Towards large scale solar panel adoption: understanding the role of context-specific reasons

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Abstract

Purpose – Despite increasing environmental awareness and a preference for eco-friendly products, adoption of renewable energy technologies remains low. The purpose of this study is to advance the behavioural reasoning theory (BRT) by examining how personal values and context-specific "reasons for" and "reasons against" influence solar panel purchase intentions in Ghana. It tests the mediating roles of all three global motives: attitude, subjective norms and perceived behavioural control.

Design/methodology/approach – A cross-sectional survey design was used to collect data from 425 homeowners in Ghana through an online survey using purposive sampling. Data was analysed using a two-stage structural equation modelling approach.

Findings – The results suggested that openness to change positively influenced purchase intention ($\beta = 0.08$, $p = 0.04$), supporting *H1a*. Reasons for purchase influenced purchase intention ($\beta = 0.47$, $p < 0.001$), supporting *H2a*. However, reasons against purchase did not directly affect purchase intention ($\beta = 0.02$, $p = 0.87$), rejecting *H3a*. Mediation analysis revealed that attitude partially mediated the relationship between openness to change and purchase intention, with a significant indirect effect ($\beta = 0.21$, $p < 0.01$). Subjective norms and perceived behavioural control also acted as partial mediators, yielding significant indirect effects of $\beta = 0.05$ ($p < 0.05$) and $\beta = 0.06$ ($p < 0.05$), respectively.

Originality/value – This study is among a few to explore the distinct effects of global motive dimensions in the BRT framework, including attitudes, subjective norms and perceived behavioural control. It offers a fresh perspective on the factors influencing solar panel adoption.

Keywords Global motives, Reasons, Openness to change, Behavioural reasoning theory, Green gap, Solar panels

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1. Introduction

In recent years, the adoption of solar panels has emerged as a critical factor in the shift towards renewable energy sources, gaining momentum and becoming increasingly cost-effective (Van Opstal and Smeets, 2023). This trend is expected to gain momentum and become increasingly cost-effective, as the International Energy Agency projected in 2021 and the Intergovernmental Panel on Climate Change in 2012. Solar panels are instrumental in achieving several of the United Nations' Sustainable Development Goals (SDGs), including SDG 7, which focuses on ensuring access to reliable, sustainable and modern energy for all; SDG 12, which promotes responsible consumption and production; and SDG 13, which emphasises urgent action on climate change (Van Opstal and Smeets, 2023).

Despite the increased environmental consciousness and articulated preferences for eco-friendly products, renewable energy technologies such as solar panels continue to face low adoption rates in consumer markets (Shahsavari and Akbari, 2018). This disconnect has been challenging to explain, given consumers' positive attitudes towards green products (Wang *et al.*, 2021a, 2021b). Understanding this "green gap" is crucial and urgent because it is the key to developing effective strategies to promote green products and accelerate the transition to renewable energy technologies.

Despite the significant academic interest in sustainable consumption (Liu *et al.*, 2022; Mukoro *et al.*, 2022; Yang *et al.*, 2021), there is still a low patronage of renewable energy technologies in consumer markets. Most research on sustainable consumption has focused on the factors influencing consumers' preferences for environmentally friendly products (Elhaffar *et al.*, 2020; Hartmann *et al.*, 2017; Ravigné and Da Costa, 2021). This stream of research assumes that consumers buy green products because their attitudes towards them are positive. However, other studies have questioned this assumption (Larranaga and Valor, 2022). Understanding this "green gap" is crucial, and it also holds the potential to bridge the divide between consumers' positive attitudes towards green products and their actual purchase behaviour. This understanding is key to developing effective strategies to promote green products and accelerate the transition to renewable energy technologies.

Although extant studies have examined the determinants of sustainable consumption (Ashfaq *et al.*, 2021; Dhir *et al.*, 2021; Sharma, 2021; Yadav *et al.*, 2022), several gaps still exist in the extant literature. Firstly, previous studies have examined the drivers of green consumption using theories like theory of planned behaviour to understand customer purchase intentions for green products (Groening *et al.*, 2018). However, these theories have not been able to explain the persistence of the green gap, as they largely overlook factors that account for resistance towards green products (Larranaga and Valor, 2022; Tandon *et al.*, 2020).

This oversight is significant, as understanding both the drivers and barriers to adoption is crucial for developing effective strategies to promote green products. Behavioural reasoning theory (BRT) addresses this gap by offering a comprehensive model that assesses the comparative effects of "reasons for" and "reasons against" behaviour. As Claudy *et al.* (2015) and Kumar *et al.* (2020) argued, BRT provides a valuable extension of the theory of planned behaviour by incorporating context-specific reasons, thus offering a more nuanced and balanced understanding of the factors influencing consumer attitudes and decisions. By accounting for both positive and negative reasoning, BRT enables a deeper and more balanced assessment of consumer behaviour in the context of green product adoption.

Secondly, the BRT postulates that global motives mediate the link between values and the intentions of individuals. However, most studies applying the BRT have only looked at attitude as a global motive, ignoring the influences of perceived behavioural control (PBC) and subjective norms as global motive constructs (Kumar *et al.*, 2020). It is argued that

attitudes alone may not always mediate the relationship between reasons and intentions; other variables may intervene in this relationship (Westaby, 2005). Hence, this study incorporates all three global motive sub-constructs to assess their differential effects on intention. Thirdly, many scholars have made recommendations for more research to close the green gap, particularly in developing nations. Studies in these contexts will enrich the literature, as context-specific reasons influencing consumption in one context may differ from another (Sharma, 2021).

Considering this, the current study makes significant contributions to the scholarly discourse by addressing essential gaps in the literature on renewable energy adoption. It advances the understanding of consumer behaviour by exploring how positive and negative reasons influence attitudes and intentions towards renewable energy adoption. This offers a more nuanced view of sustainable consumption. The study contributes to theory by addressing the limitations of existing models that often overlook resistance factors. It also enriches the empirical body of knowledge by focusing on green energy adoption in a developing country context, specifically Ghana, a region underrepresented in current research. This provides critical insights into the factors influencing green energy adoption in sub-Saharan Africa. In addition, while much of the existing literature focuses on high-income contexts, this study addresses a significant gap by applying BRT to a Sub-Saharan African country with low renewable energy penetration. The Ghanaian case provides a valuable lens to explore how context-specific barriers interact with global motives. Insights from this study may inform strategies in other developing regions.

This research departs from prior studies on adopting renewable energy in Africa (Tigabu, 2018; Akintande *et al.*, 2020). For instance, Tigabu (2018) focused on institutional functions like market formation and resource mobilisation and their roles in green energy diffusion. While Tigabu (2018) highlights institutional factors such as market development and resource allocation as key drivers of green energy dissemination, this study assesses the role of global motives and reasons in addressing consumer reluctance. This is especially pertinent in Ghana, where individual choices frequently confront structural barriers. Therefore, understanding consumer-level factors that influence intentions to adopt green energy technologies could effectively complement institutional measures.

The rest of the paper is organised as follows: Section 2 presents the literature review. The methods are presented in Section 3. The research findings are presented in Section 4 and discussed in Section 5. Sections 6 and 7 presents the major conclusions, the implications and limitations of the study and directions for future research.

2. Literature review

Recent literature suggests that values, reasons and global motives are critical in shaping behavioural intentions. However, few studies have integrated all components in a single model to examine their interactive and mediating effects (Kumar *et al.*, 2023; Sahu *et al.*, 2022). For example, Claudy *et al.* (2013) emphasised that BRT offers a more nuanced approach to understanding resistance to innovation, yet empirical studies often neglect the simultaneous influence of multiple global motives.

Moreover, studies such as Wang *et al.* (2021a, 2021b) and Dhir *et al.* (2021) have explored the green gap in high-income countries, highlighting a persistent disconnect between positive attitudes and green behaviour. However, the sociocultural and infrastructural dynamics of Sub-Saharan Africa call for context-specific investigations (Mukoro *et al.*, 2022; Simpson *et al.*, 2021). The focus on Ghana adds to a small but growing body of work exploring renewable energy behaviour in Sub-Saharan Africa, thereby

expanding the global applicability of BRT and narrowing the gap between theoretical generalisability and localised policy needs.

Finally, recent studies stress the importance of concurrently examining facilitators and barriers (Ashfaq *et al.*, 2021; Prathansong and Kananurak, 2023). Using "reasons for" and "reasons against" within a single framework addresses this call and enhances the explanatory power of BRT in consumer adoption models. This dual path analysis aligns with calls for more psychologically robust models that reflect real-world decision-making complexity (Wiederhold and Martinez, 2018).

2.1 Behavioural reasoning theory

BRT assumes that intention predicts behaviour, suggesting that if an individual has a strong desire to be involved in a behaviour, the person will probably do so. The theory also assumes a nexus between global motives and intent, similar to the conceptualisation in the theory of planned behaviour (Westaby *et al.*, 2010). It further presumes a connection between global motives and reasons.

Reasons are categorised into "reasons for" and "reasons against". "Reasons for" are a collection of facilitating factors, whereas "reasons against" are a collection of barriers (Yadav *et al.*, 2022). The theory states that the stronger an individual's reason for engaging in a behaviour, the stronger the link between global motives and the performance of the behaviour (Kumar *et al.*, 2023). BRT was chosen for this study because it considers "reasons for" and "reasons against" engaging in a behaviour. Consequently, it provides a holistic account of human decision-making. Furthermore, the reason construct is context-specific, and it provides rich contextual information.

The BRT tackles the attitude−intention gap by explaining how consumer intentions and actions are influenced by reasons for and against behaviours. Empirical applications, such as those by Kumar *et al.* (2021), demonstrate that reasons significantly impact consumers' decisions. BRT's holistic approach improves predictive power and offers policy and marketing strategy insights. It offers a robust framework for understanding consumer behaviour, particularly in the context of sustainable consumption.

2.2 Reasons

According to Westaby (2005), reasons refer to individuals' specific personal justifications to defend their behaviours. The BRT distinguishes between three types of reasons: anticipated, concurrent and post hoc. Anticipated reasons refer to individuals' subjective considerations to elucidate or justify their expected actions (Prathansong and Kananurak, 2023). Concurrent reason refers to particular subjective factors that individuals use to defend their current behaviours (Sreen *et al.*, 2023). Finally, post hoc reasons refer to the subjective factors an individual uses to justify past actions (Westaby, 2005).

The BRT holds that reasons are perceptually based phenomena that may or may not be the best or most objective justification for behaviour. Hence, the need to justify an individual's behaviour and prevent psychological discomfort could lead to less optimal outcomes or sometimes irrational behaviours informed by prejudiced, distorted or illogical reasoning (Vakola, 2016). People often engage in biased or irrational behaviours as they attempt to justify their actions and reduce psychological discomfort. This involves using cognitive strategies to maintain internal consistency and minimise dissonance from contradictory beliefs or behaviours. According to Dilakshini and Kumar (2020), cognitive dissonance can prompt individuals to rationalise their actions by modifying their beliefs or diminishing the importance of their behaviours to alleviate discomfort. This self-justification process often manifests in confirmation bias and selective perception, leading to distorted reasoning that

supports pre-existing attitudes and minimises dissonant information (Westerwick *et al.*, 2020). According to Westaby and Fishbein (1996), although individuals may have poor reasons, they could still influence their unreasonable behaviour. BRT further subdivides reasons into two broad categories: "reasons for" and "reasons against" the performance of a particular behaviour.

Regarding renewable energy adoption in Africa, several context-specific reasons have been identified to influence adoption or non-adoption. For instance, Simpson *et al.* (2021) explored barriers to off-grid renewable energy adoption in Tanzania, their findings indicate that high upfront costs and marginalisation of low-income groups are significant challenges. Their study highlights the effectiveness of innovative micro-finance models in promoting solar photovoltaic adoption and emphasises the role of awareness, motivation and pathways (AMP framework) in driving adoption decisions. In addition, Kumba *et al.* (2023) examined South Africa's renewable energy sector, focusing on the potential for renewable energy to alleviate poverty and promote industrialisation. Furthermore, Qudrat-Ullah and Nevo (2021) analysed the joint effects of renewable energy consumption, environmental sustainability and economic growth in Africa; their findings depict that renewable energy alone has not significantly reduced carbon emissions in the region. Their findings underscore the need for integrated policy approaches addressing energy access and sustainability. Across the continent, access to renewable energy remains hindered by various barriers, including financial constraints, infrastructural deficiencies and institutional challenges. One of the most pressing issues is the high upfront cost of renewable energy technologies, particularly solar photovoltaic systems, which remain out of reach for many low-income communities. This challenge is compounded by limited access to financing options, with many households and small businesses struggling to secure loans or subsidies.

2.3 Global motives

Given the robust power of intention to predict behaviour, predicting intention is a major goal of behavioural intention models. To accomplish this, behavioural intention theories, such as the theory of planned behaviour, indicate that attitudes, PBC and subjective norms are the main precursors of intent, and they intervene in the relationship between intentions and behaviour (Ajzen, 1991). BRT categorises them as global motives because they are essential determinants that constantly impact people's intentions across multiple behavioural disciplines. Subjective norm refers to a person's perception of social pressure from relevant persons to perform a behaviour, whereas attitude describes a person's overall positive or negative judgement. PBC is the extent to which people are sure they have control over the enactment of behaviour or perceive it as stress-free or difficult to accomplish (Ajzen, 1991). Various studies have found that global motives are a major predictor of intentions. Consequently, BRT incorporates these crucial components into its behaviour modelling.

Recent studies have shown that while consumers often hold favourable attitudes towards green products, practical barriers such as higher costs and scepticism can prevent these attitudes from translating into purchases (Anayat *et al.*, 2023). Understanding these mediating roles will explain the green gap by examining how reasons for and against purchasing solar panels in Ghana influence these global motives. This provides a better understanding of the factors driving renewable energy adoption and offers insights into effective strategies for promoting sustainable consumption.

2.4 Values

BRT holds that an individual's value processing directly impacts the reasons they use to explain their anticipated behaviour (Dhir *et al.*, 2018). This notion is supported by

Pennington and Hastie's (1993) theory of explanation-based decision-making and Westaby and Fishbien's (1996) reasons theory. According to these theories, people first gather evidence about choice alternatives and then assess the reliability and worth of their evidence when providing arguments to support the reasonableness of their choices (Claudy *et al.*, 2015; Duong, 2023). The option with the most comprehensible explanation and arguments that can be vigorously defended should be selected (Kumar *et al.*, 2020). Generally, values are proposed as important antecedents to people's justifications for supporting the behaviours.

Recent studies highlight that while strong environmental values lead to positive attitudes towards green products, barriers exist that often prevent these attitudes from translating into actual purchases (Lobo and Greenland, 2017). Personal values also affect subjective norms by shaping social pressures (Zhuang *et al.*, 2021) and influence PBC by altering perceptions of barriers and facilitators (Cop *et al.*, 2020). Positive attitudes and subjective norms enhance intentions to adopt environmentally friendly products; however, PBC is essential in overcoming barriers such as high costs or insufficient infrastructure (Dilakshini and Kumar, 2020). PBC enables consumers to make sustainable choices despite challenges (Geiger *et al.*, 2022). Global motives could provide insights for promoting renewable energy adoption by addressing barriers and enhancing consumer confidence through targeted interventions.

2.5 Hypotheses development

This section develops research hypotheses, relying on past theoretical and empirical research.

2.5.1 Openness to change, global motives and purchase intention. Values are regarded as motivations that depict desirable goals that people can achieve. They offer the primary direction for people's choices or the assessment of behavioural choices. BRT postulates that values have a direct relationship with global motives, devoid of the full mediation role of reasons. This indicates that reasons are sometimes not entirely activated (Westaby, 2005). According to Westaby (2005), this postulation aligns with numerous models in psychology that suggest that spontaneous information processing may bypass higher degrees of thought activation. In addition, the desire for simplified information processing causes people to use global motives and not necessarily rely on completely processing the reasons that further validate an expected action (Tandon *et al.*, 2020).

Previous studies have shown that values can directly influence global motives. This is because, under certain circumstances, individuals may depend on heuristics for motivation (Alifah and Kusumawati, 2022; Sivathanu, 2018; Tani *et al.*, 2021). In innovation studies, scholars believe that products are accepted swiftly if buyers recognise them to be consistent with the values they hold (Gupta and Arora, 2017). Conversely, at deeper levels of processing, BRT posits that individuals may fully process reasons that deeply validate their expected behaviour. Global motives are substantial, overarching factors that continuously impact intent across numerous behaviours. Therefore, subjective norms, PBC and attitude are incorporated in this group, since they are assessed at a general level of abstraction and have consistently projected intent across a wide range of studies (Sharma *et al.*, 2021).

Furthermore, Claudy *et al.* (2013) recommend that researchers investigate how global motives mediate the relationship between consumers' reasons and their intention to adopt a product. Analysing the mediating effect of global motives can also highlight elements that impact customers' decision-making in a specific context (Tandon *et al.*, 2020). In a study on the adoption of autonomous vehicles, Youlin and Qian (2021) affirm that global motives serve as mediators between "reasons for", "reasons against" and adoption intention. This is

in line with the views of the original theorists, who named PBC, attitudes and subjective norms "global" constructs.

Extending this logic to the adoption of renewable energy technologies, it is postulated that individuals' openness to change will directly influence their subjective norms, PBC and attitudes, even if they have no strong reasons to justify their actions. In addition, it is expected that attitude, PBC and subjective norms mediate the relationship between openness to change and purchase intention. Accordingly, the following hypotheses are proposed:

H1a. Openness to change significantly influences purchase intention.

H1b. Attitude plays a mediating role in the relationship between openness to change and purchase intention.

H1c. Subjective norm mediates the nexus between openness to change and purchase intention.

H1d. Perceived behavioural control mediates the link between openness to change and purchase intention.

2.5.2 Reasons for, global motives and purchase intention. Justification mechanisms perform a major function in judgement formation (Sivathanu, 2018). Reasons are linked to other psychological concepts, such as sense-making, psychological coherence or functional theorising. These concepts indicate that individuals use reason to justify the appropriateness of their decisions and defend their choices. Prior studies suggest that consumers look for the most robust reasons to validate and defend their expected purchase decisions (Dhir *et al.*, 2021). As such, for high-involvement products such as solar panels, individuals may look for reasons that will assist them in resolving cognitive dissonance and making a purchase decision with confidence (Claudy *et al.*, 2013; Kinally *et al.*, 2023; Kumar *et al.*, 2020; Sivathanu, 2018). Like global motives and values, a consumer's reasons can be conceptualised from a general standpoint. Consumers explain their decisions by selecting from various prevailing public, social and cultural discourses. For instance, a person's reason for purchasing green energy is most likely to be affected by broader discussions among participants in the energy sector.

Furthermore, BRT studies widely use the concept of reason as an antecedent to global motives. For instance, when adopting solar panels, values generally reflect an individual's view of renewable energy. By contrast, reasons comprise specific factors that affect purchase decisions. In line with BRT, it is expected that individuals who have plausible reasons for or against adopting solar panels will consequently hold positive or negative global motives towards them. Therefore, the following relationships are hypothesised:

H2a. Reasons for purchase significantly influence purchase intention.

H2b. Attitudes mediate the connection between reasons for and purchase intention.

H2c. Subjective norm mediates the nexus between reasons for and purchase intention.

H2d. Perceived behavioural control mediates the link between reasons for and global motives.

2.5.3 Reasons against, global motives and purchase intention. BRT posits that an individual's reason can be a pertinent antecedent of global motives. This viewpoint is theoretically in synchrony with the reasons theory and explanation-based decision-making. These theories assume that people evaluate different choices positively if they can offer

strong reasons to support and validate their choices. This assumption is also supported by theories demonstrating that justification is crucial in forming judgements. The processes used to analyse reason and its explanation can offer insights into the fundamentals of attitude development.

The spreading activation theory postulates that cogent reasons spread to other perceptions at greater levels of abstraction linked to identical targeted behaviours (Otgaar *et al.*, 2019). For instance, an individual who has several reasons not to engage in a behaviour will probably trigger other, more abstract perceptions, like negative global motives regarding engaging in that behaviour. In addition, experimental studies have indicated that manipulating reasons can directly affect judgements and attitudes, suggesting that reasons perform a vital function in judgement:

H3a. Reasons against purchase significantly influence purchase intention.

H3b. Attitudes mediate the relationship between reasons against purchase and purchase intention.

H3c. The relationship between reasons against purchasing and purchase intention is mediated by subjective norms.

H3d. Perceived behavioural control mediates the nexus between reasons against and purchase intention.

2.6 Research model

The research model assumes that openness to change influences consumers' reasons for or against purchasing solar panels. Openness to change also directly influences global motives. Reasons (for or against) are expected to influence global motives and purchase intentions. Reasons also mediate the relationship between openness to change and global motives. Global motives mediate the link between openness to change and purchase intention, as well as reasons and purchase intention. Figure 1 illustrates our research model.

3. Methods

The current study adopted a single cross-sectional survey design, collecting data from respondents only once. A single cross-sectional survey design is justified due to its efficiency and cost-effectiveness. It also offers a snapshot of the population at a specific time, which

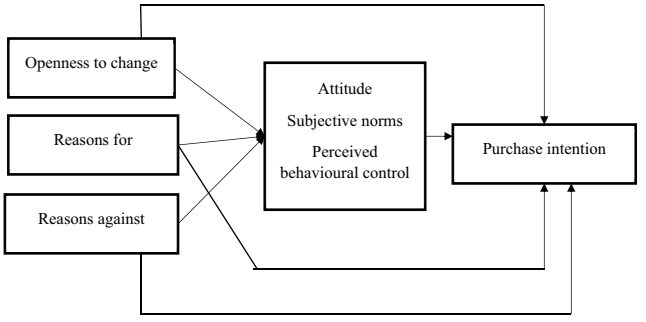

Figure 1. Research model
Source: Adapted from Westaby (2005) and Ajzen (1991)

helps assess a phenomenon's prevalence and identify correlations. This design is straightforward to implement, avoiding complexities like participant attrition found in longitudinal studies, and allows for broad data collection across various variables. In addition, it offers timely data that can inform decision-making based on current trends and conditions (Bryman, 2016). The subsequent sections discuss the research context, population and sampling techniques.

3.1 The study's context

Data from the Ministry of Energy in Ghana suggests that the contribution of solar energy to Ghana's power mix is less than 1% (Ministry of Energy, 2017). The Rural Electrification Master Plan established targets for solar lanterns, stand-alone solar systems and mini-grids. Through its Ghana Renewable Energy Program, the African Development Bank (Afdb) primarily funds the implementation of electrification projects (USAID.GOV/POWERAFRICA, 2019). Around 2015 and 2016, chronic load shedding raised the demand for off-grid power in urban markets; however, in recent years, enhancements in grid reliability have contributed to total sales levelling (USAID.GOV/POWERAFRICA, 2019). Currently, the solar home system market is dominated by a rural clientele base. These markets present diverse challenges for solar home system businesses. Some challenges include high transportation and logistics costs, retention and effectiveness of sales agents, limited access to mobile networks and low incomes (USAID.GOV/POWERAFRICA, 2019).

3.2 Sample selection

A non-probability sampling technique was used because of the lack of a sampling frame, which makes randomisation impossible. Purposive sampling was used to select homeowners in Ghana who were over the age of 18 years and were not users of solar electricity though they were aware of it and held positive attitudes towards it. Using a purposive sampling technique is consistent with prior studies applying BRT in sustainability contexts (e.g. Dhir *et al.*, 2021; Kumar *et al.*, 2023), particularly when focusing on specific target groups exhibiting an attitude–intention gap. The justification for selecting non-users with positive attitudes is based on the theorisation of the BRT, which posits that individuals may hold positive global motives but may still not engage in the behaviour because of context-specific reasons against that behaviour. Hence, non-users were chosen because they are more likely to exhibit an attitude–intention gap.

3.3 Data collection

Two screening questions were used, firstly, to determine if respondents were current users of solar PV, and secondly, to exclude those living in rented houses. The first screening question was designed to exclude current users of solar PV, as they are less likely to exhibit the attitude–intention gap central to the study's application of BRT. By focusing on non-users with positive attitudes, the research targets individuals who may have favourable perceptions of solar PV but have not yet adopted it, which is crucial for understanding the gap between attitudes and intentions. The second screening question excluded renters, as the nature of housing in Ghana makes it challenging for them to install solar PV systems; this ensured that the sample consisted of homeowners who were more likely to consider adoption. After sharing the link (URL) with the respondents, 427 responses were received, and 425 were found usable for further analysis.

3.4 Scale items and pilot testing

The survey scale items were adapted from prior studies. Questions for the openness to change construct were adapted from Prinsloo and Lew (2020). While questions for global motives were adapted from Ajzen (1991) and Westaby (2005), questions for reasons for, reasons against and purchase intention were adapted from Westaby (2005). All questions were measured on a five-point Likert scale with one representing strong disagreement with a statement and five representing strong agreement with a statement. The questionnaire for the study was pilot tested with three PhD students and five non-users of solar panels. Based on the pretest, five questions were revised. The revised questionnaire was distributed to respondents.

3.5 Data analysis technique

The study used structural equation modelling (SEM) using a two-stage approach recommended by Andersen and Gerbing (1992). The first stage assessed the measurement model through confirmatory factor analysis (CFA) using AMOS version 21, examining factor loadings, reliability (Cronbach's alpha, composite reliability) and validity (average variance extracted [AVE], discriminant validity). The second stage tested the structural model, including hypothesised paths and mediation effects. Mediation was assessed using a bootstrapping procedure with 2,000 samples, following Preacher and Hayes (2008) guidelines, to provide robust estimates of indirect effects and confidence intervals.

3.6 Common method bias

This study used Harman's one-factor test in exploratory factor analysis to statistically assess the presence of common method bias. The results indicate that none of the factors contributed to over 30% of the variance, which is less than the 50% limit recommended by Podsakoff *et al.* (2003). This means that common method variance was not a concern. The research design is depicted diagrammatically in Figure 2.

4. Results

A two-stage approach to SEM was used in the analysis (Andersen and Gerbing, 1992). Firstly, the measurement model was estimated, and the structural model was assessed in stage two.

4.1 Measurement model

Using AMOS version 21, the researchers conducted a CFA using the maximum likelihood estimation technique. Initial findings indicated model misfit across several indices, necessitating an examination of modification indices to pinpoint potential misfit sources. Adhering to Hair *et al.*'s (2010) recommendations, the researchers eliminated scale items that performed poorly in terms of model fit, construct validity or model integrity. The final fit indices of the adjusted measurement model are displayed in Table 1.

In the first stage of modification, the error terms that depicted high modification indices were covaried. In step two of the modifications, three scale items were removed from global motives. In the third stage of modification, one item each was deleted from openness to change, global motives and reasons for purchase. Thus, eight scale items were removed after the CFA.

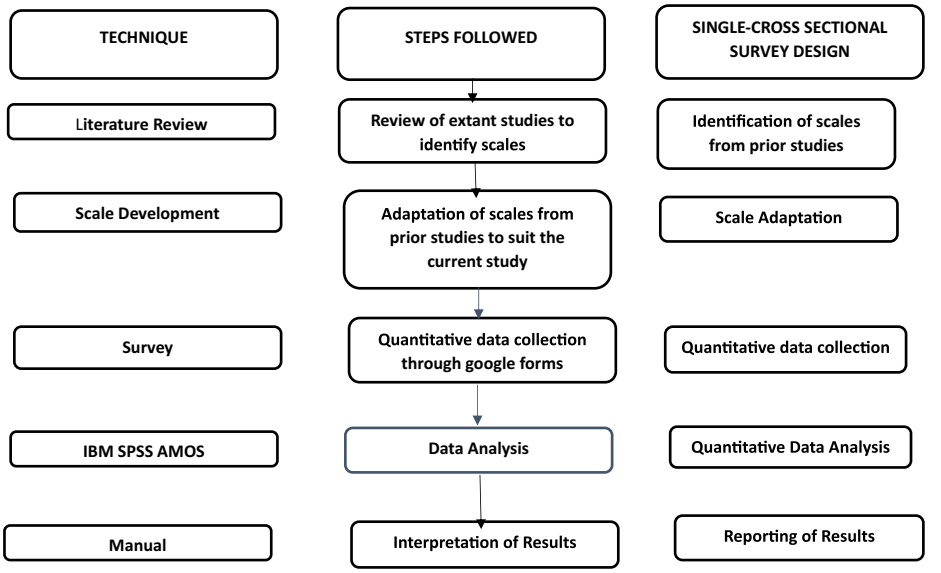

Figure 2. Diagrammatic representation of the research design adopted for the study
Source: Authors' own construction

Table 1. Fit indices for the measurement model

Indices	Cut-off criteria	Results
X^2/df	≤3	2.09
CFI	≥0.90	0.93
TLI	≥0.90	0.92
SRMR	≤0.08	0.05
RMSEA	≤0.08	0.05

Source(s): Authors' own work

4.2 Validity and reliability

Scale reliability was assessed using Cronbach's alpha values, composite reliability scores and the factor loadings of the measurement items on their respective constructs. As shown in Table 2, the results indicated that all these metrics were within the recommended thresholds, demonstrating good measurement properties. Composite reliability scores and Cronbach's alpha values were within the acceptable range of 0.70 or greater (Bagozzi and Yi, 2012). In addition, factor loadings were significant at the $p < 0.01$ level and met the critical threshold of 0.05, indicating good convergent validity. The fit indices of the measurement model also fell within the recommended thresholds, further supporting the reliability and validity of the measures. Moreover, the square roots of the AVEs for the various constructs were higher than the correlations between the constructs, providing evidence of discriminant validity. Table 2 presents the CFA results and the composite reliability scores, AVE and Cronbach's alpha values, while Table 3 presents the discriminant validity and correlation assessment results.

Table 2. CFA results

Construct	Variable code	Factor loadings	*t*-value	Composite reliability	Average variance extracted	Cronbach's alpha
Openness to change	Opennes1	0.89	Fixed	0.81	0.58	*0.70*
	Opennes2	0.88***	11.43			
	Opennes3	0.73***	8.86			
Attitude	GMattitud1	0.85***	16.24	0.88	0.60	0.73
	GMattitud2	0.81***	14.19			
	GMattitud3	0.81***	15.58			
	GMattitud4	0.72***	16.20			
	GMattitud5	0.71***	15.58			
Subjective norms	GMsubjective1	0.88***	12.30	0.89	0.67	0.75
	GMsubjective2	0.92***	12.45			
	GMsubjective3	0.84***	13.53			
	GMsubjective4	0.60	Fixed			
Perceived behavioural control	GMpbc1	0.84	Fixed	0.77	0.55	0.86
	GMpbc3	0.97***	6.73			
	GMpbc4	0.85***	9.52			
Purchase intention	PI1	0.77***	15.78	0.88	0.61	0.89
	PI2	0.76***	15.70			
	PI3	0.72***	14.81			
	PI4	0.74***	18.12			
	PI5	0.78	Fixed			
Reasons for	RFeconomic1	0.63***	12.53	0.81	0.78	0.86
	RFeconomic3	0.82	Fixed			
	RFindepen1	0.60***	12.24			
	RFindepen2	0.88***	18.16			
	RFindepen3	0.79	Fixed			
	RFenviron1	0.82***	16.96			
	RFenviron2	0.82	Fixed			
Reasons against	RAcost1	0.79***	13.86	0.70	0.50	0.83

(*continued*)

Table 2. Continued

Construct	Variable code	Factor loadings	*t*-value	Composite reliability	Average variance extracted	Cronbach's alpha
	RAcost2	0.88***	13.96			
	RAcost3	0.69	Fixed			
	RArisk1	0.71***	15.89			
	RArisk2	0.83***	12.21			
	RArisk3	0.71	Fixed			
	RAincomp1	0.79***	15.54			
	RAincomp2	0.81***	14.31			
	RAincomp3	0.95	Fixed			

Note(s): GM = global motives; Gmattitude = attitude; Gmsubjective = subjective norms; GMpbc = perceived behavioural control; RF = reasons for; Rfindepen = independence benefits; Rfenviron = environmental benefits; RA = reasons against; RA incomp = incompatibility barriers; PI = purchase intention; RAcost = cost barriers; (***) means the value is significant at the 0.001 level (two-tailed)
Source(s): Authors' own work

Table 3. Discriminant validity/correlation matrix

Variable	CR	AVE	Change	AttiGM	SMgm	pbcgm	Purchint	RF	ReA
Change	0.81	0.58	*0.76*						
AttiGM	0.88	0.60	0.61***	*0.88*					
SMgm	0.89	0.67	0.35***	0.47***	*0.82*				
pbcgm	0.77	0.55	0.27***	0.38***	0.52***	*0.74*			
Purchint	0.88	0.61	0.48***	0.73***	0.44***	0.36***	*0.86*		
RF	0.91	0.78	0.49***	0.81***	0.50***	0.41***	0.84***	*0.88*	
ReA	0.66	0.50	0.07	0.01	0.07	0.10	−0.02	−0.04	*0.64*

Note(s): AttiGM = attitude; SMgm = subjective norms; pbcgm = perceived behavioural control; RF = reasons for; ReA = reasons against; Purchint = purchase intention. (***) means the value is significant at the 0.001 level (two-tailed)
Source(s): Authors' own work

4.3 Full structural model

Once the validity and reliability of the measurement model were confirmed, the full structural model was tested in stage two to test the hypothesised relationships between the constructs.

4.3.1 Direct effects. The results demonstrated that the structural model displayed a satisfactory fit, meeting the recommended criteria with a CMIN of 2.61, TLI of 0.96, CFI of 0.99 and RMSEA of 0.05 (Hair *et al.*, 2019). A positive and significant relationship existed between openness to change and purchase intention, thus supporting *H1a* (β = 0.08, $p = 0.04$). Reasons for purchase also positively influenced purchase intention (β = 0.47, $p < 0.001$), supporting *H2a*. However, reasons against purchase did not directly influence purchase intention, so *H3a* was not supported. Table 4 presents the outcomes of the full structural model.

In summary, the direct effects show that openness to change and reasons for purchase significantly predicted purchase intention, confirming *H1a* and *H2a*. In contrast, reasons against purchase did not have a direct influence, thus *H3a* was not supported. These results highlight the stronger predictive power of facilitators over barriers in consumer solar panel adoption decisions. Table 4 presents the outcomes of the direct paths.

4.3.2 Results of mediation analysis. This study also aimed to assess the mediating role of the dimensions of global motives. Following the bootstrapping approach proposed by MacKinnon *et al.* (2004) and Preacher and Hayes (2008), a mediation test was conducted using a bootstrap sample of 2,000. The model demonstrated a good fit, with fit indices within acceptable thresholds (RMSEA = 0.06, CMIN = 2.61, TLI = 0.96, CFI = 0.99, NFI = 0.98, PCLOSE = 0.22) (Schreiber, 2017). The direct effect between openness to change and purchase intention without the mediator (attitude) was significant (β = 0.43, $p < 0.01$).

Table 4. Direct paths

Hypothesis	Path	B estimate	*p*-value	*t*-value	Results
H1a	Openness to change → purchase intention	0.08	0.04	2.11	Supported
H2a	Reasons for → purchase intention	0.47	***	10.03	Supported
H3a	Reasons against → purchase intention	0.03	0.38	0.87	Not supported

Source(s): Authors' own work

However, when attitude was introduced as a mediator, the direct effect decreased to $\beta = 0.30$ ($p < 0.01$). The indirect effect was significant ($\beta = 0.21$, $p < 0.01$), suggesting that attitude partially mediates the relationship between openness to change and purchase intention. The direct effect between openness to change and purchase intention was initially significant ($\beta = 0.22$, $p < 0.01$). Upon including subjective norms as a mediator, the direct effect was reduced to $\beta = 0.16$ ($p < 0.01$), with a significant indirect effect of 0.05 ($p < 0.05$). This indicates partial mediation by subjective norms. The relationship between openness to change and purchase intention was significant ($\beta = 0.34$, $p < 0.01$) without the mediator. When PBC was introduced, the direct effect decreased to $\beta = 0.16$ ($p < 0.01$), with a significant indirect effect of 0.06 ($p < 0.05$). This suggests partial mediation by PBC. The direct effect between reasons for and purchase intention was significant ($\beta = 0.55$, $p < 0.01$), and the introduction of attitude as a mediator reduced the direct effect to $\beta = 0.36$ ($p < 0.01$). The indirect effect was significant ($\beta = 0.13$, $p < 0.01$), indicating that attitude partially mediates the effect of reasons for on purchase intention. The direct effect of reason for on purchase intention without the mediator was significant ($\beta = 0.42$, $p < 0.01$). With subjective norms as a mediator, the direct effect decreased to $\beta = 0.27$ ($p < 0.01$), with a small but significant indirect effect of 0.03 ($p < 0.05$). This also suggests partial mediation by subjective norms. The direct effect of reasons for on purchase intention was significant without the mediating effect of PBC ($\beta = 0.42$, $p < 0.01$), and the introduction of PBC slightly reduced the direct effect to $\beta = 0.41$ ($p < 0.01$), with an indirect effect of 0.04 ($p < 0.05$). This supports partial mediation by PBC. The direct effect between reasons against and purchase intention was insignificant ($\beta = 0.02$, $p = 0.87$). After introducing attitude as a mediator, the direct effect remained non-significant ($\beta = 0.00$, $p = 0.87$), and the indirect effect was also insignificant ($\beta = -0.00$, $p = 0.83$). No mediation was found in this case. The direct effect of reasons against on purchase intention without the mediator was non-significant ($\beta = -0.04$, $p = 0.16$), and the indirect effect was also not significant ($\beta = -0.00$, $p = 0.07$), indicating no mediation. The direct effect was significant ($\beta = 0.09$, $p < 0.05$), and the inclusion of PBC as a mediator slightly reduced the direct effect to $\beta = 0.07$ ($p < 0.05$), with an indirect effect of 0.01 ($p < 0.05$). This suggests partial mediation by PBC. The outcomes of the mediation analysis are presented in Table 5.

Attitude partially mediated the relationship between openness to change and purchase intention, as both the direct and indirect paths were significant, thereby supporting *H1b*. Subjective norm also acted as a partial mediator, supporting *H1c*. Similarly, PBC partially mediated the relationship between openness to change and purchase intention, supporting *H1d*.

The three dimensions of global motives partly mediated the link between reasons for purchasing and purchase intention, supporting *H2b, H2c and H2d*. However, the findings indicate that neither attitude nor subjective norms functioned as mediators in the link between reasons against purchasing and purchase intention. PBC was the only factor that partially mediated the relationship between reasons against purchasing and purchase intention, thereby supporting *H3d* but not *H3b* or *H3c*. The detailed outcomes of the mediation analysis can be found in Table 5.

5. Discussion of findings

The study sought to identify the differential effects of openness to change, as well as the reasons and global motives that influence purchase intention. Firstly, the direct effects were tested. The test of direct relationships revealed that openness to change significantly influenced purchase intention. This finding indicates that individuals who are open to change are more willing to explore new products or brands; hence, they seek novelty and are more likely to intend to install solar panels. Individuals who are open to change are generally

Table 5. Results of mediation analysis

Hypotheses	Relationship	Direct without mediator	Direct with mediator	Indirect effects	Results	Outcome
H1b	Openness to change → attitude → purchase intention	0.43 (0.01)	0.30 (0.02)	0.21 (0.01)	Partial	Supported
H1c	Openness to change → subjective norms → purchase intention	0.22 (0.01)	0.16 (0.01)	0.05 (0.02)	Partial	Supported
H1d	Openness to change → perceived behavioural control → purchase intention	0.34 (0.01)	0.16 (0.01)	0.06 (0.01)	Partial	Supported
H2b	Reasons for → attitude → purchase intention	0.55 (0.01)	0.36 (0.01)	0.13 (0.01)	Partial	Supported
H2c	Reasons for → subjective norms → purchase intention	0.42 (0.01)	0.27 (0.01)	0.03 (0.02)	Partial	Supported
H2d	Reasons for → perceived behavioural control → purchase intention	0.42 (0.02))	0.41 (0.01)	0.04 (0.01)	Partial	Supported
H3b	Reasons against → attitude → purchase intention	0.02 (0.87)	0.00 (0.87)	−0.00 (0.83)	No mediation	Not supported
H3c	Reasons against → subjective norms → purchase intention	−0.04 (0.16)	−0.07 (0.14)	−0.00 (0.07)	No mediation	Not supported
H3d	Reasons against → perceived behavioural control → purchase intention	0.09 (0.04)	0.07 (0.04)	0.01 (0.05)	partial	Supported

Source(s): Authors' own work

inquisitive, captivated by new things and knowledge, and more eager to search for adventurous ideas. This result is similar to past research that has explored the role of openness to change in consumer decision-making (Prinsloo and Lew, 2020). Furthermore, the findings of Afridi *et al.* (2021) revealed that environmental values like man-nature orientation influence green behaviour. Afridi *et al.* (2021) argued that people with high values of man-nature orientation are potentially more worried about eco-sustainable behaviours and are more likely to work towards conserving the environment and engage in sustainable consumption. These results show that deeply held consumer values, like being open to change, can affect their decision to install solar panels.

Similarly, "reasons for" significantly impact purchase intention. In contrast, "reasons against" purchase did not significantly impact purchase intention. This suggests consumers search for context-specific justifications to defend their intention to use solar panels. Consumers find several outcomes in installing solar panels, which they weigh positively; thus, reasons for purchase have a positive effect on purchase intention. This finding confirms the theorisation of the BRT, which postulates that reasons directly affect intent to purchase even if global motives are not processed.

This result suggests that individuals might not always think through their global motives, and they sometimes make intentions based on vital reasons that are important to the adoption context to justify their actions. This finding supports the claim that certain links in behavioural intention models are not always stimulated in some situations (Sivathanu, 2018). The positive effect of reasons for purchase also aligns with previous research that applied BRT (Ashfaq *et al.*, 2021; Dhir *et al.*, 2021; Sivathanu, 2018). For instance, the results of Dhir *et al.* (2021) revealed that personal and environmental benefits were the primary reasons for consumer participation in recycling e-waste. Nonetheless, this result contradicts some previous studies (Tani *et al.*, 2022; Wang *et al.*, 2021a, 2021b; Yadav *et al.*, 2022). The findings of Claudy *et al.* (2013) reveal an insignificant link between "reasons for" and intention. Their results showed that "reasons for" only had an indirect effect on intentions through attitude and that "reasons against", not "reasons for", were the main factors that made people less likely to buy solar panels.

The study revealed an insignificant relationship between "reasons against" purchase and purchase intention. This suggests that when the perceived outcomes of performing a behaviour are positively weighed, a few barriers to performing the behaviour do not significantly negatively influence consumers' decisions. This is partially explained by consumers having several reasons for installing solar panels and fewer reasons for not installing them. Hence, their reasons for purchase have a stronger connection with adoption intentions than their reasons against purchasing. This result aligns with that reported by Tandon *et al.* (2020) but contradicts the results of Hong and Park (2024). The results of Hong and Park (2024) depicted that context-specific reasons against, like anxiety and discomfort, negatively influence the adoption intentions of autonomous vehicles.

This study further assessed the mediating effects of the dimensions of global motives on the link between openness to change and purchase intention. Prior studies mainly examined attitude as a global motive (Anayat *et al.*, 2023; Sahu *et al.*, 2022; Hong and Park, 2024); the current study further assessed the role of subjective norms and PBC. The results showed that subjective norms, attitudes and PBC partially mediated the effects of reasons for on purchase intention. However, only PBC mediated the effect of reasons against on purchase intention. This result matches that of Afridi *et al.* (2021), who found that PBC positively moderates the link between generativity and green purchasing behaviour. This positive mediating effect of dimensions of global motives on the link between reasons for and purchase intention suggests that consumers do not make purchase intentions based on their values alone. They

are also influenced by their favourable appraisal of installing solar panels, the opinions of significant others and beliefs about the ease of performing the behaviour.

Therefore, the extent to which consumers are open to new experiences and innovative ideas positively influences their global motives, which, in turn, influences their purchase intentions. This result confirms previous studies by affirming that values can guide consumers' decision-making processes (Sreen *et al.*, 2021; Yadav *et al.*, 2022). The results indicate that the higher consumers' rank on the value of openness to change, the more likely their global motives towards green consumption will be positive, influencing their intention to engage in green behaviours. Although the personal values of openness to change can directly influence intentions, consumers will also rely on their global motives to form those intentions. Individuals who buy solar panels may go through a deeper route of thought activation by relying on attitudes, subjective norms and PBC before intending to purchase solar panels.

The study revealed that of the three dimensions of global motives, only PBC significantly mediated the relationship between reasons against intention. According to BRT, attitudes, subjective norms and PBC influence people's intentions to engage in behaviours. In the case of solar panel purchases, reasons against purchase can affect consumers' intentions not to purchase through the mediating effect of PBC. Deterrents to buying solar panels might make someone feel less in control of their behaviour, which might deter them from purchasing. For instance, if consumers think that solar panels are too expensive, they might feel they have little influence on the decision. Consequently, the likelihood of purchasing may decline. On the other hand, if consumers believe they know enough about solar panels and have the money to buy them, they might feel they have much influence over the decision. Therefore, the likelihood of making a purchase may increase. This result indicates that people's beliefs about their capacity to adopt renewable energy technologies can be important in determining whether they intend to use them.

5.1 Theoretical implications

This study contributes to the literature on green consumption by empirically testing the mediating effects of different dimensions of global motives. This helps us understand the factors influencing users' intentions to purchase solar panels. The results shed light on the importance of distinguishing between different types of global motives when designing interventions to promote sustainable behaviours. While many studies aggregate these constructs, the results demonstrate their differential mediating power, particularly the unique role of PBC in overcoming adoption barriers. This refined understanding of BRT enhances its predictive power across diverse contexts, offering a replicable framework for future studies in similar socio-economic environments.

Furthermore, prior studies on BRT rarely investigate the direct effects of personal values on intention. This study shows that openness to change can directly influence intention without the mediation of reasons or global motives. By testing a complex mediating mechanism, this research enhances our understanding of the adoption of solar panels beyond what traditional studies have suggested regarding direct effects. It has demonstrated that global motives only partially mediate the impacts of openness to change on intention within the Ghanaian context, contrasting with the full mediation posited by BRT.

In addition, this study broadens the geographic scope of previous BRT applications by examining them in Ghana's emerging solar panel market. Using BRT as a theoretical lens, this research provides empirical evidence supporting the theory's relevance in a sub-Saharan African country. The findings offer valuable insights into Ghanaian consumers' purchasing behaviour and perceptions regarding solar panel installation.

5.2 Practical implications

The results of this study present various opportunities for marketers to increase the adoption of renewable energy technologies among consumers. For marketers, the results suggest that strategies aimed at increasing solar panel adoption should emphasise reasons for purchase, such as long-term savings, energy independence and environmental impact, since "reasons for" were more influential than "reasons against". Marketing communications should also highlight PBC by showcasing ease of installation, availability of technical support and affordability options. Bundled offers with financing solutions (e.g. pay-as-you-go or micro-loans) can further empower consumers who may perceive solar systems as financially inaccessible. Marketers should focus on providing more compelling reasons for purchasing, reducing perceived obstacles and further promoting the discourse around green consumption. When consumers encounter strong reasons against purchasing, they may overlook the benefits of green alternatives. Marketers can identify and diminish the impact of counterarguments by emphasising positive purchasing reasons.

5.2.1 Policy implications. On the policy front, authorities can enhance PBC through supportive measures such as tax incentives and subsidies to reduce initial costs. Furthermore, addressing infrastructural gaps by ensuring the availability of skilled technicians and maintenance services can enhance consumer confidence, as Tigabu (2018) recommends. Strengthening the institutional framework through resource mobilisation and market development would create a more conducive environment for adoption.

Moreover, feed-in tariffs are widely acknowledged as one of the most effective financial subsidy policies for promoting the broad adoption of renewable energy sources (Abbas *et al.*, 2022). Feed-in tariffs have significantly supported the deployment of 75% of global photovoltaic energy and 45% of wind energy (Abbas *et al.*, 2022). Thus, they could serve as incentives for adoption and help mitigate reasons against purchasing, facilitating the transition to clean and affordable energy. Solar home systems appear to be Ghana's dominant source of solar energy. Policymakers may improve access by expanding the mini-grid sector, lowering installation costs and enhancing PBC. These measures can strengthen PBC and reduce the weight of reasons against adoption. Given the mediating role of subjective norms, public awareness campaigns can leverage social influence by showcasing community adoption stories and endorsements by trusted figures.

6. Limitations and future research directions

The current study examined only purchase intentions, not actual purchases. Purchase intention is regarded as a close proxy for actual purchases. Future studies could examine actual purchases to further explicate the green gap by identifying the gap between intention and actual behaviour. In addition, the study only concentrated on one stakeholder group, non-users; future studies could focus on both users and non-users of solar panels to understand the context-specific reasons driving their intentions and purchase decisions to gain a comprehensive understanding of the attitude−intention gap as well as the attitude−behaviour gap. Future research could go a step further to identify users' challenges and continuous usage intentions.

7. Conclusions

This study contributes to theory, policy and practice by demonstrating how personal values and context-specific reasons interact with global motives to influence consumers' renewable energy intentions. Beyond the Ghanaian case, these findings offer transferable insights for accelerating sustainable energy transitions in developing regions. Testing a BRT model that includes all three global motives enhances the explanatory power of behavioural intention

models and supports evidence-based strategies for closing the attitude–intention gap in green technology.

References

Abbas, M., Zhang, Y., Koura, Y.H., Su, Y. and Iqbal, W. (2022), "The dynamics of renewable energy diffusion considering adoption delay", *Sustainable Production and Consumption*, Vol. 30, pp. 387-395.

Afridi, S.A., Khan, W., Haider, M., Shahjehan, A. and Afsar, B. (2021), "Generativity and green purchasing behaviour: moderating role of man-nature orientation and perceived behavioral control", *Sage Open*, Vol. 11 No. 4, p. 21582440211054480.

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211, doi: 10.1922/CDH_2120VandenBroucke08.

Akintande, O.J., Olubusoye, O.E., Adenikinju, A.F. and Olanrewaju, B.T. (2020), "Modeling the determinants of renewable energy consumption: evidence from the five most populous nations in Africa", *Energy*, Vol. 206, p. 117992.

Alifah, Q. and Kusumawati, N. (2022), "Determining determinants and barriers that influence smart home appliances adoption intention using the behavioral reasoning theory method", doi: 10.4108/eai.27-7-2021.2316910.

Anayat, S., Rasool, G. and Pathania, A. (2023), "Examining the context-specific reasons and adoption of artificial intelligence-based voice assistants: a behavioral reasoning theory approach", *International Journal of Consumer Studies*, Vol. 47 No. 5, pp. 1885-1910.

Andersen, J. and Gerbing, D. (1992), "Assumptions and comparative strengths of the two-step approach: comment on Fornell and Yi", *Sociological Methods and Research*, Vol. 20 No. 3, pp. 321-333.

Ashfaq, M., Zhang, Q., Ali, F., Waheed, A. and Nawaz, S. (2021), "You plant a virtual tree, we will plant a real tree: understanding users' adoption of the Ant Forest mobile gaming application from a behavioral reasoning theory perspective", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 310, p. 127394, doi: 10.1016/j.jclepro.2021.127394.

Bagozzi, R.P. and Yi, Y. (2012), "Specification, evaluation, and interpretation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 40 No. 1, pp. 8-34.

Bryman, A. (2016), *Social Research Methods*, Oxford University Press.

Claudy, M.C., Garcia, R. and Driscoll, A.O. (2015), "Consumer resistance to innovation — a behavioral reasoning perspective", *Journal of the Academy of Marketing Science*, Vol. 43 No. 4, pp. 528-544, doi: 10.1007/s11747-014-0399-0.

Claudy, M.C., Peterson, M. and Driscoll, A.O. (2013), "Understanding the attitude-behavior gap for renewable energy systems using behavioral reasoning theory", *Journal of Macromarketing*, Vol. 33 No. 4, pp. 273-287, doi: 10.1177/0276146713481605.

Cop, S., Alola, U.V. and Alola, A.A. (2020), "Perceived behavioral control as a mediator of hotels' green training, environmental commitment, and organizational citizenship behavior: a sustainable environmental practice", *Business Strategy and the Environment*, Vol. 29 No. 8, pp. 3495-3508.

Dhir, A., Koshta, N., Kumar, R. and Sakashita, M. (2021), "Behavioral reasoning theory (BRT) perspectives on E-waste recycling and management", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 280, p. 124269, doi: 10.1016/j.jclepro.2020.124269.

Dhir, A., Yossatorn, Y., Kaur, P. and Chen, S. (2018), "Online social media fatigue and psychological wellbeing — a study of compulsive use, fear of missing out, fatigue, anxiety, and depression", *International Journal of Information Management*, Vol. 40, pp. 141-152, doi: 10.1016/j.ijinfomgt.2018.01.012.

Dilakshini, V.L. and Kumar, S.M. (2020), "Cognitive dissonance: a psychological unrest", *Current Journal of Applied Science and Technology*, Vol. 39 No. 30, pp. 54-60.

Duong, C.D. (2023), "Environmental corporate social responsibility initiatives and the attitude-intention-behavior gap in green consumption", *Social Responsibility Journal*, Vol. 20 No. 2, pp. 305-325.

Elhaffar, G., Durif, F. and Dub, L. (2020), "Towards closing the attitude-intention-behavior gap in green consumption: a narrative review of the literature and an overview of future research directions", *Journal of Cleaner Production*, Vol. 275, p. 122556, doi: 10.1016/j.jclepro.2020.122556.

Geiger, J.L., van der Werff, E., Ünal, A.B. and Steg, L. (2022), "Context matters: the role of perceived ease and feasibility vis-à-vis biospheric values in recycling behaviour", *Resources, Conservation and Recycling Advances*, Vol. 16, p. 200122.

Groening, C., Sarkis, J. and Zhu, Q. (2018), "A compendium of applied theories and further research directions", *Journal of Cleaner Production*, Vol. 172, pp. 1848-1866, doi: 10.1016/j.jclepro.2017.12.002.

Gupta, A. and Arora, N. (2017), "Understanding determinants and barriers of mobile shopping adoption using behavioral reasoning theory", *Journal of Retailing and Consumer Services, Elsevier Ltd*, Vol. 36, pp. 1-7, doi: 10.1016/j.jretconser.2016.12.012.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2010), *Multivariate Data Analysis*, Pearson Education, Upper Saddle River, NJ.

Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019), "When to use and how to report the results of PLS-SEM", *European Business Review*, Vol. 31 No. 1, pp. 2-24, doi: 10.1108/ebr-11-2018-0203.

Hartmann, P., Apaolaza, V. and Souza, C.D. (2017), "The role of psychological empowerment in climate-protective consumer behavior framework", *European Journal of Marketing*, Vol. 52 Nos 1-2, pp. 392-417, doi: 10.1108/EJM-01-2017-0080.

Hong, E. and Park, J. (2024), "The effect of technological readiness dimensions on the adoption of autonomous vehicles: focusing on behavioral reasoning theory", *Transportation Research Part F: Traffic Psychology and Behaviour*, Vol. 100, pp. 101-114.

Kinally, C., Antonanzas-Torres, F., Podd, F. and Gallego-Schmid, A. (2023), "Solar home systems in Malawi: commercialisation, use and informal waste management", *Sustainable Production and Consumption*, Vol. 42, pp. 367-379, doi: 10.1016/j.spc.2023.10.008.

Kumar, A., Padhy, R.K. and Dhir, A. (2020), "Envisioning the future of behavioral decision-making: a systematic literature review of behavioral reasoning theory", *Australasian Marketing Journal*, Vol. 28 No. 4, pp. 145-159, doi: 10.1016/j.ausmj.2020.05.001.

Kumar, S., Talwar, S., Murphy, M., Kaur, P. and Dhir, A. (2021), "A behavioral reasoning perspective on the consumption of local food. A study on REKO, a social media-based local food distribution system", *Food Quality and Preference*, Vol. 93, p. 104264.

Kumar, A., Shankar, A., Behl, A., Arya, V. and Gupta, N. (2023), "Should I share it? Factors influencing fake news-sharing behavior: a behavioral reasoning theory perspective", *Technological Forecasting and Social Change*, Vol. 193, p. 122647.

Kumba, H., Akpan, J., Twite, B. and Olanrewaju, O. (2023), "Renewable energy adoption and integration in South Africa: an overview", *Proceedings of the 12th International Conference on Clean and Green Energy (ICCGE 2023).*

Larranaga, A. and Valor, C. (2022), "Consumers' categorization of eco-friendly consumer goods: an integrative review and research agenda", *Sustainable Production and Consumption, The Authors*, Vol. 34, pp. 518-527, doi: 10.1016/j.spc.2022.10.005.

Liu, C., Ma, Z., Zhang, X., Li, Q. and Wu, Y.C.J. (2022), "Understanding the factors influencing the adoption of solar energy technology: a meta-analysis", *Journal of Cleaner Production*, Vol. 322, p. 129047.

Lobo, A. and Greenland, S. (2017), "The influence of cultural values on green purchase behaviour", *Marketing Intelligence and Planning*, Vol. 35 No. 3, pp. 377-396.

MacKinnon, D.P., Lockwood, C.M. and Williams, J. (2004), "Confidence limits for the indirect effect: distribution of the product and resampling methods", *Multivariate Behavioral Research*, Vol. 39 No. 1, pp. 99-128.

Ministry of Energy (2017), *Sector Overview: Energy Sector*, [online], Ministry of Energy, Republic of Ghana, Accra, available at: https://energymin.gov.gh/sector-overview (accessed 20 July 2024).

Mukoro, V., Sharmina, M. and Gallego-Schmid, A. (2022), "A framework for environmental evaluation of business models: a test case of solar energy in Kenya", *Sustainable Production and Consumption, Institution of Chemical Engineers*, Vol. 34, pp. 202-218, doi: 10.1016/j.spc.2022.09.007.

Otgaar, H., Howe, M., Muris, P. and Merckelbach, H. (2019), "Associative activation as a mechanism underlying false memory formation", *Clinical Psychological Science*, Vol. 7 No. 2, pp. 191-195.

Pennington, N. and Hastie, R. (1993), "Reasoning in explanation-based decision making", *Cognition*, Vol. 49 Nos 1-2, pp. 123-163.

Podsakoff, P.M., Mackenzie, S.B., Lee, J. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903, doi: 10.1037/0021-9010.88.5.879.

Prathansong, N. and Kananurak, N. (2023), "Reason (for and against) consumers affecting organic product purchase intention: Bangkok, Thailand", *Journal of Family Business and Management Studies*, Vol. 15 No. 1.

Preacher, K.J. and Hayes, A.F. (2008), "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models", *Behavior Research Methods*, Vol. 40 No. 3, pp. 879-891.

Prinsloo, C. and Lew, C. (2020), "Openness to change and conservation in value-laden decisions", *SA Journal of Human Resource Management*, Vol. 19, pp. 1-11, doi: 10.4102/sajhrm.v19i0.1468.

Qudrat-Ullah, H. and Nevo, C.M. (2021), "The impact of renewable energy consumption and environmental sustainability on economic growth in Africa", *Energy Reports*, Vol. 7, pp. 3877-3886.

Ravigné, E. and Da Costa, P. (2021), "Economic and environmental performances of natural gas for heavy trucks: a case study on the French automotive industry supply chain", *Energy Policy*, Vol. 149, doi: 10.1016/j.enpol.2020.112019.

Sahu, A.K., Padhy, R.K. and Dhir, A. (2022), "Determinants and barriers of implementing lean manufacturing practices in MSMEs: a behavioral reasoning theory perspective", *Production Planning and Control*, Vol. 33 No. 12, pp. 1197-1213.

Schreiber, J.B. (2017), "Update to core reporting practices in structural equation modeling", *Research in Social and Administrative Pharmacy*, Vol. 13 No. 3, pp. 634-643, doi: 10.1016/j.sapharm.2016.06.006.

Shahsavari, A. and Akbari, M. (2018), "Potential of solar energy in developing countries for reducing energy-related emissions", *Renewable and Sustainable Energy Reviews*, Vol. 90, pp. 275-291.

Sharma, A.P. (2021), "Consumers' purchase behavior and green marketing: a synthesis, review and agenda", *International Journal of Consumer Studies*, Vol. 45 No. 6, pp. 1217-1238.

Sharma, R., Dhir, A., Talwar, S. and Kaur, P. (2021), "Over-ordering and food waste: the use of food delivery apps during a pandemic", *International Journal of Hospitality Management*, Vol. 96, p. 102977, doi: 10.1016/j.ijhm.2021.102977.

Simpson, N.P., Rabenold, C.J., Sowman, M. and Shearing, C.D. (2021), "Adoption rationales and effects of off-grid renewable energy access for African youth: a case study from Tanzania", *Renewable and Sustainable Energy Reviews*, Vol. 141, p. 110793.

Sivathanu, B. (2018), "Adoption of internet of things (IOT) based wearables for healthcare of older adults – a behavioral reasoning theory (BRT) approach", *Journal of Enabling Technologies*, Vol. 12 No. 4, pp. 169-185, doi: 10.1108/JET-12-2017-0048.

Sreen, N., Chatterjee, S., Bhardwaj, S. and Chitnis, A. (2023), "Reasons and intuitions: extending behavioral reasoning theory to determine green purchase behavior", *International Review on Public and Nonprofit Marketing*, Vol. 20 No. 2, pp. 447-475.

Sreen, N., Dhir, A., Talwar, S., Tan, T.M. and Alharbi, F. (2021), "Behavioral reasoning perspectives to brand love toward natural products: moderating role of environmental concern and household size", *Journal of Retailing and Consumer Services*, Vol. 61, p. 102549, doi: 10.1016/j.jretconser.2021.102549.

Tandon, A., Dhir, A., Kaur, P., Kushwah, S. and Salo, J. (2020), "Behavioral reasoning perspectives on organic food purchase", *Appetite*, Vol. 154 No. 2020, p. 104786, doi: 10.1016/j.appet.2020.104786.

Tani, M., Gheith, M.H. and Papaluca, O. (2021), "Drivers of student engagement in higher education: a behavioral reasoning theory perspective", *Higher Education*, Springer Netherlands, p. 123456789, doi: 10.1007/s10734-020-00647-7.

Tani, M., Troise, C. and Driscoll, A.O. (2022), "Exploring the new subscription plans with a behavioral reasoning perspective", *Journal of Engineering and Technology Management*, Vol. 63, p. 101674, doi: 10.1016/j.jengtecman.2022.101674.

Tigabu, A.D. (2018), "Analysing the diffusion and adoption of renewable energy technologies in Africa: the functions of innovation systems perspective", *African Journal of Science, Technology, Innovation and Development*, Vol. 10 No. 5, pp. 615-624.

USAID.GOV/POWERAFRICA (2019), *Off-Grid Solar Market Assessment Ghana*, Ghana.

Vakola, M. (2016), "The reasons behind change recipients' behavioral reactions: a longitudinal investigation", *Journal of Managerial Psychology*, Vol. 31 No. 1, pp. 202-215, doi: 10.1108/JMP-02-2013-0058.

Van Opstal, W. and Smeets, A. (2023), "Circular economy strategies as enablers for solar PV adoption in organizational market segments", *Sustainable Production and Consumption*, Vol. 35, pp. 40-54, doi: 10.1016/j.spc.2022.10.019.

Wang, J., Shen, M. and Chu, M. (2021a), "Why is green consumption easier said than done? Exploring the green consumption attitude-intention gap in China with behavioral reasoning theory", *Cleaner and Responsible Consumption*, Vol. 2, p. 100015, doi: 10.1016/j.clrc.2021.100015.

Wang, X., Zhao, D., Wang, H. and Zhang, B. (2021b), "Impact of risk perception on consumer acceptance of renewable energy: evidence from China's photovoltaic power market", *Renewable Energy*, Vol. 171, pp. 687-698.

Westaby, J.D. (2005), "Behavioral reasoning theory: identifying new linkages underlying intentions and behavior", *Organizational Behavior and Human Decision Processes*, Vol. 98 No. 2, pp. 97-120, doi: 10.1016/j.obhdp.2005.07.003.

Westaby, J.D. and Fishbein, M. (1996), "Factors underlying behavioral choice: testing a new reasons theory approach", *Journal of Applied Social Psychology*, Vol. 26 No. 15, pp. 1307-1323.

Westaby, J.D., Probst, T.M. and Lee, C.B. (2010), "Leadership decision-making: a behavioral reasoning theory analysis", *The Leadership Quarterly*, Vol. 21 No. 3, pp. 481-495.

Westerwick, A., Sude, D., Robinson, M. and Knobloch-Westerwick, S. (2020), "Peers versus pros: confirmation bias in selective exposure to user-generated versus professional media messages and its consequences", *Mass Communication and Society*, Vol. 23 No. 4, pp. 510-536.

Wiederhold, M. and Martinez, L.F. (2018), "Ethical consumer behavior in Germany: the attitude-behavior gap in the green apparel industry", *International Journal of Consumer Studies*, Vol. 42 No. 4, pp. 419-429.

Yadav, R., Giri, A. and Chatterjee, S. (2022), "Understanding the users' motivation and barriers in adopting healthcare apps: a mixed-method approach using behavioral reasoning theory", *Technological Forecasting and Social Change*, Vol. 183, p. 121932, doi: 10.1016/j.techfore.2022.121932.

Yang, S., Yang, Y., Yang, J., Qian, Z. and Zhang, Y. (2021), "Does energy poverty influence residential solar energy utilization? Evidence from China", *Energy Policy*, Vol. 148, p. 112050, doi: 10.1016/j.enpol.2020.112050.

Youlin, H. and Qian, L. (2021), "Understanding the potential adoption for autonomous vehicles in China: the perspective of behavioral reasoning theory", *Psychology and Marketing*, Vol. 38 No. 4, pp. 7-73, doi: 10.1002/mar.21465.

Zhuang, X., Hou, X., Feng, Z., Lin, Z. and Li, J. (2021), "Subjective norms, attitudes, and intentions of AR technology use in tourism experience: the moderating effect of millennials", *Leisure Studies*, Vol. 40 No. 3, pp. 392-406.

Further reading

Amoako, G.K., Dzogbenuku, R.K., Doe, J. and Adjaison, G.K. (2020), "Green marketing and the SDGs : emerging market perspective", *Marketing Intelligence and Planning*, Vol. 40 No. 3, pp. 310-327, doi: 10.1108/MIP-11-2018-0543.

Cho, Y.N. and Baskin, E. (2018), "It is a match when green meets healthy in sustainability labeling", *Journal of Business Research*, Vol. 86, pp. 119-129, doi: 10.1016/j.jbusres.2018.01.050.

energymin.gov.gh (2017), "Overview of the Ghana power sector", available at: https://energymin.gov.gh/sector-overview (accessed 7 April 2021).

Finisterra do Paço, A.M. and Raposo, M.L.B. (2010), "Green consumer market segmentation: empirical findings from Portugal", *International Journal of Consumer Studies*, Vol. 34 No. 4, pp. 429-436.

Gorton, M., Tocco, B., Yeh, C. and Hartmann, M. (2021), "What determines consumers' use of eco-labels? Taking a close look at label trust", *Ecological Economics*, Vol. 189, p. 107173.

Hameed, I., Waris, I. and Amin, M. (2019), "Predicting eco-conscious consumer behavior using theory of planned behavior in Pakistan", *Environmental Science and Pollution Research*, Vol. 26 No. 15, pp. 15535-15547.

Isensee, C., Teuteberg, F., Griese, K.M. and Topi, C. (2020), "The relationship between organizational culture, sustainability, and digitalization in SMEs: a systematic review", *Journal of Cleaner Production*, Vol. 275, p. 122944, doi: 10.1016/j.jclepro.2020.122944.

Lim, D., Baek, T.H., Yoon, S. and Kim, Y. (2020), "Colour effects in green advertising", *International Journal of Consumer Studies*, Vol. 44 No. 6, pp. 552-562.

Nguyen, N., Lobo, A. and Nguyen, H.V. (2019), "Demographics of sustainable technology consumption in an emerging market : the significance of education to energy efficient appliance adoption", *Social Responsibility Journal*, Vol. 15 No. 6, pp. 803-818, doi: 10.1108/SRJ-11-2018-0312.

Paul, J., Modi, A. and Patel, J. (2016), "Predicting green product consumption using theory of planned behavior and reasoned action", *Journal of Retailing and Consumer Services*, Vol. 29, pp. 123-134, doi: 10.1016/j.jretconser.2015.11.006.

Ryan, J. and Casidy, R. (2018), "The role of brand reputation in organic food consumption: a behavioral reasoning perspective", *Journal of Retailing and Consumer Services*, Vol. 41, pp. 239-247.

Suhartanto, D., Kartikasari, A., Hapsari, R. and Budianto, B.S. (2021), "Predicting young customers' intention to repurchase green plastic products: incorporating trust model into purchase intention model", *Journal of Asia Business Studies*, Vol. 15 No. 3, pp. 441-456, doi: 10.1108/JABS-04-2020-0150.

Tezer, A. and Bodur, H.O. (2021), "The greenconsumption effect: how using green products improves consumption experience", *Journal of Consumer Research*, Vol. 47 No. 1, pp. 25-39, doi: 10.1093/JCR/UCZ045.

VanTonder, E., Fullerton, S. and Beer, L.T.D. (2020), "Cognitive and emotional factors contributing to green customer citizenship behaviors: a moderated mediation model", *Journal of Consumer Marketing*, Vol. 37 No. 6, pp. 639-650, doi: 10.1108/JCM-06-2019-3268.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, pp. 425-478.

Yadav, R. and Pathak, G.S. (2016), "Young consumers' intention towards buying green products in a developing nation: extending the theory of planned behavior", *Journal of Cleaner Production*, Vol. 135, pp. 732-739, doi: 10.1016/j.jclepro.2016.06.120.

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