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CLIMATE NARRATIVES AND LOW-CARBON BEHAVIORAL INTENTIONS AMONG CHINA'S ECOLOGICAL MIGRANTS: MECHANISMS OF INFLUENCE THROUGH CULTURAL CONTEXT AND VALUE PERCEPTIONS

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ABSTRACT

This study aims to explore how different climate narrative frames (impact/science/action/political) influence the willingness to adopt low-carbon behaviors among China's ecological migrants. Employing a simple random assignment design, 800 ecological migrants in Qinghai Province were recruited to participate in two experiments. The results show that the action frame is most effective in enhancing behavioral willingness, while the political frame has the weakest effect; cultural background showed no significant moderating effect on the framing effect, but value perception had a partial moderating effect. This study expands the moderating mechanism of the framing effect model in climate communication. Furthermore, it clarifies the differences in information acceptance and psychological mechanisms of ecological migrants as a special group in climate communication. The findings provide references for future research and practice on climate adaptation behaviors of ecological migrants.

Key words .Climate Narrative; Low-Carbon Behavioral Willingness; Cultural Context; Value Perception; Ecological Migrants

INTRODUCTION

The global consensus on addressing climate change emphasizes the need for urgent mitigation measures and large-scale adaptation actions, which rely on media attention and broad public participation. Climate communication, as a specific domain of information dissemination, aims to convey climate change information, scientific knowledge, and lifestyle concepts to the public, promoting nationwide low-carbon actions to help solve climate change issues (Moser, 2010).

In recent years, climate narratives have gradually become a focus in international communication studies. Its core lies in influencing public risk perception, emotional attitudes, and action tendencies towards climate change through framing (Daniels & Endfield, 2009). Due to the elite-oriented, top-down model of climate communication, mainstream media tend to focus on national achievements and macro-strategies rather than the scientific risks of climate change itself or individual responses (Pan, Opgenhaffen



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

& Van Gorp, 2020). This has led to insufficient public understanding of the scientific mechanisms of climate change, manifesting as a phenomenon of "external heat but internal coldness, top heat but bottom coldness" (Wu Hairong & Zheng Quan, 2022). Overall, Chinese public attention to climate issues is increasing year by year, but the willingness and performance in actual climate action remain relatively low globally.

Since the 18th National Congress of the Communist Party of China, General Secretary Xi Jinping has personally planned, deployed, and promoted the construction of national parks, issuing important instructions multiple times regarding the ecological protection of the Three Rivers Source. China began implementing ecological migration projects in the 1980s, including the "Dingxi, Hexi" in Gansu and the "Xihaigu" region in Ningxia under the "Three West" Agricultural Construction Plan, the "Eight-Seven Poverty Alleviation Plan," the "Three Gorges Migration Project," etc., involving over ten million migrants.

The Qinghai Three Rivers Source region, the source of the Yangtze, Yellow, and Lancang Rivers, is China's highest-altitude natural wetland (average elevation over 4000 meters), renowned as the "Water Tower of China." According to the development direction established for key ecological functional zones in the "National Major Function Zoning Plan," the state implemented ecological migration in the Three Rivers Source region aimed at "closing grasslands for restoration, managing degraded grasslands, reducing livestock loads, conserving water sources, and restoring wetlands" (Wu Yongliang & Zhang Mengyuan, 2017). The essence of the Three Rivers Source ecological migration is population relocation to address regional environmental problems and poverty, aiming to adjust the relationship between humans and nature, promoting coordinated development of local population, resources, environment, and economy. Therefore, using the Qinghai Three Rivers Source ecological migrant group as a research sample is highly representative, encompassing both ecological vulnerability and social structural transformation. However, existing domestic and international literature mainly focuses on climate risk perception and behavioral willingness among the general public, with relatively few segmented studies on the Chinese public. Research on ecological migrants, who constitute a large population base, possess lower scientific literacy, and face high climate change risks, has primarily focused on their social adaptation, lacking research on the persuasive effects for promoting active behavioral change. Based on this, this paper aims to answer the following questions: How do climate narratives influence the low-carbon behavioral willingness of ecological migrants? Are there differences among different frames? Does an interaction mechanism exist?

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Climate Narrative Framing and Behavioral Willingness

Climate narrative framing influences people's cognition of climate issues and ultimately their behavioral willingness by emphasizing certain attributes of the problem



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

while ignoring others (Daniels & Endfield, 2009). Research shows that traditional climate communication centered on scientific facts may not necessarily attract the public or be effective. However, adopting different narrative frames, including green narratives, health narratives, etc., is a new approach to achieving better climate communication outcomes (Cooper & Nisbet, 2016). Regarding the mixed use of climate narratives and framing effects, some studies use information frames (environmental consequences vs. health consequences) and information forms (narrative vs. factual) as main independent variables to examine the different impacts of various narrative frames on the low-carbon behavioral willingness of the Chinese public (Wang Jilong & Lu Wanqiu, 2023). Others use the Chinese coastal public as experimental subjects, with global/local frames and gain/loss frames as independent variables, exploring the impact of various frames on public climate change mitigation behaviors (Wang Jilong & Zhong Yuan, 2024).

Table 1

Core Content of Climate Narrative Frames

Author/Year	Frame Type	Main Concept	Main Conclusion
Trumbo (1996)	Impact Narrative Frame	Consequences of climate change, discussing positive, negative, and controversial impacts.	Evokes public emotional resonance, strengthens Qinghai ecological migrants' cognition of low-carbon behavior issues.
Nisbet (2009)	Scientific Narrative Frame	Introduces history, factors, and scientific knowledge related to climate change.	Building factual basis through rigorous academic discourse helps Qinghai ecological migrants understand the scientific principles of low-carbon behavior transformation.
Nisbet (2009)	Action Narrative Frame	Encourages action participation, government response, and governance behaviors related to climate change.	Provides behavioral pathways for Qinghai ecological migrants, potentially triggering higher low-carbon action intention.
Myers (2012)	Political Narrative Frame	Emphasizes national commitments, international cooperation, and policy responsibilities.	Enhances perceived legitimacy of actions may strengthen institutional trust.



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

China's ecological migration implemented since the 21st century focuses on "protecting the natural ecology" and "improving human ecology," balancing the dual tasks of environmental protection and migrant poverty alleviation (Wu Yongliang & Zhang Mengyuan, 2017). Qinghai Province, as the "Water Tower of China," vigorously implements ecological migration projects. While effectively protecting ecology, it also influences the low-carbon behaviors of ecological migrants in ecologically fragile areas. The four frames mentioned above show differentiated effects among different audiences (see Table 1). Among them, the scientific narrative frame meets their demand for professional knowledge. The impact narrative frame awakens emotional identification with ecological protection. The action narrative frame provides participation pathways, and the political narrative frame endows them with policy legitimacy cognition. These four frames together construct a closed-loop influence mechanism of "cognition-emotion-action-institution." Based on this, this study primarily examines the impact of four narrative frames—impact, science, action, and political—on the low-carbon behaviors of Qinghai ecological migrants.

This study proposes the following hypothesis regarding the main effect of climate narrative types:

H1: Different climate narrative frames have a significant impact on the low-carbon behavioral willingness of ecological migrants.

The Mechanism of Climate Narrative Influence on Public Low-Carbon Actions under Different Cultural Backgrounds

Culture encompasses various forms, among which collectivism and individualism are the most widely discussed categories. Collectivist culture focuses on group or societal levels, interpersonal interdependence, etc.; while individualist culture emphasizes differences between individuals and others/groups, focusing on individual freedom, personal achievement, autonomy, independence, and uniqueness (Lee & Oyserman, 2009). Furthermore, collectivists and individualists have different social cognitive styles; the former consider social relationships and environmental factors more, while the latter consider abilities, efforts, and other personal factors more (Yan Jinglei & Chen Le, 2003). Since the 1990s, the cultural background of collectivism-individualism has been introduced into advertising and consumer research. Main research focuses on comparing different advertising appeal contents under these two cultural backgrounds (Kim & Markus, 1999), the processing and persuasiveness of different advertising appeal information by consumers in these two cultural backgrounds, and the determinants of purchase intention (Lee & Green, 1991). The dimension of collectivism-individualism cultural background provides inspiration for understanding the mechanism of different frames on public low-carbon actions from a cultural difference perspective.

H2: Ecological migrants under a collectivist cultural background have significantly higher low-carbon behavioral willingness than individuals under an individualist background.



The impact frame emphasizes the consequences of climate change. By stimulating the perception of threats to livelihoods, it may more easily trigger a sense of urgency in collectivist cultures (Degeling & Koolen, 2022). The political frame emphasizes policy responsibilities and institutional connections. By strengthening collective efficacy, its effect may be more significant in collectivist cultures. The scientific frame, based on data and authority, aligns with rational decision-making preferences and may be more persuasive in individualist cultures (Nakano & Hondo, 2023). Therefore, this study proposes the following hypothesis regarding the interaction between narrative type and cultural differences:

H3: Cultural background and narrative frame have a significant interaction effect, jointly influencing the low-carbon behavioral willingness of ecological migrants.

The Mechanism of Climate Narrative Influence on Public Low-Carbon Actions under Different Value Perceptions

Value perception has different classification standards, including environmental value, economic value, emission reduction value perception, etc. (Bochner, 1994). The Value-Belief-Norm theory suggests that values, perceived ability, and sense of responsibility also influence individual actual behavior (Maxwell & Delaney, 2004). Among them, economic value orientation may more easily stimulate short-term behavioral changes, while environmental value orientation may strengthen long-term sustainable behavioral motivation. Theories such as the Theory of Reasoned Action, Theory of Planned Behavior, Technology Acceptance Model, and Interpersonal Behavior Theory propose that an individual's behavioral intention is an important factor influencing their actual behavior, and behavioral intention is significantly influenced by behavioral attitude, subjective norms, perceived behavioral control, perceived ease of use, and perceived usefulness (Stern, Dietz, Abel, et al., 1999). However, these behavior change theories tend to focus on general individual behaviors and lack effective explanatory power for the specific, concrete behavior of ecological migrants' low-carbon actions. Therefore, this study intends to select value perception as a core factor influencing individual behavior based on general behavior theories and clarify its mechanism on the specific low-carbon action willingness of ecological migrants through experimental methods. Based on this, this study proposes the following hypothesis regarding the main effect of value perception:

H4: The type of value perception (environment-oriented/economic-oriented) of ecological migrants has a significant main effect on low-carbon behavioral willingness.

Within the dimension of economic value perception, the action frame may be more easily accepted by providing specific paths to economic benefits; within the dimension of environmental value perception, the scientific frame may more easily resonate through authoritative ecological data (Wang Jilong & Lu Wanqiu, 2024). Based on this, this study proposes the following hypothesis regarding the interaction between narrative type and value perception differences:



2025 ANPORA-APCA Annual Conference
November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

H5: Value perception and narrative frame have a significant interaction effect, jointly influencing the low-carbon behavioral willingness of ecological migrants.

RESEARCH DESIGN

Experimental Design

This study employs an online scenario-based experiment with two between-subjects designs: 2 (cultural background: collectivism/individualism) × 4 (narrative frame type: impact/science/action/politics) design and 2 (value perception: environmental perception/economic perception) × 4 (narrative frame type: impact/science/action/politics) design. The research explores how different climate narrative frames influence the low-carbon behavioral intentions of Chinese eco-migrants and examines the moderating effects of cultural background and value perception. The independent variables are narrative frame type, cultural background, and value perception, while the dependent variable is low-carbon behavioral intention. The experiment was conducted from March 1, 2025, to April 1, 2025.

Table 2

Specific Content of Experiment One and Experiment Two

Experiment Name	Design Type	Independent Variable 1	Independent Variable 2	Dependent Variable
Experiment 1	4 (Narrative Frame) × 2 (Cultural Background) Between-Subjects	Climate Narrative Frame Type	Cultural Background (Individual/Collective)	Low-Carbon Behavioral Willingness
Experiment 2	4 (Narrative Frame) × 2 (Value Perception) Between-Subjects	Climate Narrative Frame Type	Value Perception (Environmental/Economic)	Low-Carbon Behavioral Willingness

Experimental Participants

The Three Rivers Source region is located in the hinterland of the Qinghai-Tibet Plateau, including 21 counties across all administrative regions of Yushu, Golog, Hainan, and Huangnan Tibetan Autonomous Prefectures, and Tanggula Town in Golmud City, totaling 158 townships and 1214 administrative villages, with a total area of 395,000 square kilometers, accounting for 54.6% of Qinghai Province's total area. Among them,



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

Qinghai's migration projects mainly include the Yangtze River Source Village in Tanggula Town, Yushu, Huangnan, and Golog Tibetan Autonomous Prefectures. Based on this, the experimental subjects were ecological migrants from Qinghai Three Rivers Source National Park and surrounding areas, mainly from Yangtze River Source Village, Yushu City, Huangnan Prefecture, Golog Prefecture, etc., ensuring high representativeness. This study recruited 800 paid participants, randomly assigned to the 16 experimental groups across the two experiments, with 50 participants per group. Among them, 532 were male (66.5%), 267 were female (33.5%); 63.34% were aged 40 or below, 36.66% were aged over 40; 63.22% had relocated within the last 5 years or less, 36.78% had relocated more than 5 years ago.

Experimental Materials

The climate narrative frames used in this experiment were those commonly employed in news reports, specifically including four types: Impact Frame: Highlighting the negative impacts of climate change on human life and the environment. Scientific Frame: Emphasizing the scientific mechanisms, data evidence, and monitoring systems of climate change. Action Frame: Focusing on government policies, technical solutions, and individual participation pathways. Political Frame: Stressing national commitments, institutional construction, and international cooperation responsibilities. These four frames were based on reports about "China National Low Carbon Day." While keeping the theme consistent, the content of the reports was manipulated. All texts were sourced from real mainstream media reports, with narrative length controlled between 150-200 words to ensure experimental control validity.

For the manipulation of cultural background, it was divided into collectivism and individualism based on self-construal theory. This experiment used the pronoun circling method to prime cultural orientation. Participants read a text message about climate change, imagining themselves as an individual (individualistic construal) or as a member of a collective (collectivistic construal) engaging in low-carbon actions (Lee & Aaker, 2000). The priming material used first-person pronouns "I, my" or "We, our" for statements. After priming, participants were invited to read the experimental materials. To mask the experimental purpose and enhance information involvement, participants were told it was a public welfare activity and asked to improve the media report content.

For the manipulation of value perception, it was divided into environmental value orientation and economic value orientation. The priming method used situational simulation and case embedding. For the "Economic Value Perception" group, cases directly related to personal economic interests were provided, asking participants to evaluate the "economic payback period for purchasing energy-saving appliances." Pollution Environmental Value Perception" group, cases directly related to environmental pollution and governance were provided, asking participants to describe "how pollution



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

in their hometown river would affect daily life." After priming, participants were invited to read the experimental materials.

Experimental Procedure

This study used the Wenjuanxing platform to conduct online experiments. Participants were randomly assigned to the 16 experimental groups mentioned above. Before the experiment began, participants read and signed an electronic "Informed Consent Form," informed that "this experiment is anonymous, and results are for academic research only." First, participants read the specific scenario presented by the experiment, showing news report materials related to culture or value orientation, for example: "At the 28th UN Climate Summit, China announced it would advance its renewable energy installation target to 2027. This commitment increases the probability of achieving the Paris Agreement temperature control goal by 23% (UNEP estimate)." Subsequently, participants read news report materials with different frames. They were assigned to read the 4 types of framed reports according to their "Individualism/Collectivism" and "Economic Value Perception/Environmental Value Perception" groups and invited to answer relevant questionnaires. The experimenter sent links to participants, who used mobile phones to view experimental materials and answer questionnaires, simulating the dissemination context of climate reports. After removing invalid samples, 16 groups were formed. Participants then completed manipulation check items to detect priming and frame recognition effects and filled out the behavioral willingness scale and demographic information. Each participant only participated in one experiment. The order of experimental materials was balanced through a pre-test to avoid order effects. The answering process was completed online anonymously to simulate a real news reading scenario. The entire experiment took about 10 minutes. Each participant received remuneration upon completion.

Variable Measurement

All variables in this study were measured using Likert 5-point scales, where 1 indicated "Strongly Disagree" and 5 indicated "Strongly Agree." If other meanings applied, they were specified under each variable.

Cultural Background

The measurement for cultural background manipulation was adapted from the Chinese version of the Self-Construal Scale (CSC) revised by Pan Li and Lü Wei (2013). It included 5 "Collectivism" items (e.g., "It is important for me to respect collective decisions") (Cronbach's $\alpha = 0.864$, $M = 3.795$, $SD = 0.88$) and 5 "Individualism" items (e.g., "It is important for me that my personality traits are not constrained by others") (Cronbach's $\alpha = 0.863$, $M = 3.560$, $SD = 1.03$). The scale reliability was good.



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

Value Perception

Adapted from the scale developed by Jiang Linli (2018) measuring rice farmers' attitudes towards low-carbon production and perceived behavioral efficacy. It included 5 "Environmental Value Perception" items (e.g., "I feel obligated to reduce environmental pollution, even if it requires some economic cost") (Cronbach's alpha $\alpha = 0.89$, $M = 3.698$, $SD = 0.96$) and 5 "Economic Value Perception" items (e.g., "I think economic development should be prioritized; environmental protection can come later") (Cronbach's alpha $\alpha = 0.83$, $M = 3.56$, $SD = 1.00$). The scale reliability was good.

Low-Carbon Behavioral Willingness

The low-carbon behavioral willingness scale drew on the dimensions of everyday climate action intention measurement proposed by Degeling and Koolen (2021), emphasizing the embeddedness, feasibility, and future participation willingness of behaviors in daily life. Specific questions included 5 items such as "Eat local or seasonal food, eat less meat, avoid waste." The scale reliability was good (Cronbach's alpha $\alpha = 0.85$, $M = 3.54$, $SD = 1.41$).

RESEARCH RESULTS

Manipulation Check

To determine the effectiveness of the experimental manipulations, independent sample t-tests were conducted for cultural background and value perception. Results showed that participants' perception of cultural background differed significantly ($t = 2.42$, $p < .05$), with the collectivism group ($M = 3.80$, $SD = 0.88$) having significantly higher self-construal levels than the individualism group ($M = 3.56$, $SD = 1.03$). Participants' perception of economic value differed significantly ($M = 3.560$, $SD = 1.00$, $t = 2.87$, $p < .05$, Cohen's $d = 0.41$). Regarding the manipulation of the independent variable (narrative frame), a scale measuring climate change perception and action willingness assessment under different narrative frames was used to check frame recognition. Results showed Impact Frame ($M = 3.20$, $SD = 0.50$), Scientific Frame ($M = 3.45$, $SD = 0.45$), Action Frame ($M = 3.60$, $SD = 0.40$), Political Frame ($M = 3.10$, $SD = 0.55$). The experimental manipulations passed the checks.

Hypothesis Testing

Experiment 1: The Influence of Narrative Frame and Cultural Background on Low-Carbon Behavioral Willingness

A two-way ANOVA was conducted with low-carbon behavioral willingness as the dependent variable. Results showed that narrative frame had a significant main effect on low-carbon behavioral willingness ($F = 2.89$, $p < .05$, $\eta^2 p = 0.022$). Hypothesis H1 was



supported. Further LSD multiple comparisons revealed that the differences among the four climate narrative frames in triggering low-carbon behavioral willingness were generally limited. Only the difference in willingness scores between the Action frame and the Impact frame reached statistical significance ($p < .05$, -0.23 ± 0.133), with the Action frame scoring higher ($M = 3.62$, $SD = 0.93$) compared to the Impact frame ($M = 3.38$, $SD = 0.97$). No significant differences were found in comparisons between other frames, including: Action frame vs. Scientific frame ($p \geq .05$, -0.37 ± 0.132); Action frame vs. Political frame ($p > .05$); Scientific frame vs. Impact frame ($p > .05$, -0.13 ± 0.133); Scientific frame vs. Political frame ($p > .05$, -0.22 ± 0.133); Impact frame vs. Political frame ($p > .05$, -0.88 ± 0.133).

The main effect of cultural background on low-carbon behavioral willingness was significant ($F = 0.309$, $p < .05$, $\eta^2p = 0.03$). Hypothesis H2 was supported. Specifically, individualism ($M = 3.59$, $SD = 0.95$) had significantly higher low-carbon action willingness than collectivism ($M = 3.27$, $SD = 0.90$). The interaction effect between narrative frame and cultural background on low-carbon behavioral willingness was not significant ($F = 1.78$, $p > .05$, $\eta^2p = 0.066$). Hypothesis H3 was not statistically supported.

Table 3

Summary of ANOVA Results for the Effects of Independent Variables on the Dependent Variable

	Narrative frame			Cultural Background			Narrative frame ×Cultural Background		
	F	p	η^2p	F	p	η^2p	F	p	η^2p
Low-carbon behavioral intention	2.890	0.035*	0.022	11.654	0.001**	0.029	1.784	0.150*	0.014

*Note: Significance is indicated by *, where * $p < .05$, ** $p < .01$

Experiment 2: The Influence of Narrative Frame and Value Perception on Low-Carbon Behavioral Willingness

An ANOVA was conducted with low-carbon behavioral willingness as the dependent variable. The main effect of narrative frame on low-carbon behavioral willingness was significant ($F = 3.62$, $p < .05$, $\eta^2p = 0.03$). LSD multiple comparisons showed: Scientific frame vs. Impact frame significant ($p < .05$, 0.43 ± 0.139); Action frame vs. Impact frame significant ($p < .05$, 0.27 ± 0.137); Scientific frame vs. Action frame significant ($p < .05$, 0.43 ± 0.139); Scientific frame vs. Political frame not significant ($p > .05$, 0.17 ± 0.139); Action frame vs. Political frame not significant ($p > .05$, 0.14 ± 0.137); Impact frame vs. Political frame not significant ($p > .05$, -0.26 ± 0.137).



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

Further analysis revealed a significant interaction effect between narrative frame and value perception ($F = 13.016, p < .05$), supporting Hypothesis H5. To further analyze the interaction, simple effect analysis was conducted:

Under the environmental value orientation condition, the low-carbon behavioral willingness of the Impact frame group ($M = 2.83, SD = 0.91$) was significantly lower than that of the Political frame ($M = 3.08, SD = 0.91$), Action frame ($M = 3.75, SD = 0.91$), and Scientific frame ($M = 3.76, SD = 0.65, p < .05$).

Under the economic value orientation condition, the low-carbon behavioral willingness of the Action frame group ($M = 3.13, SD = 0.98$) was significantly lower than that of the Scientific frame ($M = 3.43, SD = 0.92$), Impact frame ($M = 3.50, SD = 1.16$), and Political frame ($M = 3.77, SD = 0.89, p < .05$).

Table 4

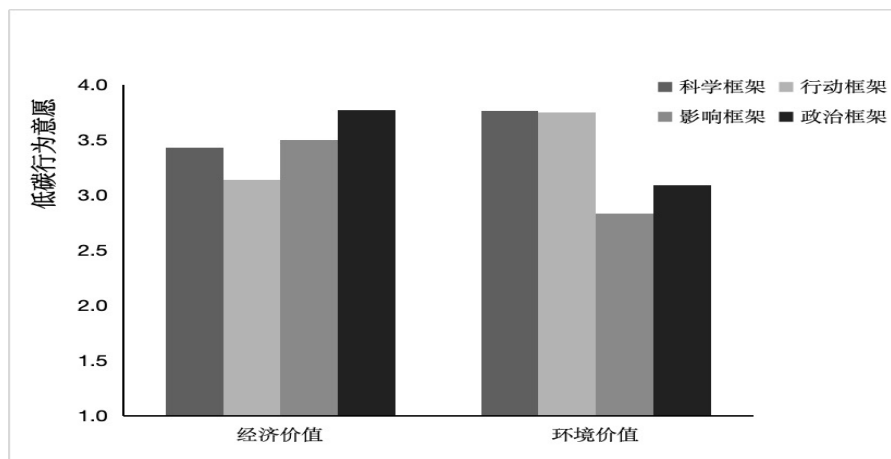
Summary Analysis of Variance (ANOVA) for Effects of Independent Variables on Low-Carbon Behavioral Intention

	Narrative frame			Cultural Background			Narrative frame ×Cultural Background		
	F	p	η^2p	F	p	η^2p	F	p	η^2p
Low-carbon behavioral intention	3.622	0.013	0.027	1.156	0.283	0.003	13.016	0.000***	0.092

Note: Significance levels are denoted with asterisks: * $p < .05$, ** $p < .01$.

Figure 1

Interaction Effect of Value Perception and Narrative Framing on Low-Carbon Behavioral Intention





2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

CONCLUSIONS AND DISCUSSION

This study systematically explores the effectiveness of different climate narrative frames under varying cultural backgrounds and value perceptions regarding the low-carbon behavioral willingness of ecological migrants through two 2×4 between-subjects experiments. The aim is to reveal strategic adaptation pathways for climate communication targeting specific groups. The main findings are as follows:

Interpretation of Key Findings and Mechanism Analysis

This study confirms the main effect of narrative framing on eco-migrants' low-carbon behavioral intentions, with the action frame demonstrating greater mobilizing efficacy than the impact frame. Further analysis reveals a significant interaction between individuals' value perception types and framing effects. Specifically, in collectivist cultural contexts, social normative pressure and group identification mechanisms significantly strengthen climate action intentions. A sense of group belonging motivates individuals to view low-carbon behaviors as a crucial way to fulfill collective obligations, and this cultural trait amplifies the motivating effect of policy narratives and action frames. In contrast, individualist cultures emphasize autonomous decision-making, where behavioral change relies more on clear cost-benefit arguments, necessitating communication strategies that prioritize pragmatic analysis over moral appeals.

Individuals' environmental value perception orientation and economic value perception orientation constitute dual cognitive pathways for information processing. Ecologically conscious groups tend to interpret climate information from a holistic perspective, with their behavioral decisions driven by long-term ecological benefits and higher receptivity to scientific frames. Such groups are more responsive to value-laden symbols like "intergenerational responsibility" and "ecological justice," though institutional support is required to sustain behavioral persistence. Conversely, groups focused on material benefits exhibit a pronounced results-oriented tendency, requiring explicit economic incentives and risk-aversion mechanisms for behavioral change (Lück, Wessler, Wozniak, & Lycarião, 2018). These individuals are more sensitive to short-term gain promises in action frames but may exhibit behavioral inconsistency due to policy fluctuations or delayed benefits.

The main effect of cultural background is also significant, with low-carbon behavioral intentions generally higher among individualist groups than collectivist groups, possibly due to their stronger attribution of behavioral responsibility to the individual. However, the experiment did not reveal a significant interaction between narrative framing and cultural background, suggesting that while cultural traits influence overall behavioral intention levels, they do not structurally interfere with frame recognition or information response patterns.

Groups with an environmental value orientation exhibit higher behavioral intentions when exposed to scientific and action frames, indicating their greater



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

responsiveness to long-term ecological benefits, moral responsibility, and intergenerational equity. In contrast, groups with an economic value orientation respond more positively to political and scientific frames but show the lowest acceptance of action frames, suggesting that their behavioral intentions rely more on cost-benefit clarity and risk-controlled information stimuli. This sensitivity to narrative alignment reflects selective reception and processing pathways for climate communication.

Existing research suggests that narrative frames across cultures may share certain universal logics, enabling these structures to transcend cultural boundaries (Jones & McBeth, 2010). With the advancement of globalization, journalism has developed convergently, leading to strong similarities in climate issue framing across nations and forming the foundational logic of global climate communication. When processing scientific information, the public does not rely solely on evidence; personal beliefs and affective worldviews also play a powerful role. Although direct interaction effects are not significant, cultural background may influence narratives through subtler pathways, including narrator stance selection and emotional expression patterns.

Additionally, the experimental subjects in this study were drawn from the same cultural sphere. Due to China's "family-nation isomorphism" narrative tradition and Confucian cultural influence, inter-group cultural differences among participants may have been attenuated, potentially diluting the interaction effect between narrative framing and cultural background.

Dialogue with Existing Literature and Divergence Analysis

This study reveals that collectivist cultures can partially substitute the function of subjective norms through the internalization of social norms, offering a new perspective for research on vulnerable populations' behavior. The independent main effect of collectivist cultural background on low-carbon behavioral intentions aligns with the classical findings of Kim and Markus (1999) in cultural psychology. However, unlike the cultural-framing interaction model proposed by Aaker and Williams (1998), this experiment did not find a significant interaction between narrative framing and cultural background, challenging Lee and Green's (1991) hypothesis that collectivist groups are more receptive to political frames.

This study is the first to uncover the differential moderating pathways of economic value perception versus environmental value perception in narrative framing effects. It demonstrates that economic-value-oriented individuals rely more on cost-benefit calculations in decision-making, whereas environmental-value-oriented groups prioritize ecological ethics. This provides a moderating mechanism explanation for Bamberg and Möser's (2007) personal moral norm-pro-environmental behavior model.

Furthermore, the study finds that the selection of narrative frames in climate communication significantly influences eco-migrants' low-carbon behavioral intentions, with different frames operating through distinct cognitive processing pathways. Action-



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

oriented narratives, by providing concrete and feasible behavioral solutions (e.g., low-carbon technology guidelines, policy incentives), effectively lower the cognitive barriers to adopting new behaviors. These narratives not only clarify the operational pathway for behavioral change but also stimulate short-term motivation through dual drivers of economic benefit promises and risk aversion. Compared to narratives emphasizing scientific principles or political commitments, action frames—due to their "solution visibility" characteristic—are more readily accepted by migrant populations with limited education and high livelihood pressures.

For individuals with an environmental value orientation, scientific frames trigger intrinsic motivation to protect ecosystems, making them more inclined toward long-term sustainable behavioral changes. However, the complexity of scientific data and the cognitive load of technical terminology limit their effectiveness among low-science-literacy groups. Political frames situate individual behavior within national strategic narratives, leveraging collective identity symbols such as "great power responsibility" and "global contribution" to enhance eco-migrants' value perception of low-carbon actions. Yet, in decision-making contexts dominated by economic value perception, political frames may be perceived as "abstract commitments," with their motivational effects constrained by individuals' real-world perceptions of policy implementation.

Impact frames emphasizing climate crisis consequences can evoke emotional resonance, but their effectiveness is highly context-dependent, requiring synchronous provision of accompanying solutions. Overly dramatized ecological disaster narratives may trigger defensive psychological mechanisms, leading audiences to employ cognitive strategies such as "risk distancing" or "consequence minimization" to weaken behavioral change motivation.

To address these challenges, in migrant communities where collectivist culture dominates, action-oriented practical narratives should be prioritized, embedded with group identity symbols to amplify communication effects. For groups with divergent value perceptions, targeted content adaptation is necessary: reinforcing authoritative expressions of scientific consensus for environmental-value-oriented groups, while highlighting tangible benefits of low-carbon actions for economic-value-oriented groups.

Theoretical and Practical Implications

This study enriches existing research on the effects of narrative framing in climate communication. Specifically, it not only confirms the superior behavioral-transformation effect of action frames proposed by Nisbet (2009) but also reveals the group-dependent nature of this effect. Contrary to Trumbo's (1996) assertion about the universality of impact frames, this study finds that eco-migrants' sensitivity to climate consequences is moderated by livelihood vulnerability, with defensive cognitive strategies weakening the efficacy of risk narratives—supporting Myers' (2012) argument that political frames must be embedded in local governance practices.



2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

Unlike Katapally's (2019) finding of a scientific frame advantage among general citizen groups (Bamberg & Möser, 2007), this study confirms that this frame is only effective among environmental-value-oriented individuals, echoing van der Linden's (2015) conclusion on the "cognitive threshold" in information reception (Vander Linden, Maibach, & Leiserowitz, 2015).

The study demonstrates that eco-migrants' low-carbon behavioral transformation depends not only on information design but is also systematically moderated by deep-seated cultural-psychological and cognitive orientations. This provides critical insights for optimizing climate communication strategies for vulnerable populations.

CONCLUSION

The core contributions of this study are threefold: First, it expands the demographic boundaries of climate communication research by focusing on eco-migrants; second, it introduces cultural/value-based moderating mechanisms into framing effect models; and third, it enhances the localized explanatory power of climate narratives by incorporating ethnic discourse and policy narrative contexts. However, this study also has several limitations. First, the measurement of cultural background factors was constrained—only collectivism and individualism were examined, without deeper exploration of the interplay between traditional Chinese cultural values (e.g., Tibetan ecological ethics) and modern collectivism. Additionally, due to variations in participants' scientific literacy and potential ambiguities in Han-Tibetan translation, measurement reliability may have been affected. Second, the typology of climate narrative frames primarily emphasized informational content, while differences in narrative form (e.g., visual presentation, colloquial expression) and their communicative effects remain underexplored. Third, the geographical scope of participant selection was limited, primarily covering the Yangtze Source Village in Tanggula Town, Yushu, Huangnan, and Golog Tibetan Autonomous Prefectures. Future research could extend to other eco-migrant resettlement areas, such as Yunnan and Ningxia, to enable cross-regional comparative analysis. Fourth, while pretesting ensured comprehension and credibility of experimental materials, the text-image presentation format may still have influenced audience perception. Subsequent studies could incorporate multimodal approaches, such as video stimuli or narrative interviews, to enhance ecological validity. Finally, behavioral intention measurements in experimental settings cannot fully replicate the complexity of real-world decision-making. Future work should investigate the mechanisms of external factors, such as policy enforcement efficacy and social network constraints, to better capture the dynamics of behavioral adoption.



2025 ANPOR-APCA Annual Conference
November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

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2025 ANPOR-APCA Annual Conference

November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

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