BJMKT
BRAZILIAN JOURNAL OF MARKETING

Received: 17 Nov. 2023/ **Approved:** 30 Mar. 2024
Responsible editors: Julio Araujo Carneiro da Cunha & André Torres Urdan
Evaluation Process: *Double Blind Review*
e-ISSN: 2177-5184
https://doi.org/10.5585/remark.v23i3.25550

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THE ROLE OF CLIMATE CHANGE CONSPIRACY IN CONSUMERS' PRO-ENVIRONMENTAL BEHAVIORS

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Objective of the study: This study seeks to investigate psychological processes driving consumers to engage in home energy efficiency investment behaviors and the potentially inhibiting role climate change conspiracy beliefs play in those processes.

Methodology/approach: Our conceptual model offers a set of hypotheses that we test through structural equation modeling.

Main results: Our model offers strong support for the values-beliefs-norms (VBN) model and the inhibiting role of climate change conspiracy beliefs in consumer energy investment behaviors.

Theoretical/methodological contributions: Our research utilizes value-belief-norm (VBN) theory to test our hypotheses. Additionally, we utilized conspiracy theory and specifically, conspiracy ideation, to demonstrate the role conspiracy beliefs play in decisions to engage in energy investment behaviors.

Relevance/originality: Conspiracy theory and climate change are two important topics affecting society. This is the first research that investigates both of these topics within the framework of VBN theory. Hence, our results have significant theoretical, management and social implications.

Management or social implications: Results suggest that those investigating decisions to adopt environmental products or engage in pro-environmental behaviors should consider the inhibiting role of conspiracies and using the VBN model as a key foundation. Moreover, these results indicate that how managers promote pro-environmental behaviors to customers and society must consider conspiracy ideation in developing their marketing strategies.

Keywords: Conspiracy Theory. Value-belief-norm theory. Energy efficiency behaviors. Sustainability. Environmental marketing.

How to cite the article

American Psychological Association (APA)

Thieme, J., Stafford, M. R., & Coleman, J. (2024, July/Sept.). The role of climate change conspiracy in consumers' pro-environmental behaviors. *Brazilian Journal of Marketing*, *23*(3), 901-922. https://doi.org/10.5585/remark.v23i3.25550

Introduction

Many Americans are aware of climate change issues and believe it is up to them to engage in pro-environmental behaviors (PEB) to contribute to reducing its negative effects. As prescribed by the value-belief-norm model (Stern, 2000; Stern at al., 1999), values regarding environmentalism influence individuals' beliefs and subsequent cultural norms regarding climate change. Based on over 1,100 interviews with adults across the nation, Leiserowitz et al. (2021) find 76% of Americans believe global climate change is occurring and 60% understand that it is human-caused. However, just 24% of Americans are aware that 90% of climate scientists support human-caused climate change. 43% of Americans believe it is at least moderately important for their family and friends to act to mitigate the effects of climate change and 38% claim they are making these efforts. Climate anxiety is directly related to pro-environmental actions (Whitmarsh 2022), yet it is evident that many Americans are favorably disposed toward pro-environmental actions, yet implementation is hindered by certain barriers.

Claudy, Peterson, and O'Driscoll (2013) and Claudy, Garcia, and O'Driscoll (2015) observe that most of the extant literature on engagement in PEB focuses on factors that have a positive influence on pro-environmental behaviors and call for more research on these barriers to implementation, where inhibiting factors are in the minority of predictor, mediator, and moderator factors. Though informative, recent work in this area has not seemed to answer these calls (e.g., Lie, Teng, & Han 2020; Rausch & Hopplin 2021). This oversight is significant. Because research focusing on positive PEB motivations predominately provides outcomes related to increasing environmental behaviors, individuals who possess personal barriers to the adoption of PEB are excluded from these implications. As such, any findings regarding how to increase PEB will be lacking. A careful analysis of potential inhibiting factors can provide a foundation for solutions to overcome them, thus increasing the efficacy of prior work promoting PEB.

A few recent studies suggest that conspiracy theories likely play this inhibiting role (Hornsey et al., 2018; Lewandowsky, Gignac, et al., 2013; Lewandowsky, Oberauer, et al., 2013; van der Linden, 2015). Belief in conspiracy theories has been pervasive since the beginning of recorded human history (Uscinski, 2019), and Uscinski et al. (2022) recently concluded the current average levels of beliefs in conspiracy theories are concerning. A prevailing climate change conspiracy theory suggests the claim that the climate is changing due to emissions from fossil fuels is a hoax perpetrated by corrupt scientists who want to spend more taxpayer money on climate research. The belief in this conspiracy theory persists despite

mounting scientific evidence to the contrary (Intergovernmental Panel on Climate Change, 2021). When identifying inhibitory barriers to the adoption of PEB, the pervasive and enduring influence of conspiracy ideations pertaining to climate change must be considered as a potentially significant factor.

Finding that most of the research on how attitudes drive pro-environmental behaviors focuses on low-involvement products, Prothero et al. (2011) call for more research on major purchases to bridge this gap in the literature. Though a focus on high-involvement products is novel, very few articles have begun to fill this gap (e.g. Han et al., 2018; Kennedy & Basu, 2013; Marzouk & Mahrous, 2020; Rezvani et al., 2018; Venugopal & Shukla, 2019). High-involvement products can play a large role in reducing greenhouse gas (GHG) emissions, as a recent tracking report by the International Energy Association demonstrates "the operation of buildings accounted for 30% of global energy consumption in 2021" (International Energy Agency, 2022).

In the United States, using existing technologies, these households could reduce energy consumption by about 30 percent, or about 11 percent of overall national consumption, without major financial or behavioral changes (Gardner & Stern, 2008). Onat, Egilmez, and Tatari (2014) find that policies aimed at improving energy efficiency by retrofitting existing buildings are more effective than policies aimed towards building new energy efficient buildings. Such behaviors promote long-lasting changes, and many recognize the magnitude of climate change issues and the deeper layers of change that are necessary to make a difference (Boluda-Verdu et al., 2022). Simple, low-involvement purchases are simply not enough, because solutions involve high costs and a longer timeframe for successful implementation (Rausch & Hopplin, 2021). A consideration of PEB for high-involvement purchases provides a much-needed opportunity for research beyond the low-involvement behaviors that have been previously explored.

The current research uses the VBN model in the context of high-involvement consumer purchase decisions to demonstrate the unique and inhibiting role climate change conspiracy ideations play in preventing the adoption of PEB. Extant research has not sufficiently considered climate change conspiracy theories relative to PEB. Further, the significance of high-involvement consumer decisions necessitates a more thorough understanding of how these inhibiting barriers function, providing opportunities for insight into how they may be overcome. Thus, the purpose of this research is 1) to gain a better understanding of the psychological processes that drive consumers to engage in home energy efficiency investment behaviors

through the application of the value-belief-norm (VBN) model (Stern, 2000; Stern et al., 1999) and 2) to investigate the relationship between belief in climate change conspiracy and pro-environmental behaviors and the inhibiting role that climate change conspiracy may play in modifying those behaviors.

This research addresses significant oversights in response to calls for a more thorough understanding of inhibiting factors preventing PEB (Claudy, Garcia, and O'Driscoll, 2015) as well as research beyond low-involvement purchases (Prothero et al. (2011). The findings from this study will demonstrate the significant barriers climate change conspiracy theories pose to the adoption of PEB in high-involvement purchase contexts, contributing to both a deficit in the literature as well as managerial implementation. If climate change conspiracy theories are indeed keeping individuals from making environmentally-conscious purchase decisions, then this research is imperative to facilitate an effective strategy for promoting PEB in light of these barriers.

Theory and hypotheses

Clearly, if climate change issues are to be addressed, significant changes in consumer behaviors are needed, particularly if those changes are related to high involvement products. We draw upon the social movement literature, specifically the value-belief-norm theory of environmentalism (Stern, 2000; Stern et al., 1999) as the theoretical foundation for understanding the process by which consumers change their pro-environmental behaviors. This theory builds on moral norm-activation theory (Schwartz, 1977) and adapts it specifically to the context of environmental movements. While a movement represents the cumulative action of a group, moral norm-activation theory and VBN theory focus on *individual* norms, not social norms. A focus on social norms reinforces the status quo, whereas movements represent changes in personal norms that challenge the status quo. A central tenet of VBN theory is that the success of a movement depends on its ability to change personal norms so that individuals feel obligated to the movement (Stern et al., 1999). This element of the theory also distinguishes it from other theories of behavior (e.g. theory of reasoned action - Fishbein & Ajzen, 2010) that focus on social norms, not personal norms. The unique convergence of both individual and social norms as prescribed by the VBN model provides for an opportunity to address individual factors which inhibit PEB adoption to a greater extent than prior work in the area (Wyss et al. 2022).

The VBN theory of environmentalism has been used as the theoretical foundation to understand pro-environmental behaviors in a variety of contexts (Collins & Chambers, 2005; Jansson, 2011; Oreg & Katz-Gerro, 2006; Steg et al., 2005). It is particularly relevant for high-involvement products, such as home efficiency solutions, which necessitate a deeper cognitive level of processing. Drawing on moral norm-activation theory (Schwartz, 1977), the VBN theory of environmentalism proposes that pro-environmental behaviors are driven by a process that begins with values (Stern, 2000). These values influence individuals' ecological worldviews, as reflected in the new ecological paradigm (NEP) (Gansser & Reich, 2023). Dunlap and Van Liere (1978) initially proposed the NEP scale to reflect perspectives related to limits to growth, achieving a steady-state economy, maintaining a balance of nature, and rejecting the proposition that natural resources exist solely for human use (antianthropocentrism). Dunlap et al. (2000) updated the scale to reflect five facets: limits to growth, antianthropocentrism, maintaining a balance of nature, rejecting the proposition that natural resources exist solely for human use, and the potential for an eco-crisis. Recent work has demonstrated the influence of the NEP on PEB (Gansser & Reich, 2023).

Drawing on moral norm-activation theory (Schwartz, 1977), the VBN theory of environmentalism proposes that pro-environmental behaviors are driven by a process that begins with values: biospheric, altruistic, and egoistic (Stern, 2000). Biospheric values are generated when an individual develops a pro-environmental attitude and takes action to avoid consequences over nature. An egoistic value is grounded in the desire to avoid consequences on the individual. Finally, altruistic values are engendered by potential consequences on others.

Stemming from this worldview (NEP), individuals became more aware of adverse consequences of various behaviors. This awareness is captured by the construct awareness of consequences (AC) in VBN theory and leads consumers to attribute responsibility for those consequences on individual behaviors. This attribution is called ascription of responsibility (AR) in VBN theory. Ascription of responsibility is a driver of personal norms (PN), which ultimately drive various behaviors in different contexts: activism, nonactivist public-sphere behaviors, private-sphere behaviors, and behaviors in organizations (Stern, 2000; Stern et al., 1999).

For this study, we employ the VBN theory in the context of a high-involvement product, specifically, adopting home energy efficiency solutions. The VBN model allows for a more nuanced and divergent explanatory model for understanding high-involvement consumer behaviors. It also provides space for the inclusion of inhibiting barriers to PEB which are based

on an individual's personal values, beliefs, and norms. Because our focus is on PEB, we only include biospheric values because they are most related to individuals' ecological worldviews in the context of our study. Also, because our interest is in home energy conservation behaviors, we include only private-sphere behaviors. Otherwise, we adopt the rest of the VBM framework in our model. Accordingly, we posit the following hypotheses that comprise the model:

H1: Values are positively related to the New Ecological Paradigm.

H2: The New Ecological Paradigm is positively related to Awareness of Consequences.

H3: Awareness of Consequences is positively related to Ascription of Responsibility.

H4: Ascription of Responsibility is positively related to pro-environmental Personal Norms.

H5: Personal Norms are positively related to Energy Efficiency Behaviors.

While the VBN framework helps explain reasons why consumers might be motivated to engage in sustainable behaviors, Claudy, Peterson, and O'Driscoll (2013) and Claudy, Garcia, and O'Driscoll (2015) highlight why it is important to study both reasons for and reasons against consumers' adoption of pro-environmental products. They argue that the literature is overly focused on factors that encourage engagement in sustainable behaviors, but factors that lead to consumer resistance to behavioral change are noticeably absent. So while VBN theory focuses on reasons for consumers to engage in sustainable behaviors, in response to Claudy, Peterson, and O'Driscoll (2013) and Claudy, Garcia, and O'Driscoll (2015), we include acceptance of climate change conspiracies, a factor representing consumer resistance to behavioral change, in our model. Our research is novel in that it is among the first to address this oversight in previous works.

Climate change conspiracies are manifestations of denial - the rejection of anthropogenic climate change. This denial is driven by a dominant social paradigm based on support for laissez faire government, support for the status quo, support for private property rights, faith in science and technology, support for individual rights, support for economic growth, faith in material abundance, and faith in future prosperity (Dunlap & Van Liere, 1984). This human-centered world view stems from Judeo-Christian beliefs that nature was created for man's use. In this paradigm, science and technology are used to leverage natural resources to improve standards of living (Dunlap & McCright, 2015). These views conflict with the environmental movement that emerged in the 1960's inspired by Rachel Carson's *Silent Spring* (Carson, 1962) and the Club of Rome's *Limits to Growth* (Meadows et al., 1972) which called for government regulation to protect natural resources. The pro-growth advocates rejected

government intervention and regulation as threats to their paradigm (Jacques et al., 2008; McCright & Dunlap, 2000).

One manifestation of the climate change denial movement is climate change conspiracy theory. Following Sunstein and Vermeule's review of conspiracy theories, we define a conspiracy theory as "an effort to explain some event or practice by reference to the machinations of powerful people, who attempt to conceal their role" (Sunstein & Vermeule, 2009, p. 205). The claim that the climate is changing due to emissions from fossil fuels is a hoax perpetrated by corrupt scientists who want to spend more taxpayer money on climate research is consistent with this definition, and the message is pervasive in the media. Claims like this and others propagate the climate change conspiracy theory that climate scientists manipulate their data and analysis to enrich themselves through continued government grants. This is accomplished by challenging the scientific evidence of climate change and the integrity of the scientists doing climate change research (McCright & Dunlap, 2010; Michaels, 2008; Oreskes & Conway, 2010).

While some work finds that exposure to climate change conspiracies reduces intentions to engage in PEB (Jolley & Douglas, 2014; van der Linden, 2015), the psychological mechanisms that connect belief in a climate change conspiracy to actual behaviors is not yet established in the literature. A recent meta-analysis of climate change by Biddlestone, Azevedo and van der Linden (2022) report climate conspiracy beliefs are moderately to greatly negatively correlated with acceptance of (climate) science, trust, pro-environmental concern, behavioral intentions and policy support, but do not report a direct link to actual behavior nor does this report explore underlying psychological explanations, a finding that coincides with the basic structure of the VBN model. Chan, Tam and Hong (2023) found evidence that belief in climate change conspiracy theories was corelated with less engagement in daily pro-environmental behaviors in both the US and China, but emphasize this finding needs more exploration to understand its impact.

To inform us on the process, we rely on the work of Lewandowsky, Gignac, and Oberauer (2013) and Lewandowsky, Oberauer, and Gignac (2013). Both studies find that a conspiracist ideation is negatively associated with acceptance of climate change science. In these studies, conspiracist ideation reflects a general tendency to believe in a variety of conspiracy theories. Lewandowsky, Oberauer, and Gignac (2013) explain how a conspiracy ideation can spread from one context to another. That is, if one believes in one conspiracy (the United States government is hiding evidence of alien life in Area 51 in Nevada), they are more

likely to believe in conspiracies in different contexts (climate change is a hoax). Thus, we extend this work by using a climate change conspiracy construct as a more narrowly defined concept than conspiracy ideation, and we adopt it in the context of high-involvement PEB.

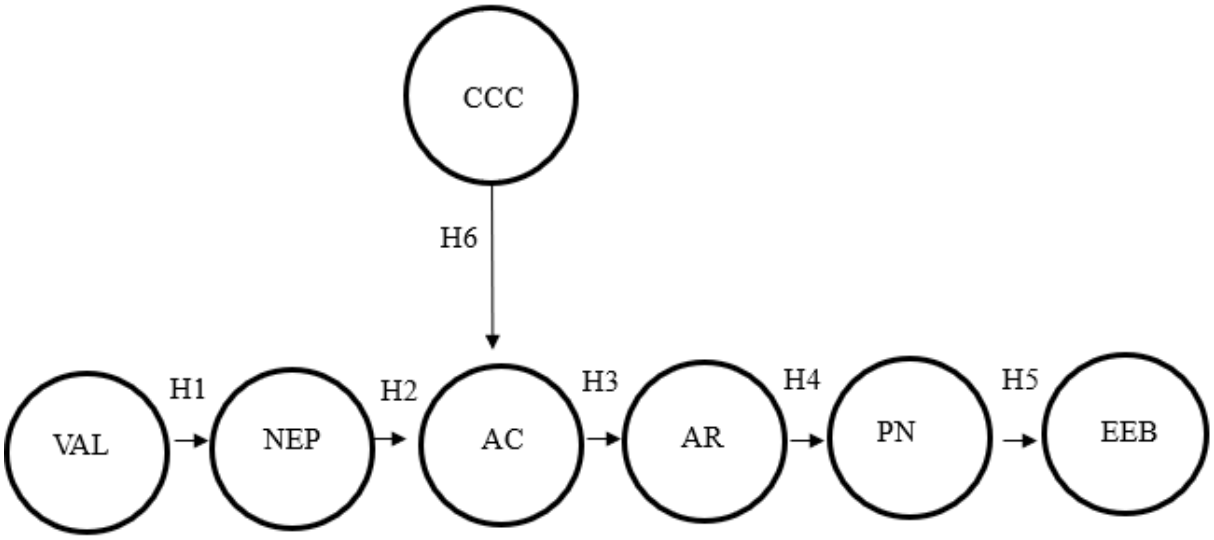
As noted earlier, the use of the VBN as an explanatory model allows for the inclusion of the acceptance of climate change science construct used by Lewandowsky, Gignac, and Oberauer (2013) and Lewandowsky, Oberauer, and Gignac (2013). An acceptance of climate change conspiracy theories as directly related to PEB in high-involvement purchases is very similar to the Awareness of Consequences construct in VBN theory in that both measure respondents' knowledge of the impacts of climate change. Adapting these findings from a more general context that conspiracy ideation is negatively associated with acceptance of climate change to our more specific context of climate change conspiracy and PEB, we offer the following:

H6: Climate Change Conspiracy is negatively related to Awareness of Consequences.

Figure 1 depicts the six hypotheses and the model that will be tested.

Figure 1

Hypothesized Model



Methodology

A link to a Qualtrics survey was distributed to 2,008 faculty and staff of a major southeastern university in the United States through the university's email distribution list; those not completing the survey were sent a reminder email two weeks after the survey was

initially sent. After removing respondents for missing values or other survey errors, the final sample resulted in 277 usable responses, a 13.8% response rate (42.6% male, average age 52, 85.6% with college degree or higher) (Appendix 1).

The survey consisted of scales derived from existing literature. Four scales were taken from Steg, Dreijerink, and Abrahamse's (2005) study where the authors tested the VBN theory in the context of adopting energy policies. Values (VAL) related to the environment were adapted using a four-item, five-point scale (not at all important to extremely important). The scales for awareness of consequences (AC) and ascription of responsibilities (AR) consisted of three items and ranged from strongly disagree to strongly agree on a five-point scale. The scale for personal norms (PN) used four items on a five-point scale ranging from strongly disagree to strongly agree. Steg, Dreijerink, and Abrahamse (2005) also incorporated the revised new ecological paradigm (NEP) scale created by Dunlap et al. (2000) into their study. The current study used a two-item, five-point scale ranging from strongly agree to strongly disagree. The two items represent the eco-crisis dimension of NEP (Amburgey and Thoman, 2012).

The scale for energy efficiency behaviors (EEB) was adapted from Gardner and Stern's (2008) research on effective sustainable actions Americans can take to reduce harmful climate change affects. This scale asked respondents the extent to which they invested in four home energy behaviors on a five-point scale ranging from never to always.

One item from Lewandowsky et al.'s (2013) scale of conspiracy ideation related directly to climate change conspiracy (CCC) reads, "The claim that the climate is changing due to emissions from fossil fuels is a hoax perpetrated by corrupt scientists who want to spend more taxpayer money on climate research." The acceptance of a climate change conspiracy is a doubly concrete construct, meaning that the object (climate change conspiracy) and its attribute (acceptance of or belief in) are easily and uniformly imagined (Bergkvist & Rossiter, 2007; Rossiter, 2002) or clearly comprehended (Rossiter, 2016), which are recommendations for the use of a single item measure. Thus, we use the single item from Lewandowsky, Oberauer, et al. (2013) to measure climate change conspiracy (CCC).

Results

Data were analyzed using structural equation modeling (SEM), which allows for an elegant and simple statistical approach for simultaneous equations. Correlations and means for all items are included in Table 1. All items were subjected to a confirmatory factor analysis (CFA) using SPSS AMOS software. The results are presented in Table 2. Overall fit statistics

indicate that the model fits the data well (χ^2 (155) = 289.10, p < .0001, RMSEA = .056, CFI = .97, NFI = .93, TLI = .96). Although the chi-square exhibited a significant result, this is most likely due to the sample size (Bagozzi & Yi, 1988); the alternative fit statistics complement this finding to indicate a good model fit. As Table 2 shows, standardized loadings range from .70 to .95, and the loadings are all significant (p < .05). Table 2 also displays the internal consistency reliability coefficients (coefficient α) of the measures, which ranged from .84 to .91, as well as the average variance extracted (AVE) and shared variance between constructs, all of which indicate that convergent and discriminant validity have been achieved and that the scales are highly reliable (Fornell & Larcker, 1981).

Table 1

Correlations and Descriptive Statistics

	VAL	NEP	AC	AR	PN	EEB	CCC
VAL	1.000						
NEP	.337*	1.000					
AC	.483*	.350*	1.000				
AR	.312*	.279*	.557*	1.000			
PN	.578*	.292*	.622*	.603*	1.000		
EEB	.501*	.234*	.414*	.232*	.499*	1.000	
CCC	.036	.198*	-.014	.044	-.008	-.074	1.000
Mean	3.874	3.214	3.517	3.156	3.556	3.289	2.106
SD	.429	.426	.508	.482	.606	.745	.703

* p < .01

Table 2

Confirmatory Factor Analysis Results

Scale Items	Standardized Coefficients
Values (VAL) (α = .90) (AVE = .70, ϕ^2 = .16 - .51)	
VAL1. Protecting the environment: preserving nature	.86
VAL2. Preventing pollution	.77
VAL3. Respecting the earth: live in harmony with other species	.88
VAL4. Unity with nature: fitting into nature	.83
New Ecological Paradigm (NEP) (α = .84) (AVE = .73, ϕ^2 = .04 - .69)	
NEP1. Humans are severely abusing the environment.	.87
NEP2. If things continue on their present course, we will soon experience a major ecological catastrophe.	.84
Awareness of Consequences (AC) (α = .87) (AVE = .69, ϕ^2 = .04 - .69)	
AC1. Global warming is a problem for society.	.95
AC2. Energy savings help reduce global warming.	.69
AC3. It is not certain whether global warming is a real problem. (R)	.83

Scale Items	Standardized Coefficients
Ascription of Responsibility (AR) (α = .91) (AVE = .77, ϕ^2 = .02 - .49)	
AR1. I am jointly responsible for the energy problems.	.83
AR2. I feel jointly responsible for the exhaustion of energy sources.	.91
AR3. I feel jointly responsible for global warming.	.90
Personal Norms (PN) (α = .91) (AVE = .73, ϕ^2 = .10 - .51)	
NORM1. I feel personally obliged to save as much energy as possible.	.84
NORM2. I feel morally obliged to save energy, regardless of what others do.	.88
NORM3. People like me should do everything they can to reduce energy use.	.87
NORM4. I feel obliged to bear the environment and nature in mind in my daily behavior.	.82
Energy Efficiency Behaviors (EEB) (α = .89) (AVE = .68, ϕ^2 = .02 - .16)	
BEH1. Install a more efficient A/C unit	.87
BEH2. Install a more efficient water heater	.85
BEH3. Caulk/weather-strip home	.74
BEH4. Install a more efficient refrigeration unit	.82

All loadings significant at $p < .05$

At the outset of the survey design, several steps were taken to reduce common method bias (Podsakoff et al., 2003). These included randomizing the order of choices and varying the lengths of the scales. Further, a single-factor model CFA was tested (χ^2 (252) = 2,597.94, $p < .0001$) and compared to the results of the multi-factor model (χ^2 (231) = 415.96, $p < .0001$). The χ^2 difference test indicated that the data fit the single-factor model significantly worse than the multi-factor model (χ^2 (21) = 2,111.98, $p < .0001$), providing evidence that common method bias is not an issue.

Subsequently, a structural model (see Figure 1) was tested, also using SPSS AMOS (χ^2 (184) = 522.14, $p < .0001$, RMSEA = .08, CFI = .92. The results of the hypothesis testing are presented in Table 3. Hypothesis 1 which states that values (VAL) are positively related to the new ecological paradigm (NEP) is supported (β = .68, $p < .0001$). Hypothesis 2 posits that NEP positively influences awareness of consequences (AC), and results indicate NEP has a significant, direct effect on AC (β = .72, $p < .0001$). Hypothesis 3 states that AC is positively related to ascription of responsibility (AR), and results show AC has a significant, direct effect on AR (β = .70, $p < .0001$). Hypothesis 4 posits that AR has a positive impact on personal norms (PN), and the results indicate that AR is positively related to PN (β = .70, $p < .0001$). Hypothesis 5 proposes that PN has a positive relationship with energy efficiency behaviors (EEB). The results show that PN is positively, directly related to EEB (β = .30, $p < .0001$). Hypothesis 6 tested the direct, negative influence an individual's CCC has on AC. This

relationship is statistically significant (β =-.50, p < .0001). Thus, support is found for all six hypothesized relationships.

Table 3

Structural Model Results

Hypothesized Paths	Standardized Coefficients	t-Value
H1: Values → New Ecological Paradigm	.68	10.48*
H2: New Ecological Paradigm → Awareness of Consequences	.72	12.07*
H3: Awareness of Consequences → Ascription of Responsibility	.70	11.10*
H4: Ascription of Responsibility → Personal Norms	.70	11.08*
H5: Personal Norms → Energy Efficiency Behaviors	.30	4.46*
H6: Climate Change Conspiracy → Awareness of Consequences	-.50	-11.19*

χ^2_{184} = 522.14, p < .0001, CFI = .92, TLI = .91, NFI = .89, RMSEA = .08

* p < .05

Discussion

In this study, each of the hypotheses in the VBN model finds support; hence, we find strong empirical support for the VBN model in the context of understanding psychological drivers of home energy efficiency investment behaviors. Thus, the current study contributes to the growing stream of research using the VBN model as a theoretical basis for understanding environmental behaviors of consumers (e.g. Collins & Chambers, 2005; Jansson, 2011; Oreg & Katz-Gerro, 2006; Steg et al., 2005). For example, our results suggest that marketing scholars engaged in research on factors influencing consumers' decisions to adopt environmental products or engage in pro-environmental behaviors should strongly consider using the VBN model as a theoretical foundation for their work. Practitioners marketing pro-environmental products and services are advised to carefully examine all components of the VBN framework for opportunities to influence consumers in their choices.

Climate change conspiracy

In response to calls for more research on inhibiting factors to the adoption of PEB (Claudy, Garcia, and O'Driscoll, 2015), this study also contributes to the literature by specifying a condition where the VBN framework is inhibited – namely, belief in a Climate Change Conspiracy. The significant impact of climate change conspiracy is interesting in that it highlights an issue that has seen very little attention in the sustainability literature. Given this study's findings, and the results of Lewandowsky, Gignac, and Oberauer (2013) and

Lewandowsky, Oberauer, and Gignac (2013), we call for more research in this area. It is clear conspiracy can play a role in consumer decision making in the PEB context through the VBN model, but further work is needed to understand what role it might play in other theoretical frameworks (e.g. Fishbein and Ajzen's (2010) theory of reasoned action (TRA).

Given how prevalent it is for conspiracies to have an impact on decision making, it is surprising the literature has not yet addressed them directly. For instance, Jolley and Douglas (2014) find simply exposing respondents to climate change conspiracies decreased their intentions to reduce their carbon footprint as well as reducing their likelihood of engaging in politics. Another example is van der Linden's (2015) findings that brief exposure to global warming conspiracy theories reduced respondents' engagement in PEB and also decreased their judgement of the level of scientific consensus that exists on anthropogenic climate change. Even their manipulation check found that exposure to global warming conspiracy theories increased the likelihood that respondents would agree to a statement that global warming is a hoax.

As an example of the possible influence conspiracy might play in marketing, Mattthes and Wonneberger (2014) and do Paço and Reis (2012) used skepticism to explain the response by consumers to green marketing and advertising. It is likely that climate change conspiracy may be the underlying mechanism that explains consumer behaviors. Similarly, skepticism toward advertising in general may be derived from consumers holding preconceived ideas about the intent of marketing efforts. In their conceptual framework for understanding conspiracy theory, Sunstein and Vermeule (2009, p. 208) note advertising's ability to capture a key component of some conspiracy theories. That is, there exists "a pervasive human tendency to think that effects are caused by intentional action, especially by those who stand to benefit." Hence, it is possible that the perceived motivations underlying marketing intent among consumers exposed to certain marketing practices may be grounded in conspiracy ideation. As such, conspiracy beliefs may play a role in consumer response to a range of marketing tactics.

Practitioners and policymakers who believe that segments of their target markets might be prone to conspiracies would be well served to incorporate strategies proposed by Lewandowsky et al. (2012). They apply cognitive psychological theory to the problem of misinformation and suggest solutions to four different types of misinformation problems. For example, one problem associated with misinformation stems from conspiracies that are repeated often, and thereby reinforce it. This is called the familiarity backfire effect. To counteract this type of misinformation or conspiracy, Lewandowsky et al. (2012) suggest reinforcing the correct facts while avoiding repetition of the conspiracy.

High-Involvement PEB

With regard to the high-involvement consumer purchases context in which this research was conducted, Attari et al. (2010) find homeowners severely underestimate the energy savings possible with home efficiency reduction investments, especially when considering large appliances with the greatest savings. They also find homeowners perceive curtailment behaviors as more effective than efficiency investment behaviors in reducing energy usage. Gardner and Stern (2008) find the opposite in their study of the most effective energy reduction actions that households can take. They find energy efficiency actions generally save more energy than curtailment actions. Curtailment behaviors are those that avoid or reduce energy usage through existing technologies (e.g. carpooling, turning off lights, adjusting thermostats). Such behaviors are distinct from low-involvement environmental decisions (Rausch & Hopplin, 2021).

Efficiency investment behaviors require a one-time financial investment of a new technology that inherently uses less energy than the technology it replaces (e.g. new energy efficient furnace or air conditioner, replacing incandescent light bulbs with LED bulbs, purchasing an electric car). Because homeowners generally underestimate potential savings on home efficiency reduction actions and incorrectly perceive curtailment as more effective in reducing energy usage than improving efficiency, it is likely that public policy efforts aimed at educating consumers about the impact of their energy usage on climate change and the potential savings they can achieve from investments in home energy efficiency compared to curtailment actions is likely to be very effective in encouraging homeowners to invest in home efficiency renovations. That is, both businesses and policymakers are encouraged to use the levers of AC and AR from the VBN model to increase the usage of home efficiency products and services in renovations.

One practical caveat to this research must be considered. That is, if some individuals will not engage in sustainable behaviors due to an inherent belief in conspiracy theories, how can proactive environmentalists encourage such skeptics to go green? Lewandowsky et al. (2012) provide several remedies for those prone to conspiracies, such as only purporting facts and not acknowledging the sources of the conspiracies as well as affirmation of individuals' worldviews accompanied by a persistence of factual information.

When attempts to persuade individuals to adopt sustainable behaviors fail, the organizations responsible for the persuasion often look to their own efforts to understand how to succeed in the future. Better marketing plans, more attractive promotional materials, and

more enthusiastic pro-environmental representatives are among some of the obvious areas for improvement. However, such efforts may still meet failure if the individuals being persuaded reject the science of climate change altogether. New approaches to encouraging the adoption of sustainable behaviors should put facts first in an attempt to debunk climate change myths, convincing skeptics of the rigidity of the science as well as the proclivity of the behaviors. Just as one conspiracy theory can turn an individual away from many credentialed scientific claims, perhaps one debunked theory can change said individual's entire paradigm toward scientific thinking, ultimately having an impact on the sustainability of our planet.

Limitations and future research

Because our sample was limited to faculty and staff from a major university in the United States, generalizability to a global population is limited. Therefore, additional research from other populations, specifically those outside the university setting as well as outside the United States is needed, such as Europe and the global South. While our findings are strong, we cannot assume they would be confirmed in other populations.

Further, since we did not test the TPB framework in this study, we cannot comment on the relative performance of the VBN model compared to the TPB model. Hence, we call for additional studies comparing the two models in different contexts.

Finally, our study was limited to higher involvement home energy investment efficiency behaviors, and findings cannot be generalized to lower involvement efficiency behaviors. As such, future research should investigate whether climate change conspiracy plays a role in the VBN model when investigated with other types of behaviors, particularly those not requiring a significant investment.

Conclusion

This study adds to the growing body of empirical support for the use of the VBN model in the study of pro-environmental behaviors. It also incorporates the context of consumer adoption of conspiracy theories. As such, it provides evidence of empirical support for an emerging theoretical foundation as well as implications for theory, practice, and public policy. Hence, it offers a unique contribution that provides insight for a range of stakeholders. To continue to gain knowledge in this area, we call for more research in both the use of the VBN model in empirical studies as well as the incorporation of conspiracy theory adoption in the study of pro-environmental behaviors

Acknowledgements

This study was supported by a grant from the Green Fee Allocation Committee at the University of Memphis. The committee was not involved in the study design; collection, analysis and interpretation of data; writing of the report; or the decision to submit the article for publication.

Authors' contribution

Contribution	Stafford, M. R.	Thieme, J	Coleman, J
Conceptualization	x	x	
Methodology	x	x	
Software			
Validation		x	
Formal analysis		x	
Investigation	x	x	
Resources	x	x	
Data Curation	x	x	
Writing - Original Draft	x	x	x
Writing - Review & Editing	x	x	x
Visualization			
Supervision			
Project administration	x	x	
Funding acquisition	x	x	

References

Amburgey, J. W., & Thoman, D. B. (2012). Dimensionality of the New Ecological Paradigm:Issues of Factor Structure and Measurement. *Environment and Behavior*, *44*(2), 235-256. https://doi.org/10.1177/0013916511402064

Attari, S. Z., DeKay, M. L., Davidson, C. I., & Bruine de Bruin, W. (2010). Public Perceptions of Energy Consumption and Savings. *Proceedings of the National Academy of Sciences*, *107*(37), 16054-16059. https://doi.org/10.1073/pnas.1001509107

Bagozzi, R. P., & Yi, Y. (1988). On the Evaluation of Structural Equation Models [journal article]. *Journal of the Academy of Marketing Science*, *16*(1), 74-94. https://doi.org/10.1007/bf02723327

Bergkvist, L., & Rossiter, J. R. (2007). The Predictive Validity of Multiple-Item Versus Single-Item Measures of the Same Constructs [Article]. *Journal of Marketing Research (JMR)*, *44*(2), 175-184. http://www.jstor.org/stable/30162466

Biddlestone, M., Azevedo, F., & van der Linden, S. (2022). Climate of conspiracy: A meta-analysis of the consequences of belief in conspiracy theories about climate change. *Current Opinion in Psychology*, *46*, 101390. https://doi.org/https://doi.org/10.1016/j.copsyc.2022.101390

Boluda-Verdu, I., Senent-Valero, M., Casas-Escolano, M., Matijasevich, A., & Pastor-Valero, M. (2022). Fear for the future: Eco-anxiety and health implications, a systematic review. *Journal of Environmental Psychology*, 84, 101904. https://doi.org/10.1016/j.jenvp.2022.101904

Carson, R. (1962). *Silent Spring*. Houghton Mifflin.

Chan, H.-W., Tam, K.-P., & Hong, Y.-y. (2023). Does belief in climate change conspiracy theories predict everyday life pro-environmental behaviors? Testing the longitudinal relationship in China and the U.S. *Journal of Environmental Psychology*, *87*, 101980. https://doi.org/https://doi.org/10.1016/j.jenvp.2023.101980

Claudy, M. C., Garcia, R., & O'Driscoll, A. (2015). Consumer Resistance to Innovation—A Behavioral Reasoning Perspective [journal article]. *Journal of the Academy of Marketing Science*, *43*(4), 528-544. https://doi.org/10.1007/s11747-014-0399-0

Claudy, M. C., Peterson, M., & O'Driscoll, A. (2013). Understanding the Attitude-Behavior Gap for Renewable Energy Systems Using Behavioral Reasoning Theory [Article]. *Journal of Macromarketing*, *33*(4), 273-287. https://doi.org/10.1177/0276146713481605

Collins, C. M., & Chambers, S. M. (2005). Psychological and Situational Influences on Commuter-Transport-Mode Choice. *Environment and Behavior*, *37*(5), 640-661. https://doi.org/10.1177/0013916504265440

do Paço, A. M. F., & Reis, R. (2012). Factors Affecting Skepticism Toward Green Advertising [Article]. *Journal of Advertising*, *41*(4), 147-155. https://doi.org/10.2753/JOA0091-3367410410

Dunlap, R. E., & McCright, A. M. (2015). Challenging Climate Change: The Denial Countermovement. In R. E. Dunlap & R. J. Brulle (Eds.), *Climate Change and Society: Sociological Perspectives* (pp. 300-332). Oxford University Press.

Dunlap, R. E., & Van Liere, K. D. (1978). The "New Environmental Paradigm". *The Journal of Environmental Education*, *9*(4), 10-19. https://doi.org/10.1080/00958964.1978.10801875

Dunlap, R. E., & Van Liere, K. D. (1984). Commitment to the Dominant Social Paradigm and Concern for Environmental Quality. *Social Science Quarterly*, *65*(4), 1013-1028.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New Trends in Measuring Environmental Attitudes: Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues*, *56*(3), 425-442. https://doi.org/10.1111/0022-4537.00176

Fishbein, M., & Ajzen, I. (2010). *Predicting and Changing Behavior: The Reasoned Action Approach*. Taylor and Francis Group, LLC. https://doi.org/https://doi.org/10.4324/9780203838020

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *JMR, Journal of Marketing Research*, *18*(3), 382-388.

Gansser, O. A., & Reich, C. S. (2023). Influence of the new ecological paradigm (NEP) and environmental concerns on pro-environmental behavioral intention based on the theory of planned behavior (TPB). *Journal of Cleaner Production*, 382, 134629. https://doi.org/10.1016/j.jclepro.2022.134629

Gardner, G. T., & Stern, P. C. (2008). The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change. *Environment Magazine*, *50*(5), 12-24. https://doi.org/https://doi.org/10.3200/ENVT.50.5.12-25

George R. Milne, Shalini Bahl, & Rohm, A. (2008). Toward a Framework for Assessing Covert Marketing Practices. *Journal of Public Policy & Marketing*, *27*(1), 57-62. https://doi.org/10.1509/jppm.27.1.57

Han, H., Olya, H. G. T., Kim, J., & Kim, W. (2018). Model of sustainable behavior: Assessing cognitive, emotional and normative influence in the cruise context. *Business Strategy and the Environment*, *27*(7), 789-800. https://doi.org/10.1002/bse.2031

Hornsey, M. J., Harris, E. A., & Fielding, K. S. (2018). Relationships among conspiratorial beliefs, conservatism and climate scepticism across nations. *Nature Climate Change*. https://doi.org/10.1038/s41558-018-0157-2

Intergovernmental Panel on Climate Change. (2021). *IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. C. U. Press.

International Energy Agency. (2022). *Buildings*. https://www.iea.org/reports/buildings

Jacques, P. J., Dunlap, R. E., & Freeman, M. (2008). The Organisation of Denial: Conservative Think Tanks and Environmental Scepticism. *Environmental Politics*, *17*(3), 349-385. https://doi.org/10.1080/09644010802055576

Jansson, J. (2011). Consumer eco-innovation adoption: assessing attitudinal factors and perceived product characteristics. *Business Strategy and the Environment*, *20*(3), 192-210. https://doi.org/10.1002/bse.690

Jolley, D., & Douglas, K. M. (2014). The Social Consequences of Conspiracism: Exposure to Conspiracy Theories Decreases intentions to Engage in Politics and to Reduce one's Carbon Footprint. *British Journal of Psychology*, *105*(1), 35-56. https://doi.org/10.1111/bjop.12018

Kennedy, M., & Basu, B. (2013). A Study on the Implementation of Renewable Heating Technologies in the Domestic Sector in Ireland with Implications on Consumers' Decision-Making [Article]. *Journal of Cleaner Production*, *44*, 133-142. https://doi.org/10.1016/j.jclepro.2013.01.018

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Carman, J., Neyens, L., . . . Goldberg, M. (2021). *Climate Change in the American Mind, September 2021*. Y. P. o. C. C. Communication.

Lewandowsky, S., Ecker, U. K. H., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and Its Correction: Continued Influence and Successful Debiasing. *Psychological Science in the Public Interest*, *13*(3), 106-131. https://doi.org/https://doi.org/10.1177/1529100612451018

Lewandowsky, S., Gignac, G. E., & Oberauer, K. (2013). The Role of Conspiracist Ideation and Worldviews in Predicting Rejection of Science. *PLOS ONE*, *8*(10), 1-11. https://doi.org/https://doi.org/10.1371/journal.pone.0075637

Lewandowsky, S., Oberauer, K., & Gignac, G. E. (2013). NASA Faked the Moon Landing—Therefore, (Climate) Science Is a Hoax: An Anatomy of the Motivated Rejection of Science. *Psychological Science*. https://doi.org/10.1177/0956797612457686

Liu, P., Teng, M., & Han, C. (2020). How does environmental knowledge translate into pro-environmental behaviors?: The mediating role of environmental attitudes and behavioral intentions. *Science of the total environment*, 728, 138126. https://doi.org/10.1016/j.scitotenv.2020.138126

Marzouk, O. A., & Mahrous, A. A. (2020). Sustainable Consumption Behavior of Energy and Water-Efficient Products in a Resource-Constrained Environment. *Journal of Global Marketing*, *33*(5), 335-353. https://doi.org/10.1080/08911762.2019.1709005

Matthes, J., & Wonneberger, A. (2014). The Skeptical Green Consumer Revisited: Testing the Relationship Between Green Consumerism and Skepticism Toward Advertising. *Journal of Advertising*, *43*(2), 115-127. https://doi.org/10.1080/00913367.2013.834804

McCright, A. M., & Dunlap, R. E. (2000). Challenging Global Warming as a Social Problem: An Analysis of the Conservative Movement's Counter-Claims. *Social Problems*, *47*(4), 499-522. https://doi.org/10.2307/3097132

McCright, A. M., & Dunlap, R. E. (2010). Anti-Reflexivity: The American Conservative Movement's Success in Undermining Climate Science and Policy. *Theory, Culture & Society*, *27*(2-3), 100-133. https://doi.org/https://doi.org/10.1177/0263276409356001

Meadows, D. H., Meadows, D. L., Randers, J., & III, W. W. B. (1972). *The Limits to Growth; A Report for the Club of Rome's Project on the Predicament of Mankind*. Universe Books.

Michaels, D. (2008). *Doubt Is Their Product*. Oxford University Press.

Onat, N. C., Egilmez, G., & Tatari, O. (2014). Towards greening the U.S. residential building stock: A system dynamics approach. *Building and Environment*, *78*, 68-80. https://doi.org/http://dx.doi.org/10.1016/j.buildenv.2014.03.030

Oreg, S., & Katz-Gerro, T. (2006). Predicting Proenvironmental Behavior Cross-Nationally: Values, the Theory of Planned Behavior, and Value-Belief-Norm Theory. *Environment and Behavior*, *38*(4), 462-483. https://doi.org/10.1177/0013916505286012

Oreskes, N., & Conway, E. M. (2010). *Merchants of Doubt*. Bloomsbury Press.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, *88*(5), 879-903. https://doi.org/http://dx.doi.org/10.1037/0021-9010.88.5.879

Prothero, A., Dobscha, S., Freund, J., Kilbourne, W. E., Luchs, M. G., Ozanne, L. K., & Thøgersen, J. (2011). Sustainable Consumption: Opportunities for Consumer Research and Public Policy [Article]. *Journal of Public Policy & Marketing*, *30*(1), 31-38. https://doi.org/10.1509/jppm.30.1.31

Rausch, T. M., & Kopplin, C. S. (2021). Bridge the gap: Consumers' purchase intention and behavior regarding sustainable clothing. *Journal of Cleaner Production*, 278, 123882. https://doi.org/10.1016/j.jclepro.2020.123882

Rezvani, Z., Jansson, J., & Bengtsson, M. (2018). Consumer motivations for sustainable consumption: The interaction of gain, normative and hedonic motivations on electric vehicle adoption. *Business Strategy and the Environment*, *27*(8), 1272-1283. https://doi.org/10.1002/bse.2074

Rossiter, J. R. (2002). The C-OAR-SE procedure for scale development in marketing [Article]. *International Journal of Research in Marketing*, *19*(4), 305. https://doi.org/https://doi.org/10.1016/S0167-8116(02)00097-6

Rossiter, J. R. (2016). How to use C-OAR-SE to design optimal standard measures [Article]. *European Journal of Marketing*, *50*(11), 1924-1941. https://doi.org/10.1108/EJM-10-2016-0546

Schwartz, S. H. (1977). Normative Influences on Altruism1. In B. Leonard (Ed.), *Advances in Experimental Social Psychology* (Vol. Volume 10, pp. 221-279). Academic Press. https://doi.org/http://dx.doi.org/10.1016/S0065-2601(08)60358-5

Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors Influencing the Acceptability of Energy Policies: A Test of VBN Theory. *Journal of Environmental Psychology*, *25*(4), 415-425. https://doi.org/https://doi.org/10.1016/j.jenvp.2005.08.003

Stern, P. C. (2000). New Environmental Theories: Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues*, *56*(3), 407-424. https://doi.org/10.1111/0022-4537.00175

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism. *Research in Human Ecology*, *6*(2), 81-97.

Sunstein, C. R., & Vermeule, A. (2009). Conspiracy Theories: Causes and Cures. *Journal of Political Philosophy*, *17*(2), 202-227. https://doi.org/10.1111/j.1467-9760.2008.00325.x

Uscinski, J., Enders, A., Klofstad, C., Seelig, M., Drochon, H., Premaratne, K., & Murthi, M. (2022). Have beliefs in conspiracy theories increased over time? *PLOS ONE*, *17*(7), 1-19. https://doi.org/10.1371/journal.pone.0270429

Uscinski, J. E. (2019). *Conspiracy Theories and the People Who Believe Them* [Book]. Oxford University Press.

van der Linden, S. (2015). The conspiracy-effect: Exposure to conspiracy theories (about global warming) decreases pro-social behavior and science acceptance. *Personality and Individual Differences*, *87*(December), 171-173. https://doi.org/http://dx.doi.org/10.1016/j.paid.2015.07.045

Venugopal, A., & Shukla, D. (2019). Identifying consumers' engagement with renewable energy. *Business Strategy and the Environment*, *28*(1), 53-63. https://doi.org/10.1002/bse.2185

Whitmarsh, L., Player, L., Jiongco, A., James, M., Williams, M., Marks, E., & Kennedy-Williams, P. (2022). Climate anxiety: What predicts it and how is it related to climate action?. *Journal of Environmental Psychology*, 83, 101866. https://doi.org/10.1016/j.jenvp.2022.101866

Wyss, A. M., Knoch, D., & Berger, S. (2022). When and how pro-environmental attitudes turn into behavior: The role of costs, benefits, and self-control. *Journal of environmental psychology*, 79, 101748. https://doi.org/10.1016/j.jenvp.2021.101748

Appendix 1

Demographic Results

Demographics	Percentage	Mean
Gender		
Male	42.6%	
Female	57.4%	
Age		52.25
Education		
Undergraduate	14.4%	
College Graduate	23.1%	
Graduate Degree	30.7%	
Post-graduate Degree	31.8%	
Ethnicity		
African American	16.2%	
Asian	1.1%	
Caucasian	77.3%	
Hispanic / Latino	0.7%	
Other	2.9%	
Mixed Ethnicity	1.8%	
University Affiliation		
Faculty	35.0%	
Staff	65.0%	