

# Low-Carbon Travel Motivation and Constraint

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Carbon dioxide emissions resulting from travel and tourism activities account for 5–14% of the world's total carbon dioxide emissions. They are rising at a rate of 3.2% per year. Transportation (e.g., aircraft, cars, and boats), accommodation, and tourism activities represent the primary means tourism consumes energy and produces carbon emissions. Jarratt and Davies have asserted that tourists could slow the rise in carbon emissions, by consuming less fuel and reducing their carbon emissions. Thus, promoting low-carbon travel has become a topic of interest to the tourism industry and academic circles over the past ten to twenty years.

low-carbon travel motivation

low-carbon travel constraint

low-carbon travel behavior

## 1. Low-Carbon Travel Motivation

Travel motivation is a broad and complex concept. McIntosh and Goeldner <sup>[1]</sup> divided primary travel motivations into four types: physical motivation, cultural motivation, interpersonal motivation, and prestige motivation. Pearce et al. <sup>[2]</sup> listed ten primary tourist motives. Experience the environment, rest and relax in a comfortable site, pursue special interests or skills, be healthier, and possess a strengthened physique, are push or internal motivation. Interact with locals, understand the local culture, improve family life, gain self-protection, gain security, be respected, win social status, and reward selves are pulled or external motivation.

As visitors in different travel situations may hold different motivations, researchers have used many aspects to discuss tourism motivation and develop different travel motivation scales. For example, rural tourists are generally motivated by relaxation, social interaction, education, family gatherings, novelty, and excitement <sup>[3]</sup>. Cruise tourists are usually motivated by self-esteem and social identity, exploration and relaxation, learning and discovery, novelty and stimulation, and socialization and cohesion <sup>[4]</sup>. Slow travelers are generally motivated by relaxation, introspection, escape, novel pursuit, participation, and discovery <sup>[5]</sup>.

Although these researchers have mainly used factor analysis or cluster analysis to determine the various travel motivations of their subjects, since the nature of travel is a series of travel activities to satisfy people's inner social-psychology needs or the external cultural seeking of a destination, tourist motivation has tended to revolve around the concepts of "pull" and "push" <sup>[6]</sup>. Most discussions in tourism have applied the theory of push-and-pull motivation when explaining why people travel <sup>[7][8][9][10]</sup>. Therefore, the push and pull factors of Crompton <sup>[6]</sup> provide the main theoretical framework in this study.

Researchers have proposed numerous factors that motivate tourists to engage in low-carbon travel. However, these explanations are scattered throughout the literature, have not been integrated into a low-carbon travel motivation construct, and are inconsistent with general tourism motivations. To address these discrepancies, this study applies the push and pull theory <sup>[11]</sup> to explore the factors that motivate tourists to participate in low-carbon travel.

## 1.1. Push Factors

Push motivation is a psychosocial need that motivates individuals to travel, and that motivation drives or guides individual travel choices <sup>[12]</sup>. Common push factors include knowledge, relaxation, family harmony, escape, self-discovery, prestige, and social interaction. According to the target framework theory of Lindenberg and Steg <sup>[13]</sup>, the researchers can explore motivation related to environmental protection behavior from three aspects: morality, emotion, and access.

Moral motivation refers to tourists participating in environmental protection behavior based on their social awareness of green products and service consumption as well as a positive self-image. Tourists choose low-carbon destinations because of environmental appeal or green policies promoted by the tourism industry <sup>[14]</sup>. When Horng et al. <sup>[14]</sup> applied self-completion theory, they discovered that consumers' inner moral identity and symbolic moral identity drove them to choose low-carbon options. Several of the subjects interviewed by Dickinson et al. <sup>[15]</sup> said they decided to travel by train out of concern for the environment. Horng et al. <sup>[16]</sup> discovered that tourists make eco-friendly decisions due to their sense of responsibility for the environment. Thus, morality appears to be a factor that motivates tourists to engage in low-carbon travel.

Emotional motivation mainly refers to the joy <sup>[17]</sup> and happiness that tourists receive from altruistic behavior <sup>[18]</sup>. Nawijn and Peeters <sup>[19]</sup> asserted that green consumers are motivated by altruism and the resulting joy. Due to expected benefits for the environment and the next generation, visitors consume low-carbon products and services from green restaurants and low-carbon players <sup>[20]</sup>. Kuo and Dai <sup>[21]</sup> have determined that, once they have recognized that travel hurts the environment, tourists begin to select low-carbon travel options to sustain the environment and recreational resources of the destination, lessening the environmental problems caused by individuals and society. Applying protection motivation theory, Horng et al. <sup>[16]</sup> determined the ESCR behavior of tourists motivated by threat assessments, such as environmental risk severity and vulnerability, and adaptation assessments, such as response effectiveness and self-efficacy. The study showed that tourists engage in ESCR tourism because they believe ESCR behavior helps protect the environment. Thus, the desire to preserve the environment of a destination and preserve its recreational resources for the next generation appears to be one reason tourists choose low-carbon travel.

Access motivation refers to tourists' desire to improve physical fitness and acquire new knowledge. Regarding physical fitness, Garrido-Cumbrera et al. <sup>[22]</sup> used focus groups to determine that tourists who choose to walk or cycle are driven by a strong motivation to exercise. Travelers interviewed by Kuo and Dai <sup>[21]</sup> said that to promote their health, they would shift from general tourism activities to low-carbon travel activities such as cycling, walking,

and eating more vegetables and less meat. As for learning, tourists are motivated to acquire new ESCR knowledge. Horng et al. [16] modified the tourist learning motivation scales of Ballantyne et al. [23] and proposed that tourists are motivated to participate in ESCR festivals. Motives include: acquiring new ESCR practices, obtaining more ESCR information, expanding more interesting ESCR topics, inspiring the willingness to implement ESCR, and discovering new ESCR methods. Therefore, personal fitness and the desire to acquire new knowledge motivate tourists to participate in low-carbon travel.

## 1.2. Pull Factors

Push motivations are usually intrinsic, whereas pull motivations are external and are related to destination choice, destination traits, attractions, and attributes. Pull factors attract people to destinations such as sunny beaches or snowy mountains and influence the perceptions and expectations of travelers. Common pull factors are natural and historical environments, cost, convenience, safety, accessibility, novelty, and education [6].

ESCR characterizes low-carbon travel. Generally, tourists engage in low-carbon travel activities to directly reduce carbon emissions and their carbon footprint while on holiday [21][24]. Moreover, visitors are attracted by low-carbon travel-related food, transportation, and accommodations. Researchers in the hotel [14] and restaurant industries [20] have confirmed that visitors generally favor companies with environmental certifications. Eco-friendly policies and actions, such as not changing sheets and towels daily, garbage sorting, and resource recycling, can also attract tourists. Tourists may also seek alternative methods to protect the environment. Thus, tourists are willing to accept ESCR technologies to engage in ESCR activities.

Some tourists reduce their travel by plane once they understand the importance of reducing their carbon footprint [15]. Garrido-Cumbrera et al. [22] discovered that tourists often walk or cycle to enjoy the outdoors. Exposure to eco-friendly products, facilities, and food also affects travelers' ESCR behavior during a trip. For example, hotels might offer ESCR rooms and facilities [14]. Low-carbon tourists seek simple packaged products and locally produced fresh foods [25]. Finally, discounts to incentivize eco-friendly consumption also motivate travelers to change their behaviors [25][26]. Each of these factors can help achieve ESCR.

Research by Kuo and Dai [21] revealed that past low-carbon travel experiences substantially influence future decisions to participate in low-carbon travel. For example, some travelers choose to engage in low-carbon activities such as walking or cycling because past experiences were relaxing and enjoyable [22]. Horng et al. [14] showed that consumers' past dining experiences could stimulate green consumption behavior in line with ESCR. Chen [26] pointed out that travelers who have previously stayed in green hotels make green accommodation decisions based on their past accommodation experiences. Thus, the characteristics that attract tourists to low-carbon travel include the ESCR characteristics and measures of the trip, residence, food, shopping, and tourists' past travel experiences.

## 1.3. Summary

Empirical research has focused on identifying tourism motivation factors and measurement scales. A variety of different motivational factors have been used to explain the behavior of visitors in different travel situations. In the past, researchers proposed a variety of motivations to explain why tourists engage in low-carbon travel. However, no research has integrated this into the low-carbon travel motivation construct. Understanding tourists' low-carbon travel motivations will help us identify the factors that drive tourists to participate in low-carbon travel. Industry operators will be better able to plan low-carbon travel activities to maximize tourist satisfaction, inspire and change attitudes, and reduce environmental stress [16]. Thus, both tourists and operators can more effectively develop low-carbon travel to achieve sustainability.

## 2. Low-Carbon Travel Constraint

Travel constraint is a multifaceted concept that refers to the factors that prevent or reduce the frequency, proportion, or fun of individuals engaging in specific activities [27][28]. Khan et al. [29] argued that travel constraint is a crucial factor that prevents people from starting or continuing to travel. Wen et al. [4] defined travel constraints as factors that inhibit travel continuity, lead to the inability to travel, fail to maintain or increase travel frequency, and negatively influence travel quality. Karl et al. [30] expanded the definition to obstacles that hinder the continuing use of leisure services, the inability to participate in new activities, the inability to maintain or increase the frequency of participation, and the negative effect on leisure experience quality.

There are a few classic conceptual models of barriers to leisure participation. The leisure constraints model developed by Iso-Ahola and Mannell [31] placed the individual in the social environment, but did not explicitly indicate the process by which barriers may operate beyond the individual. This paradigm of leisure constraints also failed to anchor these constraints within the context of the preference–participation relationship [28]. To understand the barriers or reasons that prevent people from traveling, the researchers should, comprehensively, consider the tourists' perceived constraints or switching barriers. The most common and comprehensive framework in leisure research is the three-dimensional constraint construct proposed by Crawford and Godbey [32] and Crawford et al. [33]. This model assumes that constraints could be dynamic and intervening factors that affect an individual's participation and preference [34].

Tan [35] explained that research on leisure barriers and travel constraints has often been based on a model of intrapersonal constraint, interpersonal constraint, and structural constraint. Crawford et al. [33] asserted that an individual's intrapersonal constraints are related to their mental state, including personality traits, attitudes, beliefs, and emotions. Interpersonal constraints are determined by interactions with friends, family, colleagues, neighbors, and others. Structural constraints prevent people from acting, including economic resources, available time, and accessibility. Therefore, the low-carbon travel constraint base is also in line with Crawford et al.'s [33] model. Given the complex nature of travel constraints, researchers often use the three-dimensional leisure constraint framework to explore the obstacles of tourists in different travel situations. These include essential natural tourism [36] and cruise tourism [4]. Adopting factor analysis, many travel scholars have confirmed this three-dimensional leisure constraint framework to be effective and reliable [37].

In the low-carbon travel context, researchers e.g., [21][38] have investigated the constraints of low-carbon travel. However, the factors that hinder tourists from participating in low-carbon travel are scattered throughout the literature and have yet to be integrated into a low-carbon travel constraint construct. According to McKercher et al. [24], less than 4% of Hong Kong residents surveyed have adopted low-carbon travel behavior. Juvan and Dolnicar [39] pointed out that even the best intentions of tourists might not be enough to leverage care for the environment into eco-friendly actions. Even though low-carbon travel reduces carbon emissions from travel activities and lessens the adverse effects on the environment, tourists are not always willing to engage in low-carbon travel. To examine the specific reasons that people do not participate in low-carbon travel, this study adopts the three-dimensional travel constraint framework proposed by Crawford and Godbey [32] and Crawford et al. [33]. In addition, the researchers add the concept of the “not a travel option” to explore low-carbon travel constraints.

## 2.1. Intrapersonal Constraints

Poor health and low-carbon travel awareness are the most common intrapersonal constraints. The subjects of Kuo and Dai [21] believed that poor personal health, lack of an environmental sustainability concept, and lack of low-carbon travel information prevent them from engaging in low-carbon travel. Dickinson et al. [40] interviewed slow travelers on low-carbon travel, and most respondents had an insufficient understanding of climate change and, even, doubted the scientific basis. According to Horng et al. [16], international tourists to Taiwan generally do not believe that tourism and related activities are seriously harmful to the environment. Besides, travelers may doubt that individual low-carbon travel can influence climate change [41]. Subjects of Dällenbach [38] argued that an individual's actions to reduce carbon emissions are inconsequential in a global context.

Along with poor health and lack of awareness, another cause of intrapersonal low-carbon travel constraints is tourists' unwillingness to sacrifice general tourism's advantages and personal travel benefits. Respondents of Dällenbach [38] believed that holidays are essential and are benefits that should not be restricted. Dickinson et al. [15] pointed out that tourists would continue to use air travel. Most travelers find it difficult to escape from a high-carbon lifestyle while traveling [41], choosing to act responsibly at home or in other areas [40].

## 2.2. Interpersonal Constraints

Tourism research has determined a lack of friends as the primary interpersonal constraint [36][37]. However, only a few studies have mentioned the interpersonal constraint of lack of friends in the low-carbon travel context. For example, Dickinson et al. [15] pointed out that airline tourists are influenced by family and friends and do not choose low-carbon transportation. The primary interpersonal constraint in low-carbon travel is that tourists believe responsibility lies with others.

According to Dällenbach [38], most tourists believe that governments, businesses, and other countries are the main contributors to climate change. Governments' continued expansion of airports has raised doubts regarding the government's determination that people will travel less. The tourism industry has not responded to climate change within its boundaries but has, instead, passed it on to consumers. Therefore, Becken [42] pointed out that tourists

believe that reducing carbon emissions is a public, rather than a personal, responsibility. This view has led tourists to be more inclined to spend energy on travel. Therefore, besides a lack of friends, tourists' interpersonal low-carbon travel constraints also include the belief that other parties bear a greater ESCR responsibility.

### 2.3. Structural Constraints

The characteristics of low-carbon travel, including short-distance travel, less travel, and more extended stays at destinations, are different from general travel planning and are the factors tourists consider most <sup>[15][43]</sup>. Since low-carbon travel seeks to reduce the high-carbon behavior of available tourism (such as air travel), many tourists believe that engaging in low-carbon travel is difficult, uncomfortable, and inconvenient <sup>[21][44]</sup>.

The structural constraints of low-carbon travel are that its planning and arrangement are different from general tourism. Although all survey participants are aware of climate change, they lack explicit action means. Moreover, many people firmly believe that they are not responsible for carbon emissions related to tourism travel. To a large extent, travelers are limited by tourism products. For example, if it is challenging to take a bicycle on a train, but it is easy to take a bike on low-cost airlines, low-carbon bicycle travelers may engage in high-carbon aircraft travel <sup>[40]</sup>.

### 2.4. Not a Travel Option

Many studies have interviewed travelers who generally do not consider alternative transportation on reducing airplane tours <sup>[15][38][40]</sup>. Dällenbach <sup>[38]</sup> pointed out that tourists believe that the price and time of traveling on trains are not as valuable as travel by air. Traveling by plane is the preferred and customary tourist choice, and low-cost airlines enable people to travel more overseas. Dickinson et al. <sup>[15]</sup> pointed out that aviation tourists generally have no other transportation options, and, therefore, low-carbon travel may not be a tourist's first option.

### 2.5. Summary

Travel constraints have been studied extensively in the field of tourism. Although many tourists refuse to embrace low-carbon travel, studies have not integrated the various constraints into a construct of low-carbon travel constraint. Therefore, this study applies the three-dimensional constraint architecture, proposed by Crawford and Godbey <sup>[32]</sup>, to clarify the low-carbon travel constraint. Researchers believe that tourists' low-carbon travel constraints explain why tourists with strong low-carbon travel awareness do not engage in low-carbon travel. Helping them overcome those constraints can encourage them to adopt low-carbon travel. In addition, given that travel constraints have been used as variables in the tourism market, the development of LCTCS allows researchers to precisely measure the obstacles preventing tourists from engaging in low-carbon travel and segmenting the low-carbon travel market <sup>[45]</sup>.

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