaviour in Iran (Rahnama & Rajabpour, 2017) and China (Wang, Y et al., 2019), as well as the link between pollution, energy utilisation and economic growth in the Ivory Coast, Senegal, Ghana, Nigeria and South Africa (Esso & Keho, 2016).

Despite the available literature and long-standing research on PHEV, there is a dearth of empirical research on understanding factors that influence consumer intention towards the adoption of environmentally friendly cars. The growth of the local economy and population has resulted in increased GHG emissions throughout the transport sector (Gajjar & Mondol, 2016, p. 579). Furthermore, introducing EVs into the country would be beneficial to the environment as the adoption of PHEVs will reduce GHG emissions (p. 579).

The aim of the larger study was to explore factors which influence the intentions of millennial consumers to adopt PHEVs in Gauteng, South Africa. By understanding the functional, conditional, social, emotional and epistemic values affecting consumers' behavioural intentions (Sheth et al., 1991, p. 159) towards the adoption of PHEVs, the following research question will be answered: What factors influence millennial consumers' intentions to adopt PHEVs in Gauteng, South Africa?

Literature review

Importance of Sustainability

Sustainable development is defined as the capacity to meet the needs of current generations, without impeding future generations from meeting their requirements (World Commission on Environment and Development [WCED], 1987, p. 37). In that respect, Kemper and Ballantine (2019, p. 280) argue that sustainable, responsible expansion is crucial. A plethora of literature suggests that the combination of economic, environmental and social dimensions is vital to ensure future global sustainability (Mahmoudi et al., 2019; Ozanne et al., 2016).

As expressed by Abeydeera et al. (2019), climate change is a prevalent global concern owing to increased worldwide population, per capita consumption, as well as rising CO2 emissions, which exacerbate pollution and cause global temperatures to rise. According to the United Nations Environment Programme (UNEP, 2019), the five countries that contribute the most CO2 emissions to

Multidiscip. Bus. Rev. | *Vol. 15, N° 1, 2022, pp. 63-76, ISSN 0718-400X*
DOI: *https://doi.org/10.35692/07183992.15.1.7*

the environment are China, the USA, India, Russia and Japan. Notably, in 2018 China represented the world's largest electric car market, with 3,4 million units available, of which 540 000 were PHEVs (International Energy Agency [IEA], 2019). At the end of 2018, Europe accounted for 1.2 million units, of which 610 000 were PHEVs, followed by the USA with 1.2 million EVs, of which 480 000 were PHEVs (IEA, c2019). These vehicles boost transport sustainability by decreasing the effects of fossil fuel consumption on the environment and offer an alternative to paying ever-rising oil prices (Onat et al., 2016). A study in the USA found that PHEVs are more in line with economic, social and environmental sustainability than other alternatives, such as battery and hybrid-electric vehicles (p. 21). A report by Sustainable Energy Africa (SEA, 2018) notes that environmentally friendly vehicles substantially reduce air pollution, which delivers socioeconomic and health benefits for overcrowded cities. In addition, EVs that are powered by the South African electricity grid emit slightly fewer GHGs than vehicles with internal combustion engines and, therefore, have a favourable impact on the environment.

Types of Electric Vehicles

EV classifications encompass various mechanical and electrical systems, ranging from power transfer to the monetisation of the electrical systems in vehicles (Ceven et al., 2020, p. 2). According to Liu and Wang (2017, p. 1), EVs comprise battery-electric vehicles (BEVs), hybrid-electric vehicles (HEVs) and plug-in hybrid-electric vehicles (PHEVs), all of which help to reduce the amount of GHGs emitted into the atmosphere.

Limited access to oil resources and the objective of decreasing CO2 emissions have made BEVs the most promising means of establishing sustainable transportation systems (Neumann & Krems, 2016). The batteries used in such systems are the main source of energy, and generate significant levels of power (Tran et al., 2020, p. 4). BEVs' limited driving range can be increased by adding batteries. However, their performance would decrease as a result of needing to maintain equilibrium with acceleration (Bhatia & Riddell, 2016). Vehicles which are fully hybrid electric are fuel efficient, as they have internal combustion engines alongside an electric powertrain that permits the engine to switch off when the vehicle comes to a stop (Rezvani et al., 2015, p. 123; Basu et al., 2019, p. 109). Liu et al. (2017, p. 1497) suggest that HEVs assist not only in reducing air pollution, but also the quantities of engine oil consumed.

PHEVs use batteries and electric motors that can be charged at power grids and utilise petrol to power the internal combustion engine when the battery dies (Basu et al., 2019; Zhang, et al., 2019). The makeup of the PHEVs and that of the BEVs are homogenous, with the exception that the former has an exterior electric charging plug, larger electrical components and a smaller engine than the latter (Tran et al., 2020). PHEVs are widely regarded as the preferred EV due to their use of an electric motor, alongside an internal combustion engine that permits recharging (Pirmoradi et al., 2017; Rezvani et al., 2015). Pirmoradi et al. (p. 58) state further that PHEVs house a more substantially sized battery pack, and their kilometre range can span a greater distance without using fuel than HEVs can. Moreover, PHEVs cater to consumers who put a premium on sustainability, by being an affordable option that reduces GHG emissions (p. 58). The fuel-efficient design systems of PHEVs are classified as series, parallel or series-parallel (Ding et al., 2020, p. 1; Xiao et al., 2018). The engine in a series plug-in hybrid-electric vehicle works alongside a generator to produce electrical energy to drive the motor (Zhang, L et al., 2019). No emissions are released unless the battery is depleted, the vehicle has not been charged, or distances exceed what the battery usage permits (Zhang, et al., 2019). The parallel hybrid option links the electric motor and the engine to the wheels by means of mechanical pairing, which enables them both to power the wheels directly (Xiao et al., 2018, p. 3). Also, the series-parallel PHEV, which is a combination of both classifications, maintains enhanced driving performance and reduced carbon emissions (Ding et al., 2020, p. 1).

Millennials

This generation can be defined as individuals who were born during the same time period and share similar social or economic backgrounds but differ from other generations owing to changes in the environment or their upbringing (Celik & Gürcüoğlu, 2016, p. 117). The millennial generation consists of individuals who were born between 1980 and 2000 (Jain & Dutta, 2019, p. 30), which means they currently fall into the 21–41 age bracket. Millennials, who are regarded as more technologically oriented than other generations, rely on the internet for access to information and help in making decisions (Liu et al., 2019). There has been a global shift towards the "Millennial Moment", that is a moment in history in which the millennial generation will have the greatest degree of power in the economic, cultural and political spheres (Zachara, 2019). According to Naidoo (2018, p. 24), millennials have remarkable purchasing power, with a global contribution to the economy of 2,45 trillion dollars in 2015. This generation typically displays

a favourable attitude towards green products, yet their environmental consciousness is not always reflected in their purchasing behaviour. South African millennials comprise approximately 27 per cent of the population. They are for the most part, socially aware of their environmental impact and motivated to participate in the movement towards sustainable purchases (Naderi & van Steenburg, 2018 p. 2).

Conceptual Framework and Research Hypotheses

The overarching theory used in the larger study involved consumption values, the objective being to demonstrate the relationship between those values (the functional, conditional, emotional, epistemic and social) and millennial consumers' behavioural intentions towards the adoption of PHEVs in Gauteng. Created by Sheth et al. (1991), the TCV has been used to explain why individuals choose to purchase (or not), and why they choose certain products/brands over others. The TCV is based on three fundamental propositions, namely that consumption values are independent, contribute to any choice decision made and are the result of an individual's choice (Sheth et al., 1991, p. 160). The TCV was originally used to ascertain the effect of consumption values on cigarette smokers and non-smokers. The TCV has also been used to examine the antecedents and predictors of green purchasing behaviour (Awuni & Du, 2016; Gonçalves et al., 2016). Other studies employed the TCV to determine environmental concerns regarding green product purchases (Rahnama & Rajabpour, 2017; Suki, 2016). Additionally, the theory has been applied to consumers' choice behaviour in buying green products and has analysed the impact of the five consumption values on drivers' willingness to acquire biofuels (Khan & Mohsin, 2017; Zailani et al., 2019). The TCV was also used to determine consumers' purchase intentions to adopt electric vehicles (Han et al., 2017).

This theory was deemed the most appropriate for complying with the research objectives of determining what motivates South African millennials' choices in terms of their intentions to adopt PHEVs (Sheth et al., 1991). The conceptual model in figure 1 demonstrates these five consumption values as direct antecedents of behavioural intention.

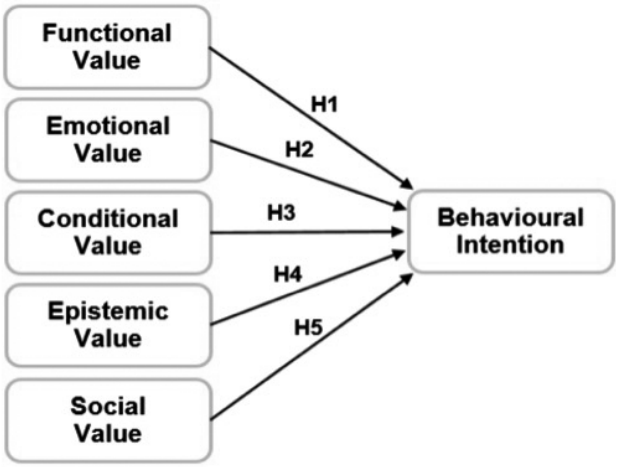
Each of the values will now be discussed in turn.

Functional Value

Functional value refers to the perceptions of utility gained from a product or service based on its functional, physical or utilitarian performance, along with its price, quality, reliability and durability (Khan & Mohsin, 2017; Sheth et al., 1991). A study in China found that functional values were a vital determinant of consumers' buying behaviour in seeking maximum benefits at the lowest cost (Awuni & Du, 2016, p. 124). The literature describes functional values in terms of quality, price and dependability (Khan & Mohsin, 2017). Wang, et al. (2019) concur, noting that functional values regarding quality and price were used to predict green buying behaviour. Studies in Australia (Singh & Pandey, 2018), Malaysia (Zailani et al., 2019) and India (Biswas & Roy, 2015) found that functional values influenced sustainable consumption behaviour. Furthermore, Han et al. (2017 report that when consumers adopted environmentally friendly cars, the rewards included performance and convenience, as well as monetary value. In terms of behavioural intention, functional values derived from the use of PHEVs include perceived functional benefits, price and quality. Given the above, the following hypothesis is put forward:

H1: Functional values will have a significant and positive impact on consumers' behavioural intentions regarding the adoption of PHEVs.

Figure 1. Conceptual model of consumers' intention to adopt PHEVs



Source: Author's compilation.

Emotional Value

Emotional value encompasses the perceptions of utility obtained from the ability of a product or service to induce feelings or affective states (Sheth et al., 1991, p. 161). Research conducted in China indicated that the intention to satisfy a psychological need(s) was a factor in consumers' purchases (Han et al., 2017). The literature suggests that consumers' environmental behaviour is associated with high emotional values, which increases their motivation to purchase green products (Zailani et al., 2019; Dilotsotlhe, 2021). Studies in Malaysia

(Abdulrazak & Quoquab, 2018) and Hong Kong (Lee, 2017) found that emotional values influenced consumers' intentions to live conscious and sustainable lifestyles. As explained by Han et al. (2017), feelings of comfort, ease of driving and pleasure are among the psychological needs fulfilled when purchasing EVs. Han et al. (2017) also found that environmentally conscious consumers demonstrated a notable willingness to decrease their CO2 footprint, and derived emotional value from adopting EVs. In terms of behavioural intention, emotional values represent the perceived emotional benefits obtained from using PHEVs. Considering these data, this study proposes the following hypothesis:

H2: Emotional values will have a significant and positive impact on consumers' behavioural intentions regarding the adoption of PHEVs.

Conditional Value

Conditional value is the perceived utility derived from a product/service as a result of certain circumstances or situations confronting the decision-maker (Sheth et al., 1991, p. 162). The literature suggests that changes in conditional values (e.g., time, context, place, personal situation) can alter consumer behaviour (Kushwah et al., 2019). A study in Malaysia supported this finding, with consumption behaviour proving to be significantly influenced by conditional values (Zailani et al., 2019). In the same vein, several researchers found that green consumer behaviour was indeed influenced by conditional values, as changes in specific conditions affected green product purchases (Khan & Mohsin, 2017). Studies in India (Biswas & Roy, 2015) and Malaysia (Wen & Noor, 2015) found that conditional values influenced consumers' behavioural intentions towards adopting environmentally friendly products. As Awuni and Du (2016) postulate, information relating to global warming or environmental concerns can sway consumer behaviour towards the adoption of sustainable products. In terms of behavioural intention, conditional values encompass the perceived situational utility obtained from the use of PHEVs. On this basis, the following hypothesis is proposed:

H3: Conditional values will have a significant and positive impact on consumers' behavioural intentions regarding the adoption of PHEVs.

Epistemic Value

Epistemic value reflects the perceived utility gained from the ability of a product or service to induce curiosity, offer novelty, or appease a yearning for knowledge (Sheth et al., 1991, p. 162). The literature suggests that novelty-seeking is a means of improving consumers' problem-solving skills, which is essential for stimulating their willingness to test new products (Awuni & Du, 2016; Zailani et al., 2019). A study in Portugal found that green product purchases are influenced by an individual's epistemic values (Gonçalves et al., 2016), while in China, Wang et al. (2019), in Iran, Rahnama and Rajabpour (2017) and in Malaysia, Suki (2016) found that epistemic values affected green consumption behaviour. As Kushwah et al. (2019, p. 4) explain, consumers seek information related to credibility, production methods, and the environmental impact of a product/service, prior to making a decision. Han et al. (2017) found that an interest in new technology enriches consumers' knowledge and influences the adoption of environmentally friendly cars. In terms of behavioural intention, epistemic values encompass perceived utility relating to the knowledge and novelty obtained from using PHEVs. Given this context, the study sets forth the following hypothesis:

H4: Epistemic values will have a significant and positive impact on consumers' behavioural intentions regarding the adoption of PHEVs.

Social Value

Social value refers to the perceived utility obtained from associating a product or service, with various social groups (cultural, demographic, socio-economic) (Sheth et al., 1991, p. 161). A study conducted in Portugal found that social value is concerned with improving self-image and gaining societal approval, both of which influence sustainable consumption behaviour (Gonçalves et al., 2016). In Pakistan, Khan and Mohsin (2017) indicated that an individual's choice behaviour is positively and significantly affected by his/her social values. Studies in China (Clark et al., 2019) and New Zealand (Johnstone & Hooper, 2016) found that social values affected consumers' behavioural intentions to consume green products. Han et al. (2017) assert that consumers are inclined to adopt environmentally friendly vehicles since such action fulfils their social obligation to help decrease CO2 emissions. A study in Malaysia suggests that perceptions of social value regarding hybrid vehicles are positively associated with consumers' purchase intentions (Zailani et al., 2019). In terms of behavioural intention, social values include social perceptions of utility acquired from the use of PHEVs. This information motivates the following hypothesis:

H5: Social values will have a significant and positive impact on consumers' behavioural intentions regarding the adoption of PHEVs.

Multidiscip. Bus. Rev. | *Vol. 15, N° 1, 2022, pp. 63-76, ISSN 0718-400X*
DOI: *https://doi.org/10.35692/07183992.15.1.7*

Research Methodology and Design

The study reported in this paper used quantitative data to examine South African millennials' intentions to adopt environmentally friendly cars. For that purpose, a positivist research philosophy was selected, since it focuses on improving ethical generalisations by way of societal realities (Saunders et al., 2016:135). Positivism is concerned with proving (or disproving) hypotheses, while valuing objectivity (Ryan, 2018, p. 1). The Statistical Package for Social Sciences (SPSS) was used to gather and interpret the data. As recommended by Saunders et al. (2016, p. 146), in the examination of the quantitative data, a deductive approach was used to determine customers' behavioural intentions towards the adoption of PHEVs.

Population and Sampling

The larger study employed a survey research strategy, with an online questionnaire. That allowed for the collection of a substantial amount of data, in a cost-efficient manner, from the target population (Saunders et al., 2016). The study population consisted of consumers, 18 years and older, based in South Africa, while the target population included millennials who live in Gauteng. Of the 600 questionnaires disseminated, 504 responses were received. A non-probability sampling design was used, and convenience sampling was applied, given the limited access to respondents owing to restrictions imposed because of the COVID-19 pandemic.

Data Collection

Self-administered online questionnaires were used to gather data from a sample within the target population. The questionnaires, which were presented on Google Forms, adhered to a five-point Likert scale. Items and statements relating to the construct were presented, and respondents were required to select, from the scale, whether they strongly disagree, disagree, are neutral, agree, or strongly agree with each item (Wiid & Diggines, 2017).

Results

Descriptive Statistics of the Sample

The demographic profile for this study included gender, education level and income level of the respondents. The sample, which comprised 504 respondents, included a higher number of female (54.8%) than male respondents (45.2%). With reference to education level, 39.1 per cent of the respondents had a bachelor's degree, followed by those who completed grade 12 (21.0%), then by those with a post-matric certificate or diploma (20.6%), followed by those respondents with a post-graduate degree (18.3%) and finally those with lower than Grade 12 (1.0%). Additionally, 22.1 per cent of the respondents indicated that they had no monthly income, 25.2 per cent earned less than R10 000, 17.1 per cent between R10 001 and R20 000, 17.5 per cent between R20 001 and R35 000, 10.5 per cent earned R50 001 or more, and 7.6 per cent earned R35 001–R50 000. Income levels were based on the South African rand (ZAR).

Descriptive Statistics of the Constructs

The descriptive statistics for each construct (functional, social, conditional, emotional and epistemic values), as well as behavioural intentions, are presented in the section with each mean and standard deviation calculated (see Table 1). A five-point Likert scale was used to measure the items presented in the questionnaire used to test each construct, where 1 indicated *strongly disagree* and 5 indicated *strongly agree*.

The functional values' mean scores ranged from 2.40–3.66 and the standard deviation from 0.695–1.427, with an overall average mean score of 322 and a standard deviation score of 0.953. The responses underscored that the respondents strongly agreed regarding consumers' purchase intentions towards environmentally friendly cars. As a result, functional values (such as hybrid cars being economical) proved to be an influential factor in making the decision whether to purchase an environmentally friendly car, as was an acceptable standard of quality in hybrid cars.

The analysis of social values regarding consumers' purchase intentions regarding environmentally friendly cars revealed a mean value ranging from 2.48–3.45, with an overall average of 2.99. The standard deviation ranged from 0.988–1.115, with an overall average of 1.060, which indicates that consumers would feel relatively better if they purchased an environmentally friendly car based on social acceptance. The social value "buying a hybrid car would improve the way that I am perceived" was found to have a direct impact on consumers' purchase intentions in this respect.

The measurement of conditional values in relation to the adoption of environmentally friendly cars indicated a mean range of 3.01–3.67 and a standard deviation ranging from 1.002–1.271. The overall mean and standard deviation averages were 3.58 and 1.002, respectively. The conditional value "I would buy a hybrid car instead of a conventional (petrol) car when there are discount prices for them" revealed that respondents were more likely to purchase an environmentally friendly car if conditional circumstances were in their favour.

Table 1. Descriptive Statistics of the Constructs

Constructs		Mean	Standard Deviation
Fuctional Values			
FV1:The hybrid car has consistent quality		2.40	1.222
FV2: The hybrid car is well made.		2.40	1.427
FV3: The hybrid car has an acceptable standard of quality.		3.66	0.695
FV4: The hybrid car would perform consistently.		3.62	0.734
FV5: The hybrid car is reasonably priced.		3.37	0.927
FV6: The hybrid car offers value money.		3.56	0.803
FV7: The hybrid car is a good product for the price.		3.14	0.898
FV8: The hybrid car would be economical.		3.62	0.921
	Overall Average	3.22	0.953
Social Values			
SV1: Buying the hybrid car would hepl me to feel admired		3.01	0.988
SV2: Buying the hybrid car would improve the way that I am perceived.		3.45	1.023
SV3: Buying the hybrid car would make a good impression on other people.		3.00	1.112
SV4: Most people who are important to me would expect that I should buy a hybrid car		2.48	1.115
	Overall Average	2.99	1.060
Conditional Values			
CV1: I would buy a hybrid car when my fanancial conditions are good.		3.36	1.077
CV2: I would buy a hybrid car instead of conventional (petrol) car under worse environmental conditions.		3.01	1.271
CV3: I would buy a hybrid car instead of conventional (petrol) car when there is a subsidy for such products.		3.61	1.030
CV4: I would buy a hybrid car instead of conventional (petrol) car when there are discount prices for them.		3.67	1.032
CV5: I would buy a hybrid car instead of conventional (petrol) car when they are available.		3.58	1.002
	Overall Average	3.45	1.082
Emotional Values			
EMV1: Buying a hybrid car would feel like making a good personal contribution to something better.		3.86	0.934
EMV2: Buying a hybrid car would feel like the morally right thing to do.		3.48	0.933
EMV3: Buying a hybrid car would make me feel like a better person.		3.50	1.040
EMV4: Buying a hybrid car would make me feel good.		3.54	0.982
	Overall Average	3.60	0.972
Epistemic Values			
EV1: Before buying a hybrid car, I would obtain substantial information about the different makes and models of the products.		3.77	1.137
EV2: I would require a great deal of information about the different makes and models before buying the green products.		3.83	1.065
EV3: I would like to search for new and different types of hybrid cars.		4.22	0.881
EV4: I would be willing to ask for new information about the hybrid cars.		4.17	0.837
	Overall Average	4.00	0.98
Behavioural Intention			
BI1: I will consider switching to a hybrid car for ecological reasons.		3.77	0.908
BI2: My willingness to buy a hybrid car is high.		3.46	1.066
BI3: I am willing to pay more for a hybrid car as it has more enviromental benefits.		3.70	0.913
BI4: I definitely want to purchase a hybrid car in my next purchase.		3.59	1.078
	Overall Average	3.63	0.930

The mean scores for emotional values ranged from 3.48–3.86, with an overall average of 3.60. The standard deviation scores for emotional values ranged from 0.933–1.040, with an overall average of 0.972. This suggests that, in general, the respondents were aware of the emotional impact that purchasing an environmentally friendly car would have on them. This was supported by the emotional value "buying a hybrid car would make me feel like making a good personal contribution to something better", with most respondents replying positively to this statement.

The epistemic values analysed, reflected the respondents' perceptions for gaining insight into the issue prior to purchasing an environmentally friendly car, with the mean scores ranging from 3.77–4.22, and the standard deviation from 0.837–1.137. The overall averages for the mean and standard deviations were 4.00 and 0.98, respectively. The epistemic values "I would like to search for new and different types of hybrid cars" and "I would require a great deal of information about the different makes and models before buying the green products" highlighted that respondents were only willing to purchase an environmentally friendly car, if they were well-informed and educated regarding the functions of a hybrid car.

With respect to consumers' behavioural intentions towards purchasing an environmentally friendly car, the overall mean and standard deviation were 3.63 and 0.930,

Multidiscip. Bus. Rev. | *Vol. 15, N° 1, 2022, pp. 63-76, ISSN 0718-400X*
DOI: *https://doi.org/10.35692/07183992.15.1.7*

respectively. The mean ranged from 3.46–3.77 and the standard deviation from 0.908–1.078, which suggests that the respondents were more willing to purchase an environmentally friendly car for the right ecological and environmental reasons. Support for the construct, "I will consider switching to a hybrid car for ecological reasons" (mean=3.77; standard deviation=0.908) confirmed this.

Construct Reliability and Validity

An internal consistency of reliability analysis, which was completed for this study, is examined below.

Internal Consistency of Reliability Analysis

As presented on Table 2, Cronbach's alpha values range from 0–1, and should be above 0.7, to effectively measure internal consistency, but values between 0.65 and 0.80 are regarded as adequate (Vaske et al., 2017).

Table 2. Cronbach's Alpha

Construct	Number of Items	Cronbach's Alpha
Functional Values	8	0.718
Social Values	4	0.718
Conditional Values	5	0.770
Emotional Values	4	0.818
Epistemic Values	4	0.773
Behavioural Intention	4	0.829

Cronbach's alpha for functional values (0.718), social values (0.718), conditional values (0.770), emotional values (0.818), epistemic values (0.773) and behavioural intention (0.829) all exceeded the minimum threshold of 0.7 for internal consistency. Thus, these results confirm the reliability of the measurement model as well as the internal consistency of the constructs.

Correlation Analysis

The Pearson correlation coefficient (r) is used to characterise the linear correlation between the features of normal distribution, and should range between -1 and 1 (Xu & Deng, 2017). As explained by Cohen (1988, p. 81), a correlation coefficient of 0.10–0.29 indicates a small effect, 0.30– 0.49 a medium effect and 0.50–1.0 a large effect. Correlation analysis was conducted using a bivariate correlation procedure and two-tailed tests for statistical significance (see Table 3).

This study found a significant and positive relationship between the social and functional values ($r=0.224$, $p<0.05$) which was considered to have a small effect. The results suggest that there was a significant and positive relationship between the conditional and functional values ($r=0.519$, $p<0.05$), which had a strong effect. Notably, there was a medium effect between the conditional and social values (0.356), which depicted a significant and positive correlation. A small effect was found for the correlation between the emotional and functional values ($r=0.298$, $p<0.05$), there was a medium effect between the emotional and social values ($r=0.449$, $p<0.05$) and a strong effect between the emotional and conditional values ($r=0.589$, $p<0.05$) – all of which demonstrated significant and positive correlations.

Furthermore, the correlation showed a small effect between the epistemic and social values ($r=0.233$, $p<0.05$), a medium effect between the epistemic and functional values ($r=0.453$, $p<0.05$), a strong effect between the epistemic and conditional values ($r=0.623$, $p<0.05$), and a strong effect between the epistemic and emotional values ($r=0.545$, $p<0.05$) – all of these demonstrated significant and positive correlations. A medium effect was found between behavioural intention and functional values ($r=0.304$, $p<0.05$), a medium effect between behavioural intention and epistemic values ($r=0.396$, $p<0.05$) and a strong effect between behavioural intention and social values ($r=0.543$, $p<0.05$). A strong effect was found between behavioural intention and conditional values ($r=0.561$, $p<0.05$), and also between behavioural intention and emotional values ($r=0.597$, $p<0.05$), therefore, demonstrating significant and positive relationships.

Model Testing

Multiple regression analysis was used in order to determine the internal reliability and validity of the research model (TCV) to test the hypotheses set out earlier. Once the validity of the model had been determined, the hypotheses were tested using multiple regression analysis, with the results presented on Table 4.

Using the variance inflation factor (VIF), the collinearity surrounding the independent variables of the study were evaluated. According to Chappelow (2018), the VIF determines the degree of multicollinearity within the independent variables as part of the multiple regression model. According to de Jongh et al. (2014), a variety of threshold values, including 2.5, 5 and 10, can be used to indicate multicollinearity. This study employed the threshold value of 5 to test for multicollinearity among the dataset. The VIF values ranged between 1.288 and 2.193 (i.e., below the threshold of 5). It is therefore possible to conclude that multicollinearity was not present in the dataset, and regression analysis could be carried out.

Several criteria were used to evaluate the coefficient of determination (R square), which Hayes (2020) suggests is a representation of the proportion

Table 3. Correlation Analysis

		Functional Values	Social Values	Conditional Values	Emotional Values	Epistemic Values	Behavioural Intention
Functional values	Pearson Correlation	1.000					
	Sig. (2-tailed)						
Social values	Pearson Correlation	0.224	1.000				
	Sig.(2-tailed)	0.000					
Conditional Values	Pearson Correlation	0.519	0.356	1.000			
	Sig.(2-tailed)	0.000	0.000				
Emotional Values	Pearson Correlation	0.298	0.449	0.589	1.000		
	Sig.(2-tailed)	0.000	0.000	0.000			
Epistemic Values	Pearson Correlation	0.453	0.233	0.623	0.545	1.000	
	Sig.(2-tailed)	0.000	0.000	0.000	0.000		
Behavioural Intention	Pearson Correlation	0.304	0.543	0.561	0.597	0.396	1.000
	Sig.(2-tailed)	0.000	0.000	0.000	0.000	0.000	

**.Correlation is significant at the 0.01 level (2-tailed).

of variance of the dependent variable (behaviour intention) that can be explained by the independent variable (consumption values) in a regression model. If R^2<0.13 (small effect and non-significant), R^2 is between 0.13 and 0.25 (medium effect and significant), if R^2>0.25, then the relationship is largely important (Cohen, 1988). The results indicated that R^2=0.501 (i.e., 50.1%), and represents a largely important relationship between the dependent and independent variables. Therefore, the positive and significant consumption values (independent variables) predicted 50.1 per cent of the behavioural intention of the respondents towards adopting PHEVs (dependent variable).

The results presented on Table 4 suggest that only three of the five structural relationships showed significance: social values (β=0.312; p-value<0.05), conditional values (β=0.281; p-value<0.05) and emotional values (β=0.299; p-value<0.05) were all significant in affecting respondents' intentions to adopt environmentally friendly cars, while functional values (β=0.007; p-value>0.05) and epistemic values (β=-0.017; p-value>0.05) were found to be not significant.

Table 4. Multiple Linear Regression Analysis – Behavioural Intention

Independent Variables	Fuctional Values Social Values Conditional Values Emotional Values Epistemic Values					
Dependent Variable	Behavioural Intention					
	Unstandardised Coefficients		**Standardised Coefficients**			
	Beta (β)	**Std.Error**	**Beta (β)**	**t**	**Sig.**	**VIF**
Constant	0.228	0.180		1.262	0.207	
Fuctional Values	0.010	0.055	0.007	0.185	0.853	1.437
Social Values	0.326	0.038	0.312	8.669	0.000	1.288
Conditional Values	0.293	0.049	0.281	5.989	0.000	2.193
Emotional Values	0.313	0.045	0.299	6.900	0.006	1.876
Epistemic Values	-0.019	0.046	-0.017	-0.403	0.687	1.871
Equation						
R	0.708					
R Square	0.501					
Adjusted R Square	0.496					

To test the hypotheses of the study, a positive β-value and a significant p-value were required in order to accept the hypotheses. Therefore, the following hypotheses were accepted owing to their positive and significant relationships with behaviour intention: social values (H5: Accepted), conditional values (H3: Accepted) and emotional values (H2: Accepted). Notably, the hypotheses for functional values and epistemic values were rejected as a result of the relationships not being significant with behavioural intentions (H1: Rejected; H4: Rejected).

Discussion and Implications

After applying multiple regression analysis, the results revealed that the emotional, conditional and social values were positively related to PHEV behavioural (purchase) intention, while the functional and epistemic values were found to be negatively related to it. These results are discussed below, alongside implications for South African millennials. Also, strategies are proposed for managers of outlets selling environmentally friendly vehicles to target this cohort, based on the findings. *First*, the results showed the negative effect of functional value on millennials' behavioural intentions to adopt environmentally friendly cars within a South African context. Therefore, H1 was not supported. This is not congruent with studies conducted in Malaysia (Zailani et al., 2019), Australia (Singh & Pandey, 2018) and India (Biswas & Roy, 2015), which found that sustainable consumption behaviour was driven by functional values, which suggests that functional values (price, quality, durability and reliability of the PHEVs) did not significantly influence South African millennials' behavioural intentions to adopt these cars. This is important for marketers to consider when they come up with pricing strategies, as this value is considered less essential inducement by this cohort.

Second, the results confirmed that emotional value had a significant influence on millennials' behavioural intentions to purchase environmentally friendly cars, thereby supporting H2. This aligns with the findings of Wang et al. (2019) who found that consumers were willing to purchase higher-priced items if their friends owned the same, since it gave them an emotional sense of belonging. For marketers, this indicates that South African millennials would be influenced to purchase PHEVs if their emotional values were stimulated (e.g., psychological needs, morals and the sense of being a better person, based on their green consumption). Marketers can highlight visual advertisements at exhibitions and events as well as utilise educational campaigns to evoke emotional responses or feelings from millennials. Participating in these events and exhibitions may also arouse positive feelings of contributing towards sustainable efforts among millennials.

Third, the results showed the positive effect of conditional value on millennials' behavioural intentions towards adopting environmentally friendly vehicles, therefore supporting H3. This result is congruent with those of studies conducted in India (Biswas & Roy, 2015), Malaysia (Wen & Noor, 2015) and Pakistan (Khan & Mohsin, 2017), which found a significant relationship between conditional values and consumers' behavioural intentions towards adopting environmentally friendly products. Marketers can take note of the fact that South African millennials are influenced by conditional values such as global warming, as well as subsidies or discounts on PHEVs. Additionally, the South African government can offer subsidies or tax exclusions on environmentally friendly vehicles, more particularly PHEVs, in order to make them more affordable to millennial consumers and to entice them to purchase these environmentally friendly cars. According to *The Korea Herald* (2020), countries such as South Korea and China have implemented subsidy schemes and tax concessions for environmentally friendly vehicles which have resulted in an increase in the purchase of such vehicles in their countries. It is therefore envisaged that implementing these subsidies and tax deductions may have the same impact in South Africa.

Fourth, the results found that epistemic value had a negative effect on millennials' behavioural intentions to adopt environmentally friendly vehicles. Therefore, H4 was not supported. Awuni and Du (2016) found that epistemic value was not significant in terms of influencing intentions to purchase green products in China, which supports the results obtained in this study. Epistemic values such as curiosity and a yearning for knowledge regarding PHEVs therefore did not significantly influence millennials' behavioural intentions to adopt these cars within a South African context.

Fifth, the results confirmed that social value had a significant influence on millennials' behavioural intentions to purchase environmentally friendly cars, therefore supporting H5. This result is congruent with that of a study conducted in Taiwan, which identified the effects that social values and image had on behavioural intention (Horng et al., 2018). This implies that social values (e.g., improved self-image, societal approval, social obligation/pressure to reduce CO_2 emissions) influenced South African millennial consumers towards adopting PHEVs. Furthermore, the marketing managers of environmentally friendly cars will need to invest more in strategies utilising social values as this was found to have the strongest relationship with behavioural intention. This can be done by implementing a social media campaign

whereby images and videos will contain messages relating to societal obligations and pressures to reduce CO2 emissions by means of purchasing PHEVs.

Overall, this study contributes to the theory by consolidating the use of the theory of consumption values in order to explain the factors that influence the intention to adopt environmentally friendly cars. Understanding the millennial cohort's functional, emotional, conditional, epistemic and social values with respect to the intention to adopt PHEVs provided valuable insights which contributed to the existing body of literature on consumer behaviour and green marketing.

With this knowledge, marketing managers are better able to define and improve customer acquisition strategies (e.g., to segment consumers based on the combinations of consumption values and to develop a communication strategy emphasising, for example, contribution to a green environment and less air pollution) and to develop product offerings that best meet the consumer's needs.

Conclusion and Recommendations for the Future Research

This study examined the impact of the TCV factors on PHEV purchase (behaviour) intention among millennials in Gauteng, South Africa. Using the proposed model, the combined factors explained 50.1 per cent of the variance in behavioural intention to purchase PHEVs. Although the findings of this study present important insights for environmentally friendly car dealers and marketing managers, it certainly has limitations. As a result of the COVID-19 pandemic, convenience sampling was used, with the researcher mailing questionnaires to respondents online. This restricted the possibility of doing physical convenience sampling in public areas in Gauteng. It is recommended that future researchers utilise quota sampling to accurately represent the population. Since this study was carried out in Gauteng, it would be beneficial for future studies to consider gathering responses from individuals throughout South Africa, to reflect the overall behavioural intentions of millennials more accurately. Additionally, most of the responses were completed using mobile devices, which meant that the researcher could not fully explain the questionnaire to respondents, causing some to misunderstand certain questions, or what was required of them. An environment which allows the researcher to engage with the respondents, for help or clarification, is recommended for future studies.

In conclusion, the research empirically linked and highlighted the effects that functional, social, conditional, emotional and epistemic values had towards the respondents' behavioural intentions to purchase cars that are environmentally friendly. The empirical findings positively supported the hypotheses that social, conditional and emotional values significantly influenced behavioural intentions in this regard, while the hypotheses affirming the influence of functional and epistemic values on behavioural intentions proved not to be significant. To conclude, the research study achieved its objectives of validating the theory of consumption values in terms of the intention to adopt PHEVs using a South African millennial consumer sample. Practical implications were identified and strategies for management were proposed to support the adoption of environmentally friendly cars.

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