Gmail Daniel Ginting <daniel.machung@gmail.com>

Invitation to Review for SAGE Open (IF 1.356), Manuscript ID SO-21-2967

1 message

SAGE Open <onbehalfof@manuscriptcentral.com> Thu, Jan 27, 2022 at 4:32 PM
Reply-To: simran.bhambri@sagepub.in
To: daniel.machung@gmail.com

27-Jan-2022

Dear Dr. Daniel Ginting

We recently received Manuscript ID SO-21-2967 entitled "How does the knowledge of renewable energy affect college students' energy-saving intentions? -- Evidence from China" and, based on your area of expertise, would like to invite you to review this manuscript. The abstract appears at the end of this letter.

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MANUSCRIPT DETAILS

TITLE: How does the knowledge of renewable energy affect college students' energy-saving intentions? -- Evidence from China

ABSTRACT: Renewable energy and its related technologies can alleviate the energy problems human beings face. Therefore, after gaining knowledge of renewable energy, do college students believe that the energy problem has been or can be solved, thus reducing their own energy-saving intentions? To answer this question, the present study conducted a field survey of college students in Xi'an, China, employing structural equation modeling to analyze college students' knowledge of renewable energy and the impact of it on energy-saving intentions. The study sought to identify the influencing factors and their influencing paths on college students' energy-saving intentions. This study also explored how the knowledge of renewable energy affects college students' energy-saving intentions through value perception. The main conclusions are as follows: (1) knowledge of renewable energy has a positive impact on college students' energy-saving intentions; (2) this impact is mainly realized through college students' value perception of energy saving; (3) knowledge of renewable energy mobilizes college students to evaluate the benefits of energy saving, which is the key to enhancing their energy-saving intentions; and (4) the impact of knowledge about renewable energy on personal norms is stronger than that on perceived value.

APPROACHES: Quantitative

METHODS: structural equation modeling

REGION(S) OF FOCUS: China

> How does the knowledge of renewable energy affect college students' energy-saving intentions? -- Evidence from China

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Evaluation Criteria

req Theoretical development of hypotheses

Good

req Quality of design and methods

Excellent

req Adequate data analyses

Excellent

req Quality of discussion

Good

req Legitimacy of conclusions

Good

req Clarity and readability

Good

req Use of references

Good

req Rationale and clarity of definition

Good

req Writing style

Good

req Contributes to new knowledge in the field

Good

req Integration of theory (if applicable)

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This paper has a robust methodology. The authors have explained the research design well. In addition, they justify the quality of the instrument, show clear data collection procedures, and even present research results in a structured manner.

The authors also have interesting conclusions: Knowledge of renewable energy positively impacts college students' energy saving intentions; (2) The impact is mainly realized through college students' perceived value (PV) of energy saving. (3) Knowledge of renewable energy mobilizes college students to evaluate the benefits of energy conservation, which is the key to enhancing their energy-saving intentions; and (4) The impact of the knowledge of renewable energy on personal norms is stronger than that on perceived value.
The authors have justified the causal explanation through theoretical triangulation (previous study). I appreciate that. However, I do not see how the authors relate the results of their research to other important factors such as cultural and demographic factors. Whereas empirically, these two factors are very influential on how people think, behave, and perceive anything in life.

Comments to the Author

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How does the knowledge of renewable energy affect college students' energy-saving intentions? -- Evidence from China

Journal:	*SAGE Open*
Manuscript ID	SO-21-2967
Manuscript Type:	SAGE Open - Research Paper
Keywords:	energy-saving intention, knowledge of renewable energy, college students, perceived value, personal norm
Main Discipline or Subject Area:	Education
Approaches:	Quantitative
Methods:	structural equation modeling
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How does the knowledge of renewable energy affect college students' energy-saving intentions? -- Evidence from China

Abstract: Renewable energy and its related technologies can alleviate the energy problems human beings face. Therefore, after gaining knowledge of renewable energy, do college students believe that the energy problem has been or can be solved, thus reducing their own energy-saving intentions? To answer this question, the present study conducted a field survey of college students in Xi'an, China, employing structural equation modeling to analyze college students' knowledge of renewable energy and the impact of it on energy-saving intentions. The study sought to identify the influencing factors and their influencing paths on college students' energy-saving intentions. This study also explored how the knowledge of renewable energy affects college students' energy-saving intentions through value perception. The main conclusions are as follows: (1) knowledge of renewable energy has a positive impact on college students' energy-saving intentions; (2) this impact is mainly realized through college students' value perception of energy saving; (3) knowledge of renewable energy mobilizes college students to evaluate the benefits of energy saving, which is the key to enhancing their energy-saving intentions; and (4) the impact of knowledge about renewable energy on personal norms is stronger than that on perceived value.

Key words: energy-saving intention; knowledge of renewable energy; college students; perceived value

1 Introduction

Buildings are important energy end-users, demanding around 3060 Mtoe each year, which in 2018 accounts for 36% of final global energy consumption and 28% of energy-related CO_2 emissions worldwide [1]. According to the Intergovernmental Panel on Climate Change, energy consumption of college buildings accounts for a large part of the total global energy consumption [2, 3]. The number of campus buildings in China accounts for only 3%–7% of the total number of urban buildings. However, the energy consumption of campus buildings accounts for 30% of the total energy consumption of all buildings, and the energy consumption per unit area of colleges is 5-10 times higher than that of ordinary residential buildings [4-6]. Moreover, the per capita energy consumption of Chinese universities is four times that of the entire country [7, 8]. This data makes clear that colleges need to bear the high cost of energy consumption and demonstrates that to realize carbon reduction and carbon neutrality, the focus needs to be on universities and on college students.

Knowledge is one of the key factors that affects the intentions and behaviors related to energy-saving [9, 10]. College students are exposed to many types of knowledge, including of renewable energy, through learning, communication with classmates or teachers and through social networks. Renewable energy is a kind of energy that can be recycled and regularly supplemented or reused in nature. In recent years, the development of renewable energy has alleviated many energy problems and is an important means to adjust the energy structure [11]. When there is a certain cognition or stereotype, people's attitude will also change [12]. The emergence of renewable energy and related technologies may lead college students to believe that the

energy problem is not serious. Therefore, we have reason to suspect that college students will change their perception and understanding of energy issues by learning or gaining contacting with relevant knowledge about renewable energy. If college students change their understanding of energy issues, their energy-saving intentions may also change. When college students realize that the energy problem can be solved by the development of renewable energy, they may develop a negative stereotype of energy-saving; if this type of knowledge indeed has a negative impact on energy-saving intentions, it is necessary to consider strategies and supporting measures for teaching in the future. The existing literature does not fully reveal how knowledge of renewable energy affects college students' energy-saving intentions. There are two reasons for this: first, whether knowledge has a positive or negative impact on energy-saving intentions remains controversial [13]; second, the mechanism of knowledge on energy-saving intentions has yet to be adequately studied [14].

The main reason behind the first point is that there exist different types of knowledge, and different types of knowledge may impose different influences on energy-saving intentions. For example, knowledge about the progress of energy-saving technology, including energy-saving products [15] and the standard of energy consumption of electrical appliances [16], has a negative impact on energy-saving intentions. However, a background knowledge of the ecological environment and energy utilization and knowledge of personal energy-saving skills typically have a positive impact on energy-saving. The back ground knowledge include environmental concern [17] and understanding of climate change and environmental issues [18]. The

knowledge of personal energy-saving skills include knowledge of household energy-saving skills [19] and of specific measures that reduce carbon dioxide emissions [20]. Knowledge about renewable energy can on one hand attribute of the advanced energy-saving technology; on the other hand, textbooks and classes about renewable energy may involve a background knowledge of environment and energy. Therefore, it is difficult to directly judge whether the impact of a knowledge about renewable energy is positive or negative.

Regarding the second point, a study on people's behaviors in buildings has summarized the existing research on energy-related behaviors and listed the relevant factors that influence energy-saving intentions [10]. Among these factors, attitude (especially perceived value) and norms are obviously affected by knowledge; however, current research on the relationship between knowledge and energy-saving intentions focuses only on whether a certain type of knowledge affects energy saving [19, 21, 22], or simply that knowledge is one of the direct influencing factors [23, 24]. Unfortunately, few studies focus on the process or relationship of "knowledge-perceived value/norm-intention."

This paper will focus on solving the following problems and put forward suggestions according to the research results, so as to better guide practice:

1. whether the knowledge of renewable energy reduces college students' energy-saving intentions;

2. whether the knowledge of renewable energy affects college students' energy-saving intentions through an impact on the perception of the value of energy-saving;

3. whether personal norms or perceived value plays a more important role in the process.

2 Literature reviewed and hypothesis postulate

2.1 Influence factors of energy-saving intention

Theory of Planned Behavior (TPB) is widely used to study environmental behaviors and intentions [10]. The core view of it is that intention is directly affected by attitude, subjective norms and perceived behavior control [25]. The purpose of this study is to explore whether and how knowledge affects energy-saving intentions; therefore, on the basis of TPB, this paper sets perceived value of energy saving and personal norms as the direct influence factors. The reasons are as follows.

First, attitude in TPB refers to the cognition of behavior and its consequences [10], and knowledge is a factor influencing this cognition [26]. Since one key goal of this paper is to explore how the knowledge of renewable energy affects energy-saving intentions, the mechanism of knowledge on attitude is analyzed (see Section 2.2 for details). Based on this and according to the definition of attitude, we specifically study one of the elements of attitude, that is, the perceived value of energy saving. The relationship between perceived value and energy-saving intentions should prove similar to the relationship between attitude and intention in TPB [27]. As such, Hypothesis 1 is put forward as the following: H1: Perceived value (PV) has a positive impact on energy-saving intentions (INT).

Second, in recent years, research on energy saving and norms has divided norms into subjective norms [28], descriptive norms (Ding et al., 2019 and personal norms [29].

Subjective norms refer to the social pressures on individuals when they carry out their behaviors; descriptive norms refer to how to carry norms out in a specific situation. Neither is directly related to knowledge. Personal norms, defined as the moral obligation to fulfill or not perform a particular act [30], are mainly about personal knowledge rather than about external pressure. Therefore, this paper replaces the subjective norms in TPB with personal norms, and assumes that they exert a positive impact on energy-saving intentions. Hypothesis 2 thus reads as follows: H2: Personal norms (PN) have a positive impact on INT.

Third, perceived behavior control mainly refers to the expectation of resources and obstacles related to the implementation of behavior. This factor is not directly related to knowledge, therefore we do not consider the influence of this factor on this study's target problems.

2.2 Influence factors of perceived value

The concept of perceived value originally refers to consumers' perceived preference and evaluation of products; it affects the whole process of consumers' perception, evaluation and purchase of product value [31]. On the basis of this concept, scholars have put forward the concept of green perceived value, which refers to consumers' overall assessment of the net income of a product or service based on environmental aspirations and expectations of sustainability [32]. In recent years, the concept of perceived value has been used to study issues surrounding the environment and energy saving [27, 33]. This paper relies on this concept to describe college students' overall evaluation of the net income of energy saving.

In recent years, research on perceived value and energy saving or environmental intention suggests that perceived value can be further subdivided [34], such as perceived quality, perceived price and emotional and environmental values. These factors will significantly positively affect consumers' purchase intention for energy-saving devices [35]. Some studies divide the factors that affect perceived value into perceived benefits and perceived sacrifices, that is, the cost of implementing green consumption. Moreover, perceived benefit is positively correlated with green consumption intention, while perceived sacrifice is negatively correlated with it [36]. Some scholars found that perceived value is affected by perceived benefit and perceived risk and that perceived benefit is affected by knowledge [15]. Wang also proposed that knowledge will positively affect perceived value [9]. Based on the references cited above, this paper sets three influencing factors of perceived value: perceived benefit (PB), perceived costs (the cost of implementing energy-saving behaviors, abbreviated as PC) and perceived risk of non-implementation of energy saving (PR). We also assume that there is interaction among the three factors. In addition, it is necessary to assume that knowledge of renewable energy has an impact on these three factors. We believe that knowledge of renewable energy points out that the energy problem can be and is being solved, so it will lead to negative energy-saving intentions. As Sun pointed out, the more people understand the performance of energy-saving products, the less willing they are to save energy [16]. To sum up, the assumptions in this part are as follows:

H3a: PB has a positive impact on PV;

H3b: PC has a negative impact on PV;

H3c: PR has a positive impact on PV;

H4a: PC has a negative impact on PB;

H4b: PR has a positive impact on PB;

H5a: Knowledge of renewable energy (KRE) has a negative impact on PB;

K5b: KRE has a negative impact on PR;

H5c: KRE has a positive impact on PC.

2.3 Influence factors of personal norm

At present, relevant studies suggest that personal norms are influenced by attitude, consequence, responsibility [37, 38], environmental concern and perceived consumer effect [29]. Since this paper has expressed attitude and the consequences of it with perceived value and its influencing factors, it is assumed that perceived value will affect personal norms, which is similar to the view that norms and attitude will interact with intention [28]. In addition, because personal norms reflect the understanding of energy saving among college students, this paper also assumes that knowledge of renewable energy will make college students think that energy problems have been gradually solved, thus they do not need to save energy. Knowledge of renewable energy will therefore negatively affect personal norms. Hypotheses 6 and 7 are as follows:

H6: PV has a positive impact on PN;

H7: KRE has a negative impact on PN.

According to the above assumptions, we established a structural model as shown in Figure 1.

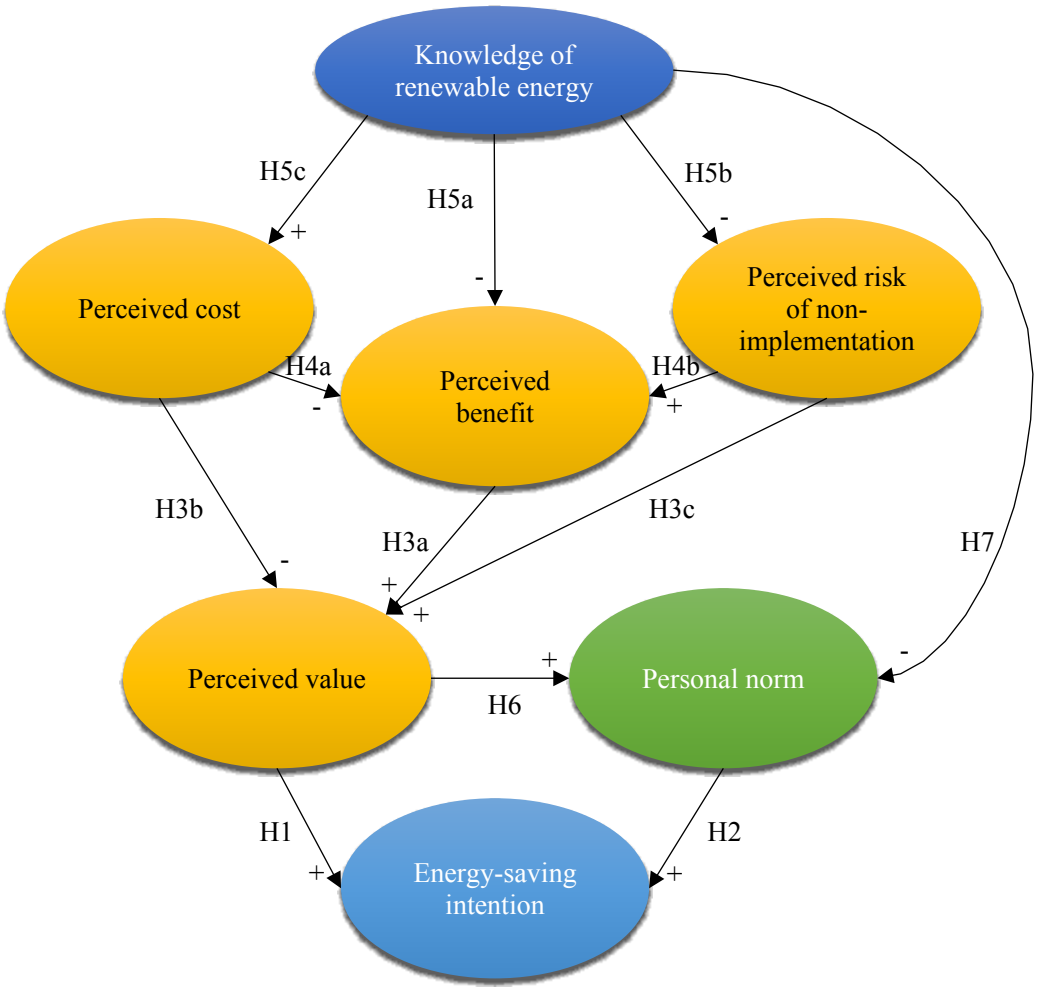

Figure 1. Structural model of the research

3 Methodology

3.1. Questionnaire and data source

The measurement items employed in this paper include energy-saving intentions, personal norms, perceived value, perceived benefit, perceived cost, perceived risk of non-implementation and knowledge of renewable energy. On the basis of reference to relevant research [39, 15, 29], questionnaire items were designed, as shown in Table 1. For all measurement items, a five-point scale was used to indicate the extent to which respondents approve of these items, where 5 represents the most agreement and 1 represents the most disagreement. Three procedures were implemented to improve the

questionnaire and in turn to improve the accuracy of measurement. First, a Chinese sentence was designed for each item based on previous research. Second, and pre-investigation, four classes of students in the school of the researcher were selected to fill out the questionnaire (127 valid questionnaires were collected) in order to identify and then modify any problems in the questionnaire. Third, a team of four teachers and five graduate students were invited to examine the questionnaire to ensure that it was easy to read and understand so that high-quality data could be collected.

Table 1. Questionnaire items employed in the main survey

Factors	Items	Explanation
Energy saving intention (INT)	INT1	I'm willing to participate in energy saving.
	INT2	I'm willing to try my best to save energy.
	INT3	I'm willing to make specific energy-saving behaviors.
	INT4	I'm willing to frequently implement energy-saving behaviors.
Perceived value (PV)	PV1	My energy-saving behavior is worth it.
	PV2	It makes sense for me to save energy.
	PV3	Energy saving is a valuable behavior.
Perceived benefits (PB)	PB1	I think saving energy is good for the development of the school.
	PB2	I think saving energy is good for society.
	PB3	I think saving energy is conducive to the sustainable development of our country.
	PB4	I think saving energy is good for the future ecological environment.
Perceived cost	PC1	Energy saving interrupts what I'm doing.

(PC)	PC2	Energy saving is a waste of time.
	PC3	I need to constantly remind myself to implement energy-saving behavior.
	PC4	Energy saving will sacrifice my study and life experience.
Perceived risk of non-implementation (PR)	PR1	If I don't save energy, I may face environmental pollution.
	PR2	If I don't save energy, people around me may think my habits are not good.
	PR3	If I don't save energy, I may face energy shortage.
Personal norm (PN)	PN1	It is necessary for me to form the habit of saving energy.
	PN2	It is necessary for me to maintain the habit of saving energy.
	PN3	It is necessary to be an energy-saving person.
	PN4	I have a responsibility to save energy for the sustainable development of our country.
Knowledge of renewable energy (KRE)	KRE1	I learned a lot about renewable energy from school learning.
	KRE2	I learned a lot about renewable energy from social media.
	KRE3	I learned a lot about renewable energy from people around me.
	KRE4	I learned a lot about renewable energy from school and social advocacy activities.

To ensure the quality of the survey, the questionnaire was distributed to students of a university in Xi'an between April and May 2021. Some classrooms were randomly selected and those students completed a questionnaire survey while on a break to ensure the identity of the respondents and the quality of the survey. Each respondent was informed of the purpose of the investigation and the anonymity of the questionnaire.

From the survey, we received a total of 473 responses, of which 401 were deemed valid. Among them, male students accounted for 44.39%; female students for 55.61%; students with less than one year remaining in school for 14.46%; 46.38% had one to two years left; 24.64% had two to three years remaining; and 14.21% had three to four years. Among all the students polled, 61.85% focused on the curriculum, 19.7% focused on self-study, 15.96% were devoted to scientific research and 2.5% focused on internship. Data sources show that the survey covers different types of college students, therefore the sociodemographic diversity of data sources was ensured.

3.2. Structural Equation Modeling

The data analysis of this study was conducted using the Structural Equation Modeling (SEM) technique and followed the two-step approach for assessing the measurement and structural models, respectively [40]. SEM technique is a commonly used method to test relationships between constructs based on their assigned indicators [41]. SEM is a powerful statistical research technique and is effective in analyzing relationships between multiple-item constructs [42]. In this study, we first used SEM to verify the hypotheses and structural model, and then used the bootstrap method [43] to test the indirect effect of some variables.

4 Results analysis

4.1 Structural equation model examination

First, confirmatory factor analysis (CFA) was employed to evaluate the reliability and validity of the model. Convergent validity and composite reliability evaluate the correlation between the items within the latent variables. According to related research,

Cronbach's alpha and composite reliability should be greater than 0.7, and the lowest average variance extracted (AVE) should greater than 0.5 [44, 45]. The relevant indicators of this study are shown in Table 2, and the results show that all measurement items have robust convergent validity.

Table 2. Results of measurement model analysis

Factors	Cronbach's Alpha	AVE	Composite reliability
INT	0.965	0.874	0.965
PV	0.936	0.826	0.935
PN	0.940	0.801	0.941
PB	0.929	0.774	0.932
PC	0.883	0.658	0.885
PR	0.794	0.583	0.804
KRE	0.837	0.567	0.838

401 samples were used to test the structural model, and the p value of some path coefficients is not significant (see Table 4 for details). Therefore, we modified the model and deleted these paths. The value of the fitting indicators and the judgment standard [46-48] of the modified model are shown in Table 3 and show that the overall fit of the structural model is good and that the modified structural model is acceptable.

Table 3. Fit indices of the models

Types of indicators	Statistics of goodness-of-fit	Standard values	Test values	Adaptability of the model
Absolute	CMIN/DF	< 3.00	2.301	Qualified

goodness-of-fit	CMIN	P < 0.05	P = 0.000	Qualified
	RMSEA	< 0.08	0.057	Qualified
	CFI	> 0.90	0.959	Qualified
Added-value	NFI	> 0.90	0.929	Qualified
goodness-of-fit	IFI	> 0.90	0.959	Qualified
	RFI	> 0.90	0.921	Qualified
	PNFI	> 0.50	0.829	Qualified
Concise	PCFI	> 0.50	0.855	Qualified
goodness-of-fit	CN	> 200	210	Qualified

The path coefficient of the modified model and its related test indicators are shown in Figure 2 and Table 4. The factor loads of all latent variables are not less than 0.5, which indicates that the model is more accurate in measuring factors. The standardized regression coefficients and their test results of each path in Table 4 show that the C.R. value of path coefficients of H3b, H3c and H5b falls in the interval (- 1.8, 1.8), and the p value of them are greater than 0.05. Therefore, the three hypotheses above are negated, and we deleted the corresponding three paths in the structural model. The paths corresponding to the other hypotheses are highly significant, and these hypotheses have been verified.

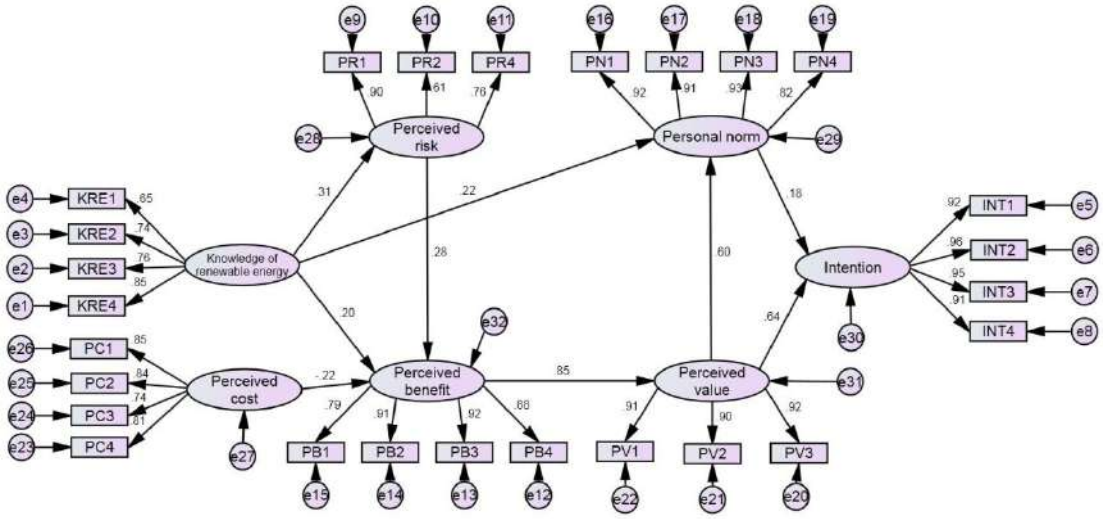

Figure 2. Testing results of the research model

Table 4. Path coefficient estimation of the model

Paths	Standardized regression weights	S.E.	C.R.	Hypotheses	Results
KRE→PC	-0.025	0.066	-0.399	H5c	Not supported
PC→PV	-0.066	-1.798	0.072	H3b	Not supported
PR→PV	0.042	0.032	1.080	H3c	Not supported
PV→INT	0.636	0.059	12.279***	H1	Supported
PN→INT	0.179	0.058	3.639***	H2	Supported
PB→PV	0.847	0.045	20.051***	H3a	Supported
PC→PB	-0.225	0.040	-4.414***	H4a	Supported
PR→PB	0.277	0.043	4.894***	H4b	Supported
KRE→PB	0.200	0.046	3.651***	H5a	Not supported
KRE→PR	0.307	0.063	5.321***	H5b	Not supported

PV→PN	0.601	0.043	13.363***	H6	Supported
KRE→PN	0.215	0.039	4.824***	H7	Not supported

Note: *p < 0.05, **p < 0.01, ***p < 0.001.

4.2 Direct effect

First, the direct effect of KRE is the most inconsistent with our expectation. The path coefficients corresponding to H5a, H5b and H7 are positive, which indicates that KRE has a positive effect on PB, PR and PN. The results contradict the hypothesis of negative effect. Therefore, H5a, H5b and H7 are negated, but the result proves the actual situation is contrary to the hypothesis. These results show that knowledge of renewable energy does not weaken college students' cognition that energy saving is valuable, as we previously thought; on the contrary, it even enhances this cognition. Second, PB is a key factor in the process of college students' perception of the value of energy saving. PC and PR have no significant direct effect on PV, while PB has significant direct effect on PV. In addition, the path coefficient of PB to PV is 0.847, and the high value shows that the relationship between them is quite close. Once college students consider that energy saving will bring benefits, they obviously tend to believe that energy saving is valuable. The significant direct effect of KRE on PB indicates that knowledge of renewable energy has a positive effect on improving college students' perception of energy saving. Third, for college students' energy-saving intentions, PV poses obvious importance. The path coefficient of PV to INT is 0.636, which is significantly higher than that of PN to INT (0.179). This result shows that college students are more concerned about the value of energy saving than whether they should

carry out energy-saving behaviors. In addition, the path coefficient of PV to PN is 0.601, and the high value indicates that college students' personal norms for energy saving will also be greatly affected by PV. This result shows the great influence of PV in energy-saving intentions from another perspective.

4.3 Indirect effect

The above test and analysis verified the direct effect between the variables. However, due to the complexity of the structural model, there are some intermediate variables among some variables. For example, KRE does not directly affect PBs; it may only affect PV, but does not affect INT through PV. Therefore, to clarify the mechanism of KRE on college students' energy-saving intentions, we need to test whether there are indirect effects among several key variables. The bootstrap method was used to test the indirect effect of some variables. We chose to repeat 5000 times, deciding the existence of indirect effects according to whether the indirect effect includes 0 in the 95% confidence interval. The results are shown in Table 5.

Table 5. Results of mediation effect analysis

			95% confidence intervals	
IV	DV	Indirect effect	lower limit	upper limit
PC	PV	-0.190	-0.304	-0.078
PR	PV	0.234	0.121	0.343
KRE	PV	0.241	0.148	0.332
KRE	PN	0.145	0.077	0.216
KRE	INT	0.218	0.140	0.300

PV	INT	0.108	0.043	0.201

There is a significant indirect effect between the tested variables because there is no 0 in the 95% confidence interval. The indirect effect of KRE on PV, PN and INT is significant, and the standardized indirect effect value is between 0.145 and 0.241, which indicates that the indirect effect of KRE is obvious in the formation process of college students' energy-saving intentions. In other words, KRE not only directly affects college students' perception of the cost, benefit and risk of non-implementation of energy saving, but also affects their personal norms and intention to save energy through these perceptions. The influence of KRE on the formation of college students' energy-saving intentions is continuous. For the same reason, PC and PR also affect PV through PB. Combined with the verification results of H3b and H3c, the mechanism of PC and PR on PV is indirect rather than direct, and the mediating variable is PB. The total effect of PV on INT is 0.744. This result shows that PV plays an important role in the formation of college students' energy-saving intentions. In addition, the total effect of KRE on PN is 0.360, which is larger than its indirect effect on PV, indicating that KRE mainly affects college students' energy-saving intentions through PN.

5 Discussion

5.1 Impact of the knowledge of renewable energy

First, the results show that the path coefficients associated with KRE are all positive, assuming that H5a, H5b and H7 are negated. That is, the impact of KRE to PV and PN is positive. In the hypotheses part, we assumed that KRE would lead college students toward a positive expectation of energy, therefore they will believe that current

energy saving efforts are unnecessary and then reduce the PV. However, the results show that KRE improves college students' PV through PB, PR and PN. In order to understand the meaning of the results, we further considered previous studies. Literature that considers that knowledge has a negative impact on energy-saving behaviors or intentions usually investigates knowledge about the energy-saving performance of energy-saving products and equipment, such as electricity consumption of energy-saving lamps, the stand-by energy consumption of electrical appliances [16] or understanding of energy-saving products [15]. The knowledge of specific energy-saving products may make residents believe that energy saving has been realized by technology and products, so their energy-saving behavior is not of great value. This is also the core idea of hypotheses H5a, H5b and H7. However, other studies report that knowledge has a positive impact on energy-saving behavior or willingness; most of these studies investigate macro or holistic knowledge about the ecological environment and energy consumption. For example, incorrect understanding of energy issues is not conducive to energy conservation [49], and understanding of the environment and carbon dioxide emissions is conducive to energy saving [20]. Considering the results of the above two types of studies, we believe that in the process of learning about renewable energy, college students gain background knowledge related to the environment, energy constraints and carbon dioxide emissions, which enhances their intentions to save energy. However, although the knowledge of renewable energy makes college students realize that the energy problem can be solved, that problem has not yet been completely solved, which stimulates college students' PV of energy saving. Therefore, in the future,

the teaching of renewable energy in colleges should be comprehensive and systematic. It is important to avoid the simple propaganda of technological progress, and supplementing background knowledge about energy and the bottleneck of renewable energy is necessary.

In addition, H5c is negated, and the actual situation is that the influence of KRE on PC is not significant. KRE has not made college students feel that it is troublesome and laborious to implement energy-saving behaviors. Combined with the positive influence of KRE on PR and PB and its discussion, this phenomenon is not difficult to understand. Meanwhile, KRE has no negative impact on PC. There may be two reasons for this result. First, the content of KRE does not involve the daily energy-saving behavior of college students. Second, the evaluation of the cost of energy saving is relatively independent; therefore, even though KRE improves the understanding of energy saving of college students, the negative emotions of students in implementing energy-saving behaviors still needs to be considered.

5.2 About perceived value

The central element of Prospect Theory is loss aversion, which describes the observation that losses have a relatively larger impact on observed decisions than gains, relative to a subjective reference point [50, 51]. According to this theory, PC and PR should have a greater impact on the judgment of the value of energy saving than PB. In recent years, studies on the application intention of energy-saving technology and equipment also show that loss and risk-averse groups are less willing to engage with energy-efficient appliances or technologies [52, 53]. However, the results of this paper

reject H3b and H3c—that is, for college students, PR and PC do not directly affect their judgment of PV. Interestingly, the test of indirect effect shows that PR and PC influence PV through the mediation effect of PB, and the path coefficient between PB and PV is relatively large; therefore, PB is the key factor for college students to judge the value of energy saving.

How is the contradiction between the results of this paper and the existing literature explained? First, the structural model reflects the structural relationship among latent variables, that is, when analyzing the relationship among PC, PR, PB and PV, it is necessary to consider the influence of KRE. KRE has a significant direct impact on both PR and PB, but college students will not directly judge the value of energy saving based on them. Instead, they will take PR and PC as the basis to comprehensively evaluate PB, and then evaluate PV according to PB. That is, although KRE can simultaneously affect college students' judgment of PR and PB, it also causes them to consider the core issue of whether energy saving is valuable. This point is consistent with our thinking when we made relevant hypotheses, but it turns out that KRE leads college students to believe that energy saving is valuable rather than unnecessary. Based on the above results, we believe that under the influence of KRE, college students will first evaluate PB (PR and PC will be considered simultaneously in this process), and then evaluate PV based on PB. Therefore, how to improve college students' PB of energy saving is the key to improving their energy-saving intentions, and KRE plays an important role in this process.

The indirect effect of KRE on PV is 0.248, which is larger than the path coefficient of KRE to PR and KRE to PB, indicating that KRE significantly improves college students' PV, and the degree of improvement is not low. Our original hypothesis stated that the main function of KRE is to make college students realize that the energy problem can be solved, and we assumed it would have a negative impact on PV and INT. However, learning relevant knowledge can in fact enhance college students' awareness of the value of energy saving. Combined with the discussion in 4.1, we propose that learning KRE makes college students realize that energy saving will elicit various benefits, so it forms a benefit-oriented value judgment. This is also similar to the results of other studies; for example, knowledge of the potential benefits of energy-saving products will enhance the intention to use such energy-saving products [9].

5.3 What affects the intention

First, the path coefficient of PV to INT is large, and the indirect effect of PV on INT is small, which indicates that INT is mainly directly affected by PV. That is, for college students, “energy saving is valuable” is more essential than “energy saving is necessary.” Relevant studies confirm this result. Zhao et al. has shown that the impact of personal norms on energy-saving intentions is less than the perception of energy-saving value [38]. Although some studies show that the impact of personal norms is greater than knowledge or attitude, they set the connotation of knowledge or attitude as relevant background knowledge [54] or perception of the cost of energy saving [55]. Combined with the studies, we determine that PV or PB has an obvious impact on the energy-saving intentions of college students, and the impact is stronger than that of PN,

while PC have little influence. Therefore, the key is to enhance college students' PV of energy saving through the teaching of systematic knowledge. It is not good practice to simply and solely popularize background knowledge of the environment and energy or to emphasize the necessity of energy saving.

As a kind of energy-saving background knowledge, the total effect of KRE on INT is 0.219, which is far lower than that of PV (0.744). Although this result shows that the impact of KRE on INT is less than PV, as one of the means to enhance the PV (the total effect of KRE on PV is 0.248), it is meaningful to spread this type of knowledge. Moreover, the total effect of KRE on PN is 0.348, which indicates that KRE convinces college students that energy saving is necessary. Through the accumulation of background knowledge, via education, of energy, the environment and the progress of technology, KRE can lead college students toward a more positive understanding of the value of energy saving, and this understanding can work with KRE to enhance college students' PN for energy saving; ultimately, this can enhance their energy-saving intentions. This result also proves that if a college wants its students to develop self-awareness of energy saving, one effective way to do so is to carry out systematic education of energy knowledge.

6 Conclusion and policy implications

Improving college students' energy-saving intentions is the key to reducing energy consumption, improving the quality of national energy saving in the future and achieving carbon neutral and sustainable development. Different types of knowledge to which college students are exposed may pose different effects on their energy-saving

intentions. Knowledge of renewable energy is one type of knowledge. In this paper, by constructing hypotheses about the impact of the knowledge of renewable energy on energy-saving intentions, a structural equation model is applied to verify the relevant functioning paths. Through the research, the following conclusions were obtained: (1) Knowledge of renewable energy has a positive impact on college students' energy-saving intentions; (2) The impact is mainly realized through college students' perceived value (PV) of energy saving. (3) Knowledge of renewable energy mobilizes college students to evaluate the benefits of energy conservation, which is the key to enhancing their energy-saving intentions; and (4) The impact of the knowledge of renewable energy on personal norms is stronger than that on perceived value.

Based on the conclusions, three implications can be put forward to help colleges and society enhance the energy-saving intentions of college students through education and knowledge popularization. First, strengthen the education and popularization of the knowledge of renewable energy, which has a positive impact on college students' energy-saving intentions. Through the curriculum, classroom education, offline activities and information push of social platforms, college students' energy-saving intentions can be effectively improved. Second, pay attention to the systematic education of knowledge of renewable energy. The knowledge of renewable energy is a type of technological progress knowledge; therefore, simply publicizing that renewable energy can solve the energy problem may not be conducive to the energy-saving intentions. In the process of education and popularization of the knowledge of renewable energy, the energy background, technology development background and

processes, as well as the deficiencies of current technology should also be paid attention to. Third, the process of education should focus on stimulating thinking about the benefits and values of energy saving. Renewable energy, as a means and a technology to solve energy problems, brings with it a risk of reducing the subjective intention of energy saving of college students. However, if the relevant knowledge causes students to consider and evaluate their own benefits from energy saving, their energy-saving intentions will be improved. That said, some thoughts and discussions can be arranged for college students in the process of knowledge education and popularization to stimulate their thinking about the background of renewable energy technology and the significance of energy saving.

This paper uses a structural equation model to investigate the impact of the knowledge of renewable energy on college students' energy-saving intentions. Research perspectives and data collection have revealed two limitations.. First, this paper mainly studies knowledge of renewable energy from the perspective of college students, therefore we must focus on the education and popularization of knowledge of renewable energy from the perspective of college students. For this reason, we asked the respondents about the intensity of their exposure to relevant knowledge from different channels. It is worth noting that there may exist differences between the degree of contact with knowledge and the degree of understanding of knowledge. In further research, we will study the differences between the two aspects and their impact on energy-saving intentions. Second, there are many types of knowledge that affect college students' energy-saving intentions. This study focuses on the knowledge of renewable

energy and its impact on energy-saving intentions, so it does not involve other types of knowledge. In future research, we will continue to explore other types of knowledge that affect college students' energy-saving intentions and provide more comprehensive and effective suggestions for promoting college students' energy-saving education.

Reference

[1]International Energy Agency. Tracking buildings[EB/OL]. https://www.iea.org/reports/tracking-buildings#, 21th, May.
[2]ALLAB Y, PELLEGRINO M, GUO X, NEFZAOUI E, KINDINIS A. Energy and comfort assessment in educational building: Case study in a French university campus[J]. Energy and Buildings, 2017, 143: 202-219.
[3]SUN Y, LUO X, LIU X. Optimization of a university timetable considering building energy efficiency: An approach based on the building controls virtual test bed platform using a genetic algorithm[J]. Journal of Building Engineering, 2021, 35: 102095.
[4]Research Center for Building Energy Conservation. Chinese Annual Development Report on Building Energy Efficiency 2012[M]. Beijing: China Architecture & Building Press, 2012.
[5]China Building Energy Conservation Association. 2019. Report of China Building Energy Consumption research (2019)[M]. Energy Consumption Statistics Committee of China Association of Building Energy Conservation; Shanghai.
[6]HONGWEI T. Construction of energy saving supervision system of campus buildings in Colleges and Universities[J]. Construction Science and Technology, 2010, (02): 15-19.
[7]China National Bureau of Statistics. China Statistical Yearbook[EB/OL]. http://www.stats.gov.cn/tjsj/ndsj/2014/indexch.htm, 1st, June.
[8]XIA; Z, YONGCHUAN Y. Energy Consumption with Energy-saving Measures for Chongqing University[J]. Building Energy Efficiency, 2015, 43 (09): 108-111.
[9]WANG Y, HUSCROFT J R, HAZEN B T, ZHANG M. Green information, green certification and consumer perceptions of remanufctured automobile parts[J]. Resources, Conservation and Recycling, 2018, 128: 187-196.
[10]HEYDARIAN A, MCILVENNIE C, ARPAN L, YOUSEFI S, SYNDICUS M, SCHWEIKER M, JAZIZADEH F, RISSETTO R, PISELLO A L, PISELLI C, BERGER C, YAN Z, MAHDAVI A. What drives our behaviors in buildings? A review on occupant interactions with building systems from the lens of behavioral theories[J]. Building and Environment, 2020, 179: 106928.
[11]ZHOU Y, LIU Y, WANG D, LIU X, WANG Y. A review on global solar radiation prediction with machine learning models in a comprehensive perspective[J]. Energy Conversion and Management, 2021, 235: 113960.
[12]HOU C, WEN Y, HE Y, LIU X, WANG M, ZHANG Z, FU H. Public stereotypes of recycled water end uses with different human contact: Evidence from event-related potential (ERP)[J]. Resources, Conservation and Recycling, 2021, 168: 105464.
[13]COTTON D, SHIEL C, PAçO A. Energy saving on campus: a comparison of students' attitudes and reported behaviours in the UK and Portugal[J]. Journal of cleaner production, 2016, 129: 586-595.
[14]LEFKELI S, MANOLAS E, IOANNOU K, TSANTOPOULOS G. Socio-Cultural Impact of Energy Saving: Studying the Behaviour of Elementary School Students in Greece[J]. Sustainability, 2018, 10 (3): 737.
[15]PARK E, KWON S J. What motivations drive sustainable energy-saving behavior?: An examination in South Korea[J]. Renewable and Sustainable Energy Reviews, 2017, 79: 494-502.
[16]SUN L, WANG Q, GE S. Urban resident energy-saving behavior: a case study under the A2SC framework[J]. Natural Hazards, 2018, 91 (2): 515-536.
[17]URBAN J, ŠČASNý M. Exploring domestic energy-saving: The role of environmental concern and background variables[J]. Energy Policy, 2012, 47: 69-80.
[18]HAN Q, NIEUWENHIJSEN I, DE VRIES B, BLOKHUIS E, SCHAEFER W. Intervention strategy to stimulate energy-saving behavior of local residents[J]. Energy Policy, 2013, 52: 706-715.
[19]DING Z, WANG G, LIU Z, LONG R. Research on differences in the factors influencing the energy-saving behavior of urban and rural residents in China–A case study of Jiangsu Province[J]. Energy Policy, 2017, 100: 252-259.
[20]TROTTA G. Factors affecting energy-saving behaviours and energy efficiency investments in British households[J]. Energy Policy, 2018, 114: 529-539.
[21]POTHITOU M, HANNA R F, CHALVATZIS K J. Environmental knowledge, pro-environmental behaviour and energy savings in households: An empirical study[J]. Applied Energy, 2016, 184: 1217-1229.
[22]YANG R, YUE C, LI J, ZHU J, CHEN H, WEI J. The Influence of Information Intervention Cognition on College Students' Energy-Saving Behavior Intentions[J]. International Journal of Environmental Research and Public Health, 2020, 17 (5): 1659.

[23]ZHANG C-Y, YU B, WANG J-W, WEI Y-M. Impact factors of household energy-saving behavior: An empirical study of Shandong Province in China[J]. Journal of cleaner production, 2018, 185: 285-298.
[24]YUE T, LONG R, CHEN H. Factors influencing energy-saving behavior of urban households in Jiangsu Province[J]. Energy Policy, 2013, 62: 665-675.
[25]AJZEN I. The theory of planned behavior[J]. Organizational Behavior and Human Decision Processes, 1991, 50 (2): 179-211.
[26]HONG H-Y, LIN P-Y. Elementary students enhancing their understanding of energy-saving through idea-centered collaborative knowledge-building scaffolds and activities[J]. Educational Technology Research and Development, 2019, 67 (1): 63-83.
[27]WANG Y, GU J, WANG S, WANG J. Understanding consumers' willingness to use ride-sharing services: The roles of perceived value and perceived risk[J]. Transportation Research Part C: Emerging Technologies, 2019, 105: 504-519.
[28]WAN C, SHEN G Q, CHOI S. Experiential and instrumental attitudes: Interaction effect of attitude and subjective norm on recycling intention[J]. Journal of Environmental Psychology, 2017, 50: 69-79.
[29]SONG Y, ZHAO C, ZHANG M. Does haze pollution promote the consumption of energy-saving appliances in China? An empirical study based on norm activation model[J]. Resources, Conservation and Recycling, 2019, 145: 220-229.
[30]SCHWARTZ S H. Normative explanations of helping behavior: A critique, proposal, and empirical test[J]. Journal of Experimental Social Psychology, 1973, 9 (4): 349-364.
[31]WOODRUFF R B. Customer value: The next source for competitive advantage[J]. Journal of the Academy of Marketing Science, 1997, 25 (2): 139.
[32]PATTERSON P G, SPRENG R A. Modelling the relationship between perceived value, satisfaction and repurchase intentions in a business - to - business, services context: an empirical examination[J]. International Journal of Service Industry Management, 1997, 8 (5): 414-434.
[33]KIM M-K, OH J, PARK J-H, JOO C. Perceived value and adoption intention for electric vehicles in Korea: Moderating effects of environmental traits and government supports[J]. Energy, 2018, 159: 799-809.
[34]SANGROYA D, NAYAK J K. Factors influencing buying behaviour of green energy consumer[J]. Journal of cleaner production, 2017, 151: 393-405.
[35]ZHANG Y, XIAO C, ZHOU G. Willingness to pay a price premium for energy-saving appliances: Role of perceived value and energy efficiency labeling[J]. Journal of cleaner production, 2020, 242: 118555.
[36]YUE T, LIU J, LONG R, CHEN H, LI Q, LIU H, GU Y. Effects of perceived value on green consumption intention based on double-entry mental accounting: taking energy-efficient appliance purchase as an example[J]. Environmental Science and Pollution Research, 2021, 28 (6): 7236-7248.
[37]WANG B, WANG X, GUO D, ZHANG B, WANG Z. Analysis of factors influencing residents' habitual energy-saving behaviour based on NAM and TPB models: Egoism or altruism?[J]. Energy Policy, 2018, 116: 68-77.
[38]ZHAO C, ZHANG M, WANG W. Exploring the influence of severe haze pollution on residents' intention to purchase energy-saving appliances[J]. Journal of cleaner production, 2019, 212: 1536-1543.
[39]RU X, WANG S, YAN S. Exploring the effects of normative factors and perceived behavioral control on individual's energy-saving intention: An empirical study in eastern China[J]. Resources, Conservation and Recycling, 2018, 134: 91-99.
[40]ANDERSON J C, GERBING D W. Structural equation modeling in practice: A review and recommended two-step approach[J]. Psychological bulletin, 1988, 103 (3): 411.
[41]WU M. Structural Equation Model-Operation and Application of AMOS[M]. Chongqing: Chongqing University Press, 2010.
[42]IACOBUCCI D. Everything you always wanted to know about SEM (structural equations modeling) but were afraid to ask.[J]. Journal of Consumer Psychology, 2009, 19 (4): 673-680.
[43]BARON R M, KENNY D A. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations[J]. Journal of personality and social psychology, 1986, 51 (6): 1173.
[44]FORNELL C, LARCKER D F. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error[J]. Journal of Marketing Research, 1981, 18 (1): 39-50.
[45]JOSEPH F. HAIR E A. Multivariate Data Analysis: a Global Perspective[M]. Upper Saddle River: Prentice Hall, 2009.
[46]RAYKOV T, MARCOULIDES G A. A first course in structural equation modeling[M]. London: Routledge, 2012.
[47]HOE S L. Issues and procedures in adopting structural equation modelling technique[J]. Journal of

Quantitative Methods, 2008, 3 (1): 76-83.
[48]BAGOZZI R P, YI Y. On the evaluation of structural equation models[J]. Journal of the Academy of Marketing Science, 1988, 16 (1): 74-94.
[49]COTTON D, MILLER W, WINTER J, BAILEY I, STERLING S. Knowledge, agency and collective action as barriers to energy-saving behaviour[J]. Local Environment, 2016, 21 (7): 883-897.
[50]TVERSKY A, KAHNEMAN D. Advances in prospect theory: Cumulative representation of uncertainty[J]. Journal of Risk and Uncertainty, 1992, 5 (4): 297-323.
[51]D. KAHNEMAN, TVERSKY A. Prospect theory: An analysis of decision under risk[J]. Econometrica, 1979, 47 (2): 263-292.
[52]SCHLEICH J, GASSMANN X, MEISSNER T, FAURE C. A large-scale test of the effects of time discounting, risk aversion, loss aversion, and present bias on household adoption of energy-efficient technologies[J]. Energy Economics, 2019, 80: 377-393.
[53]KNOBLOCH F, HUIJBREGTS M A J, MERCURE J-F. Modelling the effectiveness of climate policies: How important is loss aversion by consumers?[J]. Renewable and Sustainable Energy Reviews, 2019, 116: 109419.
[54]NIE H, VASSEUR V, FAN Y, XU J. Exploring reasons behind careful-use, energy-saving behaviours in residential sector based on the theory of planned behaviour: Evidence from Changchun, China[J]. Journal of cleaner production, 2019, 230: 29-37.
[55]DU J, PAN W. Examining energy saving behaviors in student dormitories using an expanded theory of planned behavior[J]. Habitat International, 2021, 107: 102308.

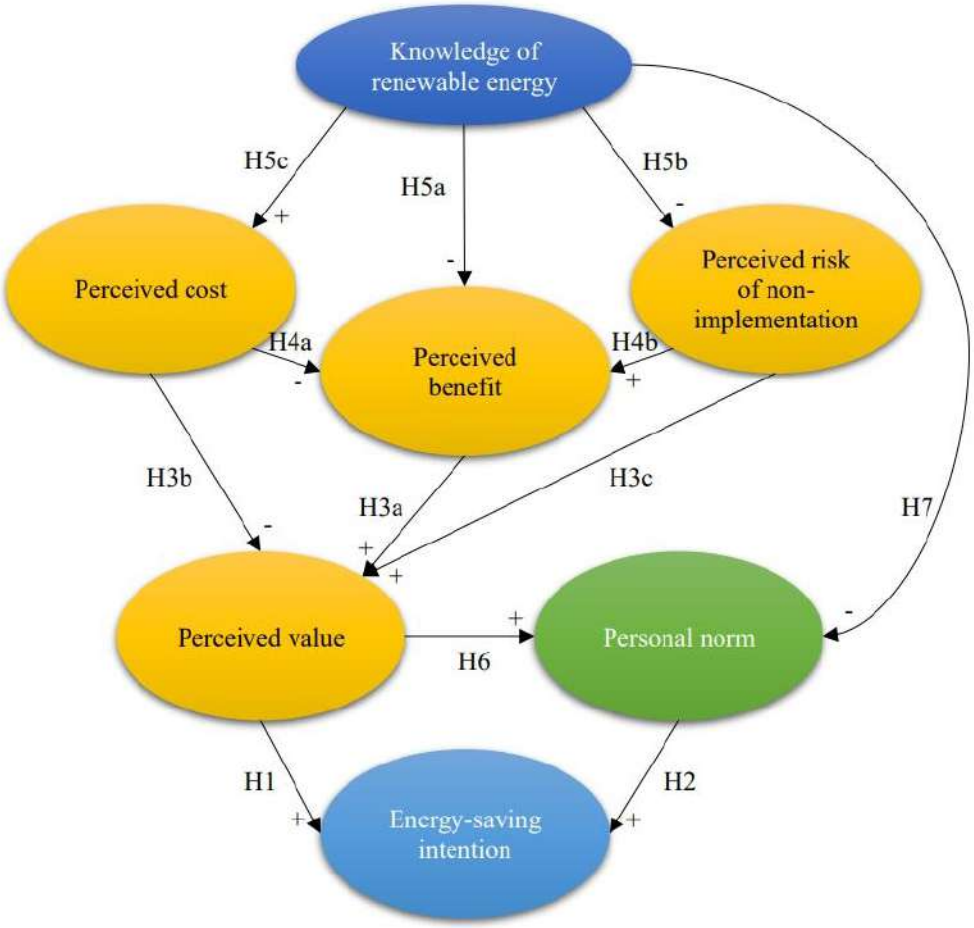

Figure 1. Structural model of the research

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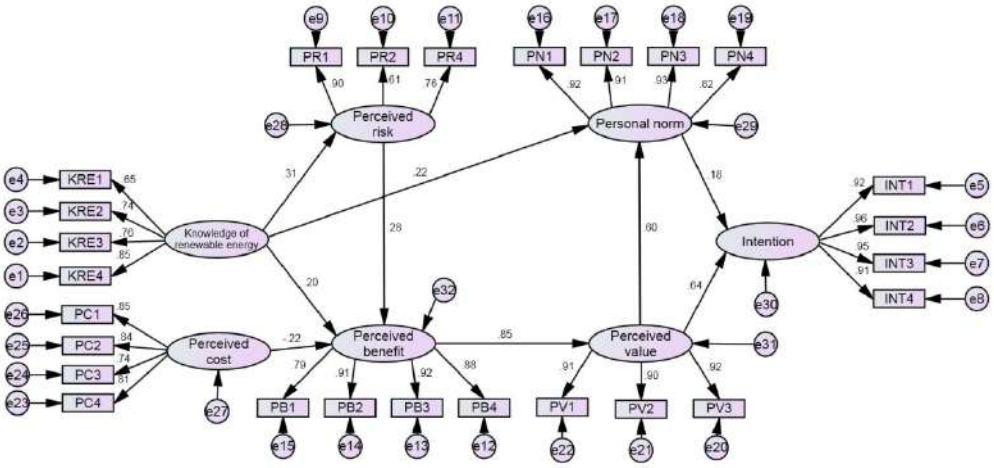

Figure 2. Testing results of the research model

405x192mm (96 x 96 DPI)