How does anticipatory trauma reaction and climate-friendly behaviour make an affect at the individual level? The role of social norms and self-efficacy

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Abstract: Climate change is unavoidable and requires serious consideration at both the organizational and individual levels. Climate change mitigation, reduction in greenhouse gas emissions globally and climate financing for developing countries, etc. are key issues and challenges towards environmental sustainability. This paper aims to develop a framework for Climate-Friendly Behaviour (CFB) for environmental sustainability from an individual perspective. The present study recognizes the role of social norms and self-efficacy in developing positive behaviour toward environmental sustainability. On the proposed integrated CFB framework of Value Belief Norms (VBN) and self-efficacy theory, this study is a unique conceptual-empirical scholarly development, examining individual-level contemplation toward climate-supportive policy measures. This research evaluates the relationship between Anticipatory Trauma Reaction (ATR) and CFB in the presence of Perceived Social Efficacy (PSE) and Perceived Social Norms (PSN) as moderators and mediators. We have used the survey method to examine a sample of 238 respondents and assess the structural equation modelling analysis and PLS predictions using SmartPLS software. The findings indicate that climate change-related anxiety-driven ATR facilitates CFB among individuals. Next, the study adds value to VBN theory as the results also suggest that PSN improves ATR's positive impact on CFB. This work further expands the horizon of self-efficacy theory by arguing that PSE transmits the positive effect of ATR on CFB. The study delivers many worthy theoretical and practical contributions toward climate change policies and environmental sustainability implications.

Keywords: Anticipatory trauma reaction; Climate change; Climate-friendly behaviour; Environmental sustainability; Perceived self-efficacy; Perceived social norms; SmartPLS software.

1. Introduction

Climate change has always been with us, constantly evolving, with its everlasting effect being seen at global, regional and local levels. Climate change concerns have become a hot topic of discussion among individuals, groups, organizations and governments (Sampei & Aoyagi-Usui, 2009; Ballew et al., 2019). It requires governance systems to manage and address climate issues at organisational level (DiGregorio et al., 2019; Arıkan & Günay, 2021). However, sustainable development at an individual level is a characteristic from a person's nature that develops into climate friendly and pro-environmental behaviour (Mikulčić et al., 2022). Exploratory attempts to capture the individual-level behavioural tendencies toward climate-friendly consumption to reduce greenhouse gas emissions have recently attracted academic attention (Schmidt, 2020; Huiskamp et al., 2022). Consistently increasing climate-change concerns at the individual level have implications for researchers and practitioners; extreme anxiety has emerged, evoked by the awareness, fear and unpreparedness towards the long-term consequences of climate change (Wullenkord et al., 2021). Although climate change is considered an unavoidable factor for governments, the attention demanded by this issue at the individual level has been largely missing. Over time, the cumulative conformity of awareness on climate change issues and their impacts have gained exponential prominence in discussions on various global platforms in the media and society at large (Sampei & Aoyagi-Usui, 2009; Doherty & Webler, 2016). The degree of climate change concern in an individual is influenced by psychological, social and environmental factors (Mavrodieva et al., 2019; Arıkan & Günay, 2021).

Wamsler et al. (2021) suggested that the climate change issue requires a pro-environmental approach emphasizing supportive factors and building the potential of individuals that can be systematically facilitated by change agents. The current climate change situation indicates that our future generations will have to bear and pay for what we are doing to nature through our use of technology, increasing the utilization of carbon as a result (Hansen et al., 2013; Sovacool et al., 2022). Friedrich et al. (2022) indicated rapid increases in climate-relevant risks and opportunities across the board. Karn et al. (2022) proposed that managers should examine the latest facts about long-term monetary benefits associated with corporate environmental sustainability; they may then be able to control negligence toward accepting corporate environmental sustainability. Current literature indicates that awareness and

accessibility of information have emerged as major contributory sources behind the most successful climate-friendly initiatives of people (Gulzari et al., 2020; Fadeeva & Van Berkel, 2021).

Crecente et al. (2021) have discussed the long-term viability of climate change policies. Economic investment in climate change prevention will incur high costs over a long period of time. Still, early actions can begin at the individual level by assessing current lifestyles toward pro-environment behaviour (Shim et al., 2018; Xavier et al., 2019). Early action, foresight and trust in science can be used as tools to face climate challenges (Manzanedo & Manning, 2020). Individual-level worry is positively associated with feelings of personal responsibility towards lowering climate change; this impacts on climate mitigation activities and climate policy support at the individual level (Bouman et al., 2020). Individual actions and their consequences have linkages with each other; these include dietary decisions, consumption of plastic-free products, and saving electricity and water. These initiatives build cause and effect relationships toward Climate-Friendly Behaviour (CFB).

The climate balance is at high systemic risk. There needs to be a control through concerted and urgent efforts using coordinated and creative procedures (United Nations Office for Disaster Risk Reduction, 2019). Threatening and fearful consequences associated with climate change issues are no longer hidden from ordinary people by authorities; these consequences can certainly cause behavioural awareness in individuals. Anticipatory Trauma Reaction (ATR) refers to the climate anxiety apparent in the form of threats and fear of the future that is aroused due to growing awareness of environmental issues. This fear and danger motivate individuals to think about pro-environmental activities or CFB. Thus, climate change anxiety and distress triggered by adverse environmental impacts may encourage individuals to engage in adaptation and mitigation behaviours (Ogunbode et al., 2019). Researchers examine climate change anxiety (anxiety or anxiousness due to the changing climate in the form of weather abnormalities or disasters etc.) in the form of ATR. An individual attitude or behaviour is mediated by another influencer i.e. social norms and efficacy. Therefore, the present study covers the private and personal sphere of an individual that leads to CFB after anticipating disruption from climate change (McCright & Dunlap, 2003; Ockwell et al., 2009).

Researchers, governments and social media participation are needed globally to convince individuals to adopt a responsible code of conduct toward climate protection (Fatica & Panzica, 2021). Researchers have previously indicated a positive association between personal norms (Reichl et al., 2021) and social identity (Vesely et al., 2021) with CFB. Smith and Mayer (2018) argued that social trust significantly supports CFB and climate change policies at the individual level.

This societal-individual linkage with CFB indicates how social norms may drive personal norms towards CFB. Social norms, emerging as a consequence of societal exchanges among individuals, constrain and further lead to action arousals toward specific hazards (Lo, 2013). Studies support this principal linkage between Perceived Social Norms (PSN) and CFB.

One such study suggested that awareness of climate change activities builds a sphere in terms of private and public climate action in which we see alarmed and concerned respondents (Doherty & Webler, 2016). Further research shows that concerned individuals participate in high level household and consumer actions to reduce climate change but are less engaged in public activities like protests and filing petitions. A relevant study also mentioned that some concerned individuals behave actively towards catalyzing government actions by filing petitions, protests etc (Maibach et al., 2009; Leiserowitz et al., 2013). Likewise, several theories and researchers explain that concern is the primary step towards the action and is a driver of change in personal-private behaviour (Stern, 2000). Thus, we argue that PSN contribute crucially towards individual-level climate-friendly behavioural developments.

Gifford et al. (2011) suggested that people may use PSN to evaluate problem-focused strategies to cope with climate change impacts, strengthening links with the natural world. Self-efficacy may refer to "beliefs in one's capabilities to execute the competencies needed to exercise control over events that affect one's welfare" (Bandura, 1986). Ojala et al. (2021) studied the connectivity of anxiety, efficacy and climate-friendly behaviours. They argued that people who fear the adverse impact of climate change also experience higher Perceived Social Efficacy (PSE) in searching for ways to control climate change issues. Thus, belief and efficacy have emerged as proven catalysts for individual actions and behavioural transformations. Still, only a few studies have specifically investigated the impact of efficacy

and belief on public climate actions (Feldman et al., 2017; Sabherwal et al., 2021; Lee et al., 2021).

Many studies covering climate change issues have been conducted in Australia (Usman et al., 2021), Canada (Greaves, 2021), the USA (Ballew et al., 2019) and South Africa (Hoogendoorn et al., 2021), but India still needs attention. This paper examines climate change anxiety in the form of ATR and its effect on the individual's behaviour. The study has also evaluated PSE and PSN as mediators and moderators. This study used a structural equation modelling analytical approach to examine the hypothesized linkage of ATR and CFB, and the intermediary roles of PSE and PSN in this linkage. The study findings enrich climate change research by indicating the supportive transmission of ATR into CFB through PSE. This study's second novel contribution includes highlighting the improvising impact of ATR on CFB. The study aims to develop a framework for CFB for environmental sustainability from an individual perspective. This research recognizes the role of social norms and self-efficacy in developing positive behaviour toward environmental sustainability. The research questions and further objectives of the study are:

i. To assess if there is a positive impact of ATR on CFB.
ii. To evaluate where ATR directly influences CFB and if the relationship is mediated by PSN or PSE.
iii. To examine whether the direct impact of ATR on CFB varies with differing levels of PSN or PSE as moderator.

This study includes eight sections. The first section covers the introduction with the second section detailing the literature review. The third section explains the conceptual model development. Section four explains the research methodology, followed by the results and findings in section five. The sixth section gives the discussion and conclusion, with theoretical and practical implications of the paper suggested in section seven. The last section identifies the limitations of the work and future scope for study.

2. Literature Review

A significant number of previous investigations have examined the association between an individual's behaviour and climate change. Stern (2002) emphasized the Value Belief Norms (VBN) theory that explains personal/individual environmental behaviour. ATR consists of future-focused distress related to climate change via various modes of information. This study draws on the periphery of VBN theory, suggesting that ATR explains an individual's environmental behaviour toward climate change issues. ATR refers to the threat experienced by individuals based on the information received from the media, friends, television, newspaper, radio, internet, phone and face to face interactions. Illustratively, Martiskainen et al. (2020) examined the behaviour of protestors involved in climate change strikes. The researchers indicated that the strikers possess diverse knowledge about climate change and attempt extensive scale activities to combat climate change. The researchers suggested that the strikers' cognitive, affective and behavioural dimensions varied largely on a continuum. The protestors possess scientific awareness of cognitive knowledge; they have positive sentiments of hope as opposed to negative emotions of anxiety and fear; they also display lower-level activities like recycling to influence higher-level activities such as reducing energy and water consumption (Jaeger & Upadhyay, 2020). Overall, the existing literature draws a comprehensive picture of ATR and CFB linkage.

The propositions of VBN theory are grounded in depicting a person’s norms and beliefs that drive that person's behaviour and arouse a sense of responsibility towards a problem; issues such as climate change are addressed through the perceived values and awareness acquired by those persons (Stern, 2000). VBN theory also indicates that the frequent display of specific actions of individuals constitutes their public behaviour. Thus, the theory inferentially suggests that the behaviour of individuals results from the consequences of their efficacy and social norms, both of which govern their overall efficacy and societal actions (Bandura, 1986; Bandura, 2000). Awareness and visibility of climate change issues in society serve as the critical source of climate-friendly actions in the public sphere. The surrounding culture, affiliating groups and workplace teams play influential roles in an individual's behaviour in thinking and acting about a prevailing problem. This individual behavioural transformation resembles how role conformity occurs in a group context. Here, the Asch

experiment explains the importance and influence of group members on each other (Larsen, 1974; Perrin & Spencer, 1981; Hu, S. et al., 2018). Ho & Shimada (2021) investigated the association of climate actions and climate issues such as drought and salinity invasion on the farm yield, profitability and earnings of 352 rice farmers. The findings of the study's multinomial endogenous treatment effect model indicated that climate change response actions significantly reduced the usage of chemical fertilizers and enhanced farmers' farm yield, profitability and earnings. Likewise, Chan et al. (2022) argued that proactive environmental strategic practices facilitate enhanced market performance rather than reactive environmental strategic practices. Business performance further improves when there are intense competitive environmental conditions. Huiskamp et al. (2022) recommended an integrated corporate strategic framework comprising climate resilience supported with climate change scenario analysis by implementing climate resilience cycle in routine practices to generate capabilities that are key to sustainability-oriented company strategies.

VBN theory proposes that the personal norms of an individual improve their behaviour. On the other hand, social influences drive the behaviour of individuals in the public sphere. In this study, the authors have considered the social norms as descriptive social norms that represent the perception of others in identical circumstances such as littering, recycling, household energy conservation etc. It is common that individuals follow the actions of others. This study has enriched existing literature by investigating the linkages of VBN, evaluating individuals' personal or private behaviour with PSE and PSN. An assessment of VBN theory has been made to investigate the CFB of individuals.

Previous studies have also revealed that public climate change behaviour is strengthened by peoples' efficacy and beliefs (Bandura, 2000; Ojedokun & Balogun, 2010). Some researchers have previously evaluated the role of social norms as the key predictor of private or personal action towards climate-friendly behaviour. Research has also examined the associations of social norms and public behaviour with household energy conservation (Nolan et al., 2008).

According to a UN report (United Nations Office for Disaster Risk Reduction, 2019), the poorest 50% of the people in the world are responsible for only half of the environmental damage caused by the wealthiest 1% of the global population. To address this, climate-

friendly behaviours must be encouraged. These include the tendency to promote awareness of climate change issues; inclination toward supportive climate actions such as recycling, reducing and reusing; preferring low Green House Gases (GHG) products (Halady & Rao, 2010). Also, climate change reduction strategies have been adopted by GHG intensive firms following regulatory compliance. These are effective and are found to be inclined toward environmental supportive actions (Laing et al., 2017; Bryant et al., 2020). There are no specific potential treatments that can protect the climate from various damaging issues and their consequences in a single effort. Ensuring a safe environment will take decades or more. There needs to be initiatives taken by governments through their policies and by leaders of nations. According to Falavigna & Ippoliti (2022), judicial inefficiency may serve as a barrier in maintaining emphasis on environment-friendly management practices. However, action needs to be taken by individuals at the personal level (Manzanedo & Manning, 2020). Previous research indicates that consumption habits and behaviours are the main drivers of climate change (Ivanova et al., 2015; Xavier et al., 2019). Shim et al. (2018) found attitude-behavior gaps in the consumer decision-making process among different environmentally friendly commodity categories; they revealed that consumer buying behavior is optimistically significant for eco-friendly products with a higher degree of involvement, cost and usage period. Kumar et al. (2017) explained the relation of awareness, knowledge and alignment to improve operational performances via green activities. This allows us to take a step towards more environmentally friendly behaviour.

Bhatia & Kumar (2022) found mediating roles of green process innovation and environmental commitment in the relationship of stakeholders and competitive pressure and the adoption of industry 4.0 technologies. This indicates that firms will embrace industry 4.0 technologies in response to corresponding pressure when they stay committed to environment protection and understand environment management practices. Adu (2022) suggested that those banks with sound corporate governance accomplish improved financial performance through sustainable initiatives. Household goods and services consumption account for 60% of global greenhouse emissions (Ivanova et al., 2015). Conclusively, leisure and a more prosperous life have led to higher energy consumption. With this, common behaviours now also have concepts of re-usage, reducing and recycling (Goldstein et al., 2008; Schultz, 1999). Han (2020) revealed from their empirical study that social norms facilitate green buying behavior indirectly by positively stimulating personal norms. Noticeably, there is a significant scarcity of available empirical literature on social norms and their perceived

efficacy. Also, there is a vast literature gap when studying the Indian context. No study has been made to investigate these associations empirically in India. Belief and efficacy have emerged as proven catalysts for the transformations in individual actions and behaviour. We have found only a few studies that have specifically investigated the impact of the efficacy and belief on public climate actions (Feldman et al., 2017; Hamann & Reese, 2020). Another study supports the view that an individual's belief shapes sustainability in the environment (Granco et al., 2022).

3. Conceptual Model Development

This section of the study explains the relationship of the variables with each other based on the literature review. The role of perceived self-efficacy and perceived social norms in the conceptual model is examined.

3.1 Anticipatory Trauma Reactions and Climate-Friendly Behaviour

Previous literature has revealed that ATR expresses negative feelings and maladaptive behaviour towards climate change anxiety. Existing studies have also explained that ATR will always impact with a negative attitude. Still, some researchers have also suggested that climate change anxiety or alarm also helps create pro-environmental behaviour and motivates individuals towards climate-friendly actions personally (Doherty & Webler, 2016; Kim & Seock, 2019). ATR is a composition of emotions, cognitions and behaviour that includes the sub-factors of feelings related to future threats - preliminary thoughts and actions designed to protect self and others, with disruption to daily activities. These sub-scales reflect a meaningful and logical division of the proposed components of the ATR construct by seeking and collecting information on how an individual reacts and perceives climate change issues. One study compared CFB with the perceived effort in addressing climate change issues. The study evaluated low perceived effort such as the signing of a petition, compared to high effort by reviewing changes in habits and volunteering activities toward CFB (Ram-kissoon et al., 2013). Duc et al. (2021) analyzed the detrimental influences of climate changes on agricultural production. They suggest that policymakers should develop farmers' information accessibility regarding weather and market conditions. This process will enable farmers to effectively manage climate change uncertainty by adopting sustainable agricultural production, such as consistency in climate change adoption and the committed alternatives of techniques acquired by the farmers. Some researchers have also examined climate change

threats or anxiety by using the level of an individual's commitment to create and make a change in society (Tonge et al., 2015). An experimental study on moral framing, pro-environmental attitudes and behaviours revealed that moral framing significantly affects climate change actions and behaviours (Wolsko et al., 2016). Therefore, available literature establishes a significant connection between ATR and climate change control-related behaviours of people.

Beak et al. (2020) recommended a broader range of climate supportive actions. They suggested activities such as increased consideration of renewable energy in charging electric vehicles (EVs) to make an effective contribution toward CO_2 reduction rates instead of narrowing the focus on environment-friendly behaviour as a marketing strategy for attracting customers. In addition, renewable energy usage is found to have a negative and significant impact on carbon emissions in India, showing that managers need to promote renewable energy applications more widely (Zoaka et al., 2022; Sharma et al., 2022). Upadhyay et al., 2021 stated that adoption of philosophy "do-it-yourself" business strategies helps the logistic manager to promote an eco-friendly environment that starts with the intentions of the individual. On the other hand, CFB are conceptualized by intentions, i.e. they are specific and general (Halpenny, 2010). Walker & Chapman (2003) evaluated the categories of CFB based on initiatives such as picking up your own litter, reducing poaching, helping in cleaning parks, beaches etc. (Walker and Chapman, 2003). Noticeably, the researchers also referred to climate change anxiety reactions as actions related to Environmentally Responsible Behaviour (ERB). ERB defines the actions taken by individuals toward the protective and sustainable uses of natural resources (Vaske & Kobrin, 2001). CFB is also associated with the sustainable usage of natural resources (Groshong et al., 2020).

Previous studies on CFB and ATR are limited and mainly concentrate on management policies (Gundersen et al., 2015; Jakučionytė-Skodienė & Liobikienė, 2021). Also, studies on public support and awareness of individual contributions to climate change anxiety are scarce (Xu et al., 2020; Ojala et al., 2021). Thus, our study covers the CFB of consumers in terms of their pro-environment behaviour. Based on previous literature reviewed, the researchers propose the first hypothesis of the study as follows.

H1: *ATR enhances an individual's behaviour toward CFB*

3.2 Anticipatory Trauma Reactions, Perceived Social Norms and Climate-Friendly Behaviour

PSN affect the behaviour of individuals either positively or negatively. A positive affect leads to climate-friendly activities, whereas a negative impact causes stress and mental health issues (Doherty & Clayton, 2011). Karpudewan (2019) suggested that climate change behaviours are significantly associated with values, beliefs and personal norms. This study further indicated the importance and framework of teaching a climate change curriculum in primary schools. News, social media, radio and other modes of information directly or indirectly affect the stressors. Further, climate-related anxiety may be an appropriate reaction to a realistic threat, or it may be excessive and disproportionate (Clayton, 2020). Adequate anxiety levels may motivate individuals to act appropriately towards climate change issues, such as adopting alternate modes of controlling the corresponding carbon footprint. Although Hrabok et al. (2020) suggested a noticeable perspective relevant to the impact of anxiety levels on individuals, even adequate anxiety levels may lead some of these individuals to vulnerability and suffering. The researchers indicated the cognitive hopelessness of these individuals in dealing with climate change issues at individual or mass levels.

Researchers have previously suggested the inclusion of diverse societal orientations, such as social dominance orientation, characterized by one social group's dominating nature over others, to examine corresponding dangers associated with climate change collective threats (Uenal et al., 2021).

A previous study explains that norms play a vital role in teaching individual behaviour. Norms lead to values, beliefs, consequences, awareness, together with a sense of dread and responsibility (Stern, 1999). Hynes & Wilson (2016) suggested that social media, materialism and self-esteem-based appeals may not be instrumental enough to influence large-scale behavioural transformation toward climate-friendly food. On the other hand, previous research indicates that the acute exposure of media-driven advertising of materialism and consumption to the general public could drive only the male population to scepticism towards climate change actions and adverse climate behaviours. However, the female population remains unaffected by such exposure (Vázquez et al., 2021). Manika et al. (2021)

recommended that societal organizations should promote pride through pro-environmental technologies to accomplish their social responsibilities. Some studies also explained PSN as mediators and moderators in the association between climate anxiety and climate action. Steentjes et al. (2017) concluded that social norms play a vital role in the interpersonal confrontation of anti-normative behaviour such as climate change disregard. PSN mediate the relationship between perceived risk and insurance buying behaviour. This research finding echoes the assumption of the present study that PSN may play a mediating role in the relationship between ATR and CFB (Lo, 2013). The emerging media facilitates the mass and the streaming of information about climate change being transferred to their audiences by any mode of communication. This can determine the PSN of individuals toward identified risk, expressed behaviour and attitude (Uenal et al., 2021).

Clayton (2020) explained that social and cultural contexts mediate the response or reaction toward climate change. Saracevic & Schlegelmilch (2021) also concluded that PSN positively impact pro-environmental behaviour. Further, Wang & Zhang (2022) recently pointed out that consumer-friendly waste sorting behaviour found positive support from environmental norms at the societal level. Therefore, we propose that

H2: *PSN motivate an individual towards CFB*

H4: *PSN mediate the relationship between ATR and CFB*

3.3 Perceived Self-Efficacy and Climate-Friendly Behaviour

Self-efficacy is the belief in one's capability toward accomplishing a task while experiencing a sense of efficacy; this may modify an individual's behaviour instead of just remaining concerned about the problem (Doherty & Webler, 2016). Self-efficacious individuals are individuals who believe that their efficacy enables them to take one step toward the behaviour modification that can impact problem-solving. However, the impact remains. Self-efficacious people believe in adaptive behaviour instead of blaming external factors (Ajzen, 2002) and think that "First change in yourself then expect from someone". A sound volume of studies reveals that control, response and personal efficacy remain critical predictors of climate change intentions and behaviour (McCright et al., 2016; Bouman et al., 2020). Vesely et al. (2021) explained that people who feel involved and engaged in environmental communities have a belief in connection with nature, places and parks. An individual's belief helps to create norms within a group towards climate protection.

Eom et al. (2018) suggested that greater emphasis is required to identify the psychological determinants of people with varied cultural surroundings; this can help to address societal contexts like climate change. Caby et al. (2020) found that banks displayed socially responsible behaviour within environmentally friendly and developed countries. However, their working practices varied in less advanced countries. A study investigating the Italian population from a gender perspective revealed significant differences in the efficacious efforts displayed toward energy-saving behaviours (Rainisio et al., 2022). This study's results indicated that women remained more efficacious toward climate supportive, sustainable behaviours such as switching-off electrical appliances. The behaviours of men were less positive, restricted to activities such as switching off unnecessary lights.

Hine et al. (2016) suggested that information shared through messaging, with the aim of eroding intentions, plays an essential role in increasing CFB. The study further revealed that such an exchange of information also generates concern among those receivers who are not highly concerned about climate change. A research study investigated the effect of place attachment on CFB and revealed that social bonding with the place positively impacts climate-friendly behaviour (Groshong et al., 2019). Thus, it seems inferential from these studies that efficacious individuals might be more capable of adopting climate change coping strategies.

Researchers have made numerous studies to determine the predictors of climate action. One study examined climate change predictors on both the more active and less active respondents. The study's findings revealed that social norms, self-efficacy, personal response efficacy and collective efficacy are highly significant in the more active respondents but less significant in the less active respondents. Jugert et al. (2016) found that improvements in collective efficacy can enhance pro-environmental intentions by creating positive PSE at both individual and collective levels. Another research study suggested that when individuals are supported with verifiable information about achievable collective-level efforts, pro-environmental acts can be enhanced through individual efficacy. The study also revealed that if individuals are supported with verifiable information about the linkage of personal efforts and ripple effects on collective-level efforts, this again may enhance pro-environmental acts

through individual efficacy (Hornsey et al., 2021; Dong et al., 2022). Rainear & Christensen (2022) argued that climate change exposure impacts self-efficacy and response efficacy, relating to pro-environmental behavioural intentions. Thus, we hypothesize that

H3: *PSE motivates an individual towards CFB*

H5: *PSE mediates the relationship between ATR and CFB*

3.4 Moderating Role of Perceived Self-Efficacy and Perceived Social Norms

Social norms and self-efficacy are the strongest predictors of environmental behaviour (Farrow et al., 2017). Several studies show the positive strength of the association between social norms and environmental behaviour across countries (Sawang et al., 2014; Tam & Milfont, 2020). An individual enacts behaviour because of group conformity; this influences adoption of beliefs towards climate change (Savani et al., 2015; Groshong et al., 2019). Several studies suggest that a person's intention to adopt environmentally friendly behaviour can be enhanced through several functions i.e. attitude, belief and norms (Thogersen, 2006; Morren & Grinstein, 2016). An individual can be influenced by unwritten, informal rules and commonplace actions conducted by peers and superiors. Sawang et al. (2014) identified a moderating role of social norms in adopting behaviour toward technology. Further, this study explains that knowledge spread by interpersonal social networks (e.g. peers, supervisors, family, media etc.) is associated with eco-friendly behaviour.

Clearly, efficacy and social norms are essential catalysts for different behaviours in different contexts. An individual's motivation to act is partly driven by the belief that comes from the action for desired results. Decades of research suggest that efficacy beliefs strongly influence behaviour (Doherty & Webler, 2016). Self-efficacy can be strengthened through successful direct experiences. PSE is the critical variable in the behavioural change process Consequently, whether anxiety affects the behaviour or not may depend on the level of an individual's self-efficacy and social norms (Bandura, 2000). These variables can weaken or strengthen behaviour process (the moderator). Self-efficacy may be a moderator of the effects of reactions on behaviour (Luszczynska et al., 2011). Thus, we hypothesize that

H6: *PSN moderate the relationship between ATR and CFB*

H7: *PSE moderates the relationship between ATR and CFB*

Figure 1 depicts the conceptual presentation of the hypothesized study model.

[Figure 1 about here]

4. Research Methodology

SmartPLS version 3 was used for various reasons in this study. Firstly, the theoretical model was tested from the prediction perspective. Secondly, the analysis is concerned with testing the hypothesis with a complex structural model where many constructs, indicators and relationships are involved (Heir et al., 2019). Figure 2 shows a systematic representation of the study from literature review to future scope.

[Figure 2 about here]

The researchers followed the validated steps of SmartPLS version 3 to analyze the mediation and moderation effects of PSN and PSE (Heir, 2018; Ringle et al., 2020). This study included four validated steps to evaluate the proposed framework of CFB i.e. assessment of the measurement model, evaluation of the structural modelling, predictive model assessment plus mediation and moderation analysis.

4.1 Procedures and Samples

Data was collected from 238 adults (aged 18 years and above). Researchers focused on Tier 1 cities based on higher economic development and better awareness of climate change based on the Intergovernmental Panel on Climate Change (IPCC, 2022) The survey included 43% females and 57% males. The age range of respondents was from 19 years to 40 years; 62 participants were more than 25 years of age.

4.2 Measurements

The scale of ATR was measured using nine items of the feeling sub-scale proposed by Hopwood et al. (2019). CFB compromises four items (Devine-Wright & Clayton, 2010). PSN consists of ten items, with sub-scales of social norms both general and specific plus identification (Clayton, 2017). PSE includes ten scale items (Clayton et al., 2017; Ojala et al., 2021). All the questionnaire items were rated using a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree).

4.3 Common Method Bias

Harman's single-factor (Podsakoff et al., 2003) test is applied by loading all variables into one factor with the application of exploratory factor analysis (EFA) in statistical software for social sciences (SPSS). The results of Harman's single-factor test showed that the total variation explained by a single factor was 10.105; this was significantly less than the threshold value of 50% (Podsakoff et al., 2003). Therefore, CMB (common method bias) was not an issue in the present study.

5. Results and Findings

This section focuses on the results from assessment of the measurement model (reliability and validity of the constructs and items), structural modelling and comparison of the adopted model with alternative models, mediation and moderating results.

5.1 Assessment of the Measurement Model

The model fit indices were investigated by Standardized Root Mean Square Residuals (SRMR). The value of SRMR for the estimated model was found to be 0.076. Additionally, the Standardized Root Mean Square Residual (SRMR) is under the acceptable level of 0.08 (Hu & Bentler, 1999; Hair et al., 2014), indicating a good model fit. Finally, the researchers evaluated the discriminant validity of the constructs using the Fornell-Larcker criteria; this is shown in Table1 (Fornell & Larcker, 1981; Henseler et al., 2015).

[Table 1 about here]

Table 1 shows consistent reliability (Rho A), Internal reliability (Cronbach's Alpha), Composite Reliability (CR), as well as Average Variance Extracted (AVE) and Discriminant Validity (DV) along with the recommended threshold/acceptable range (Ringle et al., 2020; Hair et al., 2017). Table 1 indicates that the outer loading of all the constructs were more significant, with a recommended threshold value of 0.70, except ATR_4, ATR_6 and PSE_3. Researchers have not excluded these items as their deletion would not improve the composite reliability of the constructs (Dijkstra & Henseler, 2011). Also, the AVEs of all the constructs were in the acceptable range with a recommended value of more than 0.5.

5.2 Assessment of Structural Model

The structural model was assessed by hypothesis testing and evaluation. The Variance Inflation Factor (VIF) values in Table 1 remained less than the recommended value of 5

(Ringle & Sarstedt, 2018; Ringle et al., 2020). This outcome shows that there is no issue of multi-collinearity in the model. Figure 3 shows the value of the path coefficients of the dependent variable as the CFB with ATR ($\beta = 0.165, p < 0.00$), PSN ($\beta = 0.590, p < 0.00$), and PSE ($\beta = 0.497, p < 0.00$). Co-efficient of determination (R2) of constructs CFB ($\beta = 0.187, p < 0.00$), PSN ($\beta = 0.348, p < 0.00$), and PSE ($\beta = 0.247, p < 0.00$) was found to be in the acceptance range of path coefficients and co-efficient of determination. Structural modelling results are shown in Figure 3.

[Figure 3 about here]

Predictive analysis (*Q-2)* in the sample model fit included the bootstrapping re-sampling method with 5000 re-samples (Hair et al., 2017). Table 2 indicates that the constructs' *Q-2* is more significant than zero; this shows a moderate predictive accuracy of PSE (*Q-2 =0.154*) and PSN (*Q-2 =0.199*). On the other hand, the *Q-2* value of CFB is 0.088, showing that CFB is low predictive. Also, the effect size of ATR (*F2=0.067*) indicates a small effect size on CFB. On the other hand, PSN (*F2=0.505*) and PSE (*F2=0.327)* show a large effect size on CFB (Cohen, 1988) as per the recommended threshold of effect size indicated (above 0.02 = Small; above 0.15 = Medium; above 0.35 = Large effect).

[Table 2 about here]

5.3 Out of the Sample Predictive Relevance

The researchers examined the PLS predict to analyze the model parameter and model's predictive power from the sample based on training and holdout samples (Shmueli et al., 2019). Model comparison by using PLS predict is shown in Table 3.

[Table 3 about here]

Predictions based on Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE), and Root Mean Squared Error (RMSE) are included. PLS-SEM-based residuals were checked to assess the normality of the data. Non-symmetric data was found that shows the left tail distribution and indicates over-prediction in the model (Danks & Ray, 2018). Based on non-symmetric data, researchers compared the MAE value with the Linear Model (LM) value of each indicator (Shmueli et al., 2019); high predictive power was found after calculating the difference between PLS-MAE and LM-MAE. All indicators show the negative value with the highest predictive power in the out-of-sample model fit. However, the

researchers noted that the *Q-2* predict value of each item of dependent variables was more than zero; it is recommended for threshold value that *Q-2* should be more than zero (Shmeuli et al., 2019). This indicates that Model 3 has high predictive power. As observed from Table 3, *Q-2* values of all dependent variables are highest among all four models. So, the PLS predict model displays a better fit with Model 3, a general combination of a mediator and a moderator.

5.4 Mediation and Moderator Roles of Perceived Social Norms and Perceived Self-Efficacy

PE positively and significantly mediates the relationship between ATR and CFB. PSE partially mediates the ATR and CFB. Additionally, PE shows the competitive mediation, which indicates that PSE weakens the direct connection between ATR and CFB. Researchers examined the complete mediation or partial mediation by evaluating the Variance Accounted for (VAF) (Helm, Eggert & Garnefeld, 2010). The mediation effect of perceived self-efficacy and perceived social norms is shown in Table 4.

[Table 4 about here]

The findings reveal that the direct impact of PSN on CFB is highly significant, although it does not act as a moderator in the proposed association of ATR and CFB. PSN does not show a mediating role between ATR and CFB. The simple slope plot represents the direction and strength of moderating variables in the proposed associations. The results thus reveal that the two-stage approach and presence of moderator PSN strengthen the relationship between ATR and CFB (Baron & Kenny, 1986; Frazier et al., 2004). On the other hand, PSE does not directly indicate a moderating effect in the ATR and CFB relationship. Still, it depicts a supportive role in the moderating impact of PSN in Model 3 (Gardener et al., 2017). Hypothesis results are presented in Table 5.

[Table 5 about here]

The findings support H1 as ATR significantly affects CFB (t =2.025, p = .00) (Table 5). PSE has a significant effect on CFB (t =2.289, p = .00) (Table 5). The researchers also investigated the indirect effect of ATR on CFB via PSN, and ATR on CFB via PSE. Table 5 supports H4 as ATR's indirect effect on CFB via PSE is significant. Figure 4 reveals the moderator effect of PSN and PSE on CFB. The findings support H6 as PSN is significant with CFB as a moderator.

[Figure 4 about here]

6. Discussion of Findings

Deriving from the fundamentals of VBN theory, the study enlightened the Climate Friendly Behaviour (CFB) building mechanism by evaluating the significance of climate anxiety in the form of Anticipatory Trauma Reaction (ATR) and the mediating roles of Perceived Efficacy (PSE) and Perceived Social Norms (PSN) at individual level actions. The results of this study indicate that PSE has a direct and significant relationship with CFB, and also that it mediates the relationship between ATR and CFB. The study also suggests that PSN do not significantly affect CFB but, on the other hand, strengthen the relationship between ATR and CFB. This study is in agreement with several other studies that have also identified the positive relationship between ATR and CFB (Lubell et al., 2007; Roser-Renouf, 2014). Many other studies have also indirectly supported the present study focus of CFB at individual level. One research, using an evaluating logistic infrastructure, indicated that the adoption of green practices at individual level enhances customers' engagement in promoting eco-friendly business practices (Upadhyay et al., 2021). Further, PSE influences the moderating role of PSN in the association of ATR and CFB. This study represents the situation of the Indian scenario toward ATR and its impact on CFB.

This study reveals that young people, who contribute to the majority of the Indian population, seek awareness on climate change developments and also intend to support this crucial notion. Sahoo et al. (2022) argued that green technologically innovative behaviour facilitates enterprise environmental performance. The study reveals that society and belief of an individual can mitigate climate change concerns via CFB. This study argues that PSN and PSE are two motivational determinants of an individual's behaviour that can direct people toward recognizing and understanding climate-related issues.

6.1 Theoretical and Practical Contributions

The present study suggests important implications for both theory and practice.

6.1.1 Theoretical contributions

This study has highlighted specific motivators of CFB that can assist the change-makers in determining the contributions needed at individual level to save the planet by engaging

individuals in climate supportive actions. Also, this study contributes to VBN behaviour theory by linking the efficacy aspect of individuals with CFB. Daddi et al. (2018) appealed for increased exploration of management theories in climate change investigations in future research. Perera et al. (2022) investigated the Australian population and suggested significant associations of norms and pro-environmental behaviour on the fundamentals of VBN theory. They also recommended that norms and pro-environmental intentions still need to be examined in developing countries in light of other social contexts. Some recent studies identified the association of circular economy and socio-economic benefits, arguing that integrative and innovative approaches toward environmental issues may deliver positive outcomes towards sustainable business (Agrawal et al., 2022; Kühnen et al., 2022). Also, an emphasis on extended empirical evaluation is needed to understand pro-environmental initiatives. Thus, this study enriches CFB literature by empirically examining the aspects of norms and efficacy in India.

The present study also significantly contributes toward the moderating mechanism of PSN in the relationship between ATR and CFB. CFB researchers may use this study as an attempt to investigate other public behaviours toward climate change issues in the light of various components of social networks (Wang & Zhang, 2022). The study is a unique theoretical framework that offers more profound insights into consumer-friendly behaviour's unique psychological and motivational mechanism. Further, future studies should emphasize tapping more CFB antecedents to identify other potential motivators.

6.1.2 Practical contributions

A crucial challenge for the country is aligning and motivating climate anxiety in individuals towards CFB instead of leaving them to suffer with severe mental and other health-related issues. Many studies have found this notion to be of crucial importance (Uenal et al., 2021) and thus our study supports policymakers by drawing their attention to climate-friendly philosophy at both the individual (via self-efficacy) as well as collective (via social norms) levels. Biswas et al. (2022) argued that the promotion of eco-centric leadership behaviour may enhance voluntary environmental behaviour of employees in a developing country where workers remain leader-centric and engage in task-related roles. Cop et al. (2020) suggested that training of employees on environment-friendly practices leads to increased commitment as well as organizational citizenship behaviour. Thus, managers are advised to

build the notion of eco-friendly work behaviour in their organizations by promoting eco-friendly practices through inculcating intervention modules in employee training programs. Also, a study conducted by Tavakolifar et al. (2021) on S&P 1500 companies revealed that its media investment to propel branding and environmental protection measures exceed the costs associated with meeting its commitment towards climate supportive practices. PSN have been found to significantly influence consumer's environmental attitudes and green buying behaviour, and therefore social norms need to be internalized in order to establish the consumer's green buying behaviour (Lin & Niu, 2018). Thus, our study also suggests that policy builders use media functions such as issue framing and agenda-setting to transform the lower proclivity climate action firms toward enhanced commitment climate action. This alignment will encourage sustainable CFB at both the individual and corporate levels.

At industry level, the corporate strategy of keeping emphasis on improving energy efficiency can further boost the socio-economic objective of green entrepreneurship (Drago & Gatto, 2022). Kaipainen & Aarikka-Stenroos (2022) indicated that techno-innovations are no longer merely inputs for strategic frameworks but stay even beyond the implementation stage toward building sustainable advantages, arguing that the techno-strategic alignment should be in consonance with the strategic renewal to accomplish sustainability. Jell-Ojobor & Raha (2022) suggested that a certified environmental management system mediates the relationship of green supply chain management practices and corporate financial performance, emphasizing improving corporate performance through environment-friendly management practices. Nguyen & Adomako (2022) suggested that an extended facilitative support of financial resources to environmental management practices will lead to improvement in environmental performance. Thus, managers are advised to adopt innovative eco-friendly behaviour into corporate strategic frameworks to achieve climate friendly sustainable management practices. Existing literature brings to light the various antecedents of CFB, but the critical empirical results on mediating and moderating propositions of this study highlight specific deeper areas for future researchers to understand more about people's dispositions toward climate change issues (Hornsey et al., 2021; Vázquez et al., 2021). A few other studies touch on the mediating and moderating roles of CFB determinants, highlighting VBN theory and self-efficacy theory toward supportive environmental practices (Perera et al., 2022; Rainear & Christensen, 2022). This study thus provides a solid base for future researchers to optimize initiatives to support climate-friendly practices.

The present study also suggests that governments, environmental leaders and policymakers should build strategies to promote a climate-friendly environment through social norms and efficacy development. Seebauer & Babcicky (2020) found that social norms build self-efficacy toward people's behaviour that is displayed in the public domain. PSE further act as a core driver of private flood mitigation. Thus, an appropriate governing model to improve awareness of climate-friendly practices will enable efficacious and socially susceptible individuals to be more adaptable toward pro-environmental behaviours.

7. Conclusion

The study draws a few concrete conclusive strands to CFB research. The study evaluates the impact of ATR on CFB and the mediating and moderating roles of PSE and PSN on this association. The researchers proposed a conceptual CFB framework and used PLS strategy to empirically examine whether individual level ATR facilitates CFB that can further develop environmental sustainability. The findings of the study indicate that ATR positively impacts CFB. The results of the study also show that PSE mediates the relationship between ATR and CFB. Further, analytical insights have revealed that PSN enhance the positive impact of ATR on CFB.

The authors have reached the deductive terminal of advocating the impact of climate issues awareness at an individual level to encourage climate friendly behaviours. Indicatively, the effectiveness of mass awareness of rising concerns of climate change will largely rely upon individual level interpretation of the negative impacts of climate change. Therefore, the individual level participation toward environmental sustainability should be emphasized rather than just maintaining focus on the government role of mitigating climate change issues.

In accordance with the empirical revelations, it can be derived that self-efficacious individuals are comparatively better prepared to absorb environmental shocks; they respond more effectively with climate friendly actions, supporting pro-environmental behaviours. Social norms provide supportive moderation on the relationship of an individual’s climate perception and climate friendly dispositions, making environmental sustainability more attainable. In addition, societal promotional events justifying climate change concerns and

highlighting the significance of corresponding climate change mitigating behaviours can support self-efficacious individuals toward climate friendly behaviours. Arguably, the study is a rare effort to theoretically and empirically examine environmentally sustainable CFB within the individual spectrum.

7.1 Limitations and Future Scope of Research

Despite the many worthy theoretical and practical contributions proposed in the study, a few important insights open new pathways for future research on CFB literature. The present study is of a cross-sectional nature whereas a longitudinal study may delve deeper into the varying perceptions of people toward climate change aspects. Secondly, the study involved respondents only from India and if future researchers can expand the horizon of study to other countries, then the results of the study can be verified in a cross-cultural context. The third limitation of the study is that the respondents were evaluated on self-reporting scales. Future researchers are recommended to attempt a qualitative approach to examine CFB mechanisms.

References

Adu, D. A. (2022). Sustainable banking initiatives, environmental disclosure and financial performance: The moderating impact of corporate governance mechanisms. *Business Strategy and the Environment*, 31(5), 2365–2399. https://doi.org/10.1002/bse.3033

Agrawal, R., Wankhede, V. A., Kumar, A., Upadhyay, A., & Garza-Reyes, J. A. (2021). Nexus of circular economy and sustainable business performance in the era of digitalization. *International Journal of Productivity and Performance Management*, *71*(3), 748-774. https://doi.org/10.1108/IJPPM-12-2020-0676

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior 1. *Journal of Applied Social Psychology*, 32(4), 665–683. https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

Amaro, S., & Duarte, P. (2015). An integrative model of consumers' intentions to purchase travel online. *Tourism management*, *46*, 64-79. https://doi.org/10.1016/j.tourman.2014.06.006

Arıkan, G., & Günay, D. (2021). Public attitudes towards climate change: A cross-country analysis. *The British Journal of Politics and International Relations*, 23(1), 158–174. https://doi.org/10.1177/1369148120951013

Ballew, M. T., Leiserowitz, A., Roser-Renouf, C., Rosenthal, S. A., Kotcher, J. E., Marlon, J. R., Lyon, E., Goldberg, M. H., & Maibach, E. W. (2019). Climate change in the American mind: Data, tools, and trends. *Environment: Science and Policy for Sustainable Development*, 61(3), 4–18. https://doi.org/10.1080/00139157.2019.1589300

Bandura, A. (1986). Social foundations of thought and action. *Englewood Cliffs*, New Jersey. https://psycnet.apa.org/record/1985-98423-000

Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science*, 9(3), 75–78. https://doi.org/10.1111/1467-8721.00064

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Beak, Y., Kim, K., Maeng, K., & Cho, Y. (2020). Is the environment-friendly factor attractive to customers when purchasing electric vehicles? Evidence from South Korea. *Business Strategy and the Environment*, 29(3), 996–1006. https://doi.org/10.1002/bse.2412

Bhatia, M. S., & Kumar, S. (2022). Linking stakeholder and competitive pressure to Industry 4.0 and performance: Mediating effect of environmental commitment and green process innovation. *Business Strategy and the Environment*, 31(5), 1905–1918. https://doi.org/10.1002/bse.2989

Biswas, S. R., Uddin, M. A., Bhattacharjee, S., Dey, M., & Rana, T. (2022). Ecocentric leadership and voluntary environmental behavior for promoting sustainability strategy: The role of psychological green climate. *Business Strategy and the Environment*, 31(4), 1705–1718. https://doi.org/10.1002/bse.2978

Bouman, T., Verschoor, M., Albers, C. J., Böhm, G., Fisher, S. D., Poortinga, W., Whitmarsh, L., & Steg, L. (2020). When worry about climate change leads to climate action: How values, worry and personal responsibility relate to various climate actions. *Global Environmental Change*, 62, 102061. https://doi.org/10.1016/j.gloenvcha.2020.102061

Bryant, A., Griffin, J. J., & Perry, V. G. (2020). Mitigating climate change: A role for regulations and risk-taking. *Business Strategy and the Environment*, 29(2), 605–618. https://doi.org/10.1002/bse.2391

Caby, J., Ziane, Y., & Lamarque, E. (2020). The determinants of voluntary climate change disclosure commitment and quality in the banking industry. *Technological Forecasting and Social Change*, 161, 120282. https://doi.org/10.1016/j.techfore.2020.120282

Chan, R. Y., Lai, J. W., & Kim, N. (2022). Strategic motives and performance implications of proactive versus reactive environmental strategies in corporate sustainable development. *Business Strategy and the Environment*, 31(5), 2127–2142. https://doi.org/10.1002/bse.3011

Clayton, S., Prévot, A. C., Germain, L., & Saint-Jalme, M. (2017). Public support for biodiversity after a zoo visit: Environmental concern, conservation knowledge, and self-efficacy. *Curator: The Museum Journal*, 60(1), 87-100. https://doi.org/10.1111/cura.12188

Clayton, S. (2017). Social issues and personal life: considering the environment. *Journal of Social Issues*, 73(3), 667-681. https://doi.org/10.1111/josi.12237

Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, 74, 102263. https://doi.org/10.1016/j.janxdis.2020.102263

Cop, S., Alola, U. V., & 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*, 29(8), 3495–3508. https://doi.org/10.1002/bse.2592

Crecente, F., Sarabia, M., & del Val, M. T. (2021). Climate change policy and entrepreneurial opportunities. *Technological Forecasting and Social Change*, 163, 120446. https://doi.org/10.1016/j.techfore.2020.120446.

Daddi, T., Todaro, N. M., De Giacomo, M. R., & Frey, M. (2018). A systematic review of the use of organization and management theories in climate change studies. *Business Strategy and the Environment*, 27(4), 456–474. https://doi.org/10.1002/bse.2015

Danks, N.P. and Ray, S. (2018). Predictions from Partial Least Squares Models, Ali, F., Rasoolimanesh, S.M. and Cobanoglu, C. (Ed.) Applying Partial Least Squares in

Tourism and Hospitality Research, *Emerald Publishing Limited,* Bingley, 35-52. https://doi.org/10.1108/978-1-78756-699-620181003

Devine-Wright, P., & Clayton, S. (2010). Introduction to the special issue: Place, identity and environmental behaviour. *Journal of Environmental psychology*, 30(3), 267-270. https://doi.org/10.1016/S0272-4944(10)00078-2

Di Gregorio, M., Fatorelli, L., Paavola, J., Locatelli, B., Pramova, E., Nurrochmat, D. R., May, P. H., Brockhaus, M., Sari, I. M., & Kusumadewi, S. D. (2019). Multi-level governance and power in climate change policy networks. *Global Environmental Change*, 54, 64–77. https://doi.org/10.1016/j.gloenvcha.2018.10.003

Dijkstra, T. K., & Henseler, J. (2011). Linear indices in nonlinear structural equation models: Best fitting proper indices and other composites. *Quality & Quantity*, 45(6), 1505–1518. https://doi.org/10.1007/s11135-010-9359-z

Doherty, K. L., & Webler, T. N. (2016). Social norms and efficacy beliefs drive the alarmed segment's public-sphere climate actions. *Nature Climate Change*, 6(9), 879–884. https://doi.org/10.1038/nclimate3025

Doherty, T. J., & Clayton, S. (2011). The psychological impacts of global climate change. *American Psychologist*, *66*(4), 265. https://doi.org/10.1037/a0023141

Dong, X., Jiang, B., Zeng, H., & Kassoh, F. S. (2022). Impact of trust and knowledge in the food chain on motivation-behavior gap in green consumption. *Journal of Retailing and Consumer Services*, 66, 10295. https://doi.org/10.1016/j.jretconser.2022.102955

Drago, C., & Gatto, A. (2022). An interval-valued composite indicator for energy efficiency and green entrepreneurship. *Business Strategy and the Environment*, *31*(5), 2107–2126. https://doi.org/10.1002/bse.3010

Duc, K. N., Ancev, T., & Randall, A. (2021). Farmers' choices of climate-resilient strategies: Evidence from Vietnam. *Journal of Cleaner Production*, 317, 128399. https://doi.org/10.1016/j.jclepro.2021.128399

Eom, K., Kim, H. S., & Sherman, D. K. (2018). Social class, control, and action: Socioeconomic status differences in antecedents of support for pro-environmental action. *Journal of Experimental Social Psychology*, 77, 60–75. https://doi.org/10.1016/j.jesp.2018.03.009

Fadeeva, Z., & Van Berkel, R. (2021). Unlocking circular economy for prevention of marine plastic pollution: An exploration of G20 policy and initiatives. *Journal of Environmental Management*, 277, 111457. https://doi.org/10.1016/j.jenvman.2020.111457

Falavigna, G., & Ippoliti, R. (2022). Financial constraints, investments, and environmental strategies: An empirical analysis of judicial barriers. *Business Strategy and the Environment*, 31(5), 2002–2018. https://doi.org/10.1002/bse.2995

Farrow, K., Grolleau, G., & Ibanez, L. (2017). Social norms and pro-environmental behavior: A review of the evidence. *Ecological Economics*, *140*, 1-13. https://doi.org/10.1016/j.ecolecon.2017.04.017

Fatica, S., & Panzica, R. (2021). Green bonds as a tool against climate change? *Business Strategy and the Environment*, 30(5), 2688–2701. https://doi.org/10.1002/bse.2771

Feldman, L., Hart, P. S., Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2017). Do hostile media perceptions lead to action? The role of hostile media perceptions, political efficacy, and ideology in predicting climate change activism. *Communication Research*, 44(8), 1099–1124. https://doi.org/10.1177/0093650214565914

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. https://doi.org/10.1177/002224378101800104

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing Moderator and Mediator Effects in Counseling Psychology Research. *Journal of Counseling Psychology,* 51*(1)*, 115–134. https://doi.org/10.1037/0022-0167.51.1.115

Friedrich, T. J., Velte, P., & Wulf, I. (2022). Corporate climate reporting of European banks: Are these institutions compliant with climate issues? *Business Strategy and the Environment*. https://doi.org/10.1002/bse.3272

Gardner, L. A., Magee, C. A., & Vella, S. A. (2017). Enjoyment and behavioral intention predict organized youth sport participation and dropout. *Journal of Physical Activity and Health*, 14(11), 861–865. https://doi.org/10.1123/jpah.2016-0572

Gifford, R., Kormos, C., & McIntyre, A. (2011). Behavioral dimensions of climate change: Drivers, responses, barriers, and interventions. *Wiley Interdisciplinary Reviews: Climate Change*, 2(6), 801–827. https://doi.org/10.1002/wcc.143

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, 35(3), 472–482. https://doi.org/10.1086/586910

Granco, G., Caldas, M., Bergtold, J., Stamm, J. L. H., Mather, M., Sanderson, M., ... & Ramsey, S. (2022). Local environment and individuals' beliefs: The dynamics shaping public support for sustainability policy in an agricultural landscape. *Journal of Environmental Management*, 301, 113776. https://doi.org/10.1016/j.jenvman.2021.113776

Greaves, W. (2021). Climate change and security in Canada. *International Journal: Canada's Journal of Global Policy Analysis*, 76(2), 183–203. https://doi.org/10.1177/00207020211019325

Groshong, L., Stanis, S. W., Morgan, M., & Li, C. J. (2020). Place attachment, climate friendly behavior, and support for climate friendly management action among state park visitors. *Environmental Management*, 65(1), 98–110. https://doi.org/10.1007/s00267-019-01229-9

Gulzari, A., Wang, Y., & Prybutok, V. (2022). A green experience with eco-friendly cars: A young consumer electric vehicle rental behavioral model. *Journal of Retailing and Consumer Services*, 65, 102877. https://doi.org/10.1016/j.jretconser.2021.102877

Gunderson, I., Goyette, S., Gago-Silva, A., Quiquerez, L., & Lehmann, A. (2015). Climate and land-use change impacts on potential solar photovoltaic power generation in the black sea region. *Environmental Science & Policy*, 46, 70–81. https://doi.org/10.1016/j.envsci.2014.04.013

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science*, 45(5), 616–632. https://doi.org/10.1007/s11747-017-0517-x

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107–123. https://doi.org/10.1504/IJMDA.2017.087624

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Halpenny, E. A. (2010). Pro-environmental behaviours and park visitors: The effect of place attachment. *Journal of Environmental Psychology*, 30(4), 409–421.
https://doi.org/10.1016/j.jenvp.2010.04.006

Han, H. (2020). Theory of green purchase behavior (TGPB): A new theory for sustainable consumption of green hotel and green restaurant products. *Business Strategy and the Environment*, 29(6), 2815–2828. https://doi.org/10.1002/bse.2545

Hansen, J., Kharecha, P., Sato, M., Masson-Delmotte, V., Ackerman, F., Beerling, D. J., Hearty, P. J., Hoegh-Guldberg, O., Hsu, S.-L., & Parmesan, C. (2013). Assessing "dangerous climate change": Required reduction of carbon emissions to protect young people, future generations and nature. *PloS One*, 8(12), e81648. https://doi.org/10.1371/journal.pone.0081648

Helm, S., Eggert, A., & Garnefeld, I. (2010). Modeling the impact of corporate reputation on customer satisfaction and loyalty using partial least squares. In *Handbook of partial least squares*, 515–534. Springer. https://doi.org/10.1007/978-3-540-32827-8_23

Henseler, J., & Chin, W. W. (2010). A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. *Structural Equation Modeling*, 17(1), 82–109. https://doi.org/10.1080/10705510903439003

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. *Industrial Management & Data Systems*, 116(1), 2–20. https://doi.org/10.1108/IMDS-09-2015-0382

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hine, D. W., Phillips, W. J., Cooksey, R., Reser, J. P., Nunn, P., Marks, A. D., Loi, N. M., & Watt, S. E. (2016). Preaching to different choirs: How to motivate dismissive, uncommitted, and alarmed audiences to adapt to climate change? *Global Environmental Change*, 36, 1–11. https://doi.org/10.1016/j.gloenvcha.2015.11.002

Ho, T. T., & Shimada, K. (2021). The effects of multiple climate change responses on economic performance of rice farms: Evidence from the Mekong Delta of Vietnam. *Journal of Cleaner Production*, 315, 128129. https://doi.org/10.1016/j.jclepro.2021.128129

Hoogendoorn, G., Stockigt, L., Saarinen, J., & Fitchett, J. M. (2021). Adapting to climate change: The case of snow-based tourism in Afriski, Lesotho. *African Geographical Review*, 40, 92–104. https://doi.org/10.1080/19376812.2020.1773878

Hornsey, M. J., Chapman, C. M., & Oelrichs, D. M. (2021). Ripple effects: Can information about the collective impact of individual actions boost perceived efficacy about climate change? *Journal of Experimental Social Psychology*, 97, 104217. https://doi.org/10.1016/j.jesp.2021.104217

Hopwood, T. L., Schutte, N. S., & Loi, N. M. (2019). Stress responses to secondary trauma: Compassion fatigue and anticipatory traumatic reaction among youth workers. *The Social Science Journal*, 56(3), 337-348. https://doi.org/10.1016/j.soscij.2018.08.008

Hrabok, M., Delorme, A., & Agyapong, V. I. (2020). Threats to mental health and well-being associated with climate change. *Journal of Anxiety Disorders*, 76, 102295. https://doi.org/10.1016/j.janxdis.2020.102295

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hu, S., Li, Z., Zhang, J., & Zhu, J. (2018). Engaging scientists in science communication: The effect of social proof and meaning. *Journal of Cleaner Production*, 170, 1044–1051. https://doi.org/10.1016/j.jclepro.2017.09.210

Huiskamp, U., ten Brinke, B., & Kramer, G. J. (2022). The climate resilience cycle: Using scenario analysis to inform climate-resilient business strategies. *Business Strategy and the Environment*, 31(4), 1763–1775. https://doi.org/10.1002/bse.2982

Hynes, N., & Wilson, J. (2016). I do it, but don't tell anyone! Personal values, personal and social norms: Can social media play a role in changing pro-environmental behaviours? *Technological Forecasting and Social Change*, 111, 349–359. https://doi.org/10.1016/j.techfore.2016.06.034

IPCC (2022). AR6 Synthesis Report: Climate Change 2022, Univ. Press, Cambridge, U K and New York, USA: Available at: https://www.ipcc.ch/report/sixth-assessment-report-cycle/

Ivanova, D., Stadler, K., Steen-Olsen, K., Wood, R., Vita, G., Tukker, A., & Hertwich, E. G. (2016). Environmental impact assessment of household consumption. *Journal of Industrial Ecology*, *20*(3), 526–536. https://doi.org/10.1111/jiec.12371

Jakučionytė-Skodienė, M., & Liobikienė, G. (2021). Climate change concern, personal responsibility and actions related to climate change mitigation in EU countries: Cross-cultural analysis. *Journal of Cleaner Production*, 281, 125189. https://doi.org/10.1016/j.jclepro.2020.125189

Jaeger, B., & Upadhyay, A. (2020). Understanding barriers to circular economy: cases from the manufacturing industry. *Journal of Enterprise Information Management*, 33(4), 729-745. https://doi.org/10.1108/JEIM-02-2019-0047

Jell-Ojobor, M., & Raha, A. (2022). Being good at being good—The mediating role of an environmental management system in value-creating green supply chain management practices. *Business Strategy and the Environment*, 31(5), 1964–1984. https://doi.org/10.1002/bse.2993

Jugert, P., Greenaway, K. H., Barth, M., Büchner, R., Eisentraut, S., & Fritsche, I. (2016). Collective efficacy increases pro-environmental intentions through increasing self-efficacy. *Journal of Environmental Psychology*, 48, 12–23.

https://doi.org/10.1016/j.jenvp.2016.08.003

Kaipainen, J., & Aarikka-Stenroos, L. (2022). How to renew business strategy to achieve sustainability and circularity? A process model of strategic development in incumbent technology companies. *Business Strategy and the Environment*, 31(5), 1947–1963. https://doi.org/10.1002/bse.2992

Karn, I., Mendiratta, E., Fehre, K., & Oehmichen, J. (2022). The effect of corporate governance on corporate environmental sustainability: A multilevel review and research agenda. *Business Strategy and the Environment*, 1–36. https://doi.org/10.1002/bse.3279

Karpudewan, M. (2019). The relationships between values, belief, personal norms, and climate conserving behaviors of Malaysian primary school students. *Journal of Cleaner Production*, 237, 117748. https://doi.org/10.1016/j.jclepro.2019.117748

Kim, S. H., & Seock, Y.-K. (2019). The roles of values and social norm on personal norms and pro-environmentally friendly apparel product purchasing behavior: The mediating role of personal norms. *Journal of Retailing and Consumer Services*, 51, 83–90. https://doi.org/10.1016/j.jretconser.2019.05.023

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, 28(1), 227–261. https://doi.org/10.1111/isj.12131

Kühnen, M., Silva, S., & Hahn, R. (2022). From negative to positive sustainability performance measurement and assessment? A qualitative inquiry drawing on framing effects theory. *Business Strategy and the Environment*, 31(5), 1985–2001. https://doi.org/10.1002/bse.2994

Kumar, N., Brint, A., Shi, E., Upadhyay, A., & Ruan, X. (2019). Integrating sustainable supply chain practices with operational performance: an exploratory study of Chinese SMEs. *Production Planning & Control*, *30*(5-6), 464-478. https://doi.org/10.1080/09537287.2018.1501816

Laing, T., Upadhyay, A., Mohan, S., & Subramanian, N. (2019). Environmental improvement initiatives in the coal mining industry: maximisation of the triple bottom line. *Production Planning & Control*, *30*(5-6), 426-436. https://doi.org/10.1080/09537287.2018.1501813

Larsen, K. S. (1974). Conformity in the Asch experiment. *The Journal of Social Psychology*, 94(2), 303–304. https://doi.org/10.1080/00224545.1974.9923224

Lee, T., Liu, C.-H. S., & Li, P.-H. (2021). The influences of cooperative climate, competitive climate and customer empowerment on service creativity. *Journal of Retailing and Consumer Services*, 63, 102726. https://doi.org/10.1016/j.jretconser.2021.102726

Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Howe, P. (2013). Americans' actions to limit global warming in April 2013. *Yale University and George Mason*

University. New Haven, CT: Yale Project on Climate Change Communication. https://www.climatechangecommunication.org/wp-content/uploads/2016/03/April-2013-Americans-Actions-to-Limit-Global-Warming-2013.pdf

Lin, S.-T., & Niu, H.-J. (2018). Green consumption: E nvironmental knowledge, environmental consciousness, social norms, and purchasing behavior. *Business Strategy and the Environment*, 27(8), 1679–1688. https://doi.org/10.1002/bse.2233

Lo, A. Y. (2013). The role of social norms in climate adaptation: Mediating risk perception and flood insurance purchase. *Global Environmental Change*, 23(5), 1249–1257. https://doi.org/10.1016/j.gloenvcha.2013.07.019

Lohmöller, J.-B. (2013). *Latent variable path modeling with partial least squares*. Springer Science & Business Media.

Loy, L. S., Hamann, K. R., & Reese, G. (2020). Navigating through the jungle of information. Informational self-efficacy predicts climate change-related media exposure, knowledge, and behaviour. *Climatic Change*, 163(4), 2097–2116. https://doi.org/10.1007/s10584-020-02918-9

Lubell, M., Zahran, S., & Vedlitz, A. (2007). Collective action and citizen responses to global warming. *Political Behavior*, 29(3), 391–413. https://doi.org/10.1007/s11109-006-9025-2

Luszczynska, A., Schwarzer, R., Lippke, S., & Mazurkiewicz, M. (2011). Self-efficacy as a moderator of the planning–behaviour relationship in interventions designed to promote physical activity. *Psychology and Health*, *26*(2), 151-166. https://doi.org/10.1080/08870446.2011.531571

Mah, A. Y., Chapman, D. A., Markowitz, E. M., & Lickel, B. (2020). Coping with climate change: Three insights for research, intervention, and communication to promote adaptive coping to climate change. *Journal of Anxiety Disorders*, 75, 102282. https://doi.org/10.1016/j.janxdis.2020.102282

Maibach, E., Roser-Renouf, C., & Leiserowitz, A. (2009). Global warming's six Americas 2009: An audience segmentation analysis. *Yale Project on Climate Change, Yale University and George Mason University, New Haven, CT*. https://cdn.americanprogress.org/wp-content/uploads/issues/2009/05/pdf/6americas.pdf

Manika, D., Antonetti, P., Papagiannidis, S., & Guo, X. (2021). How Pride Triggered by Pro-environmental Technology Adoption Spills Over into Conservation Behaviours: A Social Business Application. *Technological Forecasting and Social Change*, 172, 121005. https://doi.org/10.1016/j.techfore.2021.121005

Martiskainen, M., Axon, S., Sovacool, B. K., Sareen, S., Del Rio, D. F., & Axon, K. (2020). Contextualizing climate justice activism: Knowledge, emotions, motivations, and actions among climate strikers in six cities. *Global Environmental Change*, 65, 102180. https://doi.org/10.1016/j.gloenvcha.2020.102180

Manzanedo, R. D., & Manning, P. (2020). Covid-19: Lessons for the climate change emergency. *Science of the Total Environment*, 742, 140563. https://doi.org/10.1016/j.scitotenv.2020.140563

Mavrodieva, A. V., Rachman, O. K., Harahap, V. B., & Shaw, R. (2019). Role of social media as a soft power tool in raising public awareness and engagement in addressing climate change. *Climate*, 7(10), 122. https://doi.org/10.3390/cli7100122

McCright, A. M., & Dunlap, R. E. (2003). Defeating kyoto: The conservative movement's impact on us climate change policy. *Social Problems*, 50(3), 348–373. https://doi.org/10.1525/sp.2003.50.3.348

McGlade, J., Bankoff, G., Abrahams, J., Cooper-Knock, S. J., Cotecchia, F., Desanker, P., ... & Wood, M. (2019). Global assessment report on disaster risk reduction, 1-28. Accessed on 10 January 2021. https://discovery.ucl.ac.uk/id/eprint/10087200/1/GAR19%20Distilled_FINAL.pdf

Mikulčić, H., Baleta, J., Wang, X., Duić, N., & Dewil, R. (2022). Sustainable development in period of climate crisis. *Journal of Environmental Management*, 303, 114271. https://doi.org/10.1016/j.jenvman.2021.114271.

Milfont, T. L., & Markowitz, E. (2016). Sustainable consumer behavior: A multilevel perspective. *Current Opinion in Psychology*, *10*, 112-117. https://doi.org/10.1016/j.copsyc.2015.12.016

Morren, M., & Grinstein, A. (2016). Explaining environmental behavior across borders: A meta-analysis. *Journal of Environmental Psychology*, *47*, 91-106. https://doi.org/10.1016/j.jenvp.2016.05.003

Nguyen, N. P., & Adomako, S. (2022). International orientation and environmental performance in Vietnamese exporting small-and medium-sized enterprises. *Business Strategy and the Environment*, 31(5), 2424–2436. https://doi.org/10.1002/bse.3035

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34(7), 913–923. https://doi.org/10.1177/0146167208316691

Ockwell, D., Whitmarsh, L., & O'Neill, S. (2009). Reorienting climate change communication for effective mitigation: Forcing people to be green or fostering grass-roots engagement? *Science Communication*, 30(3), 305–327. https://doi.org/10.1177/1075547008328969

Ogunbode, C. A., Böhm, G., Capstick, S. B., Demski, C., Spence, A., & Tausch, N. (2019). The resilience paradox: Flooding experience, coping and climate change mitigation intentions. *Climate Policy*, 19(6), 703–715. https://doi.org/10.1080/14693062.2018.1560242

Ogunbode, C. A., Doran, R., Hanss, D., Ytre-Arne, B., Moe, H., Ojala, M., & Salmela-Aro, K. (2019). Investigating associations between Media Exposure, Climate Anxiety and Mental Health (MECAMH). Retrieved from osf.io/6n4rb accessed date:August,2021

Ojala, M., Cunsolo, A., Ogunbode, C. A., & Middleton, J. (2021). Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review. *Annual Review of Environment and Resources*, 46, 35–58. https://doi.org/10.1146/annurev-environ-012220-022716

Ojedokun, A. O., & Balogun, S. K. (2010). Environmental attitude as a mediator of the relationship between self-concept, environmental self-efficacy and responsible environmental behaviour among residents of high density areas in ibadan metropolis, Nigeria. *Ethiopian Journal of Environmental Studies and Management*, 3(2), 111–119. https://doi.org/10.4314/ejesm.v3i2.59834

Perera, C. R., Kalantari, H., & Johnson, L. W. (2022). Climate Change Beliefs, Personal Environmental Norms and Environmentally Conscious Behaviour Intention. *Sustainability*, 14(3), 1824. https://doi.org/10.3390/su14031824

Perrin, S., & Spencer, C. (1981). Independence or conformity in the Asch experiment as a reflection of cultural and situational factors. *British Journal of Social Psychology*, *20*(3), 205–209. https://doi.org/10.1111/j.2044-8309.1981.tb00533.x

Rainear, A. M., & Christensen, J. L. (2022). Examining Pre-existing Environmental Beliefs: Using a PSA to Investigate the Role of Self-Efficacy and Response Efficacy on Behavioral Intentions. *Communication Studies*, 73(2), 1–21. https://doi.org/10.1080/10510974.2022.2026426

Rainisio, N., Boffi, M., Pola, L., Inghilleri, P., Sergi, I., & Liberatori, M. (2022). The role of gender and self-efficacy in domestic energy saving behaviors: A case study in Lombardy, Italy. *Energy Policy*, 160, 112696. https://doi.org/10.1016/j.enpol.2021.112696

Ramkissoon, H., Smith, L. D. G., & Weiler, B. (2013). Testing the dimensionality of place attachment and its relationships with place satisfaction and pro-environmental

behaviours: A structural equation modelling approach. *Tourism Management*, *36*(June), 552–566. https://doi.org/10.1016/j.tourman.2012.09.003

Reichl, J., Cohen, J. J., Klöckner, C. A., Kollmann, A., & Azarova, V. (2021). The drivers of individual climate actions in Europe. *Global Environmental Change*, 71, 102390. https://doi.org/10.1016/j.gloenvcha.2021.102390

Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. *The International Journal of Human Resource Management*, 31(12), 1617–1643. https://doi.org/10.1080/09585192.2017.1416655

Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: From key beliefs to political action. *Climatic Change*, 125(2), 163–178. https://doi.org/10.1007/s10584-014-1173-5

Sabherwal, A., Ballew, M. T., van Der Linden, S., Gustafson, A., Goldberg, M. H., Maibach, E. W., Kotcher, J. E., Swim, J. K., Rosenthal, S. A., & Leiserowitz, A. (2021). The greta thunberg effect: Familiarity with greta thunberg predicts intentions to engage in climate activism in the United States. *Journal of Applied Social Psychology*, 51(4), 321–333. https://doi.org/10.1111/jasp.12737

Sahoo, S., Kumar, A., & Upadhyay, A. (2022). How do green knowledge management and green technology innovation impact corporate environmental performance? Understanding the role of green knowledge acquisition. *Business Strategy and the Environment*, 1-19. https://doi.org/10.1002/bse.3160

Sampei, Y., & Aoyagi-Usui, M. (2009). Mass-media coverage, its influence on public awareness of climate-change issues, and implications for Japan's national campaign to reduce greenhouse gas emissions. *Global Environmental Change*, 19(2), 203–212. https://doi.org/10.1016/j.gloenvcha.2008.10.005

Saracevic, S., & Schlegelmilch, B. B. (2021). The impact of social norms on pro-environmental behavior: A systematic literature review of the role of culture and self-construal. *Sustainability*, 13(9), 5156. https://doi.org/10.3390/su13095156.

Savani, K., Wadhwa, M., Uchida, Y., Ding, Y., & Naidu, N. V. R. (2015). When norms loom larger than the self: Susceptibility of preference–choice consistency to normative influence across cultures. *Organizational Behavior and Human Decision Processes, 129*, 70-79. https://doi.org/10.1016/j.obhdp.2014.09.001

Sawang, S., Sun, Y., & Salim, S. A. (2014). It's not only what I think but what they think! The moderating effect of social norms. *Computers & Education, 76*, 182-189. https://doi.org/10.1016/j.compedu.2014.03.017

Schmidt, K. (2020). Behavioral effects of guideline-provision on climate-friendly food choices–A psychological perspective. *Journal of Cleaner Production*, 277, 123284. https://doi.org/10.1016/j.jclepro.2020.123284

Schultz, P. W. (1999). Changing behavior with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology*, 21(1), 25–36. https://doi.org/10.1207/s15324834basp2101_3

Seebauer, S., & Babcicky, P. (2020). The sources of belief in personal capability: Antecedents of self-efficacy in private adaptation to flood risk. *Risk Analysis*, 40(10), 1967–1982. https://doi.org/10.1111/risa.13531

Sharma, M., Kumar, A., Luthra, S., Joshi, S., & Upadhyay, A. (2022). The impact of environmental dynamism on low-carbon practices and digital supply chain networks to enhance sustainable performance: An empirical analysis. *Business Strategy and the Environment*. 31(4), 1776-1788. https://doi.org/10.1002/bse.2983

Shim, D., Shin, J., & Kwak, S.-Y. (2018). Modelling the consumer decision-making process to identify key drivers and bottlenecks in the adoption of environmentally friendly products.

Business Strategy and the Environment, 27(8), 1409–1421. https://doi.org/10.1002/bse.2192

Shmueli, G., Ray, S., Estrada, J. M. V., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research*, 69(10), 4552–4564. https://doi.org/10.1016/j.jbusres.2016.03.049

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), 2322–2347. https://doi.org/10.1108/EJM-02-2019-0189

Smith, E. K., & Mayer, A. (2018). A social trap for the climate? Collective action, trust and climate change risk perception in 35 countries. *Global Environmental Change*, 49, 140–153. https://doi.org/10.1016/j.gloenvcha.2018.02.014

Sobel, M. E. (2008). Identification of causal parameters in randomized studies with mediating variables. *Journal of Educational and Behavioral Statistics*, 33(2), 230–251. https://doi.org/10.3102/1076998607307239

Sovacool, B. K., Newell, P., Carley, S., & Fanzo, J. (2022). Equity, technological innovation and sustainable behaviour in a low-carbon future. *Nature Human Behaviour*, 1–12. https://doi.org/10.1038/s41562-021-01257-8

Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424. http://web.stanford.edu/~kcarmel/CC_BehavChange_Course/readings/Stern_metareview_2000.pdf

Stern, P. C. (1999). Information, incentives, and proenvironmental consumer behavior. *Journal of Consumer Policy*, 22(4), 461–478. https://doi.org/10.1023/A:1006211709570

Tavakolifar, M., Omar, A., Lemma, T. T., & Samkin, G. (2021). Media attention and its impact on corporate commitment to climate change action. *Journal of Cleaner Production*, *313*(September), 127833. https://doi.org/10.1016/j.jclepro.2021.127833.

Thøgersen, J. (2006). Norms for environmentally responsible behaviour: An extended taxonomy. *Journal of environmental Psychology*, *26*(4), 247-261. https://doi.org/10.1016/j.jenvp.2006.09.004

Tonge, J., Ryan, M. M., Moore, S. A., & Beckley, L. E. (2015). The effect of place attachment on pro-environment behavioral intentions of visitors to coastal natural area tourist destinations. *Journal of Travel Research*, 54(6), 730–743. https://doi.org/10.1177/0047287514533010

Uenal, F., Sidanius, J., Roozenbeek, J., & Van der Linden, S. (2021). Climate change threats increase modern racism as a function of social dominance orientation and ingroup identification. *Journal of Experimental Social Psychology*, 97, 104228. https://doi.org/10.1016/j.jesp.2021.104228

Upadhyay, A., Kumar, A., Kumar, V., & Alzaben, A. (2021). A novel business strategies framework of do-it-yourself practices in logistics to minimise environmental waste and improve performance. *Business Strategy and the Environment*, 30(8), 3882–3892. https://doi.org/10.1002/bse.2846

Usman, M., Ndehedehe, C. E., Farah, H., & Manzanas, R. (2021). Impacts of climate change on the streamflow of a large river basin in the Australian tropics using optimally selected climate model outputs. *Journal of Cleaner Production*, 315, 128091. https://doi.org/10.1016/j.jclepro.2021.128091

Vaske, J. J., & Kobrin, K. C. (2001). Place attachment and environmentally responsible behavior. *The Journal of Environmental Education*, 32(4), 16–21. https://doi.org/10.1080/00958960109598658

Vázquez, A., Larzabal-Fernández, A., & Lois, D. (2021). Situational materialism increases climate change scepticism in men compared to women. *Journal of Experimental Social Psychology*, 96, 104163. https://doi.org/10.1016/j.jesp.2021.104163

Vesely, S., Masson, T., Chokrai, P., Becker, A. M., Fritsche, I., Klöckner, C. A., Tiberio, L., Carrus, G., & Panno, A. (2021). Climate change action as a project of identity: Eight meta-analyses. *Global Environmental Change*, 70, 102322. https://doi.org/10.1016/j.gloenvcha.2021.102322

Walker, G. J., & Chapman, R. (2003). Thinking like a park: The effects of sense of place, perspective-taking, and empathy on pro-environmental intentions. *Journal of Park & Recreation Administration*, 21(4), 71–86.

Wamsler, C., Osberg, G., Osika, W., Herndersson, H., & Mundaca, L. (2021). Linking internal and external transformation for sustainability and climate action: Towards a new research and policy agenda. *Global Environmental Change*, 71, 102373. https://doi.org/10.1016/j.gloenvcha.2021.102373

Wang, Y., & Zhang, C. (2022). Waste sorting in context: Untangling the impacts of social capital and environmental norms. *Journal of Cleaner Production*, 330, 129937. https://doi.org/10.1016/j.jclepro.2021.129937

Wolsko, C., Ariceaga, H., & Seiden, J. (2016). Red, white, and blue enough to be green: Effects of moral framing on climate change attitudes and conservation behaviors. *Journal of Experimental Social Psychology*, 65, 7–19. https://doi.org/10.1016/j.jesp.2016.02.005

Wullenkord, M. C., Tröger, J., Hamann, K. R., Loy, L. S., & Reese, G. (2021). Anxiety and climate change: A validation of the Climate Anxiety Scale in a German-speaking quota sample and an investigation of psychological correlates. *Climatic Change*, 168(3), 1–23. https://doi.org/10.1007/s10584-021-03234-6

Xavier, A. I. (2019). The European Union as a leading environmental player? A critical analysis on the policy and commitments towards global development and climate change. In *Climate Change and Global Development*, 135–151. https://doi.org/10.1007/978-3-030-02662-2_7

Xu, S., Stanis, S. W., Zhang, H., Groshong, L., & Morgan, M. (2020). Impact of travel distance and experience use history on visitors' climate friendly behavior and support for climate friendly management action. *Journal of Sustainable Tourism*, 29(6), 981–999. https://doi.org/10.1080/09669582.2020.1855435

Zoaka, J. D., Ekwueme, D. C., Güngör, H., & Alola, A. A. (2022). Will financial development and clean energy utilization rejuvenate the environment in BRICS economies? *Business Strategy and the Environment*, 31(5), 2156–2170. https://doi.org/10.1002/bse.3013

List of Tables

Table 1: Factor loadings and reliability of the constructs

Construct	CR	Cronbach's alpha	Rho	AVE	VIF	Discriminant Validity	Items	Factor loadings
Acceptable range	**>0.80**	**>0.70 and <0.95**	**>0.80**	**>0.05**	**>3 and<5**	**Approx. square root of AVE**		**>0.70**
Anticipatory Trauma reaction	0.919	0.901	0.914	0.561	1.571	0.748	ATR_1 ATR_2 ATR_4 ATR_5 ATR_6 ATR_8 ATR_9 ATR_10 ATR_11	0.712 0.846 0.600 0.838 0.692 0.761 0.817 0.756 0.829
Identification	0.906	0.791	0.791	0.827	1.208	0.703	Id_1 Id_2	0.909 0.865
Perceived social norms (general)	0.906	0.901	0.902	0.827	1.600	0.910	PSNg_1 PSNg_2 PSNg_3 PSNg_4	0.886 0.895 0.873 0.879
Perceived social norms (Specific)	0.896	0.844	0.847	0.683	1.500	0.878	PSNs_1 PSNs_2 PSNs_3 PSNs_4	0.810 0.858 0.861 0.773
Perceived self-efficacy	0.944	0.933	0.938	0.652	1.601	0.808	PSE_1 PSE_10 PSE_2 PSE_3 PSE_4 PSE_5 PSE_6 PSE_7 PSE_8 PSE_9	0.797 0.844 0.772 0.610 0.765 0.822 0.826 0.813 0.783 0.844
Climate-friendly behaviour	0.819	0.717	0.751	0.532	1.208	0.729	CFB_4 CFB_5 CFB_7 CFB_8	0.708 0.703 0.708 0.794

Table 2: The results of the structural model

Constructs	F Square	R Square	Q square
CFB	NA	0.187	0.088
PSE	0.327	0.247	0.154
PSN	0.505	0.348	0.199
ATR	0.020	NA	NA

Table 3: Model comparison by using PLS predict

Model	Latent Variable	RMSE	MAE	Q^2_predict
	CFB	0.980	0.750	0.061
Model 1: Simple Mediation	PSE	0.884	**0.709**	0.233
	PSN	**0.831**	0.671	**0.320**
Model 2: Serial mediation	CFB	0.973	**0.744**	0.069
	PSE	**0.883**	**0.709**	0.233
	PSN	0.842	0.683	0.303
Model 3: Simple mediation with two moderators' variables	**CFB**	***0.971***	***0.740***	***0.079***
	PSE	**0.885**	***0.709***	***0.234***
	PSN	***0.831***	***0.670***	***0.322***
Model 4: Complex mediation with two moderator variables	CFB	**0.971**	0.741	0.074
	PSE	0.887	0.711	0.231
	PSN	0.844	0.684	0.304

Note. Minimum values per construct remained printed in italic.

Table 4: Mediation effect of perceived self-efficacy and perceived social norms

Exogenous variables	Hypothesized mediating effect	Sobel test statistic	VAF	Types of mediation	*p*-values
PSE	ATR_PSE_CFB	4.33	0.332	Partial mediation (competitive mediation)	0.038
PSN	ATR_PSN_CFB	1.279	1.782	No mediation	0.200

Table 5: Hypothesis results

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	*t*- Statistics (|O/STDEV|)	*p*- Values	Hypothesis Result*
ATR ->CFB	0.165	0.169	0.082	2.025	**0.043**	**A**
PSN ->CFB	-0.094	-0.101	0.168	0.559	0.638	R
PSE ->CFB	0.396	0.407	0.173	2.289	**0.000**	**A**
Mediation						
ATR-PSN-CFB	-0.040	-0.038	0.056	0.715	0.474	R
ATR-PSE-CFB	0.197	0.205	0.090	2.179	**0.020**	**A**
Moderation						
Moderating Effect 1 (PSN)->CFB	0.242	0.246	0.124	1.956	**0.048**	**A**
Moderating Effect 2 (PSE)->CFB	-0.111	-0.108	0.070	1.590	0.112	R

*A: Accepted, R: Rejected

Figures

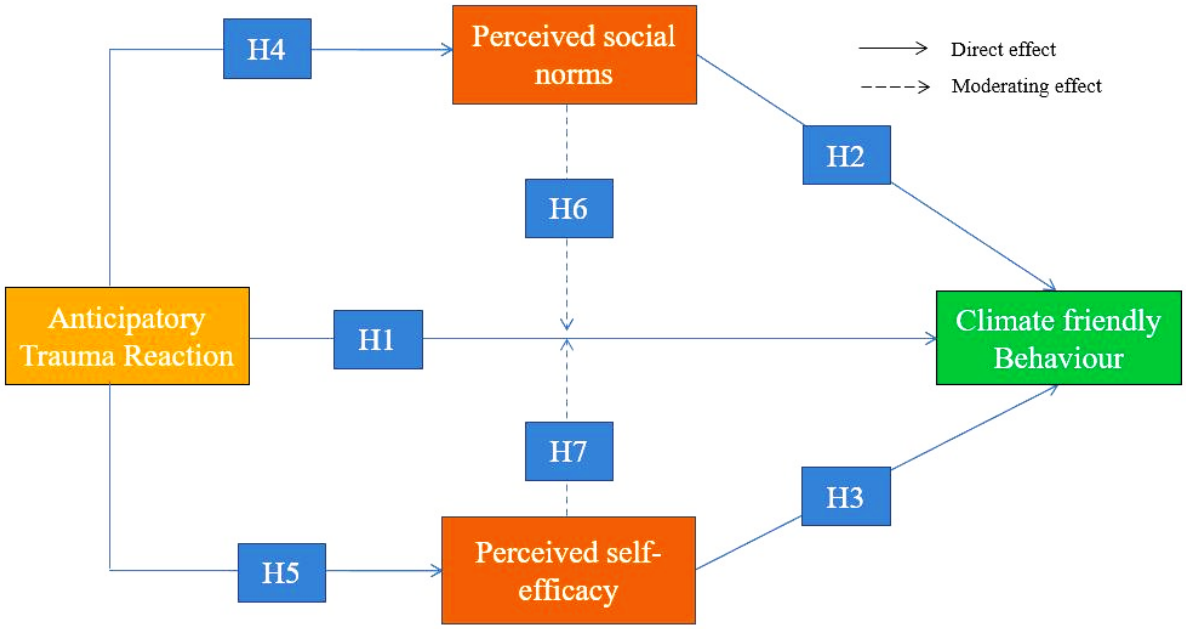

Figure 1. Conceptual model of climate-friendly behaviour

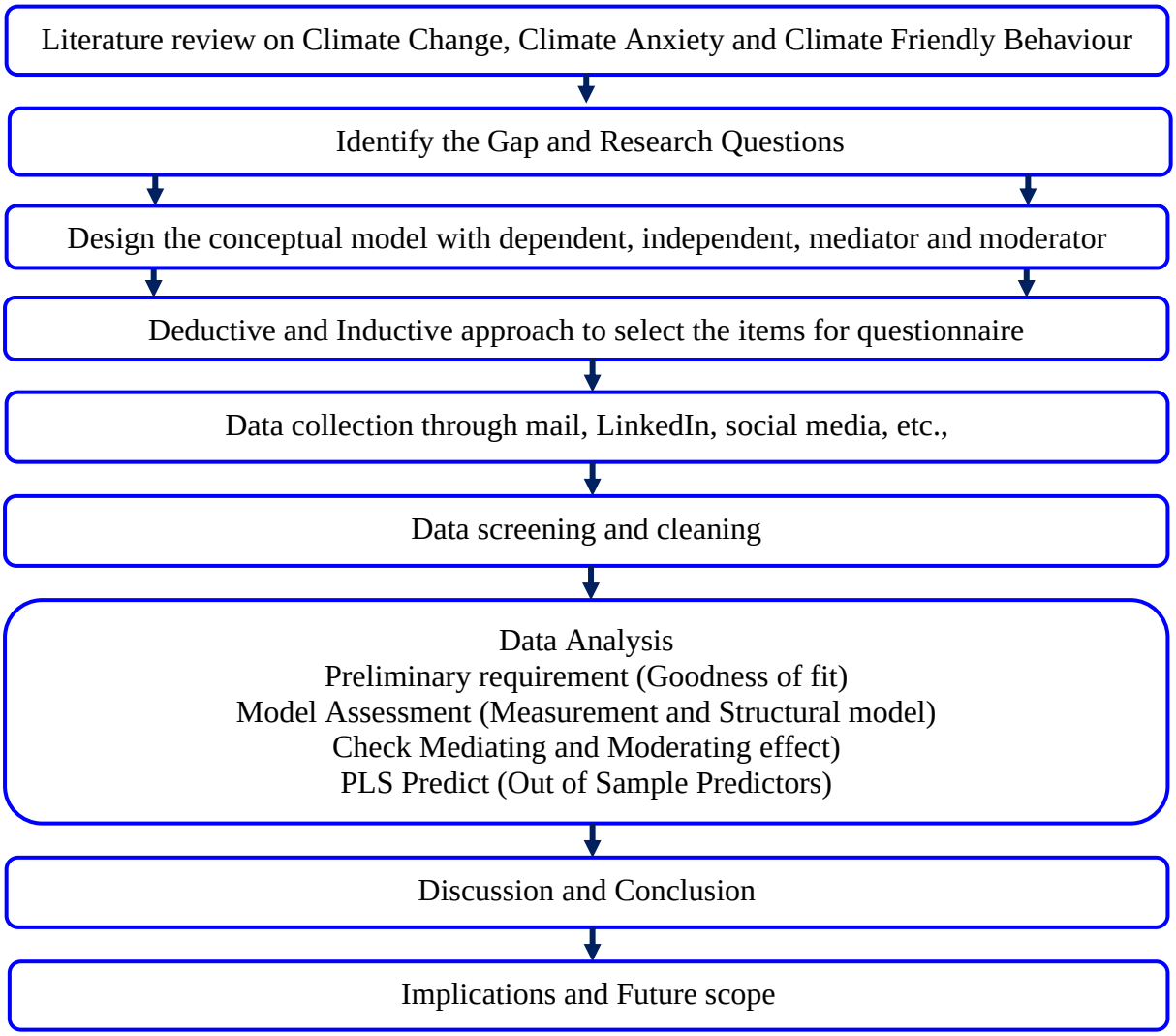

Figure 2. Systematic representation of study methodology

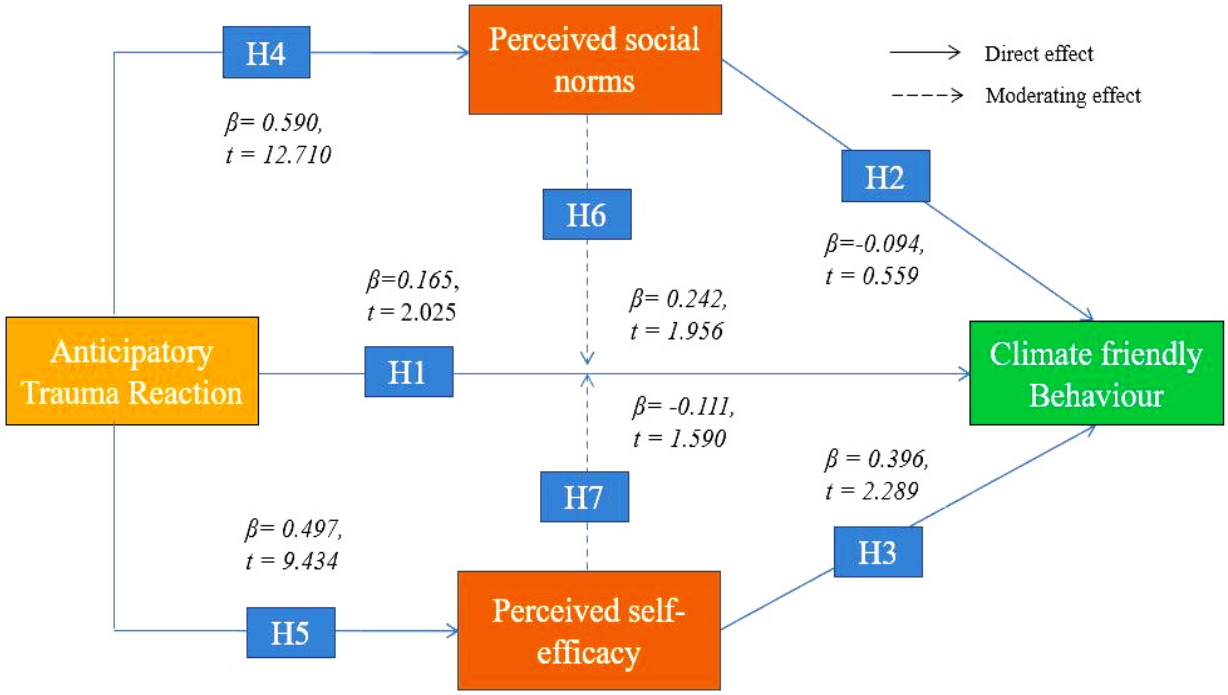

Figure 3. Conclusive structural model result

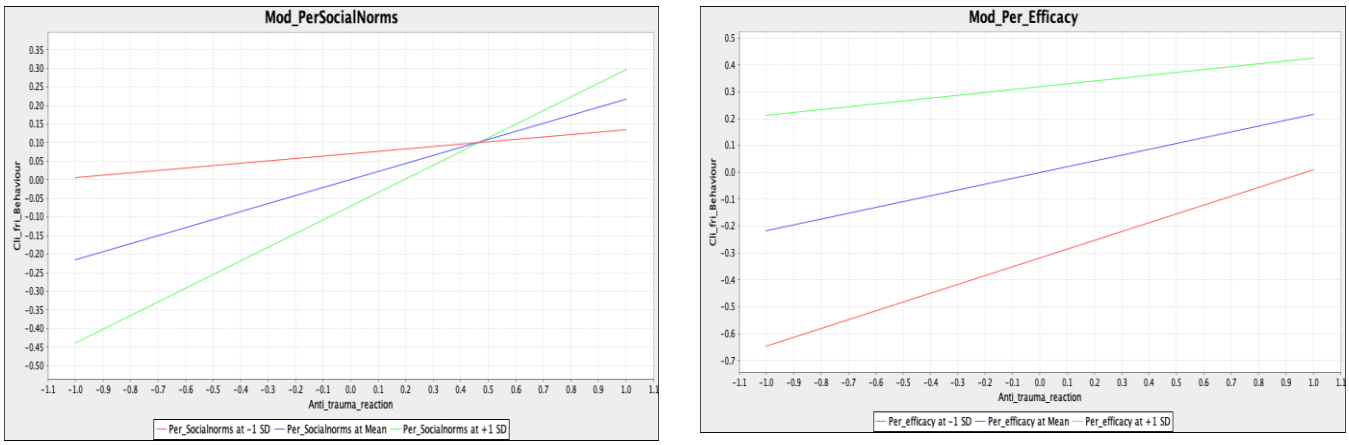

Figure 4. Moderating roles of perceived social norms and perceived self-efficacy